The International Journal of Business Management and Technology, Volume 5 Issue 5 September–October 2021
ISSN: 2581-3889

Research Article Open Access

Factors Affecting Project Performance in Rwanda: Case Study of Bugesera Airport Construction

Sarah Ufitamahoro
Masters student, University of Kigali-Rwanda

Abstract: *Project failures are increasingly reported around the globe and achieving success of construction project is becoming extremely difficult in today's turbulent environment. Performances of construction project are affected by different factors which lead the project to run over budget, behind schedule and fail to meet the intended needs. The study assessed factors affecting project performance in Bugesera airport construction, Rwanda. The study was guided by theory of constraints and closed ended questionnaire was use to collect data. The findings revealed that contractor's competence and stakeholders' participation positively and significantly affects project performance (β = 0.782, $p<0.05$; β = 0.629, $p<0.05$). The study concludes that contractor's competence and stakeholder's participation affected project success. The study recommends that there should be continuous coordination and proper relationship management between all stakeholders involved in the project and proper channels should be used to solve problems during the project life.*

Keywords: Contractor's competence, Project performance, Stakeholders' participation and Theory of Constraints

I. INTRODUCTION

1.1 Background

Despite the great relevance of individual performance and the widespread use of project performance as an outcome measure in empirical research, relatively little effort has been spent on clarifying the performance concept in construction projects. The construction process is a very complex undertaking because it involves many different activities as well as participants from initial planning through execution (Gray & Larson, 2008). The requisite tasks, and the roles and responsibilities of the owner, architect engineers, construction managers, contractors, and subcontractors can be organized in a number of different ways to deliver a construction project. The construction industry deals with large number of players who have massive effects on a nation's economy. The construction industry plays a fundamental role in the development of a nation and helps in meeting one of the society's basic needs of mobility. For a construction project to be considered as successful it must meet certain performance measures such as timely completion, within budget as well as satisfying all the stakeholder's needs in the project. The absence of reworks as well as 'fitness of purpose' for the occupiers has also been considered as project success (Pidd, 2012). Construction industry is complex in nature because it involves large number of project stakeholders as Consultants, Clients, Contractors, stakeholders, shareholders and regulators to achieve a successful completion of a project. Regardless of this complexity, the construction industry plays a major role in the development and achievement of project performance in the society (Enshassi *et al*., 2009).

Memon, Rahman and Azis, (2012) observed that delays and cost overruns are the most frequently occurring issues in construction projects worldwide. They further stressed that this trend in delay and running over-budget in construction projects is more severe in developing countries where these slippages sometimes exceeds 100% of the anticipated cost of the project. Owolabi *et al.,* (2014) indicated that seven out of ten public funded construction projects in Nigeria suffered delays in their execution. In Ghana, Frimpong *et al.,* (2003) reported that 75% of the projects in Ghana exceeded the original project schedule. Similarly in Kenya, Kivaa (2001), found that delays are common and one of the causes of poor schedule performance in construction projects in Kenya is the inadequate initial contract periods. Hence, like other developing countries in the world, Rwanda's construction industry particularly public funded projects face a lot of challenges such as the delay to complete the project in time, the expenditure exceeding the budget, and over dependence on foreign workers

Construction project failures are increasingly reported around the globe and achieving success of construction project is becoming extremely difficult in today's turbulent environment (Silva *et al.,* 2016). Juliet & Ruth (2014) also argued that the overall success of a project is determined to a large extent by the proper management of the resources which are considered as an essential aspect of project implementation. They went further to say that if the resources are adequately used and controlled, issue that relates to cost overrun would not arise. This could however result to variations and claims. Performance can be assured by identifying and eliminating the factors that cause poor project outcomes (Babu, 2015). According to Chihuri and Pretorius, (2010) shortage of skills in engineering and construction in the country has effect on the performance of some of projects. Sourced skills from foreign countries resulted in increasing project cost; Contractors usually faces difficulties in getting all the equipment they need especially capital investments, in the acquisition phase due to financial constraints (Basheka and Tumutegyereize, 2011). Performance of airport construction project are affected by different factors which leads the project to run over budget, behind schedule and fails to meet the intended needs, studies has been conducted to identify the problem but still a challenge exist in all construction industry. Airport construction projects still face the same challenges globally, in Rwanda minor studies has been addressed in other infrastructures such as roads and highways and evaluation study was done for Roads constructions and buildings but Airports left out. Therefore, study intends to fill the gap by investigating factors affecting project performance in Rwanda, case of Bugesera airport construction

