CRITICAL FACTORS AND THEIR INFLUENCE ON PERFORMANCE OF ROAD CONSTRUCTION PROJECTS IN KIAMBU COUNTY, KENYA

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Abstract
More than 50 percent of all road construction projects in Kenya are completed late with significant cost overruns. The study sought to evaluate the critical factors and their influence on performance of road construction projects in Kiambu County, Kenya. The research adopted a descriptive research design. Data was collected from a census of 9 road construction projects in the county. The target population was the 158 officers, who worked in the Kiambu regional offices for KURA, KeRRA, KeNHA and the county’s Ministry of Public Works as well as representatives of the contractors undertaking the road construction projects that were ongoing as at the time of the study. A stratified sample of 82 respondents was chosen from which data was collected using self-administered questionnaires. The collected data was analysed using descriptive statistics and inferential statistics. Inferences of the study were made using regression analysis. The findings of the study were presented in the form of charts and tables. The study found out that performance of road construction projects in Kiambu County, Kenya was affected by project funding, contractor capacity, project planning and project monitoring and evaluation. It was therefore recommended that financiers of road construction projects need to ensure that contractors with strong capacity are selected. In addition, adequate and timely financing of road construction projects ought to be undertaken as well as regular project monitoring and evaluation. Moreover, it is imperative for proper project planning to be undertaken for successful performance of road construction projects. Stakeholders’ involvement however was not found to have any significant influence on performance of road construction projects.

Keywords: Project, performance, critical factors, road construction projects

Introduction
Improvement of road infrastructure was identified by the Kenyan Government in its Vision 2030 as one of the critical drivers of the country’s economic transformation. Whereas the Government has continued to invest heavily towards road construction, the challenge of delays in completion of road construction projects and cost overruns continue to hamper accelerated road improvement in the country. Chandra (2006) argues that effective project performance in terms of meeting the set objectives is very critical for any project. This involves effective and efficient mobilization of resources to meet the project purpose. An appreciation of the critical factors that influence performance of a project is therefore imperative so as to provide project managers with an idea regarding where to lay focus on.
Project Management Institute (2004) defines project performance as an undertaking of a set of activities in a manner that optimizes outcome, whereas Desai (2013) views project performance as achievement of multiple and usually conflicting project objectives in terms of output, quality and cost. Therefore, project performance involves implementation and review of a project with a main objective of ensuring successful completion within the budgeted time, applying the resources expected as well as achieving the intended results. According to Flanagan and Norman (2013), the ultimate importance of project performance is achieved through avoiding the project’s failure to keep within cost budget, failure to keep within time stipulated for approvals, design, occupancy and failure to meet the required technical standards for quality, functionality, fitness for purpose, safety and environment protection.

Factors that influence project performance according to Ogwueleka (2010) relate to inputs to a management system that have a direct or indirect impact on the success or lack of it in a project. According to Adnan, Sheriff and Saleh (2009) critical factors in project performance are those that cause the greatest influence on the schedule, cost and quality of the project and include project planning, stakeholder involvement, project funding, contractor capacity and monitoring and evaluation. Bourne (2006) observes that it is crucial for project managers to ensure that all the factors that influence performance of construction projects are taken into account.

Aziz and Asmaa (2016) observed that performance of road construction projects in Egypt was mainly influenced by financing factors such as late payment by the financier, delays in client approval, improper selection of contractors, poor planning, geological problems on site, unrealistic contract prices, staffing issues, and disagreements with the stakeholders. On the other hand, Saraf (2013) as well as Adnan, Sheriff and Saleh (2009) observed that improper planning, poor site management and shortage of resources were major causes of delay or failure in construction. These factors were also identified by Otim and Alainaitwe (2015) who noted that most of the road construction projects in Uganda suffered from change of scope, environmental issues as well as scarcity of resources. The researchers identified poor project management as a critical contributor towards these challenges. A study by Muturi and Oguya (2016) on factors influencing performance of road construction projects in Arid and Semi-Arid areas in Kenya reached similar conclusions indicating that contractor’s competency, finances and conflicts explained 82.7 percent of the variance in the dependent variable.

Based on the results of the past studies, most of the researchers generally seem to have identified similar factors that generally influence performance of road construction projects. This study seeks to assess the critical factors that have been identified in past studies as being of influence on performance of road construction projects in Kiambu County, Kenya, which is one of the fastest growing regions in the country given its proximity to the capital city, Nairobi, according to Bundervoet, Maiyo and Sanghi (2015), and therefore infrastructural developments are very critical. The Government underscores the contribution of the county to the economy and in the financial year 2016/2017, earmarked an investment of over Kenya Shillings 100 million for road development in the county (Thugge, Heller and Kiringai, 2012), aimed at increasing access
throughout the county. The study uses a focused approach by narrowing down to Kiambu County, Kenya while incorporating a number of independent variables that have been noted to be critical in influencing road construction project performance namely; project planning, stakeholder involvement, project funding, contractor’s capacity and project monitoring and evaluation.

