

# INFLUENCE OF PROJECT PLANNING ON ROAD CONSTRUCTION PROJECTS PERFORMANCE IN UASIN GISHU COUNTY, KENYA

Ondiek Francis Benedict<sup>1</sup>, Dr. Elizabeth Nambuswa Makokha<sup>2</sup>

<sup>1</sup>Masters Student, Jomo Kenyatta University of Agriculture and Technology, Kenya

<sup>2</sup>Lecturer, Jomo Kenyatta University of Agriculture and Technology, Kenya

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**Abstract:** The purpose of this study was to investigate influence of project planning on success of road construction projects within Uasin Gishu County. This study adopted descriptive research design. The target population of this study was 51 employees in 15 government road construction projects which are in construction within Uasin Gishu County. Census was adopted in this study where project managers in each road project were involved in the study totaling to 51 respondents. The study relied on primary data which was collected through use of a questionnaire. The study established how project planning affects the performance of construction projects and the greatest roles of the top project team thus informing decision making for future road construction projects. The study found that there was a positive correlation between success of road construction project and project time planning, project scope planning, project cost planning and project risk planning. Government and individual architects, engineers, quantity surveyors, construction project managers and site agents will benefit from this study by applying the results of its findings while carrying out construction projects. The finding of the study will ensure challenges faced in project implementations are successfully mitigated.

**Keywords:** cost planning, implementation, risk planning, scope planning, time planning, Project.

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## 1. INTRODUCTION

This study sought to investigate influence of project planning on success of road construction projects within Uasin Gishu County. Over the last few decades, maintenance and development of any infrastructure is being recognized as catalyst of sustainable economic growth and investment opportunity (Ali & Khamidi, Idrus, 2009). Both developed and developing countries are facing unprecedented fiscal problems, and are unable to devote the resources necessary to properly expand and maintain it (Othman, Zain & Hamdan, 2010). Construction projects takes place all over the world, it entails building works, water works civil works, Road works and many others. Every construction project has the following constraints; time, cost and quality. It is common to experience delays during construction projects. It is against this backdrop, governments and county governments are turning to effective planning process of these projects (Engel, Fischer & Galetovic, 2010).

PMI (2011) defined planning as those processes performed to establish the total scope of the effort, define and refine the objectives, and develop the course of action required to attain those objectives. The objective of the development of the project plan is used to create a consistent, coherent document that can be used to guide project execution and control (Gupta, Aha, Nau, & Munoz-Avila, 2014). The plan should include general plans regarding all areas of the project such as; project objectives, time schedule, budget among others (PMBOK, 2011).

## 2. STATEMENT OF THE PROBLEM

Failure of project to be completed within the timeline is the main challenge in most developing countries; at least 79% of the executed project fails to meet its objective. The performance problems of project (cost overrun, time delay, quality deficiency) are caused by either in selection, planning, execution or control phase of the project and other factors. However, according to Richard (2012) one of the main reasons of project failure in developing countries, Kenya included, is lack of effective planning processes. Similarly, some of the planning processes are neglected in Kenya projects, and the execution of the project is often started without developing project plan or poor project planning.

Project failures have significant effect from economic as well as political points of view. If the project takes longer time it requires additional resources, and budgets and this increases labor, material, machinery and equipment cost. This affects the budget of other projects and in general, it affects the economy of the country. Similarly, due to delay in project implementation the people and the economy have to wait for the provision of public and services facility longer than necessary. Thus failure of project limits the growth of the economy because the output provided by infrastructure, construction, manufacturing, IT projects serve as input for many other sectors of the economy. According to According Institute of certified public Accountants of Kenya devolution baseline survey (2014), Different counties indicate that they inherit poor infrastructure thus hindering them from effectively implementing their functions. Uasin Gishu County was listed by ICPAK among the five counties with less than 15% infrastructure growth, which affect growth and development in the county. According to Uasin Gishu County integrated development plan 2013-2017 Uasin Gishu County is facing development challenges where poor infrastructure is among the challenges. Uasin Gishu County development has been hindered by poor infrastructure especially in areas where agriculture is practiced, although being among the 5 counties that had more than 25% priority to agriculture (ICPAK, 2014).

