

**RESOURCE MANAGEMENT PRACTICES AND THE PERFORMANCE OF ROAD
INFRASTRUCTURE PROJECTS IN WAJIR COUNTY, KENYA**

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DECLARATION

I hereby affirm that this is my original work and has not been submitted to any other institution either partially or entirely for the award of a degree.

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This project has been submitted for examination with my approval as university supervisor

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DEDICATION

Major dedication to members of my family for their support and encouragement. May the almighty bless all of abundantly.

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ABBREVIATIONS AND ACRONYMS

CDF	Constituency Development Funds
CIDP	County Integrated Development Plan
FY	Financial Year
GoK	Government of Kenya
INGOs	International Non-Governmental Organizations
KPLC	Kenya Power and Lighting Company
KURA	Kenya Urban Roads Authority
LDC	Least Developed Nation
M&E	Monitoring and Evaluation
NGOs	Non-Governmental Organizations
PMBOK	Project Management Body of Knowledge
PMC	Project Management Committee
PMI	Project Management Institute
SPSS	Statistical Package for Social Sciences
ToC	Theory of Constraints
UN	United Nations
UNDP	United Nations Development Programme

OPERATIONAL DEFINITION OF TERMS

Project Performance: This is the criteria of budget, deliverables and time. It is generally the quality of a given project on the basis of how valuable it is to the beneficiaries, how effective, efficient and sustainable it is in its implementation and finally how it is impacting on development.

Resource allocation: in this study, it refers to the process whereby the available resources are assigned and scheduled to specific project tasks in the most effective and economical manner.

Resource monitoring: It is the process where resources available for the project are consistently tracked in terms of their utilization, the identification of potential avenues for resource leakages and taking corrective actions which are prerequisite for ensuring the attainment of the specific deliverables within the project and with use of resources that are available.

Resource planning: this refers to the documentation or specification of the particular amount of materials, labor and equipment that are required in carrying out various tasks and activities within the project in ensuring that it is completed successfully.

Resource scheduling: in this study, it is a method used in efficiently assigning resources which are available to activities and tasks which need completion within a given project, and the setting up of dates upon which the specified tasks or activities ought to operationalize with regard to availability of resources.

ABSTRACT

The effectiveness of resource management practices can be measured in terms of the extent to which it influences project performance. Due to project management requirements to deliver projects within the specified time, budget and that satisfy client needs it is imperative that resources are managed so as to ensure high project performance. Therefore, there is need for project managers at County government of Wajir to know what they need to make a project successful so that they can effectively plan out the optimal way to use those resources towards better performance of the projects. Thus, the aim of this study was the assessment of how practices of managing resources are affecting performance of road infrastructural projects in Wajir County. This study determined how factors like the planning, scheduling, the allocation and monitoring of resources are affecting the success of road projects in Wajir County. The study was guided by the theory of project management, theory of constraints and the resource base view theory. A descriptive survey design was adopted in this research. The target was 193 project stakeholders consisting of 5 county officials under the County Transport and Infrastructure Department, 47 project managers as well as 141 project management committee members who were engaged in the 47 major road projects undertaken by the county government in Wajir North, Wajir East and Wajir South sub-counties as well as all the county wide projects for the period 2013-2017. Selection of the sample was done using stratified random sampling. Semi-structured questionnaires were utilized in gathering of primary data. There was an analysis by themes of the obtained data of the open-ended questions whereby there was coding and simple summarization extracted from emerging themes. Analysis of quantitative data was done using descriptive and inferential statistics with use of Statistical Package for Social Sciences. A multiple linear regression model aided in indicating links between practices of managing resources and performance of road projects within the county of Wajir. Resource planning, resource scheduling, resource allocation and resource monitoring were found to have a positive and significant effect on project performance. The study concluded that a key benefit to resource planning is that it helps organisations to fulfill task specifications efficiently. Successful resource scheduling allows in different ways to solve problems related to resource availability and job efficiency. Efficient resource allocation allows project managers prepare to allocate resources to the task and effectively manage them. Reporting requires daily tracking of key elements of project performance in terms of inputs, actions and outcomes. The study recommended that project planning should be such as to cope efficiently with the project's needs. On resource scheduling, the study recommended that project managers should use backward scheduling techniques when the date of delivery is set and the work has to be planned or scheduled to meet the deadline. Schedules were set and projected throughout the life cycle of the project. On resource allocation, the study recommended that project managers should be mindful of the scope of the project they are operating on, because the greater the nature of the project, the more they will decide how to distribute the money. On resource monitoring, the study recommended that project management during the execution of the plan and should include cost-control strategies, deadlines and deliverables techniques, quality standards approaches and more. The study suggests that further studies should be carried out on how project resource management practices affect the performance of road projects in other Counties in Kenya.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Projects of infrastructure among them road projects have a crucial role within societies of converging the economic development need and most importantly to change the citizens' quality of life (Onyango, Bwisa, & Orwa, 2017). The central role of public infrastructural projects in sustaining development is acknowledged in Chapter 27 of the 21st agenda of United Nations (UN Charter 1945). Likewise, the Kenya Vision 2030 recognizes infrastructure as an enabler for sustained development under the economic pillar. According to Mbaabu (2012), when there exists roads which are good and functioning properly, it greatly in enhancing growth in economy, reduces the rate of poverty, creates employment and wealth within the country.

It is the government which is the sole gigantic implementer of road projects in the public, hence the need of ensuring full implementation and performance of such projects provided that large amount of resources are channeled towards them through budgetary allocations (Yeri, 2018). The poor performance of road infrastructure projects exemplified through delays, poor quality and even cost overruns among other key performance indicators negatively impact on both the social and economic benefits to nations that would have accrued if the projects performed as planned (Kagiri & Wainaina, 2017).

With devolution, counties are now in a better position to deliver social services as they deal with specific challenges and have the local knowledge to address them unlike the national government (Kajwang, 2016). The specificity in the challenges has enabled the county governments to set aside funds that are required in carrying out different infrastructure projects in their counties among them roads (Murugu, 2014). All the counties within Kenya have individual plans for developments and specific projects, they finance sections of these projects and financial resources that are deficient are got from the national government, which accounts to at least 35% of the national budget (Adek, 2016).

The complexity and size of road projects being undertaken at the two levels of the government has increased substantially and so is the amount of resources channeled towards these projects (Musyoki, 2018). There are several activities which correlate and which rely on each other when it comes to projects involving road infrastructure. Nagaraju & Reddy (2012),

notes that with an environment which is changing vigorously in the current age, there is an imposition of several constraints when it comes to logistics, legal, environmental, ethical and on finances. Thus, such projects put to use large volumes of resources and have risks, challenges and uncertainties which are inherent. This has resulted to several sequence of issues with regard to resources, for instance, the amount that is required, their sources, the time they should be brought to the site, where to house them, how to bring them to optimal utilization and the time of demobilizing them (Kohli, 2006). Therefore, resources are an important constraint that greatly influence how road infrastructure projects are designed and the completion of the project activities (Kerzner & Kerzner, 2017). This is the case provided that specific activities have specified allocation of resources and have to operationalize within a set period of time.

Generally, road infrastructure projects being carried out by counties are of high quality, thus they allocate a lot of resources like materials, time, manpower, machines and space (Kumari & Vikranth, 2012). Major road infrastructure works in these counties involve heavy investments in terms of funds, utilizing technology of high quality and they require a model which is more advanced and supple in effectively managing the resources (Pojani & Stead, 2015). This is very crucial given that counties are implementing multiple projects and hence there is competition for limited resources among tasks in different projects. The adoption of advanced resource management methods ensures effective and reasonable allocation of the finite resources and that their ratios of use are increased (Blichfeldt & Eskerod, 2008). According to Pinha and Ahluwalia (2019), poor management of resources result to an overrun of costs and slippage in schedule in most projects of public infrastructure.

1.1.1 Project Performance

This is basically defined by criteria of budget, deliverables and time (Thomas & Fernandez, 2008). Recent studies have, however proved that project success is multidimensional and broadens the focus of performance to incorporate characteristics such as project management performance (Ika, 2009). Thus, success within a project is a concept which is multidimensional, with dimensions such as business, technical, behavioral, strategic and behavioral being interrelated (Cao & Hoffman, 2011). Performance within a project as Chen et al. (2004) notes, is based upon the set timelines, its effectiveness and efficiency. Efficiency is noted by smooth operations within the team members and how resources such as cost and time are adhered to whereas effectiveness is quality of work that is being generated and

whether objectives of the project are being met (Sundqvist, Backlund, & Chronéer, 2014). Literature on management of projects look at performance of project as that which meets the schedule, efficiency of operations, goals and budget (Zidane & Olsson, 2017). Other indicators of project performance as outlined by Ali, Al-Sulaihi, and Al-Gahtani (2013) include satisfaction within clients, change of clients, performance of the business, environmental impact, minimum conflicts and disputes, health and safety.

According to Phiri (2015), quality, time and cost are prevalent dimensions of evaluating performance. Another eminent way is by use of two sets of indicators which are very common (Pheng & Chuan, 2006). As (Enshassi, Mohamed, & Abushaban (2009) notes, the first set relates to users, the general public and stakeholders; a set of individuals who will analyze performance from a macro point of view. The second one involves the contractor and developer, a set of people who will analyze performance from a micro point of view (ibid). Afaq (2013) asserts that project performance is seen as good when it meets its technical specifications and if satisfaction is achieved among stakeholders such as end users, project team members, parent organization managers and donors or financiers.

The performance of road infrastructure projects under devolved units has been a challenging concern across a large number of nation's world over (Zakayo, 2017) and a mixture of results has been observed across nations. In Italy, Calamai (2009) points out that devolved road infrastructure governance has been constrained by countless financial resources challenges coupled with disparities in financial disbursements for road infrastructure projects across different devolved governments which resulted to 15% of regions facing road infrastructural challenges while others enjoying sufficient supply. However, in the Czech Republic, access to improved physical infrastructure had increased under devolution as a result of implementing better fiscal decentralization structures which led to timely funding of infrastructure projects by devolved units (Hemmings, 2013).

In India, the devolution of major road infrastructure projects led to development of India from a LDC to middle developed country in the early 1980s. In his study on the state of development in Asian countries, Alsuwaidi (2011) argues that India's development was tied to decentralization of its development projects. However, he argues that there is differentiated rate of development in India from one devolved unit to another due to various reasons chief among them resources constraints.

In Nigeria, road projects under devolved units were also faced with the problem of project delays and completion rate. With the road infrastructure having been devolved, there arose overrun in the costs of projects with concomitant repercussions of high costs of finishing projects as compared to the earlier sums (Omoriegbe and Radford, 2016). According to authors, out of every ten projects within Nigeria, seven of them were affected with delays during their implementation. In Tanzania, even though various reforms leading to devolved units had resulted in significant identifying, funding and implementation of road projects (Tsekpo & Hudson, 2015), major county governments had been left behind at their comfort zones of development leading to imbalances in regional project developments which was linked to insufficient finances.

In Kenya, there was a study by World Bank in 2014 on how the county governments were implementing projects which were funded by the government of Dutch and International Monetary Fund (IMF) in Nandi, Kisii, Murang'a and Kwale counties. Findings showed that only 21% of these development endeavors were effectively and efficiently finalized between 2013 and 2014. There was a failure of 48.25% within these counties on matters of re-carpeting of existent roads which were in bad condition. Nevertheless, a Devolution Annual Report (2015) produced by the Kenyan Government and United Nations Development Programme (UNDP) recognized a tremendous improvement when it comes to projects related to infrastructure following the promulgation of the new constitution in Kenya. Despite this, according to report by the devolution ministry in 2016, implementation of these projects across the counties was 55% unsuccessful as a result of several outstanding issues like insufficient finances allocated to such projects and inconsiderate utilization of available resources. This is in support of a Government of Kenya report of 2013 that revealed that 49.21% of the planned county development projects could not be achieved due to some unnecessary issues that could otherwise be avoided.

According to Adek (2015), major projects in the devolved units in Kenya have failed or taken longer than they should. In Bomet and Kisumu counties, lack of sufficient funds from both the national and county governments left about 60% of development projects not implemented. In the cases of Kwale, Kilifi, Embu, Taita Taveta, Garissa, Kitui and Kisii counties, up to 52% of the planned roads failed due to among other factors, limited resources, corruption and or embezzlement of funds. According to Musyoki (2018), 21% of the projects

within counties have realized efficient and effective implementation, 45% of them are still struggling while the rest have failed or have been abandoned.

1.1.2 Resource Management Practices

Management of resources is the deployment of resources of the organization effectively and efficiently at the time they are required (Watt, 2007). On basis of project management, managing of resources is developing of techniques, processes and philosophies of the most appropriate approach of allotting resources to activities or tasks of a given project (Maserang, 2012). Management of resources within a project is inclusive of the procurement and deployment of external and internal resources that are prerequisite for project delivery. Its major focus is prioritization when it comes to utilization of resources, monitoring production and usage of resources and measurement of the effectiveness of resources (Engwall & Jerbrant, 2003; Petrovic & Van Bruwaene, 2004).

According to Frame (2003), management of resources is an aspect of project planning which converges on supplies utilized in the production of deliverables of a project. Management of resources of a project is often inclusive, but not limited to, costs of materials, labor and equipment within the work of the project (Kerzner & Kerzner, 2017). Management of resources is a very crucial element in the phase of project planning since it is inclusive of timeframe and cost of resources utilized in delivering individual tasks (Westland, 2007). Thus, managing of resources is a vital part in project management as it makes sure that implementation of a project is in accordance with overview and scope ascertained during the phase of planning.