II. REVIEW OF RELATED LITERATURE

2.1 Theoretical Review

Theory of Constraints (TOC) based management philosophy focuses on change at three levels; mind-set of the organization, measures that drive the organization, and methods employed within the organization (Mabin & Balderstone (2003). Needs and constraints in a multi-party working situation which is necessary for construction projects bring complications in project management and therefore for effective project management, constraints have to be managed.. The theory of constraints demonstrates how managers can effectively manage organizations based on the assumption of system thinking and constraint management (Muthoka & Oduor, 2014). TOC-based management philosophy focuses on change at three levels; mind-set of the organization, measures that drive the organization, and methods employed within the organization. Needs and constraints in a multi-party working situation which is necessary for construction projects bring complications in project management therefore for effective project management, constraints have to be managed Watson *et al.,* 2007).

This study is based on the triple constraint theory where most of adopted monitoring practices from organizational perspectives may work well or fail hence leading to delays if this theory is not well embraced, (Ondari & Gekara, 2013). Delays in project completion are a common problem in the construction industry not only with an immeasurable cost to society but also with debilitating effects on the contracting parties, (Buertey *et al*., 2016). The theory of constraints is useful to the study because it helps project managers overcome the financing challenges and delays that may brought about by stakeholders opposing the implementation of projects. It's useful as it suggests methods in which managers can develop to ensure that they effectively manage hindrances to the project implementation brought about inadequate funding and involvement of stakeholders with varied suggestions and decisions. The Theory of Constraints (TOC) is an approach that is used to develop specific management techniques (Steyn (2002). The theory has been found application in two areas within project management which are scheduling of a single project to reduce project duration and simplify project control and allocation of resources that are shared by concurrent projects. This is because; Positive cash flow can be obtained faster as a result of extended duration, contingency cost of delays could be very high, and preventing changes to stakeholders need because it believes that extended project duration not only leads to escalation of overhead costs, but also lead to scope changes because stakeholder needs change over time (Steyn, 2002).

2.2 Empirical review

A project team can be viewed as a team that is newly formed to undertake a unique task. Different types of projects require different competency sets for the team managing the project. He *et al.,* (2019) notes that it is important for the appraisal to consider the competencies required by a project team to carry out a project proficiently and with an acceptable level of risk. Care should be taken to avoid building up a project team that is too large to manage. Where a project team becomes large due to the scale and complexity of a project consideration should be given to separating the operational project delivery team (the project team) from those with stakeholder duties (Kerzner, 2018). Depending upon the nature of a project certain areas of technical expertise may be required. The appraisers of a project need to be

satisfied that appropriate technical expertise exists within a project team to ensure that a project is capable of proficient delivery. It is possible that this will be acquired externally but where such expertise exists within the consideration should be given to inviting these specialists on to the project team (Harris, 2014).