According to fiscal strategy 2016-2017 infrastructure in Uasin Gishu County will contribute 6.3% of the gross domestic products (GPD) in relation to Kenya vision 2030. However, without a decent plan and estimate, resources cannot be managed or organized, risks cannot be mitigated, dates and budgets cannot be forecasted, effective reporting cannot take place, and the measures of success will be imperfect from the beginning. According to PMI (2011) lack of an implemented project plan has caused problems in all project management areas and has made it impossible for the management team to have the required control of project activities. It is against this realization that the current study aimed to investigate influence of project planning on success of road construction projects within Uasin Gishu County.

## 3. OVERALL OBJECTIVE

The aim of this study was to investigate influence of project planning on success of road construction projects within Uasin Gishu County.

## 4. SPECIFIC OBJECTIVES

The specific objectives of this study were:

- i. To determine how project time planning influences the success of road construction projects within Uasin Gishu County
- ii. To determine the effect of project cost planning on the success of road construction projects in Uasin Gishu County
- iii. To determine the effect of project scope planning on the success of road construction projects within Uasin Gishu County
- iv. To determine the effect of project risk planning on the success of road construction projects in Uasin Gishu County.

### Conceptual Framework

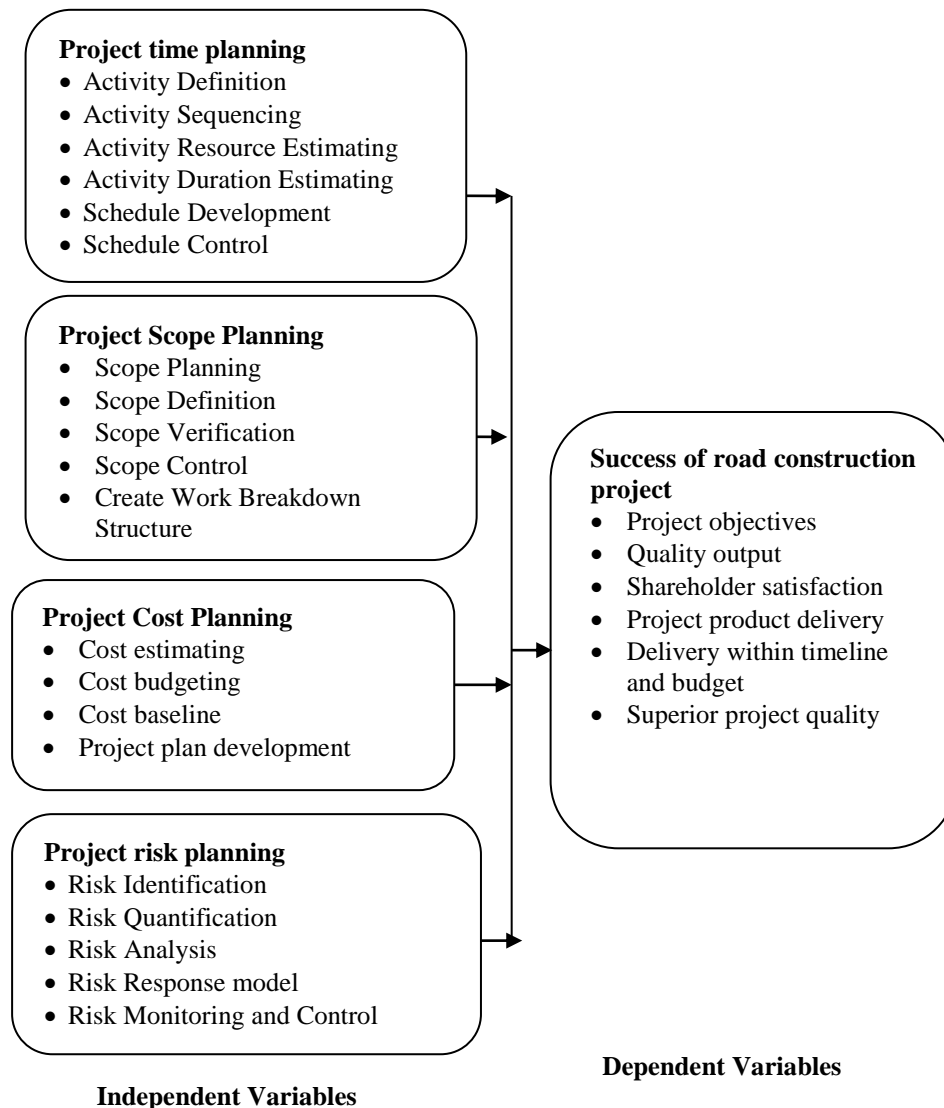


Figure 2.1: Project Planning on Success of Road Construction Projects

## 5. THEORETICAL FRAMEWORK

### Complexity Theory

This study grounded on complexity theory. The complexity theory as discussed by Curlee & Gordon (2011) is based upon the management belief that total order does not allow for enough flexibility to address every possible situation. The complexity exists in projects. The complexity theory acknowledges that projects by nature have parts that work together as a system. Because of this, even though some people would be unhappy with the changes; a lot of processes have to result from the changes. Certain impediments have to be removed, certain procedures that would be unproductive have to be changed or modified.

### Theory of Constraints

Theory of Constraints (TOC) in Project Management The primary challenge of project management is to achieve all of the project goals and objectives while honoring the preconceived project constraints, Lamb, Robert, Boyden (2002) typical constraints are scope, time, and budget. The secondary and more ambitious challenge is to optimize the allocation and integration of inputs necessary to meet pre-defined objectives. Goldratt (1984) in his theory of constraints asserts that

any manageable system is limited in achieving more of its goal by a very small number of constraints, and that there is always at least one constraint. Theory of Constraints is based on the premise that the rate of goal achievement is limited by at least one constraining process. Only by increasing flow through the constraint can overall throughput be increased (Cox, Jeff; Goldratt, Eliyahu (1986).

