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## CRITICAL FACTORS INFLUENCING IMPLEMENTATION OF ROAD PROJECTS IN KENYA

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### Abstract

**Purpose:** The Purpose of the study was to establish Critical factors influencing implementation of road projects .

**Methodology:** The study adopted a descriptive survey design. The target population of the study was all the road engineers, middle managers in department of KRB. The sample size was 188 respondents. Data collected was cleaned, pretested, validated, and coded, summarized and analyzed using statistical package of SPSS V23. The study findings were presented using graphs, histograms, bar charts and pie charts. Conclusions were derived based on the P.value and the coefficient of determination.

**Results:** The study found that the key significant determinants of sustainability of water projects in Machakos County were capacity of the project management, government policies, monitoring and resource support. The study concluded that project management capacity had the greatest determinant of sustainability of water projects in Machakos County, followed by resource support, then monitoring while government policy had the least determinant of sustainability of water projects in Machakos County.

**Contribution to policy and practice:** The study recommends that the government should advocate for proper planning with involvement of the benefiting community and timely implementation with the required results. This can be done through making of a policy by the ministry demanding for the practice of the same by the involved organizations. The project committee should set up financial structures considering both rising of funds and dissemination of the same in relation to operating and maintaining of the project. This can be done through learning and training on the same. The study also recommended that water beneficiaries and management should be sensitized to improve their knowledge on conservation and protection of water facilities

**Keywords:** *Project financial resources, project management contract, project requirements, implementation of road projects.*

### 1.0 INTRODUCTION

According to Greer (2009), a project is successful if it satisfies all three legs of the triple constraint, namely, performance (specification), cost and time. Thomsett (2002) in an extensive examination of 20 failing projects over a period of 18 years expanded this criterion of success as: Satisfies stakeholder groups, meets functional requirements, meets quality expectations and requirements, within cost, within deadline, delivers sustained and actual benefits and provides the team with professional satisfaction and learning.

The time required for the completion of road construction projects is influenced by a variety of factors both external to internal. Completion of a project within time stipulated at the tender a ward stage is a universally accepted measure of project success. Most projects would delay before they eventually take of (Samasian& soon,2007). This study presents the background of the statement of the problem, purpose of the study, research objectives and questions, study justification and significance, limitations and delimitations of the study of delay of completion of road projects in Kenya. The consequences may rather be in terms of loss in productivity, additional expenditures by way of rework and repair, re-inspection and retest in the short term. In the long term, poor efficient can hurt reputation, and if the company continues in the same way it might have to close its shop for want of new projects. If a number of construction companies of a country start neglecting the efficient aspects in their projects, this also starts reflecting on the reputation of the country (Hyvari, ). Helping the construction companies to identify the critical attributes responsible for achieving the desired efficient level (success factors) and also to find the attributes adversely affecting the project efficient (failure factors) has been the motivating factor behind this study. It is realized that maximization of the success factors and minimization of failure factors will ensure the construction industry realizes its efficient goals. Realizing these aspects, the present study was undertaken to suggest ways to improve efficient as well as to take care of certain critical factors that may lead to loss of efficient (KRB, 2011).

Although the causes for project success and failure have been the focus of numerous research studies, there has been no consensus on the issue. In a survey of west Bank in Palestinia, Mahamid(2011) indicated that the most severe factors affecting time delay in road construction projects from owners perspective are poor communication between construction parties. Examining the factors that cause delay in construction projects in Malaysia, Alghbari et al.(2007) tested 31 variables. The main finding of the study was financial factors. Faridi & El – Sayeh (2004) concluded the most significant causes of road construction delay are approval of drawings, inadequate early planning and delays in owners' decision making process

Project success and failures have become a contemporary topic within the construction industry. Research shows that construction companies are vulnerable to bankruptcy (Wong & Ng. 2010). For example only about 43% of construction firms that began operations in 2008, survived after four years of operations in the US (Ganaway). Similarly delays and time overrun are prevalent on construction projects (Al-Momani, 2000). Research shows that 10% - 30% of projects are delayed in Saudi Arabia (Assaf& Al-Hejji,) and 70% projects suffered delays during their execution in Nigeria (odeyinka &Ysuf, 2007 Cited in sambassvan& soon, 2007). Ganaway, () Key contributors to project failures are poor project management practices and lack of skills/experience of management personnel.

Cooke-Davies (2002) in a study of 136 European projects executed between 2012 and 2000 by a total of 23 organizations found that there was a strong correlation between schedule delay and cost escalation. However, cost escalation was not primarily caused by simply a schedule delay but due to a lack of a mature scope change process. It was also found that delivering project success is more difficult than delivering project management success, because it predictably involves aspects which may be beyond the control of the project team. With these second order controls, both goals and methods are prone to change; whereas project management success may be achieved by holding goals constant but changing practices to meet the predetermined goals.

Cooke-Davies (2002) argues that the ultimate aim of an organization should be to introduce practices that allow the enterprise to resource fully a portfolio of projects that are rationally and dynamically matched to the corporate strategy and business objectives. This view is further enhanced by Sutton (2005) who contends that projects are not dichotomous, it is not a matter of success or failure, but that there are

degrees of success and failure. He identifies four distinct levels of success, each having its own discipline, tools and techniques. Thus, excellence at each level is critical for absolute success.

Kaliba et al., (2009) found that the major causes of delays in construction projects in road construction projects in Zambia were delayed payments, financial deficiencies on the part of the client or the contractor. Contract modifications, economic problems, material procurement problems, and changes in design drawings, staffing problems, unavailability of equipment, poor supervision, and construction mistakes. Poor coordination on site, changes in specifications, disputes and strikes. As an executive at the public procurement and disposal Authority (PPDA), Agaba (2009) argued that it is erroneous to blame PPDA rules for delays in construction projects because delays are primarily caused by poor designs and specifications and problems with management and supervision.