Contractor's competence has found to be one of factors for failure in construction industry such factor skills shortage has been addressed as a source of failure in some projects, Critical shortage of skills in engineering and construction in the country has an effect on the performance of some projects (Chihuri and Pretorius, 2010). Lack of appropriate professional looking for risk management has been a source of problem since some project might experience change in design which may lead to change to project scope, cost overrun, time overrun, example Kuala Lumpur's new airport terminal is facing huge cost overruns and significant delays following frequent design changes Beckers *et al.,* 2013). Basheka and Tumutegyereize (2011) limited scholarly studies have been done to the study of contractor performance and understanding of the challenges that contractors themselves encounter in delivering their crucial services, in their studies they found that contractors usually face difficulties in getting all the equipment they need, and during implementation of the project the contractors problems changes, at a time a contractor faces high breakdown rates of equipment and accident from unskilled operator abuse as well as poor training on equipment use Edwards and Nicholas, (2002). Ali Khan *et al., (*2020) gives interesting findings on the significant factors causing delays in the United Arab Emirate (UAE) construction industry. The study reports shortage of skills of manpower, poor supervision and poor site management, unsuitable leadership, shortage and breakdown of equipment as some of major causes of delay in construction projects.

One of the most critical aspects of managing a project is doing what's necessary to develop and control relationships with all individuals that the project impacts (Griffin, 2010). By successfully managing stakeholders, one is able to keep a lid on scope creep, ensure project requirements are aligned, understand tolerance for risk, and mitigate issues that would otherwise delay the project. Good stakeholder management is a testimony to your influence in an organization, and a key component to a healthy project environment (Griffin, 2010). Airport construction projects have many different stakeholders, all of whom have a significant input during the project life cycle. This is due to large number of activities associated with aircraft and passenger flows (Flouris and Lock, 2016). Project manager who follow traditional ways of managing and executing construction projects often give little attention or even disregard the allocation of human-related factors within their management agendas. Instead, they focus on time, cost and quality. This behavior will have a significant impact on different expectations as no project would exist without people inputs (Flouris and Lock, 2016).

A communications planning matrix takes the stakeholder analysis and identifies each stakeholder or stakeholder group, the role they play on the project, what must be communicated, when and how often, how in terms of the communication format and whether a response is required. The project manager's number one responsibility in the project is to communicate and they must demonstrate flexibility in how that communication is delivered to best meet the needs of their stakeholders. Wahab & Dulaimi (2011) noted that the complexity of modern airport projects makes traditional design and construction management methods unable to satisfy the project management requirement, which requires dealing with the variety of Airport project components along with the advance technology used for airport operation, moreover, dealing with the huge number of stakeholders involved in the project. In all projects the user needs to be involved in how the project is progressing and as a point of contact in ensuring that complications arising during the implementation stage of the project can be discussed. Stakeholders vary in influence, expectations, and interests and they all have the potential to impact a project (Angerame & Billows, 2002). The project manager's goal is to leverage stakeholder relationships and build coalitions that foster project success. Warning signs that stakeholder management is suffering include missed deadlines, scope creep, confusion, conflict, and churning. Often this is indicative of competing priorities, a lack of focus, or a lack of commitment and it requires a communication based approach.

Large-scale infrastructure projects have been reported globally failed due to different reasons German's Berlin Brandenburg Airport (BER or the Airport Project) is currently under construction in Schoenefeld, Brandenburg is such a high profile failure being more than 4 years behind schedule and at least 70% above budget. The poor experience globally of providing public funded megaprojects in infrastructure on time and budget should have heightened the caution of decision makers responsible for Airport Project the broad reason for project failure is common mistakes in planning and executing large infrastructure projects, political consideration and ongoing innovation in the field of governing large-scale infrastructure projects (Fiedler and Wendler, 2015). The construction of Kuala Lumpur's new airport terminal is facing huge cost overruns and significant delays following frequent design changes. Since construction of airport infrastructure involves number of stakeholder with differing needs, the design of modern

Airports Construction worldwide such as Passenger Terminal, Cargo Terminal and other Airport facilities are one of the most complex construction projects nowadays.