### **Resource Based View Theory**

The core premise of the resource-based view is that organizational resources and capabilities can vary significantly across firms, and that these differences can be stable (Kiprono, P. and Daniel, W, 2016). Firms with higher competitive advantage tend to create a sense of confidence in stakeholders that their support, whether financial or otherwise, will be valued and put into action. The resource-based view in outsourcing builds from a proposition that an organization that lacks important, uncommon, unique and organized resources and capabilities, shall seek for an external provider in order to overcome that weakness (Müller & Jugdev, 2012).

### **Network Theory**

Decision-making processes are crucial in implementation of projects. Project managers should always communicate their projects through various media to do away with biasness while referring to similar projects (Olsson, 2008). This projects are exposed to numerous and interdependent risks of various nature, which makes their management more difficult. This theory aids in determining the power of social networks to improve health behavior sand methods that explain the influence of social networks on individual behaviour by mapping relationships within a community. This further enables the stakeholders and the project team to have timely information and responses that as a result impacts positively on the project duration hence success.

## **6. RESEARCH METHODOLOGY**

### **Research design**

The study employed descriptive research design. Descriptive research described data and characteristics about the population or phenomena being studied. Descriptive research answers the questions who, what, where, when and how (Pervez & Kjell 2005). Chandran (2004) describes research design as an understanding of conditions for collection and analysis of data in a way that combines their relationships with the research to the economy of procedures.

### **Target population**

Target population is defined as all the members of a real or hypothetical set of people, events or objects to which a researcher wishes to generalize the results of the research study (Borg & Gall, 1989). The study was carried out in Uasin Gishu County. Currently there are 15 Government road Projects be carried out in Uasin Gishu County. Therefore, the target population for this study consisted of employees in all the 15 Government road projects in the Uasin Gishu County that are going on.

### **Sample Size and Sampling Technique**

Sampling means selecting a given number of subjects from a defined population as representative of that population. Any statements made about the sample should also be true of the population (Orodho, 2002). Mugenda and Mugenda (2003) recommend that when the target population is small (less than 1000 members), a minimum sample of 30% is adequate for research. Since the sample the target population of this study is small and manageable, the study adopted census where all 51 respondents were involved in the study.