Research Problem

Despite the significant investment that the Government continues to make towards road construction, Macharia (2016) laments that around 55 percent of all road construction projects in the country suffer a myriad of challenges hindering their completion within schedule, experiencing cost overruns or fail to meet the requisite quality standards. Choge and Muturi (2014) observed that very few road construction projects in Kenya were completed within the budget cost estimates due to a number of challenges. A number of factors were identified as significant determinants of cost adherence such as ground conditions, poor planning and unrealistic initial requirements. Another study was conducted by Seboru (2015) and focused on the factors that result to delays in road construction projects in Kenya. The researcher noted that these factors ranged from project funding, project monitoring and evaluation, poor planning, contractor capacity and slow decision making. This research however only focused on projects that suffered delays in completion and thus did not address the issue of quality oversights and also cost overruns. Macharia (2016) undertook a study to assess the factors that influence completion of road construction projects in Embakasi, Nairobi County and identified factors such as resources, competency of staff, stakeholder participation and procurement procedures. The results of this study can however not be replicated to other counties based on its narrow scope and focus on urban roads only.

There has been no past study on the factors that influence performance of road construction projects in Kiambu County, Kenya, despite the importance of these developments and the fact that road infrastructure in the county is generally poor and particularly the lack of feeder roads connecting the mushrooming estates to the major highways. The road construction projects in the county have suffered delays, failed to meet quality standards with a number exceeding their budget estimates which is worrying though there lacks empirical research. It is against this background that this research sought to study the critical factors and their influence on performance of road construction projects in Kiambu County, Kenya.

Objectives of the Study

While the overall objective of the study was to assess the critical factors influencing performance of road construction projects in Kiambu County, Kenya, the specific objectives of this study were:

i. To investigate the influence of project planning on the performance of road construction projects in Kiambu County, Kenya

ii. To assess the influence of stakeholders’ involvement on the performance of road construction projects in Kiambu County, Kenya
iii. To determine the influence of project funding on performance of road construction projects in Kiambu County, Kenya

iv. To establish the influence of a contractor’s capacity on the performance of road construction projects in Kiambu County, Kenya

v. To assess the influence of project monitoring and evaluation on the performance of road construction projects in Kiambu County, Kenya

Significance of the Study
The findings of this study are expected to be of benefit to the county Government of Kiambu, Kenya, which is in charge of development of the access roads in the county, as the conclusions of the study are hoped to provide insights that could be applied in improving road construction in the county. The findings of the study would also provide useful ideas in improving efficiency and effectiveness in the management of road construction to the relevant central Government institutions such as the Kenya Roads Board (KRB) which is the body responsible for road development in the country and Kenya Rural Roads Authority (KeRRA) being the Government institution in charge of improvement of rural roads in conjunction with the various county Governments. Additionally, road construction companies are likely to find the findings of this study useful as they are likely to gain a deep understanding of the various strategies that could be applied to ensure successful completion of road construction projects. Thereby, such companies are likely to enhance their competitiveness through effective and efficient implementation of road construction projects. The study is also expected to interest researchers and academicians mainly in the subject of road construction projects and particularly on the critical factors that influence performance of road construction projects thereby contributing to the body of research in road construction.

Literature Review
Theoretical review
The theories that were reviewed to offer insights and explanations relevant to this study were resource dependency, stakeholder theory, and institutional theory.

Resource dependency theory, developed by Pfeffer and Salancik in 1978 posits that, the capacity of an organization in terms of resources is a critical determinant of successful implementation of tasks and projects. Proponents of this theory include Mohammed (2012) who argue that it is imperative for an organization to have adequate resources that are necessary for implementation of a project or achievement of set objectives. There are however those who criticize the theory such as Fapohunda and Stephenson (2010) who argue that there are organizations that have succeeded even without resources indicating the need to consider other factors such as effectiveness of management, organizational culture and implementation of appropriate strategies. The theory provides to this study the theoretical understanding that ability of an organization such as a contractor to perform a project, in this case road construction projects, is influenced by the availability of resources. Some of the identified critical resources that
determine successful implementation of road construction projects include finances, competence of human resources and availability of materials and equipment.

Stakeholder Theory, developed by Edward Freeman in 1983, holds that an organization has a number of parties who have an influence on its operations. Supporters of this theory such as Atkin and Skitmore (2008) observe that it is imperative for an organization to take care of its stakeholders. The theory postulates that organizations that manage to consider the interests of most of the stakeholders are likely to be successful in their endeavors. Opponents of this theory such as Manowong and Ogunlana (2010) argue that this theory lacks specificity and therefore its operationalization in a manner that would allow scientific inspection is difficult. The theory also does not adequately guide decision making such as to minimize the conflict of interest that often arise in meeting the diverse needs of the various stakeholders in an organization. Nevertheless, the theory has been applied in emphasizing the need to consider interest of stakeholders in corporate decision making. The theory will help this study to appreciate that there are a number of stakeholders that road contractors and other parties should take care of. An organization should therefore be in a position to change its mode of operation to suit the needs of its stakeholders and at the same time ensuring that the overall objective of accomplishing the set tasks is achieved. Engagement of stakeholders, consideration of the social impact of the road construction projects and appreciating the importance of negotiations to be undertaken with stakeholders are identified as critical factors that determine successful performance and implementation of road construction projects.