Resource planning is the act of allocating and utilizing resources that include people, machinery and equipment and its aim is to maximize resource efficiency, while simultaneously giving an overview of resources' availability and capacity (Monk & Wagner, 2012). According to Umble, Haft and Umble (2015) resource planning involves assigning the right tasks to the right team members at the right time, so that your project delivers the required outputs, without any delays and conflicts. Therefore, a proper resource plan will help in reducing budgeting and help forecasting accurately project expenses and lead to better project performance.

Resource scheduling is a set of actions and methodology used by organizations to efficiently assign the resources they have to jobs, tasks or projects they need to complete, and schedule

start and end dates for each task or project based on resource availability (Gordon & Tulip, 2017). Chan, Chua and Kannan (2018) observe that resource scheduling makes for better time estimates, as it provides one more metric by which to measure your project schedule. With resource scheduling comes superior organization for projects, teams, sites, equipment and any other resource associated with the project. All this sets the stage for an intelligent distribution of resources among your project tasks.

Schwindt (2016) observe that resource allocation is the process of assigning and scheduling available resources in the most effective and economical manner. Projects will always need resources and resources are scarce. The task therefore lies with the project manager to determine the proper timing of those resources within the project schedule. According to Engwall and Jerbrant, A. (2018) resource allocation in project management is important because it gives a clear picture on the amount of work that has to be done and allows to plan and prepare for the project's implementation or achieving goals which makes it possible to analyze existing threats and risks to the project resulting to better project performance.

Resource monitoring refers to the process of keeping track of all project-related metrics including team performance and task duration, identifying potential problems and taking corrective actions necessary to ensure that the project is within scope, on budget and meets the specified deadlines (Elonen & Arto, 2019). Lyons, Runge, Laskowski and Kendall (2019) observe that resource monitoring plays a pivotal role in determining sustainable abstraction volumes, the feasibility of developments, and strategy for efficient overall management of the resource. Therefore, resource monitoring helps project managers to track, analyse and report on relevant information and data throughout the life cycle of a project.

1.1.3 Road Infrastructure Projects in Wajir County

Road infrastructure projects are among the county projects highly marred with delayed completion, cost overruns and abortive works (Wairimu, 2016; Akali, 2018). Wajir County, among the North Eastern region counties has experienced challenges in its general road infrastructure which is attributable to the high levels of marginalization both geographically and historically in this region which have persisted over the years (World Bank, 2016). The county as at February 2018 had a single airport, seven airstrips and a tarmac road of about 28 kilometers. This is incomparable with the size of Wajir County (55,840km²). The sum of roads which were both unclassified and classified within the county as at 2018 was

approximately 8,000 Kilometres up from 5,280 Km road network during the First County Integrated Development Plan 2013-2017 released in 2013.

There is a general lack of salient infrastructure such as main parks for Lories and buses, a network of railway and suitable bridges. Significant portions of network of feeder roads are in poor shape and majority of the roads are deemed unpassable in the event of seasons of rain hence limiting most of the motions by road in the county. Regardless, roads are the most familiar means of transport within the county given their poor conditions. A road network which is in poor condition inhibits connections with homesteads and other counties in terms of collaboration which can be both cross-county and inter-county.

1.2 Statement of the Problem

The economic development of nations particularly developing countries is hinged on the performance of infrastructural projects implemented by governments (Calderon, Cantu, & Chuhan-Pole, 2018). These projects highly contribute to economic productivity and industrialization, increased job opportunities and poverty alleviation among other benefits. Nevertheless, the benefits accruing from these projects have been watered down by project failures with the World Bank (2010) revealing more accustomed failures than successes when it comes to implementing projects particularly in developing nations. In order to reverse the prevailing poor road infrastructure in Wajir County, the county government in its County Integrated Development Plan 2013 to 2017 set out to carry out several road projects. Under this First CIDP, the county set out to do gravelling works covering 2117 kilometers. Nevertheless, the review of the implementation of this CIDP revealed that the county only managed to gravel 320 kilometers in improving accessibility to main centers from the town of Wajir despite the large budgetary expenditure on the road sector, for instance, 1,262.2 million in the FY 2013/2014 and 1,052.67 million in the FY 2017/2018 (Wajir County Integrated Development Plan 2018-2022). The summary of the monitoring and evaluation outcome indicators showed that the level of citizen satisfaction with the road and transport was just average and only one Bus Park had been constructed for the period 2013-2018. The M&E Report on the implementation of the First CIDP showed that for the first 5 years of devolution, the county had only managed to reduce the time and cost taken to travel by 15% while the cost of transporting goods to the market had just reduced by 10%.

The major challenges highlighted in the Annual Development Plan 2017/2018 and CIDP 2018-2022 as affecting the meeting of the county project targets included insufficient resources in undertaking of major priorities but with the expensive nature of projects, weak M&E system for tracking the implementation of projects and value for money directed to these projects, delays in disbursement of funds which slowed project works as well as poor deployment of funds, equipment and staff in an optimal manner in efforts to evade the starving of key areas of priority while directing much resources in non priority areas. This called for the urgent investigation of the project resource management and how it influenced the success of road endeavors in Wajir County.

Ochieng (2014) study examined the influence of resource management practices on performance of projects in global system of mobile communications companies in Kenya and found that awareness on importance of resource management is carried out among GSM companies in Kenya. However, the study used qualitative data does not provide conclusive findings. Umulisa, Mbabazize and Shukla (2015) study examined the effects of project resource planning practices on project performance of Agaseke Project in Kigali, Rwanda and found that all project resource planning practices studied had a positive significant relationship on project performance. However, project resource planning practices alone does not affect project performance. Ndayisaba and Mulyungi (2018) study investigated the effect of resources management on project success implementation and revealed that resources management has an influence of on project success implementation of strengthening livelihoods in rural Rwanda project Muhanga district. However, the study used cross-sectional research design that uses a small sample size and hence not representative of whole population. Therefore, this study investigated the effect of project resource management practices on the performance of road projects in Wajir County, Kenya.

1.3 General Objective of the Study

The main objective of this study was to assess the effect of project resource management practices on the performance of road projects in Wajir County, Kenya.

1.3.1 Specific Objectives of the Study

The study was guided by the following specific objectives;

- i. To establish the effect of resource planning on the performance of road infrastructure projects in Wajir County, Kenya
- ii. To determine the effect of resource scheduling on the performance of road infrastructure projects in Wajir County, Kenya
- iii. To examine the effect of resource allocation on the performance of road infrastructure projects in Wajir County, Kenya
- iv. To explore the effect of resource monitoring on the performance of road infrastructure projects in Wajir County, Kenya

1.4 Research Questions

The study sought to answer the following research questions;

- i. What is the effect of resource planning on the performance of road infrastructure projects in Wajir County, Kenya?
- ii. What is the effect of resource scheduling on the performance of road infrastructure projects in Wajir County, Kenya?
- iii. What is the effect of resource allocation on the performance of road infrastructure projects in Wajir County, Kenya?
- iv. What is the effect of resource monitoring on the performance of road infrastructure projects in Wajir County, Kenya?

1.5 Significance of the Study

Findings from the study if put to use would not only aid the management of the county of Wajir but also official in other counties. These findings would inform these officials on the necessary measures that to need to be taken to ensure that county project resources are well managed and push for identification of loopholes in the management of these resources. The study was crucial in emphasizing the need for established and formalized project resource plans, schedules and frameworks and systems for ensuring that the utilization of these resources is monitored and controlled for better project performance. The county government could use the study findings to initiate benchmarking of their project resource management

practices with that of counties or other organizations that have been able to attain great project success through advance project resource management approaches.

The findings would be crucial in highlighting how poor and delayed project resource allocation has influenced the success of road projects within the county and measures being undertaken in order to diversify project resource sources especially when there are delays in disbursements from the national government. This could guide in the development of adequate project mobilization plans. The findings could also form a basis for carrying out assessments of project resource optimization in the county in order to identify the areas of resource wastage or underutilization and how the county can deploy its project resources to attain maximum project outcomes.

The study findings could also assist the policy makers in the national government such as the Ministry of Devolution in drafting guidelines and policy documents that could assist in tightening the prudence utilization of project resources at the county level in order to seal the loopholes for project resource misappropriation.

This study would also be fundamental in expanding the body of literature on project resource management which is scanty and more fundamentally providing a Kenyan perspective of the study topic. The findings from the study would be a point of reference to other researchers who might be willing to advance on research work of related field or provoke further research in this area.

1.6 Scope of the Study

This research restricted itself on the assessment of how the management of resources of the project influence success of road projects within the county of Wajir. In spite of quite a large number of project resource management practices, this study could not cover the exhaustive list as a result of constraints such as time. For this reason, this confinement was inclusive of resource planning, resource scheduling, resource allocation and resource monitoring with respect to their effect on success of road projects within the county of Wajir. Since the county is very big, only road projects in Wajir North, Wajir East and Wajir South sub-counties as well as the few county wide projects undertaken by the county were focused upon. The study was limited to the road projects completed during the period 2013 to 2017. The period for this study was 2019.

1.7 Limitations of the Study

The researcher faced a number of obstacles while undertaking this study. First, given that information touching on project resources and their management was very sensitive especially with increasing questions pertaining to utilization of government resources, there were cases of unwillingness from some respondents in disclosing of specific information which was key to the study. This was especially attributable to the fear of victimization that one could be exposed to upon releasing of information considered to be very sensitive and which could be used against them. In order to deal with this challenge, the researcher upheld high level of anonymity by excluding details linking to the respondents from the questionnaire. There was assurance to the respondents that the information was very confidential and would only be utilized for academic purposes only. The county government management would also be notified about the study.

The availability of some of the respondents particularly those in the senior management levels who could have work commitments outside the office or have busy schedules. In order to enhance the response rate of the study, the researcher with the aid of his assistant gave notification to the respondents and book appointments earlier so that the questionnaires are administered in a time convenient for the respondents. Furthermore, given that the study area was not widely researched, the researcher got challenges in getting enough research materials to support their research work. In order to deal with this obstacle, the researcher started the project earlier besides relying on materials from different sources both online and also visiting the libraries.

1.8 Organization of the Study

This study was organized in five chapters. Chapter one constitutes the background of the study, statement of the problem, objectives, significance, scope, limitations and organization of the study. Chapter two comprises of the theoretical literature review, empirical literature review, summary of literature review and research gaps and conceptual framework. Chapter three encompasses the methodology which presents the research design, target population, sampling design, research instrument, data collection procedure, data analysis and ethical considerations. Chapter four constitutes the research findings and discussion which presents the response rate, background information, descriptive statistics, inferential statistics and

analysis of qualitative data. Chapter five presents the summary, conclusion, recommendations for policy and practice, and recommendations for further study.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This is an exploration of studies which have been undertaken in connection with the subject of practices of managing resources in relation to success of projects on a global basis. This section firstly discusses theories which build upon the foundation of the study and their relevance to the study. Thereafter, the empirical studies conducted in relation to the subject matter as per the study objectives are undertaken. There is a presentation of the conceptual framework in highlight of the link existing between the variables of the study later in the chapter.

2.2 Theoretical Framework

Theories forming the basis of the study are discussed in this section. These theories consist of the theory of project management, theory of constraints theory of resource based view. The main premises of the theories are highlighted and their relevance to the study outlined.

2.2.1 Theory of Constraints

This is a theory by Goldratt (1984), which maintains that a system is faced by constraints that limit it from achieving its objectives. Some of these limiting factors emanate from production, planning, production control, managing a project, logistics, accounting, and measurement of performance and other paths of business which might impact on performance. In this theory, constraints define the output of a given system whether or not they are recognized. The aim of the top management is finding appropriate ways to minimize the constraints of a system in the organization. This way the organization can effectively be able to realize its goals and maximize profits.

This theory describes the causes of the system constraints and also sheds light on the best ways to deal with these constraints (Goldratt, 2006). An organization operates with the help of systems. A system can be described as a collection of independent and interrelated process which works together in generating outputs from inputs when pursuing certain goals. The limitation for this system is a constraint which prevents the system from its efforts of achieving organizational goals(Noreen, Smith,& Mackey, 2008).

Theory of constraints is applicable in this study since the planning, scheduling, allocation and monitoring of project resources are constraints that face project teams in counties when carrying out road infrastructure projects. The best way to handle such kind of a problem is to find ways of countering these challenges to remove barriers in implementing road projects (Ruhl, 2011). Resource management is an important aspect in executing road projects and should be undertaken in an effective manner in order to improve success of these endeavors. Among the impediments affecting success of projects are inadequate resources that are poorly allocated to project tasks. These limitations highly contribute to failure of project completion resulting into inefficiencies and delays which might result in increased costs of projects. However, the supporters of this theory; Noreen *et al.* (2012) put more emphasis on the significance of project teams identifying the limitations and establishing effective ways to deal with these limitations at early stages to reduce their impact on road projects.