In Kenya, road is the predominant mode of transport accounting for 93 percent of all freight and passenger traffic in Kenya, but costs are high (KACC, 2007). The road sub-sector is relatively large, with a total classified network of 160,886 km (of which 11,197 km are paved and 149,689 km are gravel or earth) and over 60,000 km of unclassified community roads (with corridors typically less than nine meters wide). This provides a reasonable network of roads in the densely populated parts of the country and some access throughout the rest. Unlike the neighbors, which have major areas without all-weather roads, the key challenge for Kenya is to bring the network in poor condition (56 percent) to good condition (currently just 11 percent), while ensuring that adequate maintenance is carried out on the rest. This has seen this Government initiate several road constructions projects which includes Thika road, expansion of outer road, southern by pass and many others.

The road transport industry includes large companies and individual owner operators; it is highly competitive and rates are determined by the market; the industry responds quickly to changes in demand, and road conditions and regulations. Even so, weak legal and regulatory framework has impacted negatively on the quality and reliability of services and on safety to the users (Kenya Transport Sector Support Project (KTSSP) Project Appraisal Document PAD, (2011). International development funds have had a big role in improving major routes. But these improvements are not long lasting, and soon after a road project is completed, its condition deteriorates fast resulting in huge potholes, broken bridges and culverts and muddy sections. Industrialists and other observers have attributed the poor state of Kenyan roads and road transport to the government's failure to efficiently allocate financial resources and to raise additional funds for road extensions and maintenance (IEA 2008; Watts 2000).

The Kenya Interim Poverty Reduction Strategy Paper supports this view, attributing the poor condition of Kenya's road network to several factors. These include lack of periodic and routing maintenance, rampant corruption in road construction contracts, collusion between contractors and government officials leading to approval of substandard work, increased traffic volume, overloading, El-Nino rains, and non-prioritization of roads in government expenditure (RoK 2000a). Evidently, inadequacies in the general road policy framework, in continuity and implementation of specific policy strategies, and in policy research and analysis focusing on the roads subsector explain the deterioration of the quality of the Kenyan road network over the last decade. The Government has sought to address these challenges through a variety of reforms which have included establishment of a secure road maintenance funding arrangement (road maintenance levy fund); separation of funding from policy formulation and implementation functions; creation of Kenya Roads Board (KRB) and clarification of the institutional arrangements in the management and ownership of the entire road network leading to the creation of



Kenya Roads Board (KRB), Kenya Rural Roads Authority (KeRRA) and Kenya Urban Roads Authority (KURA). The World Bank has been committed in this sector and has continued to fund road construction projects since 1960s and some of these projects have also experienced delays in their completion.

The Kenya Roads Board is a state corporation in the Ministry of Roads. The Board of Directors is made up of stakeholder representatives, each representing various interest groups and areas. The main objective of KRB is to oversee the road network in Kenya and thereby coordinate its development, rehabilitation and maintenance and to be the principal adviser to the Government on all matters related thereto. As per the Kenya Roads Board Act No. 7 of 1999, KRB has a mandate to oversee the road network in Kenya and thereby coordinate its development, rehabilitation and maintenance and be the principal adviser to Government on all matters related thereto. Clause 19 (4) of the KRB Act requires KRB to review, individually, the Annual Road Works Programmes (ARWPs) submitted by Road Agencies and sub-Agencies, and consolidate these ARWPs into an Annual Public Roads Programme (APRP) (KRB, 2018)

### **1.1 Statement of the problem**

Globally, transport infrastructure is an important factor in the development of a nation through its direct and indirect contribution to economic growth. It is in view of this that the Kenya Government has invested heavily in the road construction project and according to the Road Sector investment plan (2010-2024) the Government has allocated and continues to allocate significant resources toward improvement of transport infrastructure.

The information held by Kenya Roads board Website indicates that in the financial years 2009/10, 2010/2011 and 2011/12 the government of Kenya allocated Ksh 19 billion, Ksh 20 billion and Ksh 23.3 billion respectively for construction of road projects( KRB, 2010). In the road sub-sector, the extent of cost and time overruns in the overall portfolio is high. As at February 2007, 35 on-going projects out of a total of 207 showed cost overrun, translating into a cost overrun of Kshs. 7 billion. With regard to time overruns 184 projects exceeded their original completion time agreed at the tendering stage. On average, the actual time for completion was more than two times that at the tender stage (World Bank, 2007).

The inability to complete projects on time continues to be a problem worldwide. According to (Ahamed *et. al* 2002) Overruns on Construction Projects are a Universal Phenomenon. Azhar (2008) states that, trend of time overruns is common worldwide and that is more severe to developing countries. In Kenya information held by KRB of a few sample of road construction in Kenya have showed delay in completion for instance Rehabilitation and Construction of Londian–Fortenan Muhoroni Road (KRB 2010) was awarded 27April 2010 and received order to commence on 22 June, 2010. The initial completion period for works was 24 months with completion date of 19July, 2012. The work was completed after additional 8 months. Similarly the Construction of KCC (Sotik) – Ndanai – Gorgor Road (15) (KRB 2011). The contract was awarded with commencement date of 7<sup>th</sup> September, 2011 to 6<sup>th</sup> September, 2013 but completion date revised to 7<sup>th</sup> February, 2014. A time overrun of six months (Al-Momani, 2010)

Homabay–Mbita road located in Homabay and suba Districts of Nyanza in Western Kenya. Date of commencement of construction was 5-02-2010 for a period of 30 months with a completion date of 03-08-2012 but the completion was first revised to 23-10-2013 and a gain revised to 13-01-2014. (KRB, 2013). In view of the above, the study, therefore, intends to establish the Critical factors influencing implementation of road projects in Kenya.

## 1.2 Objectives of the study

- i. To establish how Project financial Resources affect implementation of road projects in Kenya.
- ii. To establish how Project Contract Management affect implementation of road projects in Kenya.
- iii. To establish how project management skills affect implementation of road projects in Kenya.
- iv. To establish how Project Requirements affect implementation of road projects in Kenya.

## 2.0 LITERATURE REVIEW

### 2.1 Theoretical Review

#### 2.1.1 Theory of Constraints

The basic premises of the Theory of Constraints assume that people can think, they are good and systems are simple (The Choice, Eliyhau M. Goldratt, North River Press, 2009). Yet, there must be something missing. Why do good, thinking people have so much trouble with projects? After all, projects are simply a set of tasks which must all be done within some precedence order before the project is complete. What is missing? It must be something that is a hidden understanding of how project systems perform. Or, it must be something acting upon the project management system: good, thinking people that do things to actually make the problems worse.