Institutional Theory, developed by William Richard Scott in 1995, stresses the need for organizations to have processes and procedures that guide achievement of set goals. Researchers who support this theory such as Choge and Muturi (2014) underscore the importance of organizations to act ethically and in observance of its norms, routines and rules. Adoption of fair practices in achievement of the organizational goals will for instance ensure minimal friction with the stakeholders such as the construction workers or the society. However, Brammer, Jackson and Matten (2012) criticize this theory arguing that following the recommendation of the theory does not guarantee success in an activity or project. Therefore, it is imperative not only to have processes and procedures in place, but also to ensure that such processes are geared towards successful completion of tasks. The theory could be applied by contractors who should use their experience to come up with appropriate procedures for undertaking a project in a manner that will ensure smooth implementation and guarantee success. On the other hand, there is need to understand the processes and procedures that the Government employs in management of road construction projects such as during the award of tenders, monitoring and evaluation of projects and in payment of contractors.

**Empirical review**

A report by the World Bank (2014) documented that poor planning is one of the major inhibitors for infrastructure development in Kenya. Whereas the report indicates that most of the infrastructure projects in Kenya have well documented plans, it was noted that there is usually
minimal reliance on the same during actualisation and thereby about 50 percent of the projects in the country end up being delayed in completion. Moreover, the projects ended up not meeting quality standards. As such, it is not only important to have plans in place, but also to ensure that they are actually implemented. Similarly, Wambui, Ombui and Kagiri (2015) studied the factors that affect completion of road construction projects in Nairobi City County, Kenya. They found out that most of the projects that were being implemented by KURA either failed to have reliable plans or even where the plans were available, they were rarely followed during implementation causing delays in project implementation. The study was focused on Nairobi County, Kenya and thus the need to assess whether the experiences of other counties such as Kiambu County, Kenya would have different results.

Manowong and Ogunlana (2010) noted the need to involve all stakeholders or at least consider their interests in a road construction project for effective implementation. Given the significant impact of such constructions in terms of the environment and disruption of other infrastructure such as power lines and public water pipes, it is critical to ensure that stakeholders are involved. Macharia (2016) studied road construction project in Embakasi, Nairobi County, Kenya where the researcher observed that where stakeholders are engaged before a road construction project, there is likelihood that an appropriate impact analysis will be undertaken. Concerns of all stakeholders will be taken into account during the planning phase of the project and thereby avert any possible collision that might occur during implementation. According to KRB (2016), the Government was projecting to spend in excess of Kes 60 billion towards road development in the country in the financial year 2016/2017, which is testament to the fact that road improvement had been identified as one of the critical pillars for the country’s economic development. However, Thugge, Heller and Kiringai (2012) lament that absorption of development budgets for a number of Government institutions are a critical concern since it results to a situation where funds that ought to have been utilized to improve the economy being diverted, as Wafula (2017) noted that part of the funds that the Government allocates towards road maintenance end up being misappropriated and even where such funds are applied accordingly, delays in disbursements hurts the pace and quality of roads development, attracting unnecessary frequent rehabilitation of the roads.

Contractors endowed with the requisite materials and equipment are likely to implement road construction projects successfully and in conformance with the set quality standards, since applying the right technology in road construction according to Thwala and Mvubu (2008) goes a long way in reducing the project turnaround time and at the same time ensuring that quality work is performed. Mastery of experience in project management is also critical for a contractor to successfully implement the project since experienced contractors according to Fapohunda and Stephenson (2010) are able to foresee possible challenges that might be encountered in a project and thereby undertake necessary plans to proactively deal with such and are also able to provide more realistic cost estimates for the project. Additionally, the process of government monitoring and evaluation of road contracts is quite lengthy which might cause some good contractors shy away from bidding for these jobs. In addition, Mahamid et al. (2011) observe that the Government is quite slow in approving certificate of works which slows disbursement to
contractors, with contractors often engaged in laborious exercise of following up the Government to award certificate of completion so that progress payments could be released. Contracting parties should be keen to ensure that a regular review is undertaken so that the project schedule is continuously updated based on the actual performance. Hussin and Omran (2011) argued that it is more beneficial for stakeholders to be proactive while managing road construction projects to be able to identify some of the challenges well in advance and take necessary remedial action.

Research Methodology
The study adopted a descriptive research design which according to Kumar (2010) helps the researcher to undertake an explorative design, and involves collation of data and analyzing it to provide inference including presentation, organization and interpretation. The target population for this study was the 158 officers working in nine road construction projects in Kiambu County, Kenya, from whom data was collected and included 35 officers from Government representatives in the Kiambu County, Kenya; 18 officers from the regional offices for KeNHA, 22 from KURA offices; 30 from KeRRA as well as 54 representatives of the contractors implementing the ongoing road construction projects. A stratified sampling technique was employed in this study with population strata developed according to agencies involved in road construction projects in the County. A sample size of 50 percent of the total respondents, which brings the total sample size to 82 from the total of 158 respondents, due to rounding off from the strata, was selected for the study.