Within this study, this theory guides not only the overall study objectives but also the specific ones as well. First, this theory is crucial in addressing the dependent variable which is project performance. In order to road projects undertaken by Wajir County to perform well, it is necessary to lessen the constraints that can otherwise diminish the project outcomes such as the quality of roads constructed. These constraints may pertain to how the project resources are managed in terms of their planning, scheduling, allocation and monitoring among others. This theory underlines the necessity of the project management to identify these project constraints that are likely to limit the projects' performance and taking the necessary measures on solving these constraints. This theory therefore will guide the assessment of the issues pertaining to resource management that might affect the success of road projects within the county of Wajir.

2.2.2 Resource Based View Theory

This is a theory by Barney (1991) which indicates that the possession of resources which are strategic provides a given organization with a superb chance of creating a competitive advantage over their rivals. This competitive edge can aid the organization in enjoyment of unassailable profits as when compared to similar competing groups. Managers of projects have a role of utilizing resources which are made available throughout the cycle stages of a project in ensuring their success as compared to implementation of projects of other institutions as follows; identification and classification of the resources within the firm, estimation of capabilities and vulnerabilities in relation to their rivals, identification of

opportunities in ensuring that resources are utilized in a better way, identification of capabilities of the firm, assessing the ability of resources to generate rent and how capable they are in terms of maintaining sustainability, selection of a the best resource exploitation strategy within the firm in relation to its rivals and identification of gaps in the resources that need to be bridged (Johnstone & Brenman,1996). This theory is an exploration of the desire for the right form of planning and implementation of projects on the basis of availability of resources. Based on this, management makes use of the readily obtainable resources and utilizing them for maximum success of projects in place. This theory is thus fundamental as it stresses on the correct form of planning, scheduling, allocation and monitoring of project resources towards ensuring that projects are successful.

2.2.3 Resource Dependence Theory

This study was based on resource dependence theory by Pfeffer and Salancik (1978). The theory describes projects as being exposed not only to internal but also to external contingencies. The contingencies arise because projects depend on the resources of its environment which are necessary for the project organization to exist and excel in successful completion of projects. External factors are able to control these resources to a certain degree which can influence the behaviour of project team members and build external dependence.

To increase control of power over resources and ensure successful completion of projects, project organizations try to minimize their own dependence or increase the dependence of others on themselves (Ulrich & Barney, 2014). In doing so, resource dependence theory proposes theoretically and empirically that project organizations concentrate more on resources which are critical for their long term survival. A good portion of the work by Pfeffer and Salancik (1978) concentrates on how a project organization can manage resource dependence on its environment to ensure a successful outcome.

The theory is important because an organisation's ability to gather, alter and exploit raw materials faster than competitors can be fundamental to success. Resources are often controlled by organisations not in the control of the organisation needing them, meaning that strategies must be carefully considered in order to maintain open access to resources.

2.3 Empirical Review

This section reviews empirical studies that have been undertaken and which highlight on practices of managing resources in relation to their effect on the success of projects around the globe. The section is structured as guided by the study objectives.

2.3.1 Resource Planning and Project Performance

A study by Abu El-alkass (2012) on the analysis of the system of managing resources of construction for contractors of the Gaza strip asserted that equipment planning in projects was necessitated by the need to establish the numerous types of equipment and their sizes which were either on direct purchase or on rent which aided in the control of the cost of the equipment in construction projects. It was also noted that planning of labor helped the contractors in maintaining the right number of employees at the right time with the capability to execute project tasks which were aimed at ensuring success of the project. The study highlighted that labor accounted for around 40%, which was an approximate cost in huge projects, hence maximization of productivity of labor termed as a requirement. However, this study was undertaken in a different setting hence there cannot be generalization of these findings in fitting the case of the county of Wajir.

Kumari and Vikranth (2012) undertook a study on planning of resources of the construction of highway projects of India. A survey was conducted. The study found that these projects suffered from underutilized resources which were attributed to lack of detailed and thorough planning and absurd decision making in site management. The study found that resource planning in most of these projects was confined to planning of time resources but planning on how the resources would be mobilized and utilized and planning according to resource capacity and availability was not considered. According to the study, material planning reduced the level of unnecessary wastage and ensured that all the required material for all project phases were available. The findings also demonstrated that manpower planning was fundamental in the achievement of project objectives since it ensured that in executing the projects, the right number and kind of project team, within the correct timing and place, and those capable of completing the project tasks in an effective and efficient manner was available. However, this study was a case study using a purposive sampling technique.

An assessment was performed by Umulisa, Mbabazize, and Shukla (2015) on practices of planning for resources of a project on how the projects excelled, with a focus on the Agaseke

Project of Kigali within Rwanda. A descriptive design of research was put to utilization. It was revealed that planning of human resources, planning for financial resources and planning of time and material resources had a positively significant effect on the success of these projects. There was also a significant effect of practices like forecasting, placing plans for generation of money, placing of orders, budgeting, tracking of orders which had been placed, practices of planning for procurement, training of members of the project and general teamwork on the success of the projects. Project resource planning was found to enhance the completion of projects within budget, tracking of the performance of project resources and ensured provision of the correct amount of materials required by personnel of the project within the specified time. However, the study used simple random sampling which is limited to accessing a sample that is representative of the whole population.

Sushma, Bhavya, Rajeeva and Narayan (2017) explored construction of roads by use of Primavera with regard to planning, scheduling and maximizing of resources in India. It was uncovered that planning of resources in projects of construction was paramount since it assisted in minimizing and controlling project delays. The study emphasized that considerable amounts of time, monies, and other resources were wasted annually in the construction industry due to deficiency in planning of resources of the project. The study noted that with increased vastness and complexity of construction projects, project planning softwares was paramount in the provision of proper planning and adequate flow of project resources which ensured that the desired project outcomes were achieved automatically. However, the study was undertaken in a different location which has different situational issues from that of Wajir County hence generalization of findings cannot be automatically made.

A research by Shadrack (2018) on issues affecting practices of planning of resources in the construction sector within Kenya with a shift to contractors of the county of Nairobi. A descriptive design of research was used. It was discovered that even though resource planning in the industry was used to a great extent, much of it was non-structured. It was pinpointed that the growth of projects of construction within the county continued to be adversely impacted by delays in materials as well as deficits in equipment and labor when mostly required. The study established that equipment planning, labor planning, and material planning were resource planning practices mostly carried out in previous firms of contracting and where management at the top supported the endeavors. However, this study focused on

construction projects carried out by private developers which are carried out in different contextual factors from that road projects undertaken within the county of Wajir hence there cannot be any automatic generalization of the findings.

2.3.2 Resource Scheduling and Project Performance

Dong, Li, Zhao, Li, and Yan (2008) conducted an assessment of resource scheduling in multi-software projects. The study utilized a comparative study design. The assessment revealed that resource scheduling was fundamental in providing project schedules that were effective besides enhancing efficiency in using project resources. It was emphasized that failure to perform resource scheduling would result to inefficiency in utilizing project resources and heightened costs. According to the research, resource scheduling provided a better view of how the project ought to be implemented which was attained through the placement of schedules within activities of the project, for instance the date for commencement and completion of the tasks and resources required to perform them. However, the contextual setting of this study varies from the one being focused. Also this study utilized comparative design of study, which varies from the descriptive one being relied upon.

Memon and Zin (2011) analyzed the degree to which resource-driven scheduling was being implemented within the construction sector in Malaysia. A survey was undertaken. It was articulated that resource scheduling ensured that project activities were scheduled in a way that project deadlines were achieved utilizing the defined resource availability limits. The study discovered an increased usage commercial packages in undertaking resource scheduling among the firms including Microsoft Project and Primavera Project Planner. Some of the resource scheduling practices which were being implemented on an average extent encompassed resource calendars, assignment of resources to activities, resource priority, leveling, smoothing, stretching and also resource splitting. The study recognized that given that the time span for each project activity depended on resource availability, project challenges were experienced when project work proceeded without considering the manner in which labour, equipment and material constraints would affect the scheduling of the activities. However, a survey design was used which has challenges in validity and reliability of results.

Joshi and Patil (2013) assessed resource scheduling in projects of construction with a case study design being utilized. It was noted that for a project to be completed successfully,

project resource scheduling was very critical task since it allowed for innovative planning of project activities that was limited by the resources that were available. The study found that resource scheduling reduced the unforeseen project losses which might be occur as a result of large variances in the utilization of resources. It was argued that schedules that neglected resource constraints might impact project control. The study underscored that the importance of using softwares and computer packages such as MS Project and Primavera project planner for accurate resource scheduling especially in large scale projects within the industry. However, this study used exploratory research design inhibiting generalization due to small sample size used.

Lamka and Masu (2018) evaluated the extent to which the success of companies for construction in the county of Nairobi was influenced by resource scheduling. A mixed methods design was put to use. It was underlined that faults in resource scheduling resulted in project teams allocating utilities to wrong places at incorrect timing. It was found that when resource scheduling was undertaken, it was easier for project managers toreorganize project tasks and resources in order to attain the prime quality, time and cost objectives within a constrained budget and under insufficiency of resources. However, this study focused on construction projects carried out by private developers which are carried out in different contextual factors from that those of the county of Wajir hence findings cannot be automatically generalized.

2.3.3 Resource Allocation and Project Performance

Engwall and Jerbrant (2013) analyzed the resource allocation syndrome within the context of managing multiple projects. The study was anchored in qualitative case studies. Interdependencies among projects and lack of resources were pointed out as key concerns in multi-project environments. Competition between projects called for setting priorities and at times resource reallocations. It was established that many projects suffered from short run problem solving which significantly contributed to project delays. Due to inadequacy in allocation of resources, majority of them did not meet the project goals and many lagged behind their schedules. However, the study used qualitative case studies hence a gap in the method of study as the current will rely upon the design of descriptive survey.

Bulle and Makori (2015) explored the role of resource allocation in the performance of projects carried out by Kenya Urban Roads Authority. The research relied on a descriptive

study design. As per the study, allocating financial, physical and human resources to projects affected their performance. Resource allocation affected the speed and quality of project delivery ensuring that the cost specifications were observed as outlined in the project plans. The study laid emphasis on the sufficiency of resource allocations in enhancing and sustaining project performance. When the resources are appropriately allocated and utilized, there was an assurance of efficiency and effectiveness of projects resulting to superior project outcomes. However, the contextual background of this study looks on projects undertaken by KURA while this project highlights on road projects within the county of Wajir.

Anunda (2016) assessed the issues that affected the success of projects of HIV/AIDS which were being executed by NGOs within Nairobi County. A descriptive research design was used. Allocating adequate funds and drawing a large number of donors and partners impacted on the success of these endeavors. According to argument of this study, majority of NGOs implementing the projects under study lacked adequate financing. Dedicating sufficient allocations of monetary and non-monetary resources was a fundamental factor in successfully implementing project plans. It was learnt that a large number of projects ran out of resources before they were completed. However, the contextual setting of this study varies and focuses on different projects from the ones considered in this current study.

Gashuga, Kule, and Ndabaga (2016) evaluated how the management of funds affected project performance in Rwanda focusing on a case of Dairy Community Processing Center Project Burera District. This study made use of the design of descriptive-correlation. Findings indicated that funds allocation improved project delivery and hence project performance. The study noted that the allocation of funds minimized administrative costs, it resulted to enhanced prediction of project efficiency and reduced the minimized the general project risk. It was further discovered that the allocation of project funds enhanced the proper usage of resources. However, the contextual setting and method used in the study varies from the one which will be employed in this study.

Murithi, Makokha, and Otieno (2017) assessed factors affecting timeliness in completing projects of construction of the public within the county of Trans-Nzoia in Kenya. A descriptive survey design of research was used. Results highlighted that allocation of resources within the project was significantly influencing the timely completion of public projects of construction. Allotting of sufficient resources affected project success. Challenges related to finances and payment of works that had been completed had really resulted to

delayed projects. Lack of adequate resources led to delays in procuring construction materials. However, the contextual setting of this project varies from the one being focused and only looks at one aspect of project performance which is time performance contrary to the current one which looks at other aspects of delivery of projects such as cost and quality.

Mogaka (2017) analyzed the linkage between the procedures in disbursing funds and how health projects that were funded by donors in Nairobi County were being implemented. A descriptive survey design was adopted. It emerged that allocating resources positively and significantly impacted the execution of these projects. Resource allocation as argued in the study aided in assigning resources to tasks throughout the life of the project. The study underscored the urgency of sufficient allocation of project resources in implementing the projects. The study laid emphasis on adequate training of project personnel, disbursement of project resources on time. According to the study, when projects kick off, at times there can be cases of over-allocation of resources or even competition of resources among different projects and tasks. However, the projects considered in this study differ from the ones being examined in this current study.

Njiru (2018) evaluated the connection between project management practices and implementing projects within the firms of manufacture within the county of Nairobi. The study relied upon a descriptive design of research. There was a positively significant link between allocation of resources and project implementation. Allocating resources assisted project managers to marshal project teams with great productivity and efficiency in undertaking tasks which enabled them to assess project schedules and certainly appraise resource availability with immediate effect. However, the study focused on projects undertaken privately by manufacturing firms which are different from public road projects undertaken by Wajir County hence there cannot be any generalization of findings.

2.3.4 Resource Monitoring and Project Performance

Mosago (2013) assessed impacts of financial monitoring on success of programs undertaken by international NGOs in Kenya. A mixed methods research design was used. There was a positive link between financial monitoring and programme performance for INGOs. The study underscored that the programme performance for INGOs could be greatly improved if on site visits, financial desk reviews and periodic financial review meetings were conducted. Financial monitoring needed to be conducted frequently. Thorough monitoring, reorienting

and intensifying monitoring greatly contributed to more cost-effective, socially effective and successful programmes. Financial monitoring reduced the chances of funds being misallocated as they were utilized for the core business of the programs existence. However, the contextual setting of this study varies as it focuses on projects which are different from the one being undertaken.