This was a case in the construction of one of the largest Airport Terminal Buildings in the Middle East in addition to international airport experience worldwide (Wahab & Dulaimi, 2011). Gaza Strip suffers from many problems and complex issues in performance such as cost, time and safety due to political issues, to develop human resources in the construction industry. Some projects are delayed due to lack of fund such as price increase in material example in Pakistan the New Islamabad International Airport delayed due to unavailable funding (Shahid *et al* ., 2015). In Philippine the Implementation of the Third Airports Development Project was terminated in 2005. The termination was the result of the very poor implementation performance resulting from the slow progress of land acquisition and resettlement, severe delays in the recruitment of consultants, and significant issues relating to the procurement of civil works and equipment.

$H_0$1: *Contractor's competence has no significant effect on project performance.*

$H_0$2: *Stakeholders' participation has no significant effect on project performance.*

III. RESEARCH METHODOLOGY

The research design is the conceptual step in conducting research. It serves as a guide for data collecting and measurement (Kothari, 2004). The research was conducted using a descriptive research approach. The total number of respondents in the study comprised 103 members at managerial level and key professional staff involved in construction project. Multiple linear regression analysis was applied in the study to test the hypotheses formulated and is expressed as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

Where,

Y = Project performance

X_1= Contractor's competence

X_2= Stakeholders' participation

β_0= Constant

β_1-β_2 = Coefficient of estimates

ε = Error tem

IV. DATA ANALYSIS

4.1 Correlation Analysis

Statistical results in Table 1 revealed that there was a significant and positive correlation between Contractor's competence and Project performance ($r = 0.492$, $p<0.05$). More so, the correlation between stakeholders' participation and project performance was significant and positively related at ($r =0.327$, $p<0.05$). Therefore, it can be concluded that contractor's competence and stakeholders' participation are positively associated to project performance at 5% level of significance.

Table 1 Correlation Matrix

	Project performance	Contractor's competence	Stakeholders' participation
Project performance	1		
Contractor's competence	0.492**	1	
Stakeholders' participation	0.327*	0.251*	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Source: (Field Data, 2021)

4.2 Hypothesis Testing

The statistical findings in table 2 revealed that there is existence of the link between the variables on the model (R^2 = 0.508) implying that the combined prediction of all the predictor variables accounted for approximately 50.8% of the total variation on project performance. The model was fit in predicting the contribution between the variables which was statistically significant at 5% level of confidence (F = 9.074; p<0.05).

The first hypothesis stated that there is no significant relationship contractor's competence and project performance. The study findings showed that contractor's competence exhibits a positive coefficients of estimate which was statistically significant (β = 0.782; p<0.05) hence contractor's competence had a positive and significant effect on project performance. This therefore implies that a unit change in contractor's competence increases project performance by 0.782units. The findings agree with views held by various scholars in the field of project management (Chihuri and Pretorius, 2010) who found similar results.

The second hypothesis stated that there is no significant relationship between stakeholders' participation and project performance. The statistical results showed positive and significant connection between stakeholders' participation and project performance (β = 0.629; p<0.05). This implies that a unit change in stakeholders' participation increases project performance by 0.629units. The study noted that most of the project managers acknowledged that stakeholder management was critical in improving performance of projects. The findings show that managing stakeholders improved the accuracy greatly and speed of project implementation hence influencing the project positively. On the question of the level of influence of stakeholders on project performance most respondents felt that stakeholders influence project performance to a great extent. This suggests a greater appreciation for consultation with the relevant interest groups. Chinyio & Olomolaiye (2009) advise that the inclusion of all stakeholders, including the public, is essential for successful project delivery.

