

**EFFECT OF PROJECT RESOURCE MOBILIZATION ON  
PERFORMANCE OF ROAD INFRASTRUCTURE PROJECTS  
CONSTRUCTED BY LOCAL FIRMS IN KENYA**

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**Abstract**

Efficient performance of road infrastructure projects is essential for economic growth and development. Local construction firms experience challenges in completing of the projects within the budgeted cost, time schedule and attaining the desired quality. This paper sought to establish the effects of project resource mobilization on performance of road projects constructed by local firms. The study was carried out in the Lake Basin Region, Kenya that has a total of 41 road infrastructure projects undertaken by local firms. The study concludes that project resource mobilization has a significant effect on performance of road infrastructure projects undertaken by local firms.

**Keywords:** Project resource mobilization, Infrastructure projects, Local firms, Road projects and project performance.

**1.0 Introduction**

Performance of road infrastructure projects is essential for the economic growth and development of any country. These projects play a critical role in the economy in terms of wealth creation and provision of employment opportunities. Infrastructure covers a range of services, from public utilities such as power, telecommunications, water supply, sanitation and sewerage, solid waste collection and disposal, and piped gas; to public works such as roads, dams and canal works, railways, urban transport, ports, waterways and airports (World Bank, 2012). Massive investments are put into infrastructure projects.

Throughout the world, the business environment within which construction firms operate continues to change rapidly. Firms failing to adapt and respond to the complexity of the new environment tend to experience survival problems (Lee, 2009). With increasing users' requirements, environmental awareness and limited resources and high competition, contractors have to be capable of continuously improving their performance (Samson & Lema, 2011).

There are several factors that impact on performance of projects, complexity of the project, Shortage of skills of manpower, weaknesses in organizational design and capabilities, poor supervision and poor site management, unsuitable leadership, shortage and breakdown of equipment among others cause delays in the United Arab Emirates (Faridi & El-Sayegh, 2010). Conflict, poor workmanship and incompetence of contractors had also negative impact on project performance in sub-saharan Africa (Carter, 2012). Carter further noted that project managers should be given full authority to implement the projects. Harries and Reyman (2010)

noted that on average 65 percent of road projects constructed by local firms in Africa were considered to have failed. These projects were suspended and later contracted to other firms. Therefore, performance of projects is a subject many scholars have discussed with the objective of ensuring that projects are undertaken within the stipulated cost, time schedule and meet the desired quality. However, little attention has been focused on road projects constructed by local firms. There is need therefore to understand the effects of project resource mobilization on the performance of road infrastructure projects.

### **1.1 Project Resource Mobilization and Performance of Road Projects**

Project resource mobilization involves identifying financial, human, physical and technical resources and organizing them in a way that leads to successful implementation of a project (Crivelli & Gupta, 2013). Financial resources refer to funds that are required by project contractors to buy the equipment and machinery needed in undertaking the road projects and meet other expenses related to the project such as salaries and wages for the workers and cost of fuelling the vehicles (Miller & Lessard, 2011). These equipment and machinery include tippers, graders, excavators and rollers. Many of these equipment cost millions of shillings.

Project contractors therefore need to look for adequate finances in order to be able to implement road infrastructure projects successfully. Project managers also need to employ qualified and competent staff to operate the plant machines and carry out other activities related to road infrastructure projects. Technological resources refer to modern tools and techniques used in the implementation and management of projects. Human resources involves recruitment of technical staff with competency and experience that will enable the implement infrastructure projects effectively and efficiently (Smith & Jagger, 2010).

#### **1.1.1 Resource mobilization and competitive advantage**

Resource Based View theory emphasizes the firm's resources as the fundamental determinants of competitive advantage and superior performance. The theory argues that every project manager wants to continuously improve on the performance of projects undertaken. However these firms experience limited resources and time available to invest in making the changes that are needed to improve the firm performance (William & Dettmer, 2010). Resources at the disposal of the firm can either be tangible such as machinery and equipment or intangible such as trade mark, intellectual property and processes. Adequate use of modern equipment such as excavators, tippers, rollers and graders can make a firm complete an infrastructure project within the stipulated time and also reduce the cost overruns (Gimeno, 2011).

Robert and Bradley (2013) asserted that for a firm to attain superior performance over other firms, it must first look at what resources it possesses; then it assesses their potential value generation and finally the firm defines a strategy that allows it to capture the maximum of value

in a sustainable way. Robert and Bradley further argued that resources such as capital, equipment, skills of employees and patents can enable a firm to implement its projects in an efficient manner. Also such a firm can easily deliver projects that meet customer standards.