### **Data Collection**

The main tools of data collection for this study were questionnaires where primary data was collected. The questionnaire was used for data collection because it offers considerable advantages in the administration. It also presented an even stimulus potentially to large numbers of people simultaneously and provided the investigation with an easy accumulation of data. Gay (1992) maintains that questionnaires give respondents freedom to express their views or opinion and also to make suggestions.

### Data Collection Procedure and Instruments

The study employed a questionnaire to collect primary data. Questionnaires were appropriate for studies since they collected information that was not directly observable as they inquire about feelings, motivations, attitudes, accomplishments as well as experiences of individuals, Mellenbergh (2008). The questionnaire comprised of both open and close-ended questions. Franker, (2006) stated that a questionnaire is useful in obtaining objective data because participants are not manipulated in any way by the researcher. Further, questionnaires had the added advantage of being less costly and using less time as instruments of data collection.

## 7. RESULTS

### Inferential Analysis

#### Coefficient of Correlation

To compute the correlation (strength) between the study variables and their findings the researcher used the Karl Pearson's coefficient of correlation ( $r$ ). From the findings, it was clear that there was a positive correlation between success of road construction project and project time planning as shown by a correlation figure of 0.523, it was also clear that there was a positive correlation between success of road construction project and project scope planning with a correlation figure of 0.614, there was also a positive correlation between success of road construction project and project cost planning with a correlation value of 0.746 and a positive correlation between success of road construction project and project risk planning with a correlation value of 0.521. This shows that there was a positive correlation between success of road construction project and project time planning, project scope planning, project cost planning and project risk planning.

**Table 1: Coefficient of Correlation**

|                                |  | Success of road project | Time Project Planning | Scope Project Planning | Cost Project Planning | Risk Project Planning |
|--------------------------------|--|-------------------------|-----------------------|------------------------|-----------------------|-----------------------|
| <b>Success of road project</b> | Pearson Correlation<br>Sig. (2-tailed) | 1                       |                       |                        |                       |                       |
| <b>Project Time Planning</b>   | Pearson Correlation<br>Sig. (2-tailed) | .523                    | 1                     |                        |                       |                       |
| <b>Project Scope Planning</b>  | Pearson Correlation<br>Sig. (2-tailed) | .6140                   | .3421                 | 1                      |                       |                       |
| <b>Project Cost Planning</b>   | Pearson Correlation<br>Sig. (2-tailed) | .7460                   | .1240                 | .0621                  | 1                     |                       |
| <b>Project Risk Planning</b>   | Pearson Correlation<br>Sig. (2-tailed) | .5210                   | .3420                 | .0000                  | .1660                 | 1                     |
|                                |  | .0172                   | .0031                 | 1.000                  | .0031                 |                       |

#### Coefficient of Determination

The four independent variables that were studied, explain only 83.4 percent of the success of road construction project as represented by the adjusted  $R^2$ . This therefore means that other factors not studied in this research contribute 16.6 percent to success of road construction project. Therefore, further research should be conducted to investigate the other factors (16.6 percent) that influence success of road construction project.

**Table 2: Model Summary**

| Model | R     | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------|----------|-------------------|----------------------------|
| 1     | 0.913 | 0.834    | 0.751             | 0.4538                     |

### Multiple Regression

Multiple regression analysis was conducted as to determine the relationship between success of road construction project and the four independent variables.