Table 2.Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients		
		Beta	**Std. Error**	**Beta**	**T**	**Sig.**
1	(Constant)	0.367	0.049		7.490	0.013
	Contractor's competence	0.805	0.196	0.782	4.107	0.009
	Stakeholders' participation	0.671	0.099	0.629	6.778	0.001
	Model Summary					
	R	0.713				
	R Square	0.508				
	F	9.074				
	Sig.	0.000				

* Significant at 0.5 level (2-tailed), ** Significant at 0.01 level (2-tailed)

V. CONCLUSION AND RECOMMENDATION

The aim of the study was to assess the factors affecting project performance in Rwanda: case of Bugesera airport construction**.** The findings indicated that contractors' competency and stakeholder participation are key indicators of project performance. The findings also revealed that is a strong positive association between the two predictor variable and outcome variable. Based on the research findings the researcher concludes that contractors' competency and stakeholder participation has and positive effect on project performance**.**

The study also established that skills and experience of the project manager and the management committee in general influence the implementation of construction projects in the study area. The project manager is responsible for steering and controlling the activities of the implementation team and ensures that the project realizes its goals. The study further revealed that stakeholders were involved to a great extent and that implementation was rigorous. The study has therefore contributed to knowledge by establishing that contractor's competence and stakeholder's participation influences the performance of Bugesera international construction project.

The study also concludes that stakeholder's participation affected project success. The study noted that stakeholder involvement improved the accuracy and speed of project implementation in the county. Their involvement meant that projects were implemented as planned without delays. The stakeholders were involved in different ways ranging from formulation of plans to regular progress reports through meetings.

Recommendations Based on the findings, the study recommends that:

There should be continuous coordination and proper relationship management between all stakeholders involved in the project. Proper channels should be used to solve problems during the project life cycle and develop performance of the project.

The study recommends that the project managers should engages the stakeholders more so as to harmonize its goals and objectives with the aspirations of the stakeholders and hence reduce dissonance levels thereby increasing project outcome's satisfaction. This will ensure that the stakeholders support the activities of the project and hence higher chances of success.

Suggestion for Further Research

A review of literature indicated that there has been limited amount of research on factors that influences airport construction in particularly in Rwanda- Africa. Thus, the findings of this study serve as a basis for future studies on factors influencing construction performance considering the fact that project fund, had not been widely studied which presented gaps in African and Rwandan contexts.

REFERENCES

[1.] Ali Khan, A. A. N., Singh, J. S. K., Kaur, D., &Arumugam, T. (2020). The Success of Construction Projects: Empirical Evidence from the United Arab Emirates. *Global Business & Management Research*, *12*(3).

[2.] Angerame, M., & Billows, D. (2002).*Engineering & construction project management*. Dick Billows.

[3.] Babu, N. J. (2015).Factors affecting success of construction project. *IOSR Journal of Mechanical and Civil Engineering Ver. V*, *12*(2), 2320-2334.

[4.] Basheka, B. C., & Tumutegyereize, M. (2011). Determinants of public procurement corruption in uganda: a conceptual framework. *Journal of Public Procurement*, *2*, 33-60.

[5.] Beckers, F., Chiara, N., Flesch, A., Maly, J., Silva, E., & Stegemann, U. (2013).A risk-management approach to a successful infrastructure project. *Mckinsey Work. Pap. Risk*, *52*(2013), 18.

[6.] Buertey, J. I. T., Amofa, D., & Atsrim, F. (2016). Stakeholder management on construction projects: A key indicator for project success. *American Journal of Civil Engineering*, *4*(4), 117-126.

[7.] Chihuri, S., & Pretorius, L. (2010).Managing risk for success in a South African engineering and construction project environment. *South African Journal of Industrial Engineering*, *21*(2), 63-78.

[8.] Chinyio, E., & Olomolaiye, P. (2009).Introducing Stakeholder Management. *Construction Stakeholder Management*, 1-12.

[9.] Edwards, D. J., & Nicholas, J. (2002). The state of health and safety in the UK construction industry with a focus on plant operators. *Structural Survey*.

[10.] Enshassi, A., Mohamed, S., & Abushaban, S. (2009). Factors affecting the performance of construction projects in the Gaza strip. *Journal of Civil engineering and Management*, *15*(3), 269-280.

[11.] Fiedler, J., &Wendler, A. (2016).Berlin Brandenburg Airport. In *Large infrastructure projects in Germany* (pp. 87-145). Palgrave Macmillan, Cham.