### **1.1.2 Role of physical, human and technological resources**

Barney and Smith (2010) used this theory in their study on comparing theory of constraints with MRP and JIT. They noted that for a project to be undertaken effectively and efficiently basic resources such as physical, human and technological resources need to be present. Otherwise it will quite be difficult to undertake mega infrastructure projects without such resources. Heinrich and Bofinger (2009) study on factors that influence proper management of a project also used the theory. Bofinger found out that a bundle of resources to perform some task or activity constitute the main source of comparative advantage. The theory has also been used by Crivelli and Gupta (2013) study on Public- Private Initiatives in Resource Mobilization and Might and Fisher, (2011) study on Causes and Delays in Malaysian construction Industry.

Michael (2012) also noted that Porter's diamond model agrees with the resource based view theory in the sense that the only way to stay competitive is through upgrading the resource pool. Porter also considers innovation as a force that leads to the creation of competitive advantage (CA). It is therefore crucial to the management of a firm to be committed to the necessary investments in the acquisition of better technological innovations applicable in the implementation road projects. Briceno, Karlis and Vivien (2010) in support of this theory said that the issue of firm competence has been central in strategy research for decades and it encompasses most other questions which have been raised in the field as for instance why firms differ, how they behave, how they choose strategies and how they are managed. Peteraf and Berney (2012) further argued that the central premise of the RBV theory is that firms compete on the basis of their resources and capabilities.

Project performance is influenced by resources at a firm's disposal. The paper focuses on the necessary financial, physical and technological resources required to enhance the performance of road projects. Since the intention of any construction firm is to have a successful project, performance becomes a critical issue. This paper comprises of 5 sections; section being introduction, section 2 discusses literature review, section 3 summarizes literature on the effects of project resource mobilization on performance of projects. Section 4 discusses the findings against the available literature and section 5 summarizes the key contributions of this paper.

## **2.0 Literature Review**

Literature review enables a researcher to formalize key constructs; Project resource mobilization, Infrastructure projects, Local firms, Road projects and project performance useful for this research on the effect of project resource mobilization on performance of road infrastructure projects. Literature review also highlights various studies done by other scholars and their findings. In summary, it introduces the effects of project resource mobilization has on performance of road infrastructure projects.

## **2.1 Resource Mobilization and Performance**

Majanja (2012) conducted a study on financing constraints of infrastructure projects in Kenya. The study covered 87 construction firms. Two alternative variables to measure financing constraints were used. The first one was based on the degree of financing constraints that firms face and the other was the use of bank credit by firms. To measure perceived financing constraint, respondents were asked to rate access to financing as a constraint of project performance. The study results found out that financing constraints were a major obstacle faced by construction firms. The study found out that the local construction firms faced critical issues and problems which affected financing of their projects. Majanja suggested that, government should foster Public-Private Partnerships in order to raise adequate funds for constructing road projects. Simmons, (2012) also noted that local firms had a problem of accessing credit facilities as they were viewed to lack collateral security. However, Majanja assumed a direct relationship between finance and success of a project. This study includes other important variables such as monitoring and evaluation and group dynamics management so as to improve the viability of the results.

Gitenya and Ngugi (2012) study on the assessment of determinants of performance of housing projects in Kenya pointed out that most of the local firms engaged in infrastructure projects are often hindered by lack of adequate financial resources. There is always a budget for the project and this is a major constraint. Wysocki (2012) stated that while the overall resources available may be in theory sufficient to complete the project, there were difficulties arising out of the way in which the project has been scheduled. For example, there may have been a number of activities scheduled to take place at the same time and this could not be possible given the amount of resources available. The amount of resources available therefore, plays a critical role in the success of a project undertaken. Project managers are advised therefore to optimize the utilization of resources so as to ensure project completion within the budgeted cost (Allen, 2012). Carter (2012) studied on the challenges facing road infrastructure firms in sub-saharan Africa in their effort to deliver quality projects. The study analyzed impact of outsourcing technical human resource using 100 questionnaires issued to project managers and contractors. The study showed that the local construction firms faced a number of challenges in comparison with foreign firms especially in obtaining the technical staff with the required competency skills to undertake projects. The study also found out that every organization has a limited number of resources to perform tasks. A project manager's primary role therefore is to find a way to successfully execute a project within these resource constraints. Proper execution of road infrastructure projects requires thorough resource planning which comprises of establishing a team that possesses the skills required to perform the work as well as scheduling the non-labour resources such as tools equipment and processes (Warner well, 2013).