Theory of Constraints argues that an organization facing challenges in cost management, poor performance and chronic conflicts is as a result of poor management practices and lack of necessary intervention. Eliyahu developed the theory of constraints in the early 1980s to help organizations decide what to change, identify a desirable new condition and how to trigger the change. He recommended first identifying the main factors affecting budget estimates in an organization. He then suggested that the managers figure out how to handle the constraints or barrier to success within prescribed budget. By focusing on fixing the main problem, overall performance could be improved (Eliyahu, 2004). Additionally, Baloi & Price observed that most organizations fail to examine their operations as a whole when developing cost estimates (Baloi & Price, 2003). By focusing only on short-term goals, long-term success becomes jeopardized so he suggested establishing a long-term view. According to this theory, all systems operate in an environment of cause and effect. One event causes another to happen thus prompting for factors analysis as a measure. Adherence to cost estimates is either a constraint or has the potential to become a constraint. This cause-and- effect relationship can be very complex, especially in complex systems such as those of construction projects. Capturing the essence of cause and effect within the system and identifying factors that emulate these relationships are the keys to system performance and excellent adherence to cost estimates.

The Theory of Constraints (TOC) approach focuses on successful on-time completion of the entire project. According to TOC, the main constraint in any project is the time taken for completion of the critical chain. Therefore emphasis is laid on completing activities in the critical chain without wasting any time. Hence, cutting safety time from individual activities eliminates the major cause of time wastage, thereby removing the constraint. However, this does not mean that the project is to be left unprotected against any unforeseen delays in any individual activity. The project is to be guarded against delays by providing time buffers. Projects involve a high level of uncertainty and depend heavily on the contributions of individuals. Project manager needs to work with different departments involved in the project to estimate lead times so that they meet the needs of the critical chain. The critical chain concept starts with a set of talented and driven project managers and assumes that the resource constraints are within the scope of the project but not in its leadership.

### **2.1.2 Complexity Theory**

The theory of classifying problems based on how difficult they are to solve. A problem is assigned to the P-problem (polynomial-time) class if the number of steps needed to solve it is bounded by some power of the problem's size. A problem is assigned to the NP-problem (nondeterministic polynomial-time) class if it permits a nondeterministic solution and the number of steps to verify the solution is bounded by some power of the problem's size. The class of P-problems is a subset of the class of NP-problems, but there also exist problems which are not NP. A prominent author in the field of complexity is Terry Williams who shares the view of other scholars on complexity but extends it by one additional dimension of time estimates.

In addition to the two components of complexity, vis-à-vis the number of factors and the interdependency of these factors, he introduces the third factor which is uncertainty. Since uncertainty adds to the complexity of a project, time estimates therefore can be viewed as a constituent dimension of project complexity that can be as a result of various factors (Williams, 2008). Projects occasionally demand for more additional funds as there is an increasing desire to reduce time to market thus affecting the cost estimates of the project (Williams, 2008). Kahane on the other hand puts a lot of emphasis on talking and listening to each other when solving tough problems when developing estimate costs. His approach to complexity is deeply rooted in a social environment. He distinguishes complexity in three ways. These are; Dynamic Complexity which means that the cause and effect are far apart and it is hard to grasp from firsthand experience.

It should be noted that complexity-based factors related to project dynamic are often abound. This is due to the difficulties in well understanding the nature of dynamic in construction project in order to identify relative complex factors. In other words, planning for a dynamic system is difficult due to changes in environment and circumstances. It is even more difficult to estimate when considering dependent on environmental conditions and other unknowns. There is an ongoing research in this regard and more details need to be revealed and findings explored. Project management systems are considered dynamic systems, similar to those in nature, which means they change over time and are hard to predict. This increasingly fast-paced system is creating a complexity explosion, which is affecting the way project managers need to govern. Although they are changing, there is usually an underlying predictability that can be identified.

### **2.1.3 Belbin's Team Roles Theory**

Belbin (2004) made some experiments that consisted of the fundamentals of her theory. The results of her experiments, which constituted a model of management teams, based on the roles required for the success of the team. Belbin described team roles as a servant member's, who facilitated the progress of the team as a whole with his performance, structure of team as a whole with his performance, structure of others. She believes that team members have two types of roles. The first one, as described in role theory, typical functional role. The second type is the team role(s). Team role describes how suitable the member is for the team, not the functions. In this model the role is described with six factors, namely, personality, mental abilities, motivation, values, field restrictions and experience and role learning. However, Belbin didn't demonstrate how most of the changes could be explained by each factor. Instead, she defended the opinion that high performance teams required a balanced distribution of all the roles within the team.

Belbin also thought that team role concept should be distinguished from the concept of functional role that points out job related operational and technique knowledge. As a result, some members may have the same functional role but still have different team role(s). Belbin attracts the attention to the connection

between the needs for different team roles prevailing at different stages of the development process of the team. The mentioned six stages are as follows; determining the needs, coming up with ideas, formulating the plans, realization of the ideas, forming the team and finalization of the job. At the first stages the Shaper and Coordinator are needed mostly whereas the Completer-Finishers and Implementers will come in the later stages.

Despite clear roles and responsibilities, a project team will fall short of its full potential. How often does this happen in the teams around and within us. Perhaps some team members don't complete what you expect them to do. Perhaps others are not quite flexible enough, so things "fall between the cracks." Maybe someone who is valued for their expert input fails to see the wider picture, and so misses out tasks or steps that others would expect. Or perhaps one project team member becomes frustrated because he or she disagrees with the approach of another team member. Teams can become unbalanced if all team members have similar styles of behavior or team roles. If team members have similar weakness, the team as a whole may tend to have that weakness. If team members have similar team-work strengths, they may tend to compete (rather than cooperate) for the team tasks and responsibilities that best suit their natural styles. Along these lines, the implementation of road projects was compromised.