[12.] Flouris, T. G., & Lock, D. (2016).*Managing Aviation Projects from Concept to Completion*. Routledge.

[13.] Frimpong, Y., Oluwoye, J., & Crawford, L. (2003).Causes of delay and cost overruns in construction of groundwater projects in a developing countries; Ghana as a case study. *International Journal of project management*, *21*(5), 321-326.

[14.] Gray, C.F., and Larson, E.W. (2008). Project Management: The Managerial Process, 4th ed., McGraw Hill.

[15.] Griffin, J. A. (2010). *Residential construction management: Managing according to the project lifecycle*. J. Ross Publishing.

[16.] Harris, M. J. (2014). *The challenges of implementing project-based learning in middle schools* (Doctoral dissertation, University of Pittsburgh).

[17.] He, Q., Wang, T., Chan, A. P., Li, H., & Chen, Y. (2019). Identifying the gaps in project success research: A mixed bibliographic and bibliometric analysis. *Engineering, Construction and Architectural Management*, *26*(8), 1553-1573.

[18.] Juliet, M. E., & Ruth, O. E. (2014). An evaluation of factors affecting the performance of construction projects in Niger state. *Journal of Environmental Sciences and Resources Management*, *6*(1), 34-43.

[19.] Kerzner, H. (2018). *Project management best practices: Achieving global excellence*. John Wiley & Sons.

[20.] Kivaa, P. T. (2001). *developing a model for estimating construction period: A survey of Building projects in Nairobi* (Doctoral dissertation).

[21.] Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New Age International.

[22.] Mabin, V. J., &Balderstone, S. J. (2003). The performance of the theory of constraints methodology: analysis and discussion of successful TOC applications. *International Journal of Operations & Production Management*.

[23.] Memon, A. H., Rahman, I. A., &Azis, A. A. A. (2012). Time and cost performance in construction projects in southern and central regions of Peninsular Malaysia. *International Journal of advances in applied sciences*, *1*(1), 45-52.

[24.] Muthoka, M., & Oduor, P. (2014). Effects of strategic alliances on organizational performance: supermarkets and their alliances in Kenya. *European Journal of Business and management*, *6*(34), 75-89.

[25.] Ondari, P. O., & Gekara, J. M. (2013).Factors influencing successful completion of roads projects in Kenya. *International Journal of Social Sciences and Entrepreneurship*, *1*(6), 26-48.

[26.] Owolabi, J. D., Amusan, L. M., Oloke, C. O., Olusanya, O., Tunji-Olayeni, P. F., Dele, O., ...& Omuh, I. O. (2014). Causes and effect of delay on project construction delivery time. *International journal of education and research*, *2*(4), 197-208.

[27.] Pidd, M. (2012).*Measuring the performance of public services: Principles and practice*. Cambridge University Press.

[28.] Shahid, A., Ahmad, H., Ahmad, N., Shafique, M. N., &Amjad, N. (2015). Analysis of key performance factors affecting residential construction projects in Pakistan. *Arabian Journal of Business and Management Review (Nigerian Chapter)*, *3*(10), 9-14.

[29.] Silva, S. K., Warnakulasuriya, B. N. F., & Arachchige, B. J. H. (2016). Critical Success Factors: En Route for success of construction projects. *International Journal of Business & Social Science*, *7*(3), 27-37.

[30.] Steyn, H. (2002). Project management applications of the theory of constraints beyond critical chain scheduling. *International Journal of Project Management*, *20*(1), 75-80.

[31.] Wahab, H., & Dulaimi, M. (2011). Design process and stakeholder management in airport construction. *The British University in Dubai*.

[32.] Watson, K. J., Blackstone, J. H., & Gardiner, S. C. (2007). The evolution of a management philosophy: The theory of constraisnts. *Journal of operations Management*, *25*(2), 387-402.