Primary data was collected through the use of questionnaires that were administered to the target sample in Kiambu County, Kenya, mostly through drop-and-pick-later method. Follow-ups via telephone calls and email reminders to improve the response rate and viability of the study were then done after a reasonable amount of time. The research questionnaire was aimed at assessing the perceptions of the respondents on the various factors that were identified as critical influencers of performance on road construction projects, with respondents being offered an opportunity to identify the variables that they perceived as having influence on completion of road construction projects and rate them on a Likert Scale from 5 (Strongly Agree) to 1 (Strongly Disagree). To ensure content validity, the instruments applied in this study was reviewed by research supervisors and other research experts. This ensured that the content of the instrument was appropriate and that the questions were easily understandable by the respondents and free from ambiguity. Also, to ensure reliability, simple language, clear and systematic questions were used. Cronbach’s Alpha was used to test the reliability of the research instrument. A construct composite reliability co-efficient (Cronbach Alpha) of 0.8 or above, for all the constructs, was considered to be adequate for this study, as according to Kumar (2010), a value of 0.8 is an acceptable reliability coefficient and thus this forms the benchmark for this study.

The research generated both qualitative and quantitative data which was analyzed, with qualitative data being read and categorized into distinct themes as shown by the responses. Responses with common themes or patterns were grouped together into coherent categories.
Quantitative data was also coded and entered into Statistical Package for Social Sciences (SPSS version 17) and analyzed using descriptive statistics. Descriptive statistics used included frequencies, percentages, mean and standard deviation. Multiple regression model was used to establish the relationship between dependent and independent variables. Regression analysis was used to provide the relationship between performance of projects and the independent variables such as project planning, stakeholder’s involvement, project funding, capacity of the contractors, project monitoring, and evaluation. The regression model that was used is as below:

\[ PR = \beta X_1 + \beta X_2 + \beta X_3 + \beta X_4 + \beta X_5 + \epsilon \]

Where:

- \( PR \) = Performance of road construction project.
- \( \beta \) = Coefficient of regression,
- \( X_1 \) = Project Planning
- \( X_2 \) = Stakeholders Involvement.
- \( X_3 \) = Project Funding
- \( X_4 \) = Contractor’s Capacity
- \( X_5 \) = Project Monitoring and Evaluation.
- \( \epsilon \) = the error term normally distributed about a mean of 0 and for the purpose of computation is assumed to 0.

Research Findings and Discussion

Project planning

Respondents were required to indicate the influence of the various indicators of planning on performance of road construction projects. The focus of the study was on the influence of having systematic work plans and schedules, adherence to the developed work plans and schedules, having clear communication channels, formulation of policies and procedures for undertaking the project, budgeting, and development of risk management strategies. Table 1 below provides a summary of the mean scores and standard deviation of each of these metrics.

Table 1: Project planning

<table>
<thead>
<tr>
<th></th>
<th>Work plans</th>
<th>Adhere to work plans</th>
<th>Clear communication</th>
<th>Policies &amp; procedure</th>
<th>Budgeting</th>
<th>Risk management</th>
<th>Aggregate</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>21%</td>
<td>27%</td>
<td>31%</td>
<td>40%</td>
<td>29%</td>
<td>40%</td>
<td>31%</td>
</tr>
<tr>
<td>Disagree</td>
<td>35%</td>
<td>29%</td>
<td>33%</td>
<td>31%</td>
<td>42%</td>
<td>44%</td>
<td>36%</td>
</tr>
<tr>
<td>Neutral</td>
<td>37%</td>
<td>27%</td>
<td>27%</td>
<td>25%</td>
<td>19%</td>
<td>13%</td>
<td>25%</td>
</tr>
<tr>
<td>Agree</td>
<td>8%</td>
<td>15%</td>
<td>8%</td>
<td>4%</td>
<td>6%</td>
<td>0%</td>
<td>7%</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>0%</td>
<td>2%</td>
<td>2%</td>
<td>0%</td>
<td>4%</td>
<td>2%</td>
<td>2%</td>
</tr>
</tbody>
</table>
Mean 2.17 2.31 2.17 1.92 2.13 1.79 2.12
Std dev 1.02 0.90 0.90 1.03 1.03 0.82 0.98

**Source:** Survey data (2018)

The respondents indicated with a mean of 2.17 that clear communication channels were often adopted in performance of road constructions. On the other hand, having policies and procedures for undertaking road projects had a mean score of 1.92 whereas budgeting had a mean score of 2.13 and 1.79 score for risk management respectively. Generally, most of the respondents were of the view that road construction projects in Kiambu County, Kenya were poorly planned, indicated by an aggregate mean of 2.12.

**Stakeholder involvement**

The respondents were requested to indicate their views regarding the level of involvement of stakeholders in performance of road construction projects in Kiambu County, Kenya. Their responses are summarized by table 2 below.