Ochieng (2014) investigated the degree to which resource management influenced the execution of projects undertaken by mobile communications firms within Kenya. Study relied upon the design of descriptive survey. Investigations revealed that enough efforts to monitor and control the project resources ensured that project funds were spent appropriately as planned and with proper authorization. The study noted that the tools for monitoring progress and how often financial auditing and reporting were undertaken helped to eliminate waste and served as a performance monitoring tool. Financial auditing was found to be very important in assessing the process and system used in capturing and reporting project costs. However, the study focused on projects undertaken privately by mobile communications firms which are different from public road projects undertaken by Wajir County hence the findings of the study cannot be automatically generalized to fit the case under study.

Kamwana and Muturi (2014) evaluated the level of success of projects which were financed by World Bank in particular KPLC projects was impacted by financial monitoring. A descriptive study design was applied. It was established that the monitoring of financial resources channeled to these projects was positively and significantly influencing success of the projects. It was highlighted that monitoring the funds enhanced their wise usage for the envisioned purposes and enhanced the creation of value for the beneficiaries. Financial resource monitoring ensured that cases of diversion of project resources to other purposes and interests outside the project scope and work plans were minimized. Monitoring how the resources were used ensured that projects were implemented in accordance to the set budget and time frames. The study underlined the role of unexpected audits where there was suspicion of resource misuse by financiers. However, the contextual setting of this study varies and focuses on different projects from the ones considered in this current study.

Jha and Iyer (2016) assessed the significant dynamics that affected the quality projects in the industry of construction within India. The study made use of the design of descriptive survey. It emerged from the research that appropriate monitoring of project resources and provision of feedback that was timely regarding assisted in the supervision of the level of workmanship

in executing the projects which improved their quality. Ensuring that all cases of inappropriate use of project resources, whether material, labor, plant and machinery or finances were monitored well and reporting done on time, the anticipated project quality was attained. However, the study was carried out in a different setting and focuses on different projects from those considered in this study hence a contextual gap.

2.4 Summary of Literature Reviewed and Research Gaps

A summary of literature reviewed and the research gaps identified from this review is presented in Table 2.1.

Table 2. 1: Summary of Literature Reviewed and Research Gaps

Author &Year	Topic	Finding	Research Gap	How the current study sought to fill the gaps
Shadrack (2018)	Factors that influenced the practice of planning of resources in the sector of construction within Nairobi in Kenya.	Heightened levels of planning of resources was linked to a reduction in the negative influence on the progress of projects of construction.	This study focused on construction projects carried out by private developers which are carried out in different contextual factors from that road projects undertaken within the county of Wajir hence there cannot be any automatic generalization of the findings	The study established the effect of resource planning on the performance of road projects in Wajir County, Kenya.
Sushma, Bhavya, Rajeeva, and Narayan (2017)	Planning, placement of schedules, and maximizing of resources for construction of roads by use of primavera in India.	Resource planning in construction projects was crucial since it assisted in minimizing and controlling project delays	A contextual gap. The study is undertaken in a different location which has different situational issues from that of Wajir County hence generalization of findings cannot be automatically made.	The study established the effect of resource planning on the performance of road projects in Wajir County, Kenya.
Umulisa,	Impact practices	Planning of	The study used simple	The study

Mbabazize, and Shukla (2015)	of planning of resources on success of projects with a focus on Agaseke project in Kigali within Rwanda.	human resources, financial resources, time and material resources was positively influencing success of the projects.	random sampling which is limited to accessing a sample that is representative of the whole population.	used stratified sampling method which will ensure the sample selected is representative of the whole population.
Abu El-alkass (2012)	Management of systems of resources of construction for contractors of Gaza strip.	Equipment planning, labour planning and material planning positively affected project performance by minimizing costs through reduced wastage	Contextual gap. This study was undertaken in a different setting hence there cannot be generalization of these findings in fitting the case of the county of Wajir.	The study established the effect of resource planning on the performance of road projects in Wajir County, Kenya.
Kumari and Vikranth (2012)	Planning of resources for projects of construction of highways in India.	Resource planning in projects ensured that the project costs were properly controlled since it guided the efficient allocation of resources.	Was a case study using a purposive sampling technique	This study was a survey study using a stratified sampling technique
Lamka and Masu (2018)	Extent to which success of companies for construction within the county of Nairobi was influenced by scheduling of resources.	Faults in resource scheduling resulted in project teams allocating utilities to wrong destinations at incorrect timing.	This study focused on construction projects carried out by private developers which are carried out in different contextual factors from that those of the county of Wajir hence findings cannot be automatically generalized	The study determined the effect of resource scheduling on the performance of road projects in Wajir County, Kenya.

Joshi and Patil (2013)	Resource scheduling in construction projects in India	Resource scheduling reduced the unforeseen project losses which might be occur as a result of large variances in the utilization of resources.	Exploratory research design inhibiting generalization due to small sample size used	Quantitative analysis of data will be done that is effective in generation of data due to large sample size used
Memon and Zin (2011)	The degree to which resource-driven scheduling was being implemented within the construction sector in Malaysia	Resource scheduling ensured that project activities were scheduled in a way that project deadlines were achieved utilizing the defined resource availability limits.	A survey design was used which has challenges in validity and reliability of results	A descriptive design was used which ensured validity and reliability of results
Dong, Li, Zhao, Li, and Yan (2008)	Assessment of resource scheduling in multi-software projects in Japan	Failure to perform resource scheduling would result to inefficiency in utilizing project resources and heightened costs.	The contextual setting of this study varies from the one being focused. Also this study utilized comparative design of study, which varies from the descriptive one being relied upon.	The study determined the effect of resource scheduling on the performance of road projects in Wajir County, Kenya.
Njiru (2018)	Connection between practices of managing projects and execution of projects within the manufacturing firms in Nairobi County.	Positively significant link between allotment of resources with regard to implementation of projects	Contextual gap. Focuses on projects undertaken privately by manufacturing firms which are different from public road projects undertaken by Wajir County hence there cannot be any generalization of findings.	The study examined the effect of resource allocation on the performance of road projects in Wajir County, Kenya.

Murithi, Makokha, and Otieno (2017)	Factors that affect the timeliness in completing public projects of construction within the county of Trans-Nzoia in Kenya.	Allocation of resources of the project was significantly influencing finalization of projects of construction in a timely manner.	The contextual setting of this project varies from the one being focused and only looks at one aspect of project performance which is time performance contrary to the current one which looks at other aspects of delivery of projects such as cost and quality.	The study examined the effect of resource allocation on the performance of road projects in Wajir County, Kenya.
Mogaka (2017)	Linkage between the procedures in disbursing funds and how health projects that were funded by donors in Nairobi County were being implemented	Allocating resources had a positively significant impact on implementation of the projects.	Contextual gap. The projects considered in this study differ from the ones being examined in this current study.	The study examined the effect of resource allocation on the performance of road projects in Wajir County, Kenya.
Gashuga, Kule, and Ndabaga (2016)	How the management of funds affected project performance in Rwanda focusing on a case of Dairy Community Processing Center Project Burera District.	Funds allocation improved project delivery and hence project performance	The contextual setting and method used in the study varies from the one which will be employed in this study.	The study examined the effect of resource allocation on the performance of road projects in Wajir County, Kenya.
Anunda (2016)	Issues that affected the success of projects of HIV/AIDS which were being executed by NGOs within Nairobi County	Allocating adequate funds and drawing a large number of donors and partners influenced the performance of these projects.	The contextual setting of this study varies and focuses on different projects from the ones considered in this current study.	The study examined the effect of resource allocation on the performance of road projects in Wajir

				County, Kenya.
Bulle and Makori (2015)	The role of resource allocation in the performance of projects carried out by Kenya Urban Roads Authority	Allocating financial, physical and human resources to projects affected their performance	The contextual background of this study looks on projects undertaken by KURA while this project highlights on road projects within the county of Wajir.	The study examined the effect of resource allocation on the performance of road projects in Wajir County, Kenya.
Engwall and Jerbrant (2013)	Resource allocation syndrome within the context of managing multiple projects	Due to poor allotment of resources, most of them did not achieve goals of the project and many lagged behind their schedules.	The study used qualitative case studies hence a gap in the method of study as the current will rely upon the design of descriptive survey.	The study examined the effect of resource allocation on the performance of road projects in Wajir County, Kenya.
Jha and Iyer (2016)	Significant dynamics that affected the quality of projects in the construction industry in India.	Appropriate monitoring of project resources and provision of feedback that was timely regarding assisted in the supervision of the level of workmanship in executing the projects which improved their quality	The study is carried out in a different setting and focuses on different projects from those considered in this study hence a contextual gap	The study explored the effect of resource monitoring on the performance of road projects in Wajir County, Kenya.
Ochieng (2014)	Degree to which resource management influenced the execution of projects	Monitor the financial progress of the project implementation process hence ensuring	Contextual gap. Focuses on projects undertaken privately by mobile communications firms which are different	The study explored the effect of resource monitoring on the

	undertaken by mobile communications firms in Kenya	necessary adjustments are done to keep the project on track.	from public road projects undertaken by Wajir County hence the findings of the study cannot be automatically generalized to fit the case under study	performance of road projects in Wajir County, Kenya.
Kamwana and Muturi (2014)	The level of success of projects financed by World Bank in particular KPLC projects with respect to the impact of financial monitoring	The monitoring of financial resources channeled to these projects was positively significant in influencing the success of the projects.	The contextual setting of this study varies and focuses on different projects from the ones considered in this current study.	The study explored the effect of resource monitoring on the performance of road projects in Wajir County, Kenya.
Mosago (2013)	Impacts of financial monitoring on the performance of programs undertaken by international NGOs in Kenya	There was positive links between financial monitoring and programme performance for INGOs.	The contextual setting of this study varies as it focuses on projects which are different from the one being undertaken.	The study explored the effect of resource monitoring on the performance of road projects in Wajir County, Kenya.

Source: Researcher (2019)

2.5 Conceptual Framework

Figure 2.1 presents the conceptual framework of the study which shows how the variables of the study relate. The independent variable which is resource management practices is broken down into four specific independent variables namely resource planning, resource scheduling, resource allocation and resource monitoring while the dependent variable is the performance of road projects in Wajir County.

Independent Variables

Dependent Variable

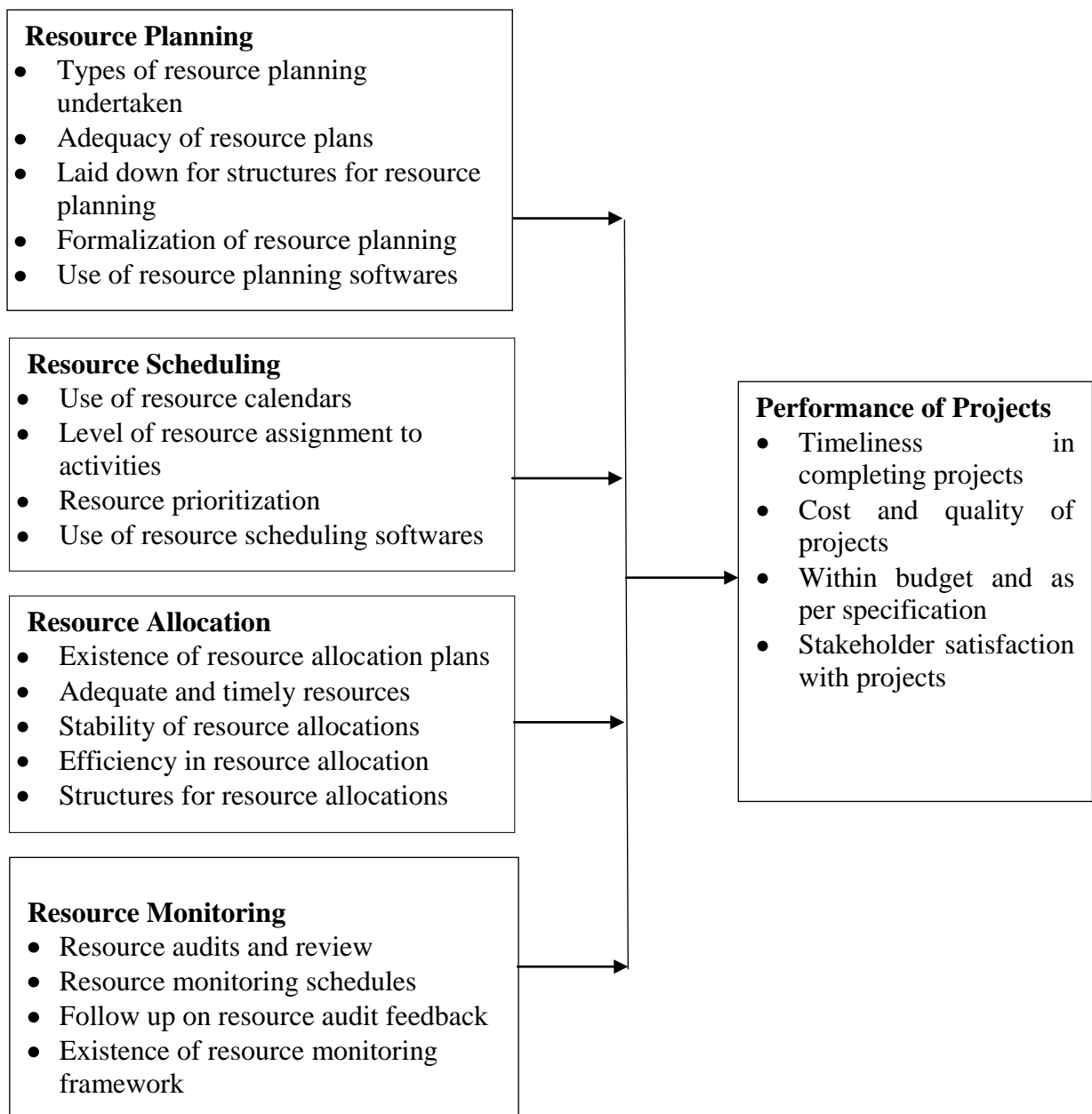


Figure 2. 1: Conceptual Framework

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This section highlights methods and procedures of research which will guide the researcher when embarking on the study. It outlines the design of the study to be adopted, the population the researcher will be targeting and the procedures for sampling, the manner in which they will collect and analyze the data as well as the ethical concerns that the researcher will observe throughout the entire research process.