## **2.2 Effect of managerial skills in infrastructure performance**

Mcrael (2013) studied the role of managerial skills in managing infrastructure projects in Europe. The study asserted that the level and training in managerial skills will boost the performance of

construction firms in terms of quality and time taken to complete the projects. Training will therefore empower people to make better decisions and provide better quality goods and services. Mcrael further asserted that in developing the schedule and assigning road infrastructure resources, the project manager determines the optimal mix of staff to activities. Mcrael emphasized clear understanding and documentation project duration and duration of each major activity as part of the scheduling process. Ghura (2013) pointed out that adequate and timely planning of personnel prevents cost overruns in road infrastructure projects. It is therefore important for the project manager to understand the size of the required team needed to perform the weekly schedule. Leyman (2013) carried out a study on project management competency development in large Swedish organizations. It was noted that lack of staff with the skills required to perform a task in road infrastructure projects is another challenge in the implementation of road projects. This is very critical to project success. Leyman argued that matching the skills of people and the work to be performed is directly related to the time it takes to perform a given task. This aspect was found lacking in the local construction firms and led to projects being completed long after the time scheduled initially. Leyman therefore recommended that project managers should develop a list of skills required for the execution of the project which in turn determines the personnel for the project. Leyman said that competent human resource leads to the achievement of quality, productivity and efficiency in implementing road infrastructure projects.

### **2.3 Technology and Performance of Infrastructure Projects**

David (2013) did a study on secrets behind successful management of infrastructure projects in Columbia. The study outlined various ways in which technical resources can be applied in running various business projects to enhance management and improve productivity. To ensure that the standard of road infrastructure projects was not compromised, the Columbian government made changes in the funding of road infrastructure projects so that contract could not be awarded to bids made below the so called “lower brackets” but rather to those that were closer to the average value of bids. The former prevents bidders from unfairly lowering their bidders to secure contracts. Additionally, the Columbian government has set out the public-private Act through which they regulate both the investors in the projects and the funds for its execution. However, the study failed to include the moderation effect and other key factors that influence performance of infrastructure projects. Fox’s research (2013) examined the effects of using modern tools and techniques in the implementation and management of road projects. The study asserted that modern tools and techniques would drastically improve the quality of the road infrastructure projects. Fox further argued that technology would lead to completion of the projects within the specified time.

Graham and Mohamed (2013) study showed that agricultural projects in Kenya were characterized by low levels of technology, inappropriate technology and inadequate institutional capacity to support adaptation and absorption of modern technological skills. Benedict (2013) asserted that use of modern technology in road infrastructure projects would result in mass high quality projects and also reduce time and cost overruns. The study did not incorporate the moderation effect.

Stephene (2013) carried out a study on the importance of technical resources in the performance of road infrastructure Projects. The study noted that no road projects can succeed by applying ancient techniques. Boiji (2013) advocated for the development of efficient and reliable information systems in managing road projects after they carried out a study on application of technology in project management. Boiji indicated that use of modern technology in business helped in efficient delivery of good roads that meet customer satisfaction. Ellaine and Harris (2014) studied the performance of power infrastructure projects and noted that technology could lead to completion of projects within the time schedule and budgeted cost. The study failed to incorporate the moderating effect by considering government policy and other variables such as finances, monitoring and project risks management.

UNESCO Report on Education (2014) also noted there was need to provide increased training opportunities for the increasing number of school leavers to enable them be self supporting. It also asked the government to provide practical education and training skills which are responsive and relevant to Kenya's agricultural, industrial, commercial and economic needs and also provide the technical knowledge and vocational skills necessary to enhance the pace of development. Among the strategies recommended by the report were, it advised the government to increase institutional capacities of various training centers, to provide quality training and increase the training opportunities through expansion and maximize utilization of all technical and training institutions.

Odeyinka and Yusuf (2014) study on the causes and effects of delays in infrastructure projects noted that infrastructure projects' performance could be improved significantly through use of modern equipment. The above studies however did not include other variables which also influence the performance of road projects. Tony (2014) in Europe asserted that some of the challenges that led to poor performance of road infrastructure projects could be addressed through use of technological solutions. This aspect also leads to low morale of workers thus affecting their efficiency. Benedict (2014) indicated that use of modern techniques in the implementation of projects would result in high quality projects and a reduction in the time span for construction. Gitenya and Ngugi (2012); Graham and Mohamed (2013) studies focused on assessment of determinants of housing projects and factors effecting performance of agricultural projects respectively and not performance of road projects.