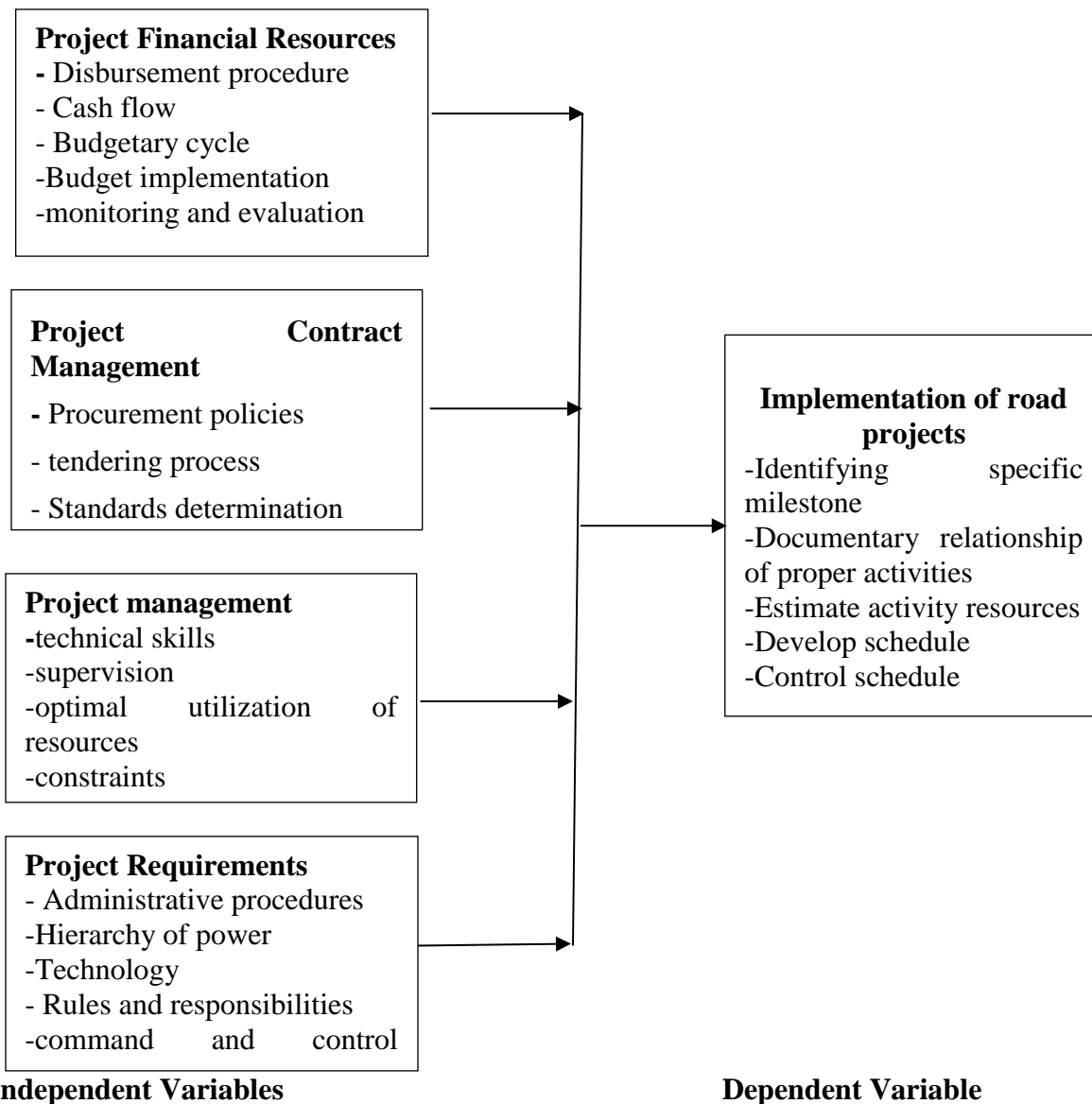
#### **2.1.4 Project management systems theory**

Project management systems are plagued with misunderstanding of Interdependence versus Independence, Finite versus Limited Capacity and Strategic versus Individual Safety. Lecture and research are ineffective at convincing members of the project management community to come together to overcome these serious obstacles. Complex systems are defined as systems with numerous stakeholders, nonlinearities, multiple interdependencies and feedback systems. Typical nonlinearities are often unanticipated changes in the scope of the project, the dismissal of project managers, shedding people with critical skills or the termination of credit arrangements with banks. The interdependencies are the relationships between project management, the suppliers and contractors, the clients and the other stakeholders. The feedback systems most common to the success and failure of project management are the rework cycles and their impact on both the demand for labour and the final budget and completion date. Every project is a 'system' in that it consists of many interrelated and interconnected parts or elements which must function together as a 'whole'. Project Managers need to be concerned with the 'big picture', and as such, they must be systems thinkers and allocate adequate attention to every part of the project management system.

Traditional approaches to competency Project Requirements have used a reductionist approach that deconstructs roles down into units, elements, underpinning knowledge and actions in the workplace as the assessment criteria. These Project Requirements move away from traditional philosophies, approaches and languages, which cannot adequately describe complex projects. Instead these Project Requirements use a Systems Thinking philosophical approach and methodology, based upon the premise that you cannot understand a whole through analyzing its parts. Views provide insights from multiple perspectives, that together provide holistic understanding a holistic understanding of the competencies required for the project management of complexity, and the assessment of individuals against those competencies, can only be achieved through using multiple Views behaviors are complex sets of interactions arising from cognitive and emotional responses to dynamic conditions. While specific behaviors are described in the Project Requirements, their source and effect are neither simple nor prescribed. It is in these complex interactions across multiple set of behaviors that competency is achieved. Behavioral flexibility and differentiation to suit the situation are measures of success.



## 2.2 Conceptual Framework



**Figure 1: Conceptual Framework.**

## 2.3. Project financial Resources

Budgeting is the process of allocating finite resources to the prioritized needs of an organization. In most cases, for a governmental entity, the budget represents the legal authority to spend money. Adoption of a budget in the public sector implies that a set of decisions has been made by the governing board and administrators that culminates in matching a government's resources with the entity's needs. As such, the budget is a product of the planning process. The budget also provides an important tool for the control and evaluation of sources and the uses of resources. Using the accounting system to enact the will of the governing body, administrators are able to execute and control activities that have been authorized by the budget and to evaluate financial performance on the basis of comparisons between budgeted and actual operations. Thus, the budget is implicitly linked to financial accountability and relates directly to the financial reporting objectives (Chan, 2006).