3.2 Research Design

In this study, a study design of descriptive survey was employed. This design was considered since it facilitates the precise and effective depiction of the aspects or variables that relate to or are relevant to the question under research. Therefore, the researcher was capable of availing an in depth description of the various resource management practices undertaken by Wajir County and how they have impacted the success of road projects within the county. In addition, according to Burns & Grove (2003), the design intends to give a clear view of the set up as it occurs naturally. Thus, through its adoption, the real picture of how the various practices of managing resources with regard to the success of road projects within the county of Wajir was displayed.

Apart from depicting the phenomenon being studied as it exists presently (Kothari, 2004), descriptive study design centers on complex analyses that assist in revealing the relationships that exist between variables (Mugenda & Mugenda, 2013). In this study, the researcher will undertake inferential analysis using quantitative techniques such as Pearson correlation and multiple regression analyses so that they can make inferences from the data pertaining to the relationships that exist between the variables of the study.

3.3 Target Population

This study targeted 193 project stakeholders consisting of 5 county officials under the County Transport and Infrastructure Department, 47 project managers as well as 141 project management committee members who were engaged in the 47 major road projects completed by the county government in Wajir North, Wajir East and Wajir South sub-counties as well as all the county wide projects for the period 2013-2017 (Wajir County Transport and

Infrastructure Department, 2019). Getting the views of various parties engaged in the carrying out the road projects in the county enabled the researcher to gather objective data related particularly to the managing and success of numerous road projects within the county which are pertinent issues touching on the county operations. Involving various stakeholders is crucial since relying on the responses of the county officials alone may lead to biased information or untrue representation of the situation on the ground related to the main study variables which might affect the conclusions drawn from the study.

Table 3. 1: Target Population

Project Stakeholders	Target Population
County transport and infrastructure department officials	5
Project management committee members	141
Project managers	47
Total	193

Source: Wajir County Transport and Infrastructure Department (2019)

3.4 Sample and Sampling Techniques

In determining size of the sample of this study, a table by Krejcie and Morgan for establishing the size of the sample by applying a 5% degree of accuracy or 95% confidence level will be used. Using the Krejcie and Morgan table as shown in Appendix III, 44 project managers and 103 project management committee members will be sampled (Krejcie & Morgan, 1970). Since the number of county officials placed at the county’s department for transport and infrastructure is small, a census of these officials will be taken. Hence, all the 5 county officials in this department was part and parcel of this study. Stratified sampling technique will then be used to in selecting the sample. Table 3.3 summarizes the sample for the study.

Table 3. 2: Sample Size

Project stakeholders	Target Population	Sample Size	Proportion/Percentage
County transport and infrastructure department officials	5	5	2.6
Project management committee members	141	103	73.0
Project managers	47	44	24.4
Total	193	152	100

Source: Wajir County Transport and Infrastructure Department (2019)

3.5 Data Collection Instrument and Procedures

Primary data focused upon with the gathering of data being performed by use questionnaires that are semi-structured. The questionnaire had different sub-sections that contained questions touching on the study variables and also the demographic characteristics of the study participants. Majority of these queries were founded on a five-point Likert scale (degree of agreement scale) as displayed in Appendix II.

Issuing of questionnaires was via a method of dropping and picking later where the researcher contracted two able research assistants to help them in carrying out this task. Follow up was taken after the elapse of two weeks to allow the respondents to adequately respond to the questions. This was undertaken after acquiring the consent of the study participants and also getting approval from pertinent authorities like the management of the county and the university. There was obtaining of a permit of research from the National Commission for Science Technology and Innovation (NACOSTI)

3.5.1 Validity Test

Validity is the level upon which the instrument of research in a study measures what it ought to (Kothari, 2004). To this effect, there was sub-division of the questionnaire into sub sections containing questions that pertain to a given objective which is generally termed to as construct validity. Moreover, the project supervisor and two project managers drawn from the Ministry of Roads was consulted to inspect and provide comments in regards to the extent to

which the questions asked are relevant and meaningful so as to boost the content validity of the tool. Any amendments to the questionnaire were taken after considering their views before the researcher can embark on the main study.

3.5.2 Reliability Test

Reliability as discussed by Sekaran and Bougie (2016) is the degree of consistency of measurement of a tool of research as per the intention to provide stable and consistent results. The test of Cronbach alpha aided in evaluating reliability of the questionnaire. It is simply a coefficient of internal consistency measuring the correlations that are present among items on the same trial and whether the severally suggested items of measuring the equivalent general idea gives rise to identical scores. A cut off point of above 0.7 will be considerably acceptable in this study.

3.6 Data Analysis and Presentation

There was application of both quantitative and qualitative approaches of analyzing data. Thematic analysis was performed on the open-ended questionnaires where information was summarized into themes and where possible coding done to summarize the information. Simple summaries were given as per each theme. Analysis of themes puts emphasis on the identification, assessment and recording of themes or patterns in the data (Guest, 2012). Statistical Package for Social Sciences aided in analyzing quantitative data. There was coding and cleaning of data before the analysis exercise is conducted. Using this approach, statistics in form of descriptions and inferences was extracted.

Statistics in form of descriptions which are inclusive of means, frequencies, standard deviation and percentages were sundered out in order to portray the fundamental traits of data that has been collected. They assisted the researcher in giving simple summaries regarding the sample and study variables (Sekaran & Bougie, 2009). Inferential analysis in this study consisted of correlation and regression analyses. Correlation analysis was normally conducted in order to find out if there are possible associations between the variables under study (Cohen, West, & Aiken, 2014). Pearson correlation coefficients (r) were applied in establishing the strength, direction and significance of the associations between resource management practices under study and success of road projects within the county of Wajir. Correlation test was fundamental since it assisted the researcher in determining the resource management practices that are relevant to be included in the final study model.

Regression analysis was undertaken in determination of the link between practices of managing resources under study namely resource planning, resource scheduling, resource allocation as well as resource monitoring and success of road projects in Wajir County. There was an evaluation of the capability, essence and direct influence of individual independent variables upon the dependent variable. In linking the variables an analysis of multivariate linear regression will be utilized. Therefore, by undertaking a multivariate regression analysis, there was quantification of each practice of managing resources upon the success of road projects within the county of Wajir. The model in equation 3.1 is a presentation of the same

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

Where:

Y = Performance of Road Infrastructure Projects in Wajir County

X₁ = Resource Planning

X₂ = Resource Scheduling

X₃ = Resource Allocation

X₄ = Resource Monitoring

β₁, β₂, β₃, β₄ = Beta coefficients

β₀ = Constant Term

ε = Error term

In order to assess whether the regression model fits the population and whether the independent variables are satisfactory predictors of the success of road projects within the county of Wajir, the F statistic and its associated p value was examined. Furthermore, the researcher evaluated the regression coefficients, their associated t statistics and p values in order to test if the independent variables have individual significant effect on product innovation at this firm. The presentation of the results was in tabular and chart form.

3.9 Ethical Considerations

In undertaking there was bearing in mind of various ethical concerns so that the integrity of the study was upheld. The researcher was honest and objective when carrying out the study. They ensured that no participant is forced or coerced to be engaged in the study which enhanced voluntary participation. The respondents responded to the questionnaire anonymously and information obtained was handled with great confidentiality. The researcher stuck to the chief objective of the study which is to accomplish the academic

assignment as per the university requirements. They sought the consent of the participants and handle them with fairness. The researcher also ensured the independence of the research.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

The chapter presents the analysis and presentation of data obtained from the field in terms of descriptive and regression statistics and presented in terms of figures, graphs, and tables.

4.2 Response Rate

A total of 152 questionnaires were self administered to County transport and infrastructure department officials, Project management committee members and Project managers in Wajir County and the return rate is shown in Table 4.1.

Table 4. 1: Response Rate

Category	Frequency	Percentage
Responded	145	95.4
Non Responded	7	4.6
Total	152	100

Source: Research Data (2019)

The results in Table shows that out 152 respondents, 145 returned their questionnaires resulting to a response of 95.4% and those who did not respond accounted for 4.6%. The results further shows that the total response rate was higher at 95.4% which shows that the data collected for the field was sufficient for analysis. This is per the recommendation by Mugenda and Mugenda (2003) who show that a response rate of 70% and above is very good for data analysis.

4.3 Reliability Test Results

The results of reliability tests are provided in Table 3.3.

Table 4. 2: Results of Reliability Tests

Variable	Alpha (α) coefficient	Remarks
Resource planning	0.795	Reliable
Resource scheduling	0.812	Reliable
Resource allocation	0.781	Reliable
Resource monitoring	0.769	Reliable
Project performance	0.803	Reliable
Average	0.792	Reliable

Source: Pilot Study (2019)

The results in Table 3.3 shows that resource scheduling had coefficient value at 0.812, followed by project performance at 0.803, resource planning at 0.795, resource allocation at 0.781 and resource monitoring at 0.769. The average coefficient value at 0.792 shows that the instrument was reliable as recommended by Sekaran and Bougie (2016)

4.4 Background Information

4.4.1 Gender

The study sought to establish the respondents' gender and the findings are presented in Figure 4.1.

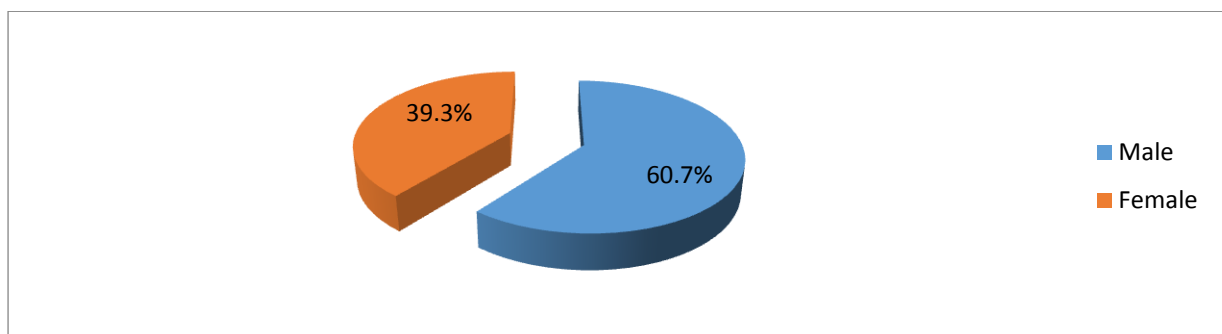


Figure 4. 1: Respondents' Gender

Source: Research Data (2019)

The findings from Figure 4.1 show that the male respondents accounted majority at 60.7% while female respondents accounted for 39.3%. This indicates that those employees sampled from Wajir County to participate in the study comprised of both genders who were well

represented. Gender of the respondents was necessary to show a true representative of both men and women in the study which means giving equal importance to both men and women in the workplace on project performance.

4.4.2 Age

The study sought to establish the respondents' age gap and the findings are presented in Table 4.3.

Table 4. 3: Respondents' Age

Years	Frequency	Percentage
Below 30	16	11.0
30 to 39	35	24.1
40 to 49	93	64.1
50 and above	1	1.7
Total	145	100

Source: Research Data (2019)

The findings from Table 4.3 show that the most of the respondents indicated that they were aged between 40 to 49 years at 64.1%, followed by those who were aged between 30 to 39 years at 24.1%, 11.0% indicated that they were aged below 30 years and only 1.7% was aged 50 years and above. This means that County of Wajir has employed people who cut across different age groups. Age diversity was important to the study as it brings about different experiences, expectations, styles and perspective in the workplace.

4.4.3 Level of Education

The study sought to establish the highest level of respondents' education and the findings are presented in Figure 4.2.