### **3.0 Discussion of Findings**

#### **3.1 Descriptive Results**

The study focused on the effect of resource mobilization on performance of road infrastructure projects in the Lake Basin Region undertaken by local firms in Kenya. Results (Table 3.1 attached at the end of this paper) from the study indicated that, 5.9 percent of the respondents reported that local firms mobilized financial resources to a very little extent, 37.8 percent reported to a little extent, 31.1 percent indicated average extent, 15.6 percent of the respondents reported a great extent and 8.9 percent indicated very great extent. Cumulatively majority of the respondents (74.8 percent) indicated that local firms were unable to mobilize adequate financial

resources for constructing road projects. The mean and standard deviation for this characteristic was 3.521 and 1.28 respectively. The implication of this is that many road projects constructed by local firms perform poorly due to insufficient financial resources. Figure 3.1 showing the relationship between project resource mobilization and performance is attached at the end of this paper.

Respondents were also asked as to whether their respective firms were able to acquire the technical equipment required in constructing road projects. The responses were; 6.7 percent indicated to a very little extent, 51.1 percent indicated a little extent, 13.3 percent reported average extent, 17.8 of the respondents reported great extent and 11.1 indicated a very great extent. Cumulatively 71.1 percent of the respondents reported that local firms had no capacity to acquire the necessary technical equipment for constructing road projects. Only 28.9 percent of the respondents were of the view that local construction firms have ability to acquire technical equipment required such as excavators, shovel, graders and other equipment. The mean for this characteristic was 1.28 and 1.04 respectively implying poor performance of road projects done by local firms.

When respondents were asked whether their firms had adequate number of machinery such as tippers to carry construction materials, their responses were; 2.2 percent indicated to a very little extent, 44.4 percent indicated little extent, 28.9 reported average extent, 17.6 indicated great extent and 6.7 percent of the respondents reported that local firms were able to acquire these machinery to a very great extent. From these findings it can be noted that 75.5 percent of the respondents reported that local firms were unable to acquire adequate machinery and other equipment required in constructing road projects. Only 24.3 percent of the respondents were of the view that local firms were able to acquire adequate machinery. The mean for this characteristic was 1.04. This implies that road projects constructed by local firms are likely to experience delays due to inadequate machinery.

On the question whether their firms applied technology in constructing road infrastructure projects, 37.9 percent of the respondents answered in affirmative while 52.1 percent indicated that technology was not applied. Ten percent of the respondents were uncertain. This implies that local firms are likely to experience challenges in completing road projects within the required time and attain the desired quality. These results show that project resource mobilization has a significant effect on performance of road infrastructure projects constructed. This findings are consistent with those of Majanja (2012) and Gitenya and Ngugi (2012) who asserted that adequate financial resources are key to performance of infrastructure projects.

### **3.2 Regression Results**

The regression results for project resource mobilization are shown in Figure 3.1 at the end of this paper. The results show that the regression coefficient for project resource mobilization was 0.217. This implies that the mean of performance of road infrastructure projects change by 0.217 per unit change in resource mobilization holding the other variables constant. The variable had a p-value of 0.036 which was  $< 0.05$  implying that mobilization of financial resources, acquisition

of trained staff, mobilization of technical equipment and acquisition of adequate machinery play a key role in the performance of road infrastructure projects.

These results support the alternative hypothesis that project resource mobilization has a significant effect on performance of road infrastructure projects constructed. This findings are consistent with those of Majanja (2012) and Gitenya and Ngugi (2012) who asserted that adequate financial resources are key to performance of infrastructure projects.

#### **4.0 Conclusion**

The study concludes that project resource mobilization has a significant effect on performance of road infrastructure projects undertaken by local firms. Financial, physical and technical resources have a significant effect on performance of road infrastructure projects. To aid acquisition of financial and technical resources, Public-private partnership and government guarantee will play an important role. This will improve performance of road infrastructure projects undertaken by local firms.

#### **5.0 Contribution to Knowledge**

Road infrastructure projects constructed in developing countries by local construction firms have continued to perform poorly in terms of cost, time and quality. Kenya's overall performance was 36.9 percent for the period 2011 to 2014. Despite this poor performance, none of the previous studies have focused on the performance of road infrastructure projects constructed by local firms in Kenya. Most of the studies focused on implementation of infrastructure projects. A few studies that have been done on performance focused other countries and hence there is need to conduct a study in Kenya.

