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Influence of Resource Planning on Performance of Government Construction Projects in Kenya

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Abstract:
The Construction Industry has a major role in the development of Kenyan economy. Kenya aims to achieve greater economic growth in the next 12 years as is stipulated in vision 2030. One of the economic pillars highlighted in the strategy is to invest heavily in the infrastructure sector. There is therefore a need to ensure that these government projects succeed. Project resource is a key pillar that anchors project success. Efficient planning and utilization of key project resources such as; financial, human and time   resources determines the level of success that a project achieves. The specific objective was to determine the influence of resource planning on performance of government construction projects in Kenya. The study adopted a descriptive research design and used simple random sampling to select a sample from the registered Architects/projects managers practicing in Nairobi Kenya and involved with government projects. The unit of analysis therefore was government construction projects while unit of observation was 728 Registered Architects/projects managers within Nairobi. A sample size of 251 was used. The study generated both qualitative and quantitative data. Data was collected using questionnaires and analysed using SPSS. The findings of the study showed a significant and positive relationship between resource planning and performance of government construction projects in Kenya. The study concluded that resource planning enhances the performance of government construction projects in Kenya.

Keywords: *Project, resource, planning, performance, Kenya*

1. Introduction

Project success is measured by its functionality technically and financially. The project should also meet the budget and schedule targets to be considered successful. Finally, the project should be evaluated depending on the performance of the contractors which analyses if they provide services that benefit the project. (Chan, et al., 2004).

According to Watt, (2018) resources are people, equipment, place, money, or anything else that you need in order to do all of the activities that you planned for. Every activity in your activity list needs to have resources assigned to it. Before you can assign resources to your project, you need to know their availability.

Developing a good budget and money generation plan strongly correlates with project performance. Having a budget for project activities and having money generation plans for the project has potential to increase project performance (Umulisa, Mbabazize & Jaya Shukla,2015).

1.1. Statement of the Problem

Kenya's' dream of achieving middle income status while offering high sustainable quality of life to its citizens is anchored on infrastructure development as one of the key pillars. The country has been heavily reliant on external funding such as from China, the World Bank and African development bank to fund its mega projects. This has significantly increased the country's debt burden. Currently, most of the projects implemented by the government experiences cost overruns and delays. Some projects stall for years due to among other things inconsistent financial and materials flow to the projects. It is therefore prudent to efficiently and effectively utilize the scarce resources to ensure that development projects in the construction sector give Kenyans value for money.

1.2. Objective of Study

The objective of this study was to determine the influence of resource planning on performance of government construction projects in Kenya.

1.3. Research Hypothesis
- H_0: Resource planning has no significant influence on performance of government construction projects in Kenya

2. Theoretical Review

2.1. Resource Dependency Theory (RDT)

This theory has its origin in the works of Pfeffer and Salancik (1978). Resource Dependency Theory (RDT) proposes that actors lacking in essential resources will seek to establish relationships with (i.e., be dependent upon) others in order to obtain needed resources. Also, organizations attempt to alter their dependence relationships by minimizing their own dependence or by increasing the dependence of other organizations on them. Within this perspective, organizations are viewed as coalitions alerting their structure and patterns of behavior to acquire and maintain needed external resources.

Acquiring the external resources needed by an organization comes by decreasing the organization's dependence on others and/or by increasing other's dependency on it, that is, modifying an organization's power with other organizations (Biermann, 2014).

2.2. Empirical Review

Emsley and Alzahrani, (2012) found that the success of construction projects is a fundamental issue for most governments, users and communities. Their study used a questionnaire survey to establish construction professionals' perception of Critical Success Factors of contractors that greatly impact on the success of construction projects. Factor analysis revealed nine underlying clusters namely : safety and quality; past performance; environment; management and technical aspects; resource; organization; experience; size/type of pervious projects; and finance. Logistic regression techniques were used to develop models that predict the probability of project success. Factors such as turnover history, quality policy, and adequacy of labour and plant resources, waste disposal, and size of past projects completed, and company image are the most significant factors affecting projects success. Enshassi, et al.,(2009) found that the most important factors affecting project performance are: delays because of borders/roads closure leading to materials shortage; unavailability of resources; low level of project leadership skills; escalation of material prices; unavailability of highly experienced and qualified personnel; and poor quality of available equipment and raw materials.