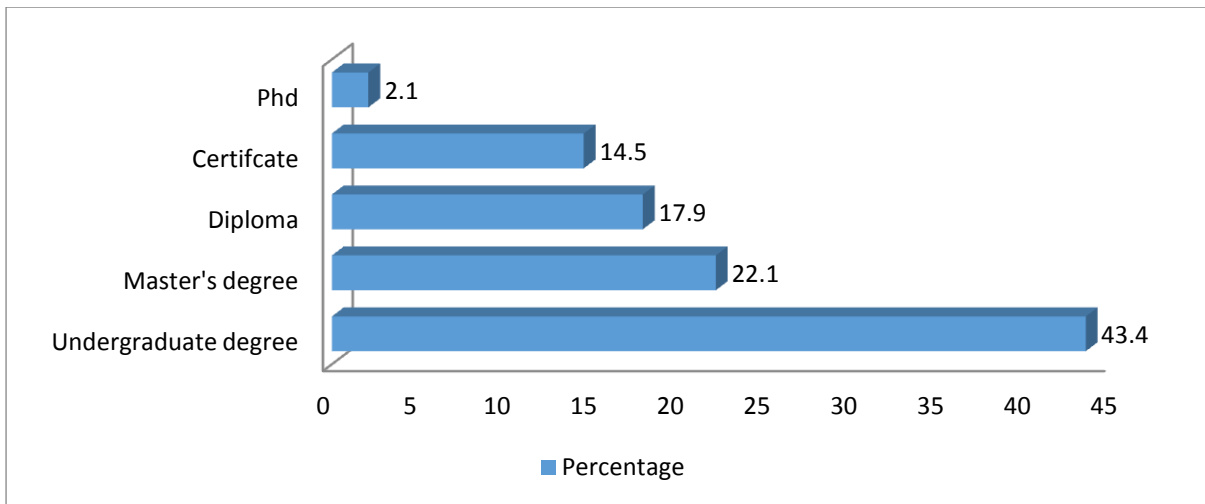


Figure 4. 2: Respondent’s Level of Education

Source: Research Data (2019)

The findings from Figure 4.2 show that the most of the respondents indicated that they had attained a undergraduate degree as their highest level of education, 22.1% Master’s degree, 17.9%, 14.5% certificate and 2.1% Phd holders. This means that the County government of Wajir has employees with highest level of education. Higher education level of an employee is important in making an organization a success because an individual has the knowledge and skills required to meet changing business needs.

4.4.4 Period of Working

The study sought to establish the period of working in the stated position within the county government and the findings are presented in Table 4.4.

Table 4. 4: Respondents’ Work Experience

Years	Frequency	Percentage
Below 1	35	24.1
1 to 2	21	14.5
3 to 4	63	43.4
Over 4	26	17.9
Total	145	100

Source: Research Data (2019)

The findings from Table 4.3 show that the most of the respondents indicated that they had been working in the stated position within the county government for a period between 3 to 4

years as shown by 43.4%, 24.1% had a work experience of below 1 years, 17.9% over 4 years and 14.5% between 1 to 2 years. This findings show that most of the respondents had a worked for a long period and so could respond to the study questions appropriately.

4.5 Results of Descriptive Analysis

Analysis of descriptive data was presented in terms of Mean (M) and Standard Deviation (SD). The results are presented as per the study specific variables as follows.

4.5.1 Resource Planning

The study established from 96.6% of the respondents that planning of project resources required in implementing road projects in the county consider the level of resource availability and capacity in the county while 3.4% were in the contrary as shown in Figure 4.3.

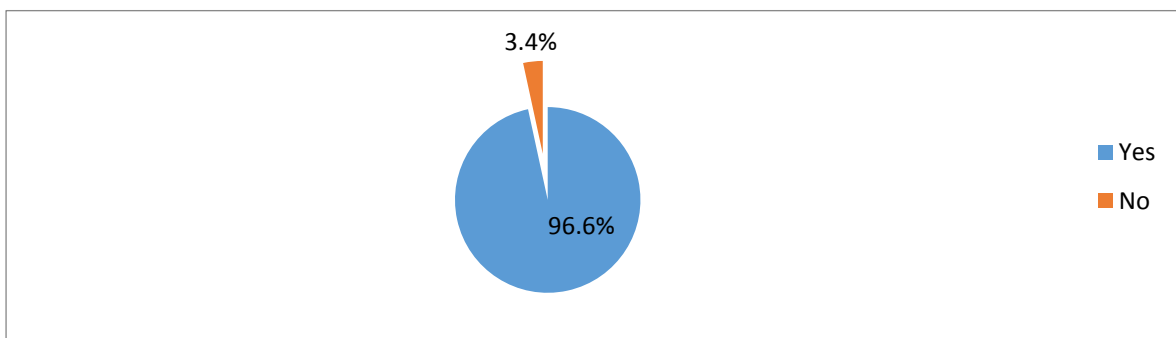


Figure 4. 3: Level of Resource Availability and Capacity in the County

Source: Research Data (2019)

The respondents were further given a list of statements related to resource planning in the road projects undertaken within the county state to state their level of agreement.

Table 4. 5: Resource Planning

Statement	SA	A	N	D	SD	M	Std.Dev
	%	%	%	%	%		
There is thorough planning of all the resources used in carrying out road projects in the county	46.7	24.6	7.4	12.3	9.0	4.12	1.140
The resource plans adhered to throughout the road project cycles within the county are very adequate	27.9	57.4	6.6	3.3	4.9	4.04	0.824
There are established structures that guide project management teams when planning for road project resources within the county	37.7	53.3	4.1	3.3	1.6	4.28	0.618
The entire process for project resource planning in the county is highly formalized	33.6	50.8	12.3	3.3	0.0	4.10	0.839
The use of resource planning softwares/ computer packages has been adopted by project management teams in the county	53.3	40.5	0.0	4.1	2.1	4.53	0.541
Average Score	39.8	45.3	6.1	4.6	3.5	4.21	0.792

Source: Research Data (2019)

From the results in Table 4.5, the average mean of 4.21 indicated that resource planning affects the performance of road projects in Wajir County, Kenya with a standard deviation of 0.792. 39.8% of the respondent strongly agreed, 45.3% agreed, 6.1% neutral, 4.6% disagreed and 3.5% strongly disagreed. A study by Abu El-alkass (2012) on the analysis of the system of managing resources of construction for contractors of the Gaza strip asserted that equipment planning in projects was necessitated by the need to establish the numerous types of equipment and their sizes which were either on direct purchase or on rent which aided in the control of the cost of the equipment in construction projects.

From the results in Table 4.5, the mean of 4.53 indicated that the use of resource planning softwares/computer packages has been adopted by project management teams in the county to a greater extent with a significance variance of 0.541. 53.3% of the respondent strongly agreed, 40.5% agreed, 4.1% disagreed and 2.1% strongly disagreed. These findings agree with Kumari and Vikranth (2012) study findings on planning of resources of the construction of highway projects of India. A survey was conducted. The study found that these projects suffered from underutilized resources which were attributed to lack of detailed and thorough planning and absurd decision making in site management.

The mean of 4.28 indicated that there are highly established structures that guide project management teams when planning for road project resources within the county with a significance variance of 0.618. This statement was strongly agreed by 37.7% of the respondents, 53.3% agreed, 4.1% neutral, 3.3% disagreed and 1.6% strongly disagreed. This is in agreement with a research by Shadrack (2018) on issues affecting practices of planning of resources in the construction sector within Kenya with a shift to contractors of the county of Nairobi and discovered that even though resource planning in the industry was used to a great extent, much of it was non-structured.

4.5.2 Resource Scheduling

Most (95.2%) of the respondents agreed that road project schedules in the county take in to consideration resource available while 4.8% disagreed. This is shown in Figure 4.4.

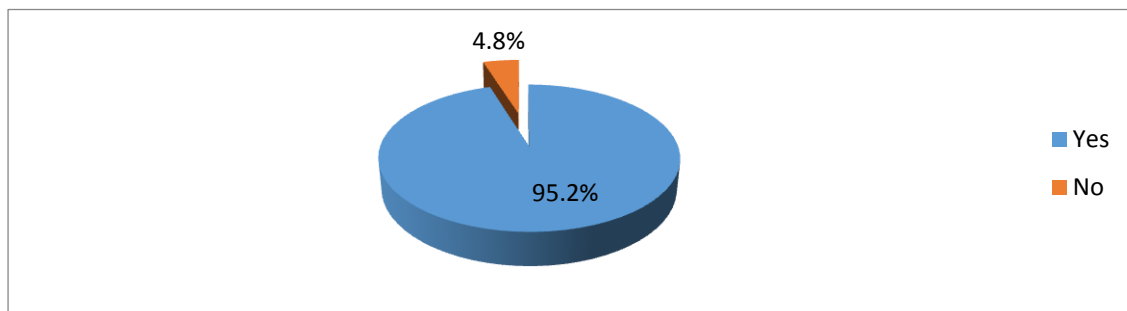


Figure 4. 4: Level of Resource Availability and Capacity in the County

Source: Research Data (2019)

The respondents were further given a list of statements related to resource scheduling in the road projects undertaken within the county state to state their level of agreement.

Table 4. 6: Resource Scheduling

Statement	SA	A	N	D	SD	M	Std.Dev
	%	%	%	%	%		
The resources available are always considered throughout the process of scheduling when implementing county road projects	51.6	41.0	4.9	2.5	0.0	4.52	0.614
There is extensive use of resource calendars when undertaking road projects in the county	44.3	33.6	8.2	5.7	8.2	4.63	0.499
There is efficient assignment of resource to different project activities throughout road project cycles in the county	41.8	28.7	11.5	7.4	10.7	3.73	1.560
Project managers have always successfully reorganized road project tasks and resources so as to achieve project objectives under limited resources and budget constraints	60.7	19.7	4.1	15.6	0.0	3.30	1.506
There has been efficient prioritization of resources in cases of competing resource demands	54.1	18.9	0.0	19.7	7.4	4.50	0.818
The use of resource scheduling softwares applied in the industry have been adopted by project management teams in the county	45.1	32.8	1.6	18.0	2.5	4.00	1.192
Average Score	49.6	29.1	5.1	11.5	4.8	3.99	1.120

Source: Research Data (2019)

From the results in Table 4.6, the average mean of 3.99 indicated that resource scheduling affects the performance of road projects in Wajir County, Kenya with a standard deviation of 1.120. 49.6% strongly agreed on this statement, 29.1% agreed, 8.1% neutral, 11.5% disagreed and 4.8% strongly disagreed. Joshi and Patil (2013) assessed resource scheduling in projects of construction with a case study design being utilized. It was noted that for a project to be completed successfully, project resource scheduling was very critical task since it allowed for innovative planning of project activities that was limited by the resources that were available. The study found that resource scheduling reduced the unforeseen project losses which might be occur as a result of large variances in the utilization of resources.

From the results in Table 4.6, the mean of 4.63 indicated that there is high extensive use of resource calendars when undertaking road projects in the county with a significance variance of 0.499. 44.3% strongly agreed on this statement, 33.6% agreed, 8.2% neutral and strongly disagreed respectively and 8.7% disagreed. These findings concur with the findings of Dong, Li, Zhao, Li, and Yan (2008) who conducted an assessment of resource scheduling in multi-

software projects and revealed that resource scheduling was fundamental in providing project schedules that were effective besides enhancing efficiency in using project resources.

The mean of 3.30 indicated to a moderate extent on the statement that project managers have always successfully reorganized road project tasks and resources so as to achieve project objectives under limited resources and budget constraints with a significance variance of 1.506. 60.7% strongly agreed on this statement, 19.7% agreed, 4.1% neutral and 15.6% disagreed. This is in disagreement with Memon and Zin (2011) study findings that analyzed the degree to which resource-driven scheduling was being implemented within the construction sector in Malaysia and that study articulated that resource scheduling ensured that project activities were scheduled in a way that project deadlines were achieved utilizing the defined resource availability limits.

4.5.3 Resource Allocation

Most (89.1%) of the respondents agreed that road project schedules in the county take in to consideration allocation of resources and 10.9% disagreed. This is shown in Figure 4.5.

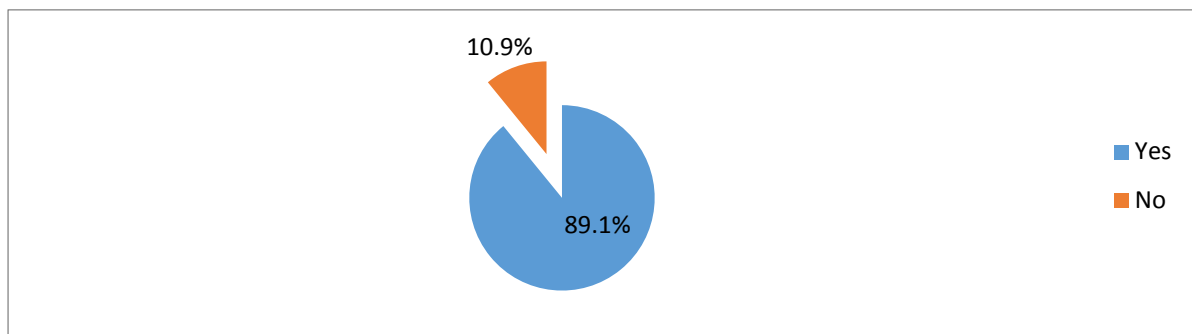


Figure 4. 5: Resource Allocation

Source: Research Data (2019)

The respondents were further given a list of statements related to resource allocation in the road projects undertaken within the county state to state their level of agreement.