Kaliba, Muya and Mumba (2009) found that the major causes of delays in construction projects in road construction projects in Zambia were delayed payments, financial deficiencies on the part of the client or the contractor. One of the major sources of funding for road works in the country is the fuel levy fund which was introduced in 1993 and is mainly used for the maintenance of roads. The fuel levy fund is collected by KRA and administered by KRB, which was established by an Act of Parliament in the year 2000, with the responsibility of presiding over planning, development and maintenance of roads. The KRB has three main agencies through which funds for roads rehabilitation, maintenance and repair are disbursed. These are: The Department of Roads at the Ministry of Roads and Public Works, which deals with Class A, B & C roads. These are international highways, the national highways and trunk roads; the District Roads Committees (DRC), which deals with Class D, E, and other roads. These are rural access roads and feeder roads and the Kenya Wildlife Service (KWS), which deals with all the construction and maintenance of roads in the national parks and game reserves (KRB, 2011).

The fuel levy fund that the KRB administers is distributed amongst these agencies, in accordance with a formula that is spelt out in the Act: 57% goes to the Department of Roads of the Ministry of Roads and Public Works; 24% goes to the District Roads Committees, Roads Department, Local Authorities and Kenya Wildlife Service; 16% goes to Constituencies through District Roads Committees and 3% goes towards the overhead costs of the KRB. The other major source of funds for road works is budgetary allocation by the Exchequer. This is directly allocated to the Ministry of Roads and Public Works. The Government also receives substantial amounts of funding for road works from development partners. In addition to disbursements from KRB, KWS also occasionally receives funds from development partners for specific road projects and allocates part of the internally 22 generated funds for road works. Local authorities allocate part of their LATF and internally generated funds to road works. Other players in the roads sub-sector such as KTDA and tea factories, KSB and sugar companies do not receive any government funding (Mbeche 2000).

Effective participation of the Kenyan people in budgetary allocations remains an elusive mirage owing to a number of factors including: inadequate information on the devolved funds, exclusion of citizenry in decision making processes regarding the funds, poor coordination resulting in projects duplication, the culture of political patronage, wanting citizenry capacity to demand accountability from the ruling elite, unresponsive government structures, unaccountable political class, weak legislative regimes on the devolved funds, apathy among the citizenry, and corruption among others as Kimenyi (2005) explains.

Kenya Roads Board (KRB) manages road maintenance funds from the Fuel Levy Fund by disbursements in tranches to appointed agents for roads maintenance. Disbursement of funds to districts by the Ministry of Roads and Public Works is done after receiving funds from KRB. Upon receiving the funds, the Ministerial allocation committee sits to deliberate on its distribution (KRB, 2011).

## **2.4 Project Contract Management**

The understanding of dynamics of Project Contract Management has been predominantly seen through experience as dissatisfying where the procurement unit was viewed from other entities in the organization as an insignificant, reactive and an administrative part of the business. The potential, however, for the procurement organization to be significant in the company was argued to be vast (Ammer 2012, Ellram & Car 2012, Van Weele 2005). In order to change the situation of the procurement organization, Project Contract Management was informed that they should in gradual steps develop the procurement organization towards more sophisticated and significance (Reck & Long 2008) producing strategies that were aligned with overall company strategy including the development of policies, procedures, systems, tools and processes (cousins 2002, cousins *et al* 2008). This process changed the perspective of the

procurement organization which among other things, allowed the procurement entity to contribute to implementation of supply chain management (freeman & Cavinato 1990).

Gesuka and Namusonge (2013) conducted a study on the factors affecting compliance of PP in Kenya with 70 respondents that were purposively selected from the Butere district commissioner's office, procurement committees, procurement unit, user departments and suppliers. Primary and secondary data was collected through the administration of a structured questionnaire, interviews and records analysis respectively. The findings indicated some level of compliance to the legal requirements, but also revealed weak familiarity of procurement rules of all the stakeholders. Eyaa and Oluka (2011) also conducted a cross sectional study on the causes of non-compliance in public procurement in Uganda that targeted was 120 Central Government Procuring and Disposing Entities (PDEs). The authors' model indicates a 52.4% variation in compliance with the regulations.

In the context of road construction, procurement is very critical in the sense that for the projects to be completed at the right time, procurement of the project requirements should be done at the right time and right quality, according to Kagiri and Wainaina (2007), donors require the recipient to follow specific rules (i.e procurement guidelines) for identifying the contractor who constructs the road and to set up specific financial right systems to oversee the use of donor funds. Basheka (2008) undertook a study among 99 local government stakeholders selected from 11 Districts of Uganda, using a correlation research design. The data was analyzed using principal component factor analysis that aimed at identifying the critical components of procurement planning and accountable local governments systems in Uganda. Results of the study indicated a significant positive relationship between procurement planning and accountable local government procurement systems. He critically analyzed the contribution of the roles of a manager one of which is planning.

However, the scholar failed to acknowledge that while planning is key in the roles and responsibilities of managers, there are other roles including; coordinating, organizing, leading and controlling. This study dwelt on planning only and did not take cognizance of other roles. Further study fell short of explanation on the sample. It did not highlight whether the sample was representative of the local government agencies to enable generalization of findings.

Kenya through the Public Procurement and Disposal Acts 2005, created the Public Procurement Oversight Authority (PPOA), the Public Procurement Advisory Board (PPAB) and the continuance of the Public Procurement Complaints, Review and Appeal Board as the Public Procurement Administration Review Board (PPARB). The PPOA is mandated with the responsibility of ensuring that Project Contract Management established under the Act are complied with, monitoring the procurement system and reporting on its overall functioning, initiating Public Procurement Policy and assisting in the implementation and Operation of the public procurement system.

## **2.5 Project management**

Ellis and Thomas (2000) conducted a study to investigate the root cause of delays in highways construction. In their study, both excusable and non excusable delays are considered. It was found that 31% to 55% of all highway projects experience an average time delay of 44% in excess of their original

contract periods. It was observed that time delays occur more frequently for contracts in Urban areas as the focus of that study was to identify the root causes of delays. The main root cause of delays in road projects include Business practices, procedures, utilities, unforeseen site conditions, contractors and state highway agencies management of scheduling and planning, maintenance of traffics work zone, and Design errors and omission (Choudhury2008).

Zwikael and Saleh (2007) study aimed to identify the best practices for planning and executing a project, and then employ it as a benchmark for improving project planning in other industries. This study only looked at benchmarking activity, dealing with only one step in the planning process. Benchmarking however should be combined or aligned with risk analysis and other planning activities. Divr and Lechler (2004) emphasised the importance and positive impact of using formal planning approaches with regard to the project success. It is considered that a carefully created plan is the foundation on which project success is built. Moreover, the plan helps in keeping participants updated and engaged (Hartman & Ashrafi, 2004).

Chan *et al.* (2007) indicated that the five principal causes delays in Hong Kong construction projects are poor site management and supervision, unforeseen ground conditions, low speed of decision making involving all project teams, client initiated variations and necessary variations of works. In a survey of the west bank in Palestine, Mahamid (2011) indicated that the most severer factors affecting time delay in road construction projects from the owners perspective are , poor communication between construction parties, poor resource management, delays in commencement, insufficient inspectors and network. The study found that project management is the process of the application of knowledge, skills, tools, and techniques to project activities to meet project requirements. That is, project management is an interrelated group of processes that enables the project team to achieve a successful project.

These processes manage inputs to and produce outputs from specific activities; the progression from input to output is the nucleus of project management and requires integration and iteration. For example, a feasibility report could be an input to a design phase; the output of a design phase could be a set of plans and specifications. This progression requires project management acumen, expertise, tools and techniques, including risk management, contingency development, and change control (Ellis & Thomas, 2003). According to Prabhakar, (2005), successful project implementation entails various stages arranging from brainstorming, project start, diagnosis, planning, formal start and implementation has been known as one of the requisites of a successful projects. He emphasized that in order to successfully conduct a project, the project team should be in 12 total control of the implementation and the project itself must have implications to the client that are well comprehended. According to Mpofu (2010), who did thesis on project management said a project is a temporary endeavor undertaken to create a unique product or service or result. According to him, this takes place within stipulated time frames with a start and an end date as stipulated in the Project Management Body of Knowledge (Project management institute, 2012). The project management process involves having a plan, which is then executed accordingly, in order to meet the objectives of the project.

Mpofu (2010) posits that project management has nine knowledge areas that have a relationship that is defined by one of its areas, called integration (coordinating of processes and activities in other knowledge areas), the other eight being scope, time, cost, quality, risk, human resources, and procurement management. These areas do not function in isolation, but require an understanding of systems thinking from the leadership at both top and project level for project execution to be realized. The key responsibility of the project manager is to successfully accomplish the project objectives by balancing the competing demands for quality, scope, time, and cost.



Derivative responsibilities include identifying the project requirements; establishing clear and achievable objectives; and adapting the specifications, plans, and approach to the different concerns and expectations of the various stakeholders. Fundamentally, the project manager must direct the project from its inputs, through its nucleus, to delivery of its outputs. (Bent, James 2012) In order to accomplish these multifaceted responsibilities, the roles of the project manager include that of a leader, administrator, entrepreneur, facilitator, arbitrator and mediator, liaison, and coordinator.

The project manager must lead teams to operate cross functionally towards a common objective while assuring cohesiveness and continuity as the project progresses through project processes and project phases. “The project manager acts as the key catalyst to stimulate effective communication and coordination between design, procurement and construction activities. In order to effectively manage these responsibilities and assume these roles, a project manager must have experience in the following project management knowledge areas: project integration, scope, time, cost, quality, human resources, communications, risk, and procurement management. A project management plan is a fundamental tool for the project manager to deliver the project successfully (Bent, James 2012).

Strategic and formalized planning enables project managers to accomplish the project’s objectives by describing how the project is to be executed, monitored and controlled, which includes creating a project work breakdown structure, identifying and planning to mitigate risk, identifying manners in which to effectively communicate with stakeholders and other project team members, and developing a plan to manage changes. It is essentially a guide for executing the project, and a manner in which to gain buy-in and approval from stakeholders and sponsors prior to commencement. This plan is a living document that is updated and revised throughout the project at strategic milestones or significant events to accommodate the progressive, elaborative nature of the project. The project management plan will vary based on size, complexity, risk, and/or sensitivity of the project. Implementing the project management plan requires competency in all of the project management knowledge areas and is critical to the success of the project (Ellis & Thomas, 2003).

## **2.6 Project Requirements**

Project Requirements are essential in an increasing complex world. They should enable collaboration within and across organizations in order to improve effectiveness and efficiency in project related activities. Globalization forces a lot of organizations to do projects in an multi-national and cross-cultural context. Thus, Project Requirements should give guidance for people involved in such activities. In terms of quality Project Requirements it could be monitored by the amount of rework or by the degree of client satisfaction. The long-term indicators will not have been realised yet and consequently they cannot be measured. Therefore, it is convenient to judge success at this time by whether the project management criteria have been satisfied rather than the project criteria. So project management success becomes synonymous with project success, and the two are inseparable.

The main industry Project Requirements that the players are concerned with are project support, process/methodology, training, internal consulting/mentoring, and software/hardware tools. The challenges road constructors face today include boosting the knowledge we have about transportation research, cutting costs, and improving on project delivery in terms of time and budget. By providing structure and support both needed to standardize and facilitate project management practices, we may be able to determine methodologies for repeatable success.