**Table 3: Regression Coefficients**

| Model                         | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig.  |
|-------------------------------|-----------------------------|------------|---------------------------|-------|-------|
|                               | B                           | Std. Error | Beta                      |       |       |
| (Constant)                    | 1.308                       | 1.342      |                           | 1.623 | 0.357 |
| <b>Project Time Planning</b>  | 0.558                       | 0.310      | 0.172                     | 4.342 | .0276 |
| <b>Project Scope Planning</b> | 0.731                       | 0.156      | 0.210                     | 3.532 | .0285 |
| <b>Project Cost Planning</b>  | 0.785                       | 0.322      | 0.067                     | 3.542 | .0202 |
| <b>Project Risk Planning</b>  | 0.620                       | 0.245      | 0.148                     | 3.458 | .0249 |

As per the SPSS generated table 4.14, the equation

( $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon$ ) becomes:

$$Y = 1.308 + 0.558X_1 + 0.785X_2 + 0.620X_3 + 0.731X_4$$

The regression equation above has established that taking all factors into account (project time planning, project scope planning, project cost planning and project risk planning) constant at zero, success of road construction project will be 1.308. The findings presented also shows that taking all other independent variables at zero, a unit increase in project time planning will lead to a 0.558 increase in success of road construction project; a unit increase in project scope planning will lead to a 0.731 increase in success of road construction project; a unit increase in project cost planning will lead to a 0.785 in success of road construction project and a unit increase in project risk planning will lead to a 0.620 increase in success of road construction project. This infers that project cost planning contribute most to success of road construction project followed by project scope planning then project risk planning while project time planning contributed the little to success of road construction project.

## 8. FINDINGS AND DISCUSSIONS

### Project Time Planning

On project time planning the study found that most of the organizations consider project time planning in road construction projects. This is clearly manifested by most of organization having completed other project done previously within the stipulated time. Further the study established that during the road construction project, project management, activities sequence is key as it defines the logical sequence of work to obtain the greatest efficiency given all project constraint. Likewise, during the construction identifying and documenting the specific activities to be performed to produce the project deliverables is key in project management and that activity duration estimates helps to quantify assessments of the likely number of work periods that will be required to complete an activity.

### Project Scope Planning

From the data, the study established that project scope planning influences success of road construction projects. Creating work breakdown structure provides the necessary framework for detailed cost estimating and control, along with providing guidance for schedule development and control. Definition of project scope helps in identifying major project work components, deliverables, and requirements. Scope verification helps to defines how project work will be confirmed and ultimately accepted by the client. The practice of scope planning is key in management practices for planning and delivering project successfully.

### Project Cost Planning

On project cost planning, the study found that indeed project cost planning influences success of road construction projects. The study also established that project cost planning on success of road construction projects. Allocating the

overall cost estimate to individual work items to establish a baseline for measuring success of project is key. Identify situations where project labor resources are being used on multiple projects to ensure smooth flow of the project and its success and to ensure project success, employees conduct cost estimate of the costs of the resources needed to complete project activities.

### Project Risk Planning

To the objective of project risk planning, the survey found that most project risk planning influences success of road construction projects. Contractors also consider having a strong risk identification system is important to the successful completion of project. Quantitative risk analysis helps to analyze numerically the probability of each risk and its consequence on project objectives, as well as the extent of overall project risk. Project risk quantification helps to identify the risk that may occur within the course project and then coming up with a plan or course of action in order to prevent it. Construction firm have developed risk response plans to reduce the probability or impact of the risk.

## 9. CONCLUSIONS

The study aimed at finding out influence of project planning on road construction projects performance in Uasin Gishu County. Based on the findings the study made the following conclusion. Time is key success of road construction project and this has been observed by majority of the contractors. The study also concludes that during the road construction project, project management, and activities sequence are key aspects as they defines the logical sequence of work to obtain the greatest efficiency given all projects constrain.

Creating work breakdown structure provides the necessary framework for detailed cost estimating and control, along with providing guidance for schedule development and control. Definition of project scope helps in identifying major project work components, deliverables, and requirements.

To project cost planning, the study concluded that indeed project cost planning influences success of road construction projects. Allocating the overall cost estimate to individual work items to establish a baseline for measuring success of project is key. Identify situations where project labor resources are being used on multiple projects to ensure smooth flow of the project and its success.

On the objective of project risk planning, the study concluded that most project risk planning influences success of road construction projects. Contractors also consider having a strong risk identification system is important to the successful completion of project. Quantitative risk analysis helps to analyze numerically the probability of each risk and its consequence on project objectives, as well as the extent of overall project risk. Construction firm have developed risk response plans to reduce the probability or impact of the risk.

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