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PROJECT PLANNING, GOVERNMENT REGULATIONS AND PERFORMANCE OF COMPLETED ROAD PROJECTS IN ARID AND SEMI-ARID COUNTIES IN KENYA

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ABSTRACT

The road projects in Kenya have been experiencing poor performance in form of delays in completion, high cost, and low quality. This study objective was to assess the moderating effect of government regulations on the relationship between project planning and performance of completed road projects in arid and semi-arid counties in Kenya. The study was anchored on theory of constraints and supported by Stakeholder Theory, Resource Based View Theory and Regulation Theory. The study adopted positivism philosophy. The study applied a cross sectional survey design and used census sample method. The study population were the 88 completed road projects in 22 Arid and Semi-arid counties in Kenya. The study adopted convenience sampling technique where primary data was collected using a questionnaire from 198 respondents. The study respondents were the contracted company's project managers, county public works officers and the local community leaders who are most advantageously placed and in the best position to provide the information required. Quantitative data was analyzed using descriptive and inferential statistics which included correlation and multiple regressions. The research demonstrates a significant positive correlation ($r = 0.477$, $p < 0.001$) between government regulations and the performance of completed road projects in arid and semi-arid counties in Kenya. It highlights the critical influence of government regulations, including a regulatory framework and a code of conduct, on project outcomes in these regions. The study aimed to assess the moderating effect of government regulations on the relationship between project planning and performance, ultimately rejecting the null hypothesis of no moderation effect. Results confirm that government regulations significantly moderate this association, with project planning identified as a key predictor of project performance. This emphasizes the need for effective governance and regulatory measures to improve road project efficacy. Recommendations include strengthening and implementing comprehensive government regulations to guide project planning and execution. Additionally, training programs should be established for stakeholders to ensure understanding and adherence to these regulations. Regular assessments and updates of the regulatory framework are essential to address the unique challenges of arid environments. Collaboration between government agencies and local communities should be enhanced to incorporate community needs into project planning. Finally, investing in monitoring and evaluation systems will facilitate ongoing assessment of project performance and regulatory compliance, ultimately fostering successful road infrastructure development

Keywords: Road Assets Maintenance; Budgetary Allocation; Performance; Road agencies; Kenya

1.1 INTRODUCTION

Roads are a fundamental component of transportation infrastructure that provides support for human society. They establish crucial connections between target markets, manufacturing facilities, and production hubs. They promote economic progress, which is evident in the form of increased employment opportunities as well as improvements in the social, health, and education sectors. These factors are crucial in combating poverty (Wandiri & James, 2020). Research conducted in the USA has found that project owners worldwide are reducing or canceling capital construction projects due to financial constraints, uncertainty regarding costs, inadequate management, and concerns about potential delays that could affect the project's feasibility (Gitonga, Muchelule & Nyang'au, 2022). According to Lu Shan (2018), Chinese construction firms successfully completed their projects on time and within budget by utilizing effective planning and control techniques, ensuring proper coordination between designers and contractors,

and leveraging their technical and professional expertise. According to Boddy (2015), the effective implementation of infrastructure projects relies on management commitment, proper information and communication channels, and qualified workers.

Studies in the Gulf region revealed that time and cost overruns had an impact on a number of construction projects (Gunduz & Elsherbeny, 2020). Due to issues including poor design and inaccurate schedule and cost predictions, over 85% of construction projects in Qatar ran over budget and into other problems (Gunduz & Elsherbeny, 2020). The construction industry in Bahrain has had similar issues, with projects being delayed as a result of crucial variables like poor scheduling and planning. Additionally, it was discovered that some construction projects in Oman faced scheduling delays of more than 40% above the initial plans (Yap et al., 2021).These studies in the Gulf region showed that among the most important factors causing schedule deviations and cost overruns are inadequate planning and poor scheduling of project activities, ineffective design phases, ineffective project stakeholder collaboration and ignorance of project requirements (Yap et al., 2021). According to Mishmish and El-Sayegh (2018), the primary factors behind project delays included poor scope definition, an unrealistic beginning or baseline plan, and changes in the requirements of project stakeholders, particularly owners. As a result, it is important to concentrate on project planning issues because they have a negative effect on the project's performance.

Nikkhah and Redzuan (2019) argue that community development is difficult to attain without the active participation of community members. According to Ika, Diallo, and Thuillier (2018), projects are effective tools for enhancing welfare and achieving development. Participation guarantees that the local community has a sense of ownership over the project. Chess and Purcell (2015) pointed out that successful community initiative in Western Canada show that demand should be the driving force behind sustainable community development. The implementation of community development initiatives aims to provide a conducive atmosphere for the community to take legal authority, ownership, and responsibility for the finished projects. They also observed that when young people actively participate in community initiatives, it empowers them to have autonomy over choices that directly impact their lives. Their conclusion was that community engagement in the execution of community development initiatives would result in community empowerment.