Table 2: Involvement of stakeholders

<table>
<thead>
<tr>
<th>Source</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Engagement</td>
<td>Negotiation</td>
<td>Social impact assessment</td>
<td>Aggregate</td>
</tr>
<tr>
<td>N</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>31%</td>
<td>38%</td>
<td>10%</td>
<td>26%</td>
</tr>
<tr>
<td>Disagree</td>
<td>35%</td>
<td>25%</td>
<td>12%</td>
<td>24%</td>
</tr>
<tr>
<td>Neutral</td>
<td>25%</td>
<td>23%</td>
<td>29%</td>
<td>26%</td>
</tr>
<tr>
<td>Agree</td>
<td>4%</td>
<td>12%</td>
<td>31%</td>
<td>15%</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>6%</td>
<td>2%</td>
<td>19%</td>
<td>9%</td>
</tr>
<tr>
<td>Mean</td>
<td>2.13</td>
<td>2.19</td>
<td>3.38</td>
<td>2.57</td>
</tr>
<tr>
<td>Std dev</td>
<td>1.12</td>
<td>1.21</td>
<td>1.10</td>
<td>1.28</td>
</tr>
</tbody>
</table>

**Source:** Survey data (2018)

A good number of respondents (mean score of 3.38) were in agreement that social impact assessment was often done during the performance of road construction projects in Kiambu County, Kenya. This could be attributable to the fact that this is actually a legal requirement in Kenya. Before any construction project is undertaken, necessary approvals are a requirement one
of which is from the National Environmental Management Authority (NEMA). Before approval from NEMA is obtained, a formal Social Impact Assessment (SIA) is required and thus most of the respondents noted that SIA was undertaken for the projects. However, there was minimal active engagement (mean score 2.13) with the stakeholders to negotiate the impact of these projects (mean score of 2.19). Other than undertaking SIAs, the project managers were not keen to engage the stakeholders or negotiate with them regarding the impact of road construction projects which might have caused the various stakeholders not to offer requisite support to such projects.

**Project funding**

The study sought responses regarding various perspectives of project funding including; their views regarding availability of funds from the government to finance the projects, speed of disbursement of funds to the contractors, whether bureaucracies were experienced in approval of overruns, and whether the retention rates were low. The descriptive statistics of the responses received are provided in table 3 below.

Table 3: Project funding

<table>
<thead>
<tr>
<th></th>
<th>Funds availability</th>
<th>Disbursement speed</th>
<th>No overruns approval</th>
<th>Low retention rates</th>
<th>Aggregate</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>42%</td>
<td>56%</td>
<td>17%</td>
<td>56%</td>
<td>43%</td>
</tr>
<tr>
<td>Disagree</td>
<td>37%</td>
<td>13%</td>
<td>13%</td>
<td>17%</td>
<td>20%</td>
</tr>
<tr>
<td>Neutral</td>
<td>15%</td>
<td>13%</td>
<td>10%</td>
<td>10%</td>
<td>12%</td>
</tr>
<tr>
<td>Agree</td>
<td>4%</td>
<td>10%</td>
<td>25%</td>
<td>6%</td>
<td>11%</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>2%</td>
<td>8%</td>
<td>35%</td>
<td>12%</td>
<td>14%</td>
</tr>
<tr>
<td>Mean</td>
<td>1.87</td>
<td>2.00</td>
<td>3.46</td>
<td>2.00</td>
<td>2.33</td>
</tr>
<tr>
<td>Std dev</td>
<td>0.95</td>
<td>1.34</td>
<td>1.51</td>
<td>0.40</td>
<td>1.46</td>
</tr>
</tbody>
</table>

**Source:** Survey data (2018)

Most of the respondents (mean score 3.46) indicated that they had experienced bureaucracies as they sought approval of overruns from the financier (government). There was also a common view that the government did not have sufficient funds to finance the road construction projects (mean score 1.87) and also the pace of disbursement of funds was noted to be slow (mean score 2.00). Further, the respondents decried the level of retention rates with a majority (56%) noting that the rates were too high (mean score of 2.00). Based on the responses, it is discernible that
undertaking road construction projects in Kiambu County, Kenya suffered a number of financing issues.

**Contractor capacity**

The study assessed the capacity of the contractors in terms of experience and resources necessary to effectively undertake road construction projects in Kiambu County, Kenya. The descriptive statistics for the responses collated are summarized using table 4 below.

<table>
<thead>
<tr>
<th>Source: Survey data (2018)</th>
</tr>
</thead>
</table>

A number of contractors (mean score 2.42) were dependent on resources from the financier to undertake the road construction projects since they did not have adequate resources to carry out these projects. As such, they did not have the requisite resources to carry out the project in the events there were delays in getting funding from the financier. However, most of them (mean score 3.96) had the requisite experience to carry out the road construction projects successfully. This could be informed by the qualification reviews that are undertaken during the tender award process. They however lacked skilled workers (mean score 1.98) while the respondents also strongly disagreed that the appropriate materials (mean score 2.48) and equipment required (mean score 2.50) were available.

**Project monitoring and evaluation**

The study reviewed the process of project performance right from the process of award of tenders to project completion including monitoring and evaluation. The objective was to evaluate

<table>
<thead>
<tr>
<th>Table 4: Contractor capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
</tr>
<tr>
<td>Strongly disagree</td>
</tr>
<tr>
<td>Disagree</td>
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<tr>
<td>Strongly agree</td>
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<tr>
<td>Mean</td>
</tr>
<tr>
<td>Std dev</td>
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<tr>
<td>Resources</td>
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<tr>
<td>52</td>
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<tr>
<td>25%</td>
</tr>
<tr>
<td>25%</td>
</tr>
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<tr>
<td>17%</td>
</tr>
<tr>
<td>8%</td>
</tr>
<tr>
<td>2.58</td>
</tr>
<tr>
<td>1.26</td>
</tr>
</tbody>
</table>
whether there were factors that influenced performance of the road construction projects throughout the project cycle. Table 5 below provides a summary of the descriptive statistics.

Table 5: Project monitoring and evaluation

<table>
<thead>
<tr>
<th></th>
<th>Timely tender award</th>
<th>M&amp;E reports</th>
<th>Remedial action</th>
<th>Progress certificates</th>
<th>Aggregate</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>63%</td>
<td>83%</td>
<td>62%</td>
<td>60%</td>
<td>67%</td>
</tr>
<tr>
<td>Disagree</td>
<td>10%</td>
<td>4%</td>
<td>10%</td>
<td>15%</td>
<td>38%</td>
</tr>
<tr>
<td>Neutral</td>
<td>10%</td>
<td>8%</td>
<td>10%</td>
<td>10%</td>
<td>9%</td>
</tr>
<tr>
<td>Agree</td>
<td>8%</td>
<td>4%</td>
<td>12%</td>
<td>10%</td>
<td>8%</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>10%</td>
<td>2%</td>
<td>8%</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Mean</td>
<td>1.90</td>
<td>1.38</td>
<td>1.94</td>
<td>1.87</td>
<td>1.77</td>
</tr>
<tr>
<td>Std dev</td>
<td>1.39</td>
<td>0.93</td>
<td>1.38</td>
<td>1.27</td>
<td>1.27</td>
</tr>
</tbody>
</table>

Source: Survey data (2018)

The respondents noted that tender award process was not concluded within reasonable time (mean score 1.90) and that there was no close monitoring and supervision by the financier (mean score 1.38), remedies pointed out from M&E reports were also not effectively implemented (mean score 1.94) and completion/progress certificates were not issued on time (mean score 1.87). The process of project monitoring and evaluation was therefore noted to be poor from most of the responses received. An aggregate of 67% of the respondents strongly disagreed with the view that there were strong indicators for effective project monitoring and evaluation.

Project performance
Views were sought from the respondents regarding the performance of road construction projects in Kiambu County, Kenya in terms of completion within the set budget cost, timelines as well as whether there was conformance to the quality specifications. The responses were analysed using descriptive statistics whose results are presented in table 6 below.
Table 6: Project performance

<table>
<thead>
<tr>
<th>Label</th>
<th>Value</th>
<th>Timely completion</th>
<th>Budget adherence</th>
<th>Conformance to standards</th>
<th>Aggregate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td>1</td>
<td>59.61</td>
<td>69.22</td>
<td>61.53</td>
<td>63.20</td>
</tr>
<tr>
<td>Slightly disagree</td>
<td>2</td>
<td>11.54</td>
<td>3.85</td>
<td>11.54</td>
<td>8.55</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>7.69</td>
<td>9.62</td>
<td>9.62</td>
<td>9.9</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>5</td>
<td>11.54</td>
<td>7.69</td>
<td>13.46</td>
<td>10.85</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Mean</td>
<td>2.00</td>
<td>1.83</td>
<td>2.02</td>
<td>1.95</td>
<td>1.95</td>
</tr>
<tr>
<td>Std. Dev</td>
<td>1.22</td>
<td>1.37</td>
<td>1.51</td>
<td>1.44</td>
<td></td>
</tr>
</tbody>
</table>

Source: Survey data (2018)

Based on the responses collated, 59.61 percent of the respondents strongly disagreed with the view that road construction projects in Kiambu County, Kenya were completed in time with an additional 11.54 percent of the respondents slightly disagreeing. Only 7.69 percent of the respondents agreed that projects were completed within time whereas 11.54 percent of the respondents strongly agreed to this. A majority of the respondents were therefore of the view that road construction projects in Kiambu County, Kenya experienced delays in completion.

Regarding conformance to laid down budget estimates, seventy three percent of the respondents were in disagreement (69.23 strongly disagreed, 3.85 slightly disagreed) with the view that road construction projects in Kiambu County, Kenya adhered to the initial cost budgets. Only a paltry 9.62 percent agreed and 7.69 strongly agreed with the view that the projects were undertaken in adherence to allocated cost budgets. This is an indication that these projects required additional financing from the government as the contractors claimed for cost overruns. This could be partially explained by the fact that very few of the projects were completed within the scheduled time.

Over sixty one percent of the respondents strongly disagreed with the view that road construction projects in Kiambu County, Kenya conformed to the quality specifications with an additional eleven percent slightly disagreeing with this view. However, 13.46 percent of the respondents were in strong agreement with this view, with an additional 9.62 percent of the respondents agreeing with the view. Overall, the majority of the respondents therefore felt that the quality of road construction projects in the County was poor.
Overall, the results indicated that most of the respondents were of the view that road construction projects in Kiambu Country, Kenya were not completed on time (mean score 2.00), did not adhere to the set budgets (mean score 1.83) and failed to conform to the set standards (mean score 2.02). There was therefore a general view that projects in Kiambu County were not performed effectively and efficiently, as only a small fraction of the respondents (mean score 1.95) felt that the projects were undertaken within the stipulated time, were completed within budget and that they were done to the required quality standards.

**Multiple Regression Results**
Multiple regression analysis was undertaken to assess the nature and statistical significance of the relationship between each of the predictor variables and the dependent variable (performance of road construction projects). This was performed using data collected from the field and tested at 5% significance level. The results of the test are summarised in table 7 below.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficients</th>
<th>Standard Error</th>
<th>t Stat</th>
<th>P-value</th>
<th>Lower 95%</th>
<th>Upper 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.63</td>
<td>0.72</td>
<td>-0.88</td>
<td>0.38</td>
<td>-2.08</td>
<td>0.81</td>
</tr>
<tr>
<td>Project planning</td>
<td>0.23</td>
<td>0.20</td>
<td>1.12</td>
<td>0.01</td>
<td>-0.18</td>
<td>0.63</td>
</tr>
<tr>
<td>Stakeholder involvement</td>
<td>0.15</td>
<td>0.10</td>
<td>1.49</td>
<td>0.14</td>
<td>-0.05</td>
<td>0.35</td>
</tr>
<tr>
<td>Project funding</td>
<td>0.15</td>
<td>0.21</td>
<td>0.72</td>
<td>0.00</td>
<td>-0.27</td>
<td>0.58</td>
</tr>
<tr>
<td>Contractor capacity</td>
<td>0.68</td>
<td>0.22</td>
<td>3.16</td>
<td>0.00</td>
<td>0.25</td>
<td>1.12</td>
</tr>
<tr>
<td>Project monitoring and evaluation</td>
<td>0.32</td>
<td>0.08</td>
<td>0.62</td>
<td>0.00</td>
<td>0.31</td>
<td>1.21</td>
</tr>
</tbody>
</table>

**Source:** Survey data (2018)

The regression analysis model can therefore be presented as below;

\[
\text{Project performance} = -0.63 + 0.23*\text{X1} + 0.15*\text{X2} + 0.15*\text{X3} + 0.68*\text{X4} + 0.32*\text{X5}
\]

The above equation implies that holding all other independent variables constant, changing the variable under consideration by a single unit leads to a change in project performance by the indicated coefficient, with a positive sign indicating positive relationship while negative sign indicates a negative relationship between that particular independent variable and project performance. The exact coefficient value of +1 means perfect positive relationship, the exact value of -1 indicates a perfect negative relationship while the exact value of 0.00 indicates no relationship exists between the two variables. Thus a coefficient closer to +/-1 would indicate a strong relationship while values close to 0 mean weak relationships between the variables.
Discussion of Findings
Regarding the first objective of the study which is to investigate the influence of project planning on the performance of road construction projects in Kiambu County, Kenya, it can be deduced from the regression analysis presented in table 7 above that project planning has a significant influence on the dependent variable, since its value is 0.01 which is less than p-value of 0.05. Additionally, the two variables are positively related (positive coefficient), meaning that holding all other variables constant and changing project planning by a single unit would lead to a change in project performance by 0.23 units, as per the model above. This is in line with the findings by Wambugu (2013) who studied the factors that affect completion of rural electrification projects in Kenya. He noted that poor planning had an adverse effect on the timely closure of the rural electrification projects in Kenya as well as the quality of the projects so undertaken. The researcher found out that with proper planning, a contractor gains a thorough understanding of the project since the scope is clarified. Marzouk and Tarek (2014) also analysed the causes of delays in Egyptian construction projects, and noted that construction delays were very common in Egypt and most of them were due to lack of prioritization of project tasks.

On the objective of assessing the influence of stakeholders’ involvement on the performance of road construction projects in Kiambu County, Kenya, it will be noted that the study did not find any significant influence of stakeholders’ involvement on the performance of road construction projects in the county, since p is greater than 0.05 (p=0.14). This however contrasted findings by Maina (2013) who studied the influence of stakeholders’ participation in education projects in Nakuru County, Kenya. Based on the study, the researcher noted that involvement of stakeholders is critical in projects through a proactive approach. However, the researcher observed that use of a reactive approach where stakeholders are involved only when problems have arisen is likely to be counterproductive. This mainly occurs where stakeholders are not involved on time for complex situations that have far reaching impacts. In that case, a project is likely to face delays as the problems are resolved whereas this could be avoided if consultations are undertaken in the course of the project.