Chan et al., (2004) developed a conceptual framework on critical success factors by reviewing previous works on project success on seven major journals in the construction field. Five major groups of independent variables, namely project-related factors, project procedures, project management actions, human related factors, and external environment were identified as crucial to project success. Their study recommended that further studies on the key performance indicators is needed to identify the causal relationships between critical success factors and key performance indicators. The causal relationships, once identified, will be a useful piece of information to implement a project successfully. All projects because of the prioritized control of resources, require formal detailed planning. The project manager is key to successful project planning. It is desirable that the project manager be involved from project conception through to execution. Project planning must be systematic, flexible enough to handle unique activities. Advantages of planning include; to eliminate or reduce uncertainty, to improve efficiency of operation, to obtain a better understanding of the objectives and to provide a basis for monitoring and controlling work. (Kerzner, 2009). Due to the resource-driven nature of construction management, Resource Management is really a difficult task. The construction manager must develop a plan of action for directing and controlling resources of workers, machines and materials in coordinated and timely manner in order to deliver a project within the frame of limited funding and time. (Nagaraju & Reddy, 2015).

According to Riddell, (2017) the goal of a resource management plan is to identify and reserve resources to meet projects objectives and requirements

3. Methodology

The study adopted a descriptive research design and used simple random sampling to select a sample from the registered Architects/projects managers practicing in Nairobi Kenya and involved with government projects. The unit of analysis therefore was government construction projects while unit of observation was 728 Registered Architects/projects managers within Nairobi. A sample size of 251 was used. The study generated both qualitative and quantitative data. Data was collected using questionnaires and analysed using SPSS. Analysed data was presented using tables and charts.

3.1. Sampling Techniques and Sample Size

The study was limited to an industry expert survey group consisting of Architects/Construction projects managers. There are 728 registered Architects in Nairobi County where the study was focused on for the investigation. A sample size of 251 was utilized for the study by applyingn = $(z2pq)/d2$ and an adjusting formula, nf = $n/(1+n/N)$ by Mugenda and Mugenda, (2003).The study adopted a simple random sampling technique. According to, Starnes (2008) a simple random sample is a subset of individuals (a sample) chosen from a larger set (a population). Each individual is

chosen randomly and entirely by chance, such that each individual has the same probability of being chosen at any stage during the sampling process, and each subset of k individuals has the same probability of being chosen for the sample as any other subset of k individuals. A simple random sample is an unbiased surveying technique. This technique is free of classification error, and requires minimum advance knowledge of the population other than the frame. Its simplicity also makes it relatively easy to interpret data collected in this manner.

Sample calculation formula:

$n = (z^2pq)/d^2$

Where:

n = the desired sample size when the target population is greater than 10,000

z = standardized normal deviations at a chosen confidence level, for this study, confidence level is 95%, and z =1.96.

p = the proportion in the target population that assumes the characteristics being sought.

q = The balance from p to add up to 100%. That is 1- p, which in this case yield 1- 50% (0.5)

d = Appropriate significance level, for this study at 95%, the significance level is 0.05.

Using this procedure, the sample size is found to be n= $(1.96^2$ x 0.5 x 0.5)/0.05^2 = 384. Since the population is less than 10,000, an adjusting formula, nf = n/(1+n/N) is used where: nf = the desired sample size after adjustment.

n = the desired sample size

N = an estimate of the population size

The adjusted sample size is therefore nf = 384/ (1+384/728) = 250.9, taken as 251

3.2. Measurement of the Variables

The study conducted a statistical analysis of the variables to establish the influence of risk management on performance of government construction projects in Kenya

3.3. Sample Description

The study adopted a simple random sampling technique for the unit of observation since the population drawn from the construction industry was homogenous.

4. Findings

The study results show that resource planning statistically significantly influences the performance of government construction projects in Kenya. This is shown by the regression analysis value $F_{(1, 209)}$ = 47.715, p< .01, R^2= .466. Correlation analysis revealed that there is a statistically significant positive correlation between resource planning X_2 and the performance of government construction projects in Kenya (r =0.431, p < 0.01).

The descriptive analysis revealed that majority of contractors working on government construction projects moderately provided for competent work forces at 44%. These contractors moderately provided for adequate financing at 44% and moderately provided for the required machinery at 47%.The study generated several options through which contractors undertaking Kenyan government construction projects can enhance their resource mobilization abilities. The three key aspects identified by the study include; embracing partnerships with development partners at 10.2%, provision of advance payments/mobilization fees to contractors at 8.8% and proper scoping of works and comprehensive budgeting at 8%. The other alternatives are documented in the Table 1bellow

Response	n	%
Embracing partnerships with development partners	20	14.6
Optimal planning during design phase	19	13.9
Undertake comprehensive design and budgeting	14	10.2
Proper scoping of projects to enhance comprehensive budgeting	11	8.0
Enhance access to affordable loans	10	7.3
Involving all project stake holders	9	6.6
Diversification of financial sources	1	0.7
Embracing public private partnerships	5	3.6
Assigning competent personnel to projects	4	2.9
Aligning projects to national priorities	1	0.7
Timely honoring of payment certificates	4	2.9
Implementing projects in functional phases in case of financial constraints	1	0.7
Discourage resource reallocation midway through projects	5	3.6
Securing all resources before project commencement	6	4.4
Engaging competent project consultants	7	5.1
Proper definition and understanding of project deliverables	1	0.7
Institutional funding	4	2.9
Limiting/regulating the number of projects that contractors can be awarded at any one time	3	2.2
Availing advance payments/mobilization fee to enable contractors commence works	12	8.8

Table 1: Mechanisms of Enhancing Resource Mobilization and Planning

According to Heagney, (2012) one of the major causes of project failures is poor planning. Failing to develop a plan means that there can be no actual control of the project.

4.1. Results of Correlation Analysis

The Pearson correlation coefficient was used to analyse the relationship between resource planning and performance   of government construction projects in Kenya. The results indicate that resource planning has a positive significant relationship with performance of government construction projects in Kenya at a $\acute{\alpha}$ =0.01. The relationship was represented by a correlation coefficient of 0.559. The number of respondents considered was 211.

4.2. Results of Regression Analysis

The coefficient of determination R-Square is 0.466 at 0.05 significance level. The coefficient of determination indicates that 46.6% of the variation in the performance of government construction projects in Kenya is influenced by resource management while 53.4% is influenced by other factors. The analysis of variance (ANOVA) results also confirms the appropriateness of the model fit at p-value of 0.000 which is less than 0.05 the significance level. The degree of freedom is 209.This implies that there is a significant positive relationship between risk management and performance of government construction projects in Kenya.

The fitted model is Y =2.538+0.454X_3+ Ɛ. This implies than there is a linear relationship between risk management and successful completion of government construction projects in Kenya. A unit change in resource planning will increase the performance of government construction projects in Kenya by the rate of. 0.454. When X_3 is =0 then Y= 2.538.

4.3. Hypothesis Testing

The hypothesis of the study stated that resource planning has no significant influence on performance of government construction projects in Kenya. The findings of the study showed a significant and positive relationship between resource planning and performance of government construction projects in Kenya. The hypothesis is therefore rejected.

5. Discussions

The objective of this study was to determine the influence of resource planning on performance of government construction projects in Kenya and to test the hypothesis that Resource planning has no significant influence on performance of government construction projects in Kenya. The study sought understand the adequacy with which key project resources such as work force, finance and machinery are provided in Kenyan government construction projects. The study findings indicate that the adequacy of provision of key resources is moderately done in Kenyan government construction projects. Provision of adequate competent workforce is majorly moderate at 44%, provision of adequate financing is equally majorly moderate at 44% and adequacy of machinery is also majorly moderate at 47%.

The Cronbach's alpha was 0.729, which indicates a high level of internal consistency of the study instrument and data. The statistical analysis and findings showed a linear relationship between resource planning and performance of government construction projects in Kenya.

The results agree with those of Enshassi, et al., (2009) who found that the most important factors affecting project performance are: delays because of borders/roads closure leading to materials shortage and unavailability of resources.

6. Conclusions

From the findings of the study, it can be concluded that resource planning enhances the performance of government construction projects in Kenya. The study findings relate with those of Nyamweya, (2017) which found that resource planning greatly enhances the performance of government construction projects.

The findings of this study supports the Resource Dependency Theory (RDT) Resource which postulates that actors lacking in essential resources will seek to establish relationships with (i.e., be dependent upon) others in order to obtain needed resources. The findings of the study has given various options through which contractors handling government construction projects can enhance resource mobilization and planning to the success of these projects.

7. Recommendations

The study recommends adoption of comprehensive resource mapping and planning before actual projects implementation commences in government construction projects.

8. Areas of Further Research

It is therefore recommended from this research that further studies can be conducted to establish the best alternative between renting and using personal resources by contractors in implementation of Kenyan government construction projects.

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