Construction quality Project Requirements for highway infrastructure are seldom discussed in the economic literature. The assumption is that the desired quality of the project (generally the thickness of the pavement) will be achieved and controlled according to the Project Requirements based on economic

analysis. Generally speaking, it is reasonable to assume that highway quality control is not a big problem for highway projects since most important decisions regarding quality are made during the design and planning stages rather than during construction. Quality control during construction consists largely of ensuring conformity to the original design (Hendrickson & Au 1989). However, whether the owners, contractors and construction companies stick to the design is questionable in many developing countries, especially when the owners and contractors are all in the public sector and job responsibilities and accountability criteria are difficult to discern. The low quality of highway infrastructure brings about losses to users and various social groups, and thereby reduces the efficiency of highway projects.

### **3.0 METHODOLOGY**

The study adopted a descriptive survey design. The target population of the study was all the road engineers, middle managers in department of KRB. The study population was project managers (total=188) in charge of the projects in KRB. A questionnaire was designed to collect information from engineers which will contain open ended and closed ended questions. This provided a basis to identify the critical success factors affecting implementation of road projects. The sample size was 188 respondents. Data collected was cleaned, pretested, validated, and coded, summarized and analyzed using statistical package of SPSS V23. The study findings were presented using graphs, histograms, bar charts and pie charts. Conclusions were derived based on the P.value and the coefficient of determination.

### **4.0 RESULTS**

#### **4.1 Response Rate**

Fowler (1994) defines the response rate as the extent to which the final data set includes all sample subjects and it is calculated as the number of the people with whom interviews are completed, divided by the total number of people in the entire sample, including those who refused to participate and those who were unavailable, multiplied by 100. A total number of 188 questionnaires were administered to the sample selected. The data in table 4.1 shows that 130 questionnaires were collected back. The response of 69% facilitated towards gathering sufficient data that was generalized to reflect the opinions of respondents. This was in tandem with Graham (2002) that a response rate above 60% of the total sample size contributes towards gathering of sufficient data that could be generalized to represent the opinions of respondents in the target population on the sought study problem.

#### **4.2 Descriptive Statistics**

##### **Budgetary Allocation**

The study sought to investigate the influence budgetary allocation on Implementation of road projects in Kenya. The results in table 1 below, 14.6 % strongly agree that budgetary allocation implementation of road projects in Kenya, 32.2% agree while 21.5% disagree and 4.6% strongly disagree. These findings are in line with Ryder (2016) that budgetary allocation implementation of road projects in Kenya.

**Table 1: Budgetary Allocation**

		Frequency	Percent
Valid	SD	6	4.6
	D	28	21.5
	N	30	23.1
	A	42	32.3
	SA	19	14.6
	Total	130	100.0

**Procurement Management**

The study sought to investigate the influence of Project Contract Management on Implementation of road projects. The results in table 2 below, 8.1 % strongly agree that Project Contract Management affects Implementation of road projects in Kenya, 25% agree while 25.8% disagree and 13.7% strongly disagree. These findings tally with AGC (2011) that Project Contract Management is a critical aspect of Implementation of road projects in Kenya.

**Table 2: Procurement Management**

		Frequency	Valid Percent
Valid	SD	17	13.7
	D	32	25.8
	N	34	27.4
	A	31	25.0
	SA	10	8.1
	Total	130	100.0

**Project Management****Table 3 Project Management**

		Frequency	Valid Percent
Valid	SD	15	12.2
	D	31	25.2
	N	35	28.5
	A	30	24.4
	SA	12	9.8
	Total	130	100.0

The study sought to investigate the influence of Project Management on Implementation of road projects in Kenya. The results in table 3 below, 9.8 % strongly agree that Project Management affects Implementation of road projects in Kenya, 24.4% agree while 25.2% disagree and 12.2% strongly disagree.

**Project Requirements**

The study sought to investigate the influence of Project Requirements on Implementation of road projects in Kenya in the formal and informal sectors. The results in table 4 below, 10.4 % strongly agree that Project Requirements affects Implementation of road projects in Kenya, 33.6% agree while 25.6% disagree and 8.0% strongly disagree.

**Table 4 Project Requirements**

		Frequency	Valid Percent
Valid	SD	10	8.0
	D	32	25.6
	N	28	22.4
	A	42	33.6
	SA	13	10.4
	Total	130	100.0

### 4.3 Inferential Statistics

This section covers the correlation between the variables under consideration, the regression analysis relating the variables and the determination of the strength of the variables.

#### Correlation Coefficient

Table 5 shows the Pearson correlation coefficient generated from the data. If the critical factors implementation of road projects in Kenya, one should expect a positive relationship between the measures of independent variables and Implementation of road projects in Kenya. The correlation matrix depicts that Implementation of road projects in Kenya in Kenya is positively correlated with all the independent variables i.e. Project financial Resources, Procurement Management, Project Management and Project Requirements. The correlation matrix is negating the existence of multi-co linearity among the independent variables as all the correlations are below 0.90.

From the finding in the table above, the study found that there was positive correlation coefficient between Implementation of road projects in Kenya and Project financial Resources as shown by correlation factor of 0.597, this relationship was found to be statistically significant as the significant value was 0.001 which is less than 0.05. The study found weak positive correlation between Implementation of road projects in Kenya and Project Contract Management as shown by correlation coefficient of 0.018, the significant value was 0.016 which is less than 0.05. Further, the study found positive correlation between Implementation of road projects in Kenya and Project Management as shown by correlation coefficient of 0.598 and had a significant value of 0.014 which is less than 0.05. The correlation between Implementation of road projects in Kenya and Project Requirements was positive as shown by correlation factor of 0.588, this relationship was found to be statistically significant as the significant value was 0.024 which is less than 0.05



**Table 5: Correlation Table**

		Implementation of road projects in Kenya	Project financial Resources	Procurement Management	Private Public Partnership	Project Requirements
Implementation of road projects in Kenya	Pearson Correlation	1	.597	.018**	.598*	.588**
	Sig. (2-tailed)		.001	.016	.014	.024
	N	130	95	95	95	95
Project financial Resources	Pearson Correlation	.597	1	.016	.005	.103
	Sig. (2-tailed)	.001		.898	.965	.406
	N	130	95	95	95	95
Procurement Management	Pearson Correlation	.018**	.016	1	.746**	.021
	Sig. (2-tailed)	.016	.898		.000	.863
	N	130	95	95	95	95
Project Management	Pearson Correlation	.598*	.005	.746**	1	.052
	Sig. (2-tailed)	.014	.965	.000		.676
	N	130	95	95	95	95
Project Requirements	Pearson Correlation	.588**	.103	.021	.052	1
	Sig. (2-tailed)	.024	.406	.863	.676	
	N	130	95	95	95	95
	Sig. (2-tailed)	.029	.897	.000	.000	.862
	Pearson Correlation	.018**	.016	1	.746**	.021