Table 4. 7: Resource Allocation

Statement	SA	A	N	D	SD	M	Std.Dev
	%	%	%	%	%		
There are established resource allocation plans that guide resource allocations towards execution of road projects in the county	68.0	16.4	0.0	4.1	11.5	3.93	1.065
There is always adequate and efficient allocation of resources needed in implementing road projects in the county	59.8	39.3	0.0	0.8	0.0	4.80	0.838
There is always stability in resource allocations as planned for all road project activities throughout the entire duration of the projects in the county	54.9	32.0	3.3	0.0	9.8	4.81	0.527
There is timely allocation of resources needed in implementing road projects in the county	58.2	40.2	0.0	0.0	1.6	4.83	0.379
There are established structures that have been laid down to guide the entire resource allocation process in the execution of road projects in the county	64.8	24.6	4.1	1.6	4.9	3.96	0.455
Average Score	61.1	30.5	1.5	1.1	5.6	4.47	0.653

Source: Research Data (2019)

From the results in Table 4.7, the average mean of 4.47 indicated that resource allocation affects the performance of road projects in Wajir County, Kenya with a standard deviation of 0.653. This was strongly agreed (61.1%) of the respondents, 30.5% agreed, 1.5% neutral, 5.6% disagreed and 5.6% strongly disagreed. Murithi, Makokha, and Otieno (2017) assessed factors affecting timeliness in completing projects of construction of the public within the county of Trans-Nzoia in Kenya and the results highlighted that allocation of resources within the project was significantly influencing the timely completion of public projects of construction.

From the results in Table 4.7, the mean of 4.83 indicated that there is good timely allocation of resources needed in implementing road projects in the county with a significance variance of 0.379. This was strongly agreed (58.2%) of the respondents, 40.2% agreed and only 1.6% strongly disagreed. This finding is supported by Engwall and Jerbrant (2013) study that analyzed the resource allocation syndrome within the context of managing multiple projects and established that many projects suffered from short run problem solving which significantly contributed to project delays.

The respondents also strongly agreed that there is always stability in resource allocations as planned for all road project activities throughout the entire duration of the projects in the county as shown by mean of 4.81 and standard deviation of 0.527. This is supported by Gashuga, Kule, and Ndabaga (2016) study that noted that the allocation of funds minimized administrative costs, it resulted to enhanced prediction of project efficiency and reduced the minimized the general project risk.

The respondents agreed that there are established resource allocation plans that guide resource allocations towards execution of road projects in the county as shown by mean of 3.93 and standard deviation of 10.65. This is in agreement with Bulle and Makori (2015) study which found that allocating financial, physical and human resources to projects affected their performance. Resource allocation affected the speed and quality of project delivery ensuring that the cost specifications were observed as outlined in the project plans.

4.5.4 Resource Monitoring

Majority (89.7%) of the respondents agreed that resources channeled towards implementation of road projects in the county are monitored on a continuous basis while 10.3% disagreed.

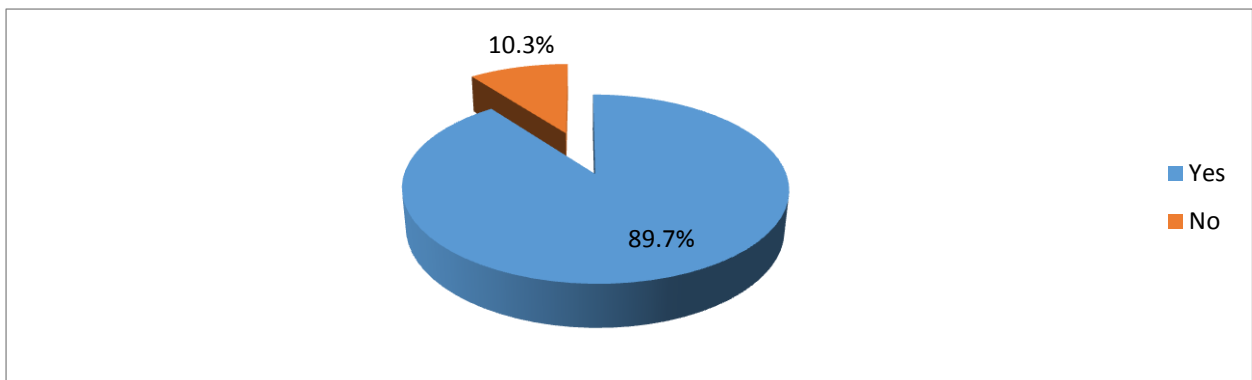


Figure 4. 6: Monitoring of Resources

Source: Research Data (2019)

The respondents were further given a list of statements related to resource monitoring in the road projects undertaken within the county state to state their level of agreement.

Table 4. 8: Resource Monitoring

Statement	SA %	A %	N %	D %	SD %	M	Std.Dev
The county has a recognized framework and tools for monitoring the use of resources in executing road projects	58.2	17.2	0.0	6.6	18.0	4.39	1.265
There is continuity in inspecting the physical and financial progress of road projects in the county against established resource plans	41.0	37.7	0.0	3.3	18.0	4.81	0.717
The county transport and infrastructure committee makes periodic visits to the road project sites and inspects the projects' books of accounts	55.7	25.4	0.0	5.7	13.1	4.07	1.690
County project supervisors give emphasis to auditing and reviewing the use of road project resources at frequent intervals and on a timely basis	62.3	22.1	0.0	6.6	9.0	4.72	0.533
Results and feedback from road project resource audits and reviews are always provided on time	63.9	22.1	6.6	0.0	7.4	4.08	0.755
Resource audit follow-ups are implemented throughout lifecycle of road projects in the county	59.8	18.0	0.0	17.1	4.9	4.11	1.316
Average Score	46.9	20.8	1.1	6.6	11.7	4.39	1.179

Source: Research Data (2019)

From the results in Table 4.8, the average mean of 4.39 indicated that resource monitoring affects the performance of road projects in Wajir County, Kenya with a standard deviation of 1.179. 46.9% of the respondents strongly agreed, 20.8% agreed, 1.1% neutral, 6.6% disagreed and 11.7% strongly disagreed with the statement. Jha and Iyer (2016) assessed the significant dynamics that affected the quality projects in the industry of construction within India and revealed that appropriate monitoring of project resources and provision of feedback that was timely regarding assisted in the supervision of the level of workmanship in executing the projects which improved their quality.

From the results in Table 4.7, the mean of 4.81 indicate that there is continuity in inspecting the physical and financial progress of road projects in the county against established resource with a significance variance of 1.316. 41.0% of the respondents strongly agreed, 37.7% agreed, 3.3% disagreed and 18.0% strongly disagreed with the statement. These findings are in line with the findings of Mosago (2013) study that assessed impacts of financial

monitoring on success of programs undertaken by international NGOs in Kenya and found a positive link between financial monitoring and programme performance for INGOs. The study underscored that the programme performance for INGOs could be greatly improved if on site visits, financial desk reviews and periodic financial review meetings were conducted.

The respondents also indicated that the County project supervisors give more emphasis to auditing and reviewing the use of road project resources at frequent intervals and on a timely basis as shown by mean of 4.72 and a standard deviation of 0.533. This is supported by Ochieng (2014) study findings that investigated the degree to which resource management influenced the execution of projects undertaken by mobile communications firms within Kenya and revealed that enough efforts to monitor and control the project resources ensured that project funds were spent appropriately as planned and with proper authorization.

The mean of 4.07 indicated that the county transport and infrastructure committee makes periodic visits to the road project sites and inspects the projects' books with standard deviation of 1.690. Kamwana and Muturi (2014) study agree with this findings after evaluating the level of success of projects which were financed by World Bank in particular KPLC projects was impacted by financial monitoring and established that the monitoring of financial resources channeled to these projects was positively and significantly influencing success of the projects.

4.5.5 Performance of Road Projects in Wajir County

The study sought to investigate the performance of road projects in Wajir County, Kenya due to resource management practices and the findings are presented as under.

Table 4. 9: Performance of Road Projects in Wajir County

Statement	SA	A	N	D	SD	M	Std.Dev
	%	%	%	%	%		
Level to which the project has directly benefited the intended users	51.6	41.0	4.9	2.5	0.0	4.42	0.702
Level of satisfaction with the road projects among the residents	44.3	33.6	8.2	5.7	8.2	4.52	0.614
Level of adherence to project budgets during the implementation of road projects	41.8	28.7	11.5	7.4	10.7	4.63	0.499
Level of successful completion of road projects on time	60.7	19.7	4.1	15.6	0.0	3.73	1.560
Level to which the road projects in the county have been completed	54.1	18.9	0.0	19.7	7.4	3.59	0.769
Level of adherence to set quality standards and road project specifications	33.6	50.8	12.3	3.3	0.0	4.15	0.757
Average Score	46.7	32.1	6.8	9.0	4.4	4.72	0.867

Source: Research Data (2019)

From the results in Table 4.9, the average mean of 4.72 indicated that resource management practices affects the performance of road projects in Wajir County, Kenya to a very great extent with a standard deviation of 0.867. This was strongly agreed by 46.7%, 32.1% agreed, 6.8% neutral, 9.0% disagreed and 4.4% strongly disagreed. According to Maserang (2012) on basis of project management, managing of resources is developing of techniques, processes and philosophies of the most appropriate approach of allotting resources to activities or tasks of a given project.

The mean of 4.63 indicated that the level of adherence to project budgets during the implementation of road projects is very high. This was strongly agreed by 41.8%, 28.7% agreed, 11.5% neutral, 7.4% disagreed and 10.7% strongly disagreed. This finding is in support with Watt (2007) who indicate that management of resources is the deployment of resources of the organization effectively and efficiently at the time they are required.

The study observe that level of adherence to set quality standards and road project specifications is also high as shown by mean of 4.15 with standard deviation of 0.757. This was strongly agreed by 33.6%, 50.8% agreed, 12.3% neutral and 3.3% disagreed. Li, Nie, Yang, and Wang (2017) highlight project resource availability, planning, allocation, balance,

and coordination as crucial aspects of resource management especially in multi-project management.

The level to which the road projects in the county have been completed was indicated to a lower extent as shown by mean of 3.59 and a standard deviation of 0.769. This statement was strongly agreed by 54.1% of the respondents, 18.9% agreed, 19.7% disagreed and 7.4% strongly disagreed. This is in line with Adek (2016) who emphasizes the crucial need of managers of projects of monitoring the flow and utilization of utilities in the entire life cycle of the project to ensure the timely making of necessary changes in allocation of resources.

4.6 Inferential Statistics

4.6.1 Correlation Analysis

Table 4. 10: Correlation Analysis

		Resource planning	Resource scheduling	Resource allocation	Resource monitoring
Resource planning	Pearson Correlation	1	.679**	.117	.137
	Sig. (2-tailed)		.000	.160	.100
	N	145	145	145	145
Resource scheduling	Pearson Correlation	.679**	1	.325**	.124
	Sig. (2-tailed)	.000		.000	.138
	N	145	145	145	145
Resource allocation	Pearson Correlation	.117	.325**	1	.803**
	Sig. (2-tailed)	.160	.000		.000
	N	145	145	145	145
Resource monitoring	Pearson Correlation	.137	.124	.803**	1
	Sig. (2-tailed)	.100	.138	.000	
	N	145	145	145	145

Source: Research Data (2019)

The results in Table 4.10 indicate that resource planning strongly correlates with resource scheduling as shown by the Pearson r value of 0.679(67.9%). This means that planning of resources leads to better scheduling of the resources and vice versa. This agrees with Shadrack (2018) study that discovered that even though resource planning in the industry was

used to a great extent, much of it was non-structured. Li *et al.* (2008) study revealed that resource scheduling was fundamental in providing project schedules that were effective besides enhancing efficiency in using project resources

The Pearson r value of 0.803(80.3%) indicates that resource allocation is strongly correlated with resource monitoring. Therefore, it can be concluded that better allocation of resources leads to effective monitoring. Gashuga *et al.* (2016) study that noted that the allocation of funds minimized administrative costs, it resulted to enhanced prediction of project efficiency and reduced the minimized the general project risk. Ochieng (2014) study revealed that enough efforts to monitor and control the project resources ensured that project funds were spent appropriately as planned and with proper authorization.

4.6.2 Regression Analysis

Table 4. 11: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.835 ^a	.712	.687	.781	.112	4.427	4	140	.002

Source: Research Data (2019)

The adjusted R², also called the coefficient of multiple determinations, is the percent of the variance in the dependent explained uniquely or jointly by the independent variables. Therefore, the four independent variables (resource planning, resource scheduling, resource allocation and resource monitoring) that were studied, explain 68.7% of the performance of road projects in Wajir County, Kenya as represented by the adjusted R square. This therefore means that other factors not studied in this research contribute 31.3% of the project performance. The results also show a significant R square change at 0.112 and F-change at 4.447 which shows a significant improvement of the prediction. The model is also significant at p value of 0.002 which is less than 0.005.

Table 4. 12: Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	10.806	4	2.702	4.427	.002 ^a
Residual	85.442	140	.610		
Total	96.248	144			

Source: Research Data (2019)

The p-value is 0.002^a which is less than 0.05 thus the model is statistically significant in predicting how resource planning, resource scheduling, resource allocation and resource monitoring influenced the performance of road projects in Wajir County, Kenya. The F calculated at 5% level of significance was 4.427. Since F calculated is greater than the F critical (p value =2.702), this shows that the overall model was significant.