On the issue of establishing the influence of project funding on the performance of road construction projects in Kiambu County, Kenya, it was noted that project funding had a strong significance (p=0.00) on performance and was also found to be positively related to the dependent variable, meaning that holding all other variables constant, a unit increase in project funding would result in an improvement in project performance by 0.15 units. This finding was similar to that made by Olatunji (2010) who noted that project finance is one of the challenges in road construction projects that are often beyond the control of the parties in a road construction project though it has a significant impact on the smooth flow of a project’s schedule of activities. Where payment for a road construction project is slow, some contractors minimize the amount of resources committed or only avail such resources when payment is received. This creates unnecessary disruptions to the project thus causing delays in project completion.
With regard to the objective of assessing the influence of contractor capacity on the performance of road construction projects in Kiambu County, Kenya, the study found that contractor capacity had a strong significance (p=0.00) and was also found to be positively related to project performance, meaning that holding all other variables constant and increasing contractor capacity by a single unit would result in an improvement in project performance by 0.68 units as presented in the regression model above. Similar findings were made by Fapohunda and Stephenson (2010) who noted that experienced contractors are able to foresee possible challenges that might be encountered in a project and thereby undertake necessary plans to proactively deal with such. Similarly, Hamzah (2012) argues that the ability of a contractor to execute the project will depend on the quality of workforce that is employed. A project team should therefore have the mist of skills that are required from time to time. A number of activities are undertaken in a road construction project and thus the need to engage a variety of professionals.

Regarding the objective of assessing the influence of project monitoring and evaluation on the performance of road construction projects in Kiambu County, Kenya, the study found that project monitoring and evaluation had a strong significance (p=0.00) and is positively related to the dependent variable, meaning that holding all other variables constant and increasing project monitoring and evaluation by a single unit would result in an improvement in project performance by 0.32 units as presented in the regression model above. This was in agreement with a study by Ondieki (2011) who studied the factors that influence performance of Local Authority Transfer Fund (LATF) projects in Kisii County, Kenya. The researcher found that it was critical for continuous monitoring and evaluation of road construction projects particularly by the stakeholders. This was found to create project ownership by the host community and at the same time put pressure for accountability upon the contractor.

**Conclusion**

Project planning was noted to have a significant impact on performance of road construction projects. In addition, the study found out that road construction projects in Kiambu County, Kenya were generally completed late and did not adhere to the set budgets. Further, the said projects failed to adhere to be set quality standards and were often completed late. This could explain the poor state of the roads in the county despite its proximity to the city as cited by several studies.

Project funding in terms of availability and adequacy of funds, speed of their disbursement and speed of approval of any overruns was also noted to positively influence the performance of road construction projects in Kiambu County, Kenya. Where the financier provides funds to the contractor in good time and promptly approves overruns, the contractor is able to effectively undertake the projects and complete them in good time and to the required quality standard as they are able to acquire the right materials, equipment and skilled labour force.
The capacity of contractors was assessed in terms of its influence on performance of road construction projects in Kiambu County, Kenya. The study found out that a contractor’s capacity has a significant influence on project performance. This is because contractor’s capacity would mean that they have the resources, skilled labour, experience and expertise and with such, they would be able to prepare realistic budgets and work plans and also be able to adjust and use own resources in case there are delays in disbursements by the financier, greatly enhancing project performance and delivery.

Project monitoring and evaluation was noted to have a significant influence on performance of road construction projects in Kiambu County, Kenya. Further, the study found out that for budgets to be adhered to, project managers should ensure that appropriate remedial actions are taken to close any gaps identified from the monitoring and evaluation reports. Where continuous monitoring and evaluation by the Government and construction managers are prompt to implement corrective action to cure the deficiencies noted from M&E reports, there will be significant improvement in performance of road construction projects in Kiambu County, Kenya.

The study did not find any significant influence of stakeholders’ involvements on performance of road construction projects in Kiambu County, Kenya.

**Recommendations**

Based on the study findings, the study recommends that appropriate project plans should be developed with clear task schedules, realistic resource estimates and guiding policies and procedures before a project is undertaken to guide road construction projects. Such would ensure that adequate preparations are made to reduce inefficiencies throughout the project cycle.

Project funding was found to be very critical towards performance of road construction projects. It is therefore recommended that financiers such as the Government should ensure that financing is undertaken on a timely basis and approvals for overruns where necessary are speedily done. The study found out that engagement of contractors with the requisite capacity has an impact on performance of road construction projects. The Government should therefore be keen to ensure that appropriate evaluation of contractors is undertaken before issuance of tenders.

Project monitoring and evaluation was found to have significant influence on performance of road construction projects. The Government should undertake timely and continuous monitoring and evaluation of the projects to ensure that quality specifications set are met. In addition, it is important for contractors to ensure that the gaps identified in the monitoring and evaluation reports are addressed through appropriate remedial actions. Team work should therefore be maintained between the Government and contractors for successful project implementation to be achieved.
Contribution to Knowledge
Project managers and contractors in the road construction industry are likely to find the findings of this study useful as they are likely to gain a deep understanding of the various strategies that could be applied to ensure successful completion of road construction projects. Thereby, such companies are likely to enhance their competitiveness through effective and efficient implementation of road construction projects by giving weight to the identified critical factors with greatest influence. The study is also expected to interest researchers and academicians mainly in the subject of road construction projects and particularly on the critical factors that influence performance of road construction projects thereby contributing to the body of research in road construction.

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