Furthermore, no study has specifically focused the Lake Basin Region in spite of poor road infrastructure network. The study therefore has shed light on the effect of project resource mobilization on the performance of road projects constructed by local firms in Kenya. Hence, out that mobilization of financial, physical and technical resources were key factors in the performance of road infrastructure projects. Previous studies emphasized more on the funding of the road projects neglecting the input physical and technical resources in performance.

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**Table 3.1: Project Resource Mobilization and Performance**

	V. Little Extent %	Little Extent %	Average Extent %	Great Extent %	V. Great Extent %	Mean	SD
Mobilization of financial resources	5.9	37.8	31.1	15.6	8.9	3.521	1.28
Acquisition of trained staff.	4.4	22.2	35.6	28.9	8.9	2.57	1.01
Acquisition of technical equipment	6.7	51.1	13.3	17.8	11.1	1.28	1.04
Acquisition of adequate machinery	2.2	44.4	28.9	17.6	6.7	1.04	0.97
Overall effect of resource mobilization on project performance.	4.2	2.1	10.4	56.2	27.1	3.979	0.91

Source: Survey (2017)

**Table 3.2: Regression Results**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std Error			
Constant	0.299	0.291		1.026	0.311

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PRM	0.217	0.100	0.235	2.164	0.036
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a. Dependent Variable: PRI

Graph showing Relationship between Project Resource Mobilization and Performance

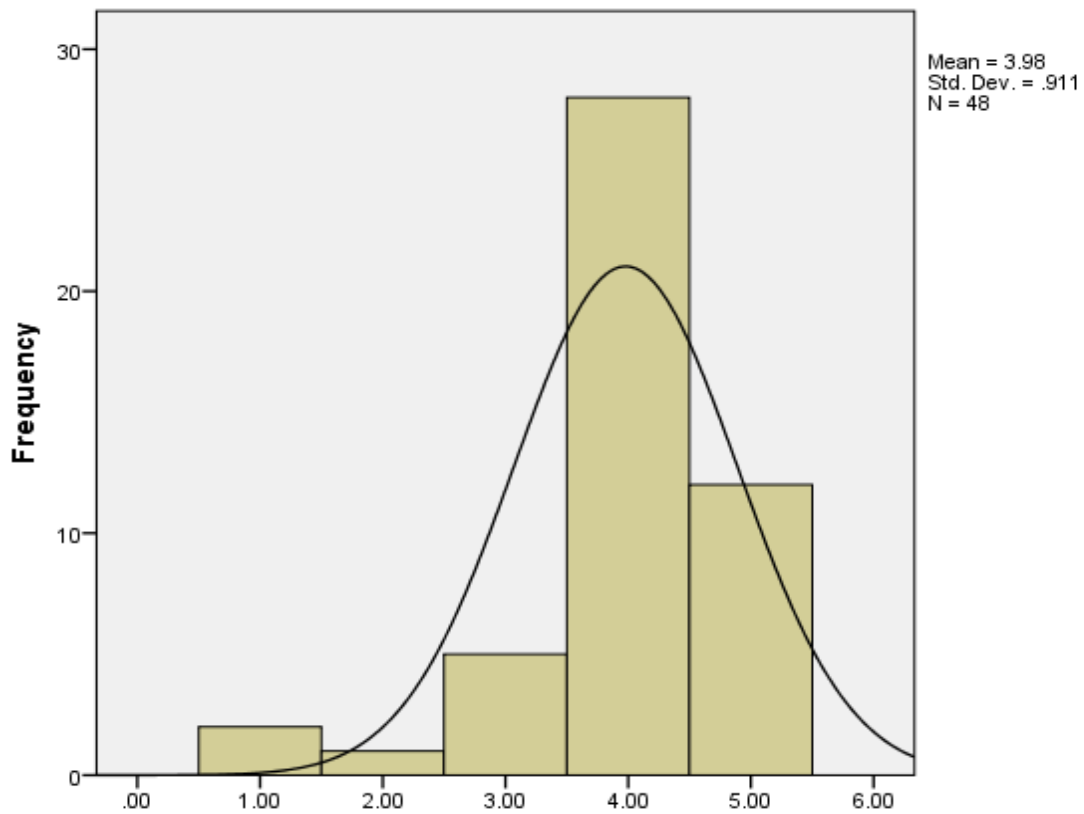


Figure 3.1: Relationship between project resource mobilization and performance