Table 4. 13: Multiple Regressions Results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	0.522	.635		4.604	.000
Resource planning	0.765	.155	4.049	1.417	.001
Resource scheduling	0.887	.206	1.237	1.881	.000
Resource allocation	0.766	.081	3.317	2.045	.003
Resource monitoring	0.565	.080	1.305	2.080	.001

Source: Research Data (2019)

The established regression equation by the study was:

$$Y = 0.376 + 0.828X_1 + 0.678X_2 + 0.703X_3 + 0.503X_4$$

Where

- Y = Project Performance
- X₁ = Resource Planning
- X₂ = Resource Scheduling
- X₃ = Resource Allocation
- X₄ = Resource Monitoring

From the above regression model, holding all the independent variables studied constant, performance of road projects in Wajir County, Kenya would be 0.522. As shown in table 4.12 resource planning, resource scheduling, resource allocation and resource monitoring had a

positive and significant effect on performance of road projects in Wajir County, Kenya as indicated by t-values. The relationships ($p < 0.05$) are all significant with resource planning ($t = 1.417$, $p < 0.05$), resource scheduling ($t = 1.881$, $p < 0.05$), resource allocation ($t = 2.045$, $p < 0.05$) and resource monitoring ($t = 2.080$, $p < 0.05$). Resource scheduling was found to have a greater (88.7%) on the performance of road projects in Wajir County, Kenya compared to resource allocation (76.6%), resource planning (76.5%) and resource monitoring (56.5%).

The study established that resource planning had a positive and significant effect on project performance by beta value ($\beta = 4.049$, $p < 0.05$). This is in line with Kumari and Vikranth (2012) study found that these projects suffered from underutilized resources which were attributed to lack of detailed and thorough planning and absurd decision making in site management.

The study revealed that that resource scheduling had a positive and significant effect on project performance by beta value ($\beta = 1.237$, $p < 0.05$). This is in agreement with Dong *et al.* (2008) study that revealed that resource scheduling was fundamental in providing project schedules that were effective besides enhancing efficiency in using project resources.

The study established that resource allocation had a positive and significant effect on project performance by beta value ($\beta = 3.317$, $p < 0.05$). This is supported by Engwall and Jerbrant (2013) study which established that many projects suffered from short run problem solving which significantly contributed to project delays.

The study established that resource monitoring had a positive and significant effect on project performance by beta value ($\beta = 1.305$, $p < 0.05$). This is in agreement with Ochieng (2014) study that revealed that enough efforts to monitor and control the project resources ensured that project funds were spent appropriately as planned and with proper authorization.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the findings, conclusions, recommendations for policy and practice and recommendations for further studies.

5.2 Summary

The main objective of this study was to assess the effect of project resource management practices on the performance of road projects in Wajir County, Kenya. The specific objectives of the study were to establish the effect of resource planning, resource scheduling, resource allocation and resource monitoring on performance. A study design of descriptive survey was employed. Data was collected from the County transport and infrastructure department officials, project management committee members and project managers using questionnaires which was analysed using descriptive statistics and regression analysis. The summary of the findings are presented as below:

The study sought to establish the effect of resource planning on the performance of road projects in Wajir County, Kenya. Resource planning was found to have a positive and significant effect on project performance. The use of resource planning softwares/computer packages has been adopted by project management teams in the county. There are established structures that guide project management teams when planning for road project resources within the county and that there is thorough planning of all the resources used in carrying out road projects in the county.

The study sought to determine the effect of resource scheduling on the performance of road projects in Wajir County, Kenya. Resource scheduling was found to have a positive and significant effect on project performance. There is extensive use of resource calendars when undertaking road projects in the county, the resources available are always considered throughout the process of scheduling when implementing county road projects and that there has been efficient prioritization of resources in cases of competing resource demands.

The study sought to examine the effect of resource allocation on the performance of road projects in Wajir County, Kenya. Resource allocation was found to have a positive and significant effect on project performance. There is timely allocation of resources needed in implementing road projects in the county, there is always adequate and efficient allocation of

resources needed in implementing road projects in the county and that there is always stability in resource allocations as planned for all road project activities throughout the entire duration of the projects in the county.

The study sought to explore the effect of resource monitoring on the performance of road projects in Wajir County, Kenya. Resource monitoring was found to have a positive and significant effect on project performance. There is continuity in inspecting the physical and financial progress of road projects in the county against established resource plans, County project supervisors give emphasis to auditing and reviewing the use of road project resources at frequent intervals and on a timely basis and that the county has a recognized framework and tools for monitoring the use of resources in executing road projects.

5.3 Conclusions

The study concludes on resource planning that a key benefit to resource planning is that it helps organisations to fulfill task specifications efficiently. Project managers should recognize skill shortages or criteria for learning, helping to mitigate potential possible asset tensions or negative effects. Planning requires people to be assigned to work on the basis of a number of specific factors such as their capacity, expertise and position for project managers will always be certain that they have the right person for the right job.

The study concludes on resource scheduling that successful resource scheduling allows in different ways to solve problems related to resource availability and job efficiency. The allocation of capital lets you coordinate all things to prepare and complete the project efficiently. Efficient use of assets to accomplish the projects on time and within the allotted budget is an important aspect of any project scheduling management.

The study concludes on resource allocation that efficient resource allocation allows project managers prepare to allocate resources to the task and effectively manage them. Allocation of resources allows you to realize who is overwhelmed and who at that moment is available. Without much workload, you can assign tasks to the available resource. Proper allocation of resources will help you identify the role of group member (s) or employee(s) in a specific task and make it easier for you to delegate assignments based on their availability.

In terms of resource management, the study concludes that reporting requires daily tracking of key elements of project performance in terms of inputs, actions and outcomes. Good evaluation helps to know whether the expected goals are being accomplished as anticipated,

which steps are needed to achieve the intended results during the implementation of the project, and whether these measures have a positive impact on the execution of the project.

5.4 Recommendations

The study recommends on resource planning that according to job and efficiency requirement, more workers during busy hours, and fewer staff at slower times. Planning should be such as to cope efficiently with the project's needs, should be focused on the best use of the assets' expertise, should be achieved well in advance and should take into account the satisfaction and confidence of the workers at the same time.

The study recommend that different approaches to task scaling and planning on asset management. Of example, ahead thinking techniques can be used if a specific project date is established and the assignments are used to decide the timetable and the corresponding deadlines of completion. Additionally, project managers can use backward scheduling techniques when the date of delivery is set and the work has to be planned or scheduled to meet the deadline. Schedules were set and projected throughout the life cycle of the project. The project should begin with a specified planning strategy and this method is likely to change as the plan progresses and changes take place. The aim is to stay informed and agile and to resolve as quickly as possible all scheduling issues.

The study recommends that project managers should be mindful of the scope of the project they are operating on, because the greater the nature of the project, the more they will decide how to distribute the money. Identify the facilities by specifying the type of equipment to be used where the work activities are to be done and the storage required. Start by creating a project's high-level schedule consisting of its specifications and results and start tracking time and workload.

The study recommends that project management during the execution of the plan and should include cost-control strategies, deadlines and deliverables techniques, quality standards approaches and more. The different techniques in use should include basic and common methods such as scientific analysis meetings such as earned value analysis and critical path analysis. The project manager and other partners identify the best strategy, taking into account specific project goals, availability of capital, environmental factors and more.

5.5 Suggestion for Further Studies

The current study focused on assessing the effect of project resource management practices on the performance of road projects in Wajir County, Kenya specifically on how resource planning, resource scheduling, resource allocation and resource monitoring affects performance. Therefore, further studies should be carried out on how project resource management practices affect the performance of road projects in other Counties in Kenya.

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APPENDICES

Appendix I: Consent Letter

Dear (Respondent)

RE: VOLUNTARY PARTICIPATION IN DATA COLLECTION

I am a postgraduate student at Kenyatta University pursuing a MBA in Project Planning and Management. In order for me to be awarded this degree, I am required to carry out a research project. The title of my research paper is “**Effect of Resource Management Practices on the Performance of Road Infrastructure Projects in Wajir County.**” I am therefore inviting you to be part of this study by filling the attached questionnaire. The information that I’m going to collect will be used purely for accomplishing this academic assignment. Please fill the questionnaire anonymously. Your honest opinion regarding the issues highlighted in the questionnaire will be greatly valuable. In case you are interested in the findings of the study, you will be provided with a copy of the final report as per the university guidelines.

Your cooperation will be highly appreciated.

Yours Faithfully,

ALI ABASS ABDI

APPENDIX II: QUESTIONNAIRE

The chief objective of this questionnaire is enabling the researcher in obtaining data connected to the “**Effect of Resource Management Practices on the Performance of Road Infrastructure Projects in Wajir County.**”Your honest and objective opinion regarding the issues highlighted in the questionnaire will be greatly appreciated.

Please do not indicate your details in any part of this questionnaire.

Section I: Basic Information

1. Gender

a. Male []

b. Female []

2. Age bracket

a. Below 30years []

b. 30 to 39 years []

c. 40 to 49years []

d. 50years and above []

3. Level of education

a. Certificate []

b. Diploma []

c. Undergraduate degree []

d. Master’s degree []

e. PhD []

f. Others (specify)

4. Position held in the county government

a. County transport and infrastructure department official []

b. Project management committee members []

c. Project managers []

5. Period of working in the stated position within the county government?

a. Less than a year { }

b. 1 to 2 years { }

c. 3 to 4 years { }

d. Over 4 years { }

Section II: Resource Planning

6. To what extent do project management teams that are implementing road projects in the county plan for the following resources in the course of the project cycle?

Resource	Not at all	Small extent	Moderate extent	Great extent
Time				
Materials				
Finances				
Labour				
Equipment				
Other (specify)				

7. Does the planning of project resources required in implementing road projects in the county consider the level of resource availability and capacity in the county?

a. Yes []

b. No []

Explain your answer

.....

.....

.....

.....

.....

.....

8. Does the county government plan on how resources needed for carrying out road projects will be mobilized?

a. Yes []

b. No []

9. State your level of agreement with the following statements related to resource planning in the road projects undertaken within the county.

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
There is thorough planning of all the resources used in carrying out road projects in the county.					
The resource plans adhered to throughout the road project cycles within the county are very adequate.					
There are established structures that guide project management teams when planning for road project resources within the county.					
The entire process for project resource planning in the county is highly formalized.					
The use of resource planning softwares/computer packages has been adopted by project management teams in the county.					

10. How has the level of resource planning when implementing road projects in the county affected the performance of these projects?

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Section III: Resource Scheduling

11. Do road project schedules in the county take in to consideration resource available?

- a. Yes []
- b. No []

Explain your answer

.....

.....

.....

.....

12. State your level of agreement with the following statements related to resource scheduling in the road projects undertaken within the county.

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The resources available are always considered throughout the process of scheduling when implementing county road projects.					
There is extensive use of resource calendars when undertaking road projects in the county.					
There is efficient assignment of resource to different project activities throughout road project cycles in the county.					
Project managers have always successfully reorganized road project tasks and resources so as to achieve project objectives under limited resources and budget constraints.					
There has been efficient prioritization of resources in cases of competing resource demands.					
The use of resource scheduling softwares applied in the industry have been adopted by project management teams in the county.					

13. How has the performance of county road projects been affected by the level of resource scheduling?.....

.....

.....

.....

Section IV: Resource Allocation

14. Comment on the level of resource allocation towards the implementation of road infrastructure projects in this county?

.....

15. State your level of agreement with the following statements related to resource allocation in the road projects undertaken within the county.

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
There are established resource allocation plans that guide resource allocations towards execution of road projects in the county.					
There is always adequate and efficient allocation of resources needed in implementing road projects in the county.					
There is always stability in resource allocations as planned for all road project activities throughout the entire duration of the projects in the county.					
There is timely allocation of resources needed in implementing road projects in the county.					
There are established structures that have been laid down to guide the entire resource allocation process in the execution of road projects in the county.					

16. How has the level of resource allocation in the county affected the performance of road projects?

.....

.....

Section V: Resource Monitoring

17. Are the resources channeled towards implementation of road projects in the county monitored on a continuous basis?

a. Yes []

b. No []

18. If yes in 17, what are the techniques/ways in which resource monitoring is carried out in the implementation of road projects in the county?

.....

19. In your opinion, how has the level of resource monitoring affected the performance of road projects in the county?

.....

20. State your level of agreement with the following statements related to resource monitoring in the road projects undertaken within the county.

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The county has a recognized framework and tools for monitoring the use of resources in executing road projects.					

There is continuity in inspecting the physical and financial progress of road projects in the county against established resource plans.					
The county transport and infrastructure committee makes periodic visits to the road project sites and inspects the projects' books of accounts					
County project supervisors give emphasis to auditing and reviewing the use of road project resources at frequent intervals and on a timely basis.					
Results and feedback from road project resource audits and reviews are always provided on time.					
Resource audit follow-ups are implemented throughout lifecycle of road projects in the county.					

Section VI: Performance of Road Projects in Wajir County

21. Considering the road projects undertaken by the county, rate their performance based on the following indicators.

Statement	Very Poor	Poor	Average	Good	Very Good
Level to which the project has directly benefited the intended users.					
Level of satisfaction with the road projects among the residents.					
Level of adherence to project budgets during the implementation of road projects.					
Level of successful completion of road projects on time.					
Level to which the road projects in the county have been completed.					
Level of adherence to set quality standards and road project specifications					
Level of adherence to road project sustainability.					

Appendix III: Krejcie and Morgan Table

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970