**Regression Results**

This section covers the regression results from the model

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where Y is the dependent variable (Implementation of road projects in Kenya),

$\beta_0$  is the regression coefficient,

$\beta_1, \beta_2, \beta_3$  and  $\beta_4$  are the slopes of the regression equation,

X<sub>1</sub>-Project financial Resources

X<sub>2</sub>-Procurement Management

X<sub>3</sub>- Project Management

X<sub>4</sub>- Project Requirements, while  $\varepsilon$  is an error term

### Model Summary

Results from table 6 indicates R square value of .874, This implies that Implementation of road projects in Kenya is collectively influenced by Project financial Resources, Procurement Management, Project Management and Project Requirements and 87.4 %. This therefore means that majority agree the independent variables are critical factors to Implementation of road projects in Kenya at 0.05 level of significance. %. This concurred with Graham (2002) that (R<sup>2</sup>) is always between 0 and 100%: 0% indicates that the model explains none of the variability of the response data around its mean and 100% indicates that the model explains all the variability of the response data around its mean. In general, the higher the (R<sup>2</sup>) the better the model fits the data.

**Table 6: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.935 <sup>a</sup>	.874	.778	2.942

### Analysis of Variance

Table 7 presents the results of ANOVA test which reveal that all the independent variables notably; (X<sub>1</sub>) Project financial Resources, (X<sub>2</sub>) Procurement Management, (X<sub>3</sub>) Project Management and (X<sub>4</sub>) Project Requirements have a significance influence on Implementation of road projects in Kenya. Since the P value is actual 0.00 which is less than 5% level of significance. Table 4.10 also indicates that the high value of F (79.086) with significant level of 0.00 is large enough to conclude that all the independent variables significantly influence Implementation of road projects in Kenya.

**Table 7: Analysis of Variance**

#### Beta Coefficients

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2280.980	29	78.654	79.086	.000 <sup>b</sup>
	Residual	328.961	100	8.657		
	Total	2609.941	129			

Table 4.11 presents the results of the test of beta coefficients which indicates that the significant relationship between independent variables notably; (X<sub>1</sub>) Project financial Resources, (X<sub>2</sub>) Procurement Management, (X<sub>3</sub>) Project Management and (X<sub>4</sub>) Project Requirements and dependent variable Y = Implementation of road projects in Kenya.

As presented in table 4.11, (X<sub>1</sub>) Project financial Resources coefficient of 0.865 was found to be positive at significant level of 0.0012 and this indicates that Project financial Resources has a positive influence on Implementation of road projects in Kenya. , (X<sub>2</sub>) Project Contract Management coefficient of 0.868

was found to be positive at significant level of 0.0022 and this indicates that Project Contract Management has a positive influence on Implementation of road projects in Kenya, (X<sub>3</sub>) Project Management coefficient of 0.810 was found to be positive at significant level of 0.0019 and this indicates that Project Management has a positive influence on Implementation of road projects in Kenya. (X<sub>4</sub>) Project Requirements coefficient of 0.741 was found to be positive at significant level of 0.001 and this indicates that Project Requirements has a positive influence on Implementation of road projects in Kenya. This clearly demonstrates that all the independent variables significantly influenced Implementation of road projects in Kenya in Nairobi Kenya. However, since the significance values were less than 0.005, all the coefficients were significant and thus the regression model was fit;

$$Y = 243 + 868X_1 + 865X_2 + 810X_3 + 741X_4 + \epsilon$$

From Table 8, the t values of 1.703, 1.060, 1.335 and 1.723 is statistically significant. Kothari (2008) notes that the closer T is to 0, the more likely there isn't a significant difference.

**Table 8: Beta Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error			
(Constant)	.243	.233		1.546	.0001
Project financial Resources	.865	.508	.156	1.703	.0012
Project Management	.868	.819	.130	1.060	.0022
Project Management	.810	.607	.130	1.335	.0019
Project Requirements	.741	.430	.140	1.723	.0009

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

### 5.0 Conclusions

Project financial Resources is a major factor in Implementation of road projects in Kenya and that policy priorities for tackling implementation of road projects in Kenya is essential. These policy priorities are not presented in any order of precedence. An integrated approach (e.g. national action plans on Implementation of road projects in Kenya), where not just the Ministry of transport, but also other key Ministries, address the issue of Implementation of road projects in Kenya, could be helpful in this regard. Project Management is critical to Implementation of road projects in Kenya. The private sector in Kenya is vibrant, well developed and hosts one of the largest business communities in sub-Saharan Africa. The private sector is split into two parts: a formal, large business sector which is relatively healthy and productive and a massive informal sector made up of small and medium-sized businesses, which is poorly supported in terms of working conditions, financing and skills development programmes. Construction quality Project Requirements for highway infrastructure are seldom discussed in the economic literature. The assumption is that the desired quality of the project (generally the thickness of the pavement) will be achieved and controlled according to the Project Requirements based on economic analysis. Generally speaking, it is reasonable to assume that highway quality control is not a big problem for highway projects since most important decisions regarding quality are made during the design and planning stages rather than during construction. There need to prioritize the development of an integrated system that the country meets the ever-increasing demands for timely and accurate completion of road projects.

## **5.2 Recommendations**

The study established that Project financial Resources, Procurement Management, Project Management and Project Requirements implementation of road projects in Kenya in Kenya, therefore they need to be checked in a more appropriate for change. Provision of accessible and practical skills training that has been developed with input, either additionally or independently of formal education. Training programs should comply with nationally recognized quality assurance Project Requirements to ensure training is relevant and appropriate for development. Life-long career paths must be brought to the fore of Implementation of road projects in Kenya rather than focusing on “short-term” isolated job interventions.



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