1.1.1 Project Planning

Practices for project time planning comprise all planning steps required for a timely project completion. The activities definition, activity sequencing, schedule development, activity length estimation, and resource estimation of the activity are the planning processes in the time knowledge domain, according to PMBOK (2004). The time plan is one of the project's most crucial plans. Time schedules are created using a work-breakdown structure (WBS) that has already been defined. To create realistic and doable plans, tasks must be precisely scheduled, according to Antvik & Sjöholm (2007). The process of activity resource estimation includes calculating the projected amount of each resource to be consumed as well as the resources that are required. Materials planning procedures result from the need for equipment, manpower, and other resources. The procedure also includes scheduling the availability of each resource, particularly the material needed in the project (PMBOK, 2004). There are typically two resource estimation techniques: top-down and bottom-up. The top-down technique is typically used when there is limited information. It is run by the project's top management and is based on lessons learned from previous initiatives of a similar nature. The bottom-up approach is also known as qualitative-based estimations since it includes each distinct work classification in the process.

Cost budgeting and cost estimation are both included in the project's financial planning stage. The goal of cost planning is to complete the project within the allocated spending limit. (PMBOK, 2004). Project budgets are crucial because they have an impact on every aspect of planning and execution. The tracking of all expenditures, including those for the numerous work packages that make up a project, is essential (Abdi, 2021). The construction of a sound and efficient cash flow is facilitated by the professional budget development for a project, which helps to control project expenses. According to Herrera et al. (2020), insufficient cash flow caused by bad budgeting causes completion delays and significant additional expenditures, which increases the danger of a temporary halt to the entire project. The project scope, the WBS, and the project plan should all be taken into consideration when estimating costs. According to Mardiani (2018), a reserve cost may be applied to activities with a low work package level or thorough information with potential high financial risks because there are many unpredictable aspects present in a project.

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1.1.2 Government Regulations

Government policies and investments have a widespread and significant impact on the business environment and economic progress of any country. (U.S. Department of Transportation, 2016)

Government rules are statutory tools used to ensure the implementation of the construction policies outlined in the applicable legislation (Siddiqui, 2019). The health, safety, and welfare of the workers must be taken into account both during the actual construction phase and while planning construction operations, and regulations are statutory instruments that outline the minimum legal standards for construction works (Zwalf, 2020). Government regulations on road projects are laws, policies, and rules that have been approved by the government or one of its agencies and may have a good or negative impact on how well road projects work. As a result, the effectiveness of government regulations will be evaluated in relation to their criteria for compliance, disclosure, alignment with policy objectives, and code of conduct.

For the majority of road construction projects in any given nation, regulations approval is necessary. Regulation in the field of road building includes the registration of contractors, projects, skilled laborers, site managers, training facilities, and rules governing the collection and payment of the construction levy (G.O.K, 2012).Construction regulation authorities are typically established in every nation to harmonize construction laws found in statutes that may conflict with one another, prohibit the entry and penetration of unqualified contractors by controlling and enforcing the Building Code's implementation in the construction sector, and enhance bureaucratic requirements and procedures. Additionally, construction regulation authorities eradicate corruption in the building sector, prioritize contractor performance and material quality, and update the Building Codes to guarantee their applicability (Wamugu & Ogollah, 2017).

1.1.3 Performance of Road Project

Evaluating project deliverables against key performance indicators (KPI) allows for the determination of road construction project performance. These key performance indicators (KPIs) assess the timeliness, cost-effectiveness, quality, efficiency, accuracy, safety, and profitability of project delivery (Vandevoorde & Vanhoucke, 2016). According to Pheng and Chuan (2006), the performance of a project may be evaluated from two perspectives: the stakeholders' viewpoint and the developer's viewpoint. Project time refers to the period starting at the beginning of a project and ending at its conclusion. According to Ngacho (2013), there are two primary time factors to consider: the project time and the actual completion time. Project time failures occur when there are excessive delays or overruns in the execution process (Lensinko, 2015).

Akali (2018) expresses concern over the government's ongoing efforts to construct roads in Kenya's arid and semi-arid counties. It is observed that approximately 75% of these road projects face various obstacles, resulting in delays, exceeding the budget, or failing to meet the desired quality standards. In addition, as stated by Abdi (2020), a mere 10% of the development projects undertaken in the area by Kenyan construction companies using Constituency Development Funds (CDF) were completed effectively. 30% of the balance was unfinished, while 60% were never completed. According to the World Bank report of 2018, analysis of the public works records from the counties under investigation indicated that around 40% of the road infrastructure projects executed by local enterprises saw delays of 1-2 years, while 60% of the road projects suffered delays of 2-4 years.

By comparing project deliveries to key performance indicators (KPI), road construction project performance can be determined. These KPIs demonstrate if projects are completed on schedule, within budget, without defects, effectively, correctly the first time, safely, and profitably (Densford et al., 2018). If a project is finished on schedule, within budget, and meets all functional and technical requirements, it is considered to have done well. Indicators of performance for the road construction project were taken into consideration for this study, including quality, timing, and cost. Time as an indicator considered how long it took to complete a project, from its commencement to its end. While quality looked at how well the project complied with requirements and was suitable for use in achieving its intended purpose, the cost indicator was interested in the evaluation of the amount of cash and resources utilized in a project (Densford et al., 2018).

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1.2 Statement of the Problem

Successful road construction is a stimulus for economic development, as stated in Kenya Vision 2030 (Kenya Vision, 2030). As a result, the government has made large investments in the construction of roads (Abdi, 2021). For example, in the 2017/2018 Financial Year, Kenya National Highways Authority (KeNHA) proposed to construct 13,238.73 kilometers of roads at an outlay of Ksh. 21,459,228,002, while Kenya Rural Roads Authority (KeRRA) planned to sustain 28,244 kilometers of roads with a spending plan of Ksh. 11,893,617,021. The Kenya Urban Roads Authority (KURA), on the other hand, supposed to maintain 2,339 kilometers of roads for a total of 5,206,382,979 people (KRB, 2016). Akali (2018) laments that, despite the government's continued investment in road building, nearly 75% of all projects (road construction) in Kenya's arid and semi-arid counties encounter a number of challenges that prevent them from being finished on schedule, incurring cost overruns, or falling short of the required quality standards. Furthermore, according to Abdi (2020), only 10% of the building projects carried out in the region by construction firms registered in Kenya using Constituency Development Funds (CDF) were successfully completed. The balance were either incompletely (30%) or never finished (60%) finished and therefore if current trend in road construction continues unaddressed, Kenya's Vision 2030 of enhancing domestic and regional trade through construction and upgrading 10,000 Kilometers of the national and county roads network won't be realized. This study aims at examining the effect of project planning and government regulations on performance of completed road projects in arid and semi-arid counties in Kenya.

1.3 Research Objective

To determine the moderating effect of government regulations on relationship between project planning and performance of completed road projects in arid and semi-arid counties in Kenya

1.4 Research Hypothesis

Ho_1: There is no significant moderating effect of government regulations on the relationship between project planning and performance of completed road projects in arid and semi-arid counties in Kenya

2.0 LITERATURE REVIEW

2.1 Theoretical Literature

2.1.1 Theory of Constraints (TOC)

Dr. Eliyahu Goldratt conceived the Theory of Constraints (TOC), and introduced it to a wide audience through his bestselling 1984 novel, “The Goal”. Because of this, TOC has kept changing and growing, and now it is an important part of best practices for management. The Theory of Constraints is a way to figure out which constraint is the biggest problem that is stopping you from reaching your goal and then gradually making that constraint better until it is no longer a problem. This kind of problem is often called a bottleneck in production. The Theory of Constraints is a scientific way to find ways to make things better. It says that every complicated system, like an industrial process, is made up of several activities that are related to each other. One of these activities limits the whole system; this is called the "weakest link in the chain." One of the things that makes the Theory of Constraints appealing is that it naturally puts growth tasks at the top of the list. The present limitation is always the most important thing. For situations where change is needed right away, TOC provides a very focused way to make quick progress. A successful Theory of Constraints implementation will have the following benefits: Increased profit is the primary goal of TOC for most companies. Fast improvement is the result of focusing all attention on one critical area: the system constraint. Improved Capacity: optimizing the constraint enables more products to be manufactured. Reduced lead times by optimizing the constraint results in smoother and faster product flow. Reduced inventory: eliminating bottlenecks means there will be less work-in-process (Şimşit, Günay, & Vayvay, 2014).

The core concept of the Theory of Constraints is that every process has a single constraint and that total process throughput can only be improved when the constraint is improved. A very important corollary to this is that spending time optimizing non-constraints will not provide significant benefits; only improvements to the constraint will further the goal (achieving more profit).Thus, TOC seeks to provide precise and sustained focus on improving the current constraint until it no longer limits throughput, at which point the focus moves to the next constraint. The underlying power of TOC flows from its ability to generate a tremendously strong focus on a single goal (profit) and to remove

the principal impediment (the constraint) to achieve more of that goal. The Theory of Constraints provides a specific methodology for identifying and eliminating constraints, referred to as the Five Focusing Steps.

The Five Focusing Steps are: Identify; Identify the current constraint (the single part of the process that limits the rate at which the goal is achieved). Exploit: Make quick improvements to the throughput of the constraint using existing resources (i.e., make the most of what you have).Subordinate; Review all other activities in the process to ensure that they are aligned with and truly support the needs of the constraint. Elevate; If the constraint still exists (i.e., it has not moved), consider what further actions can be taken to eliminate it from being the constraint. Normally, actions are continued at this step until the constraint has been "broken" (until it has moved somewhere else). In some cases, capital investment may be required. Repeat; The Five Focusing Steps are a continuous improvement cycle. Therefore, once a constraint is resolved, the next constraint should immediately be addressed. This step is a reminder to never become complacent, aggressively improve the current constraint and then immediately move on to the next constraint.

2.1.2 Regulation Theory

Regulation Theory, also known as the Regulation School, is a critical approach to understanding the economic dynamics of capitalism. It focuses on how different forms of regulation (institutions, rules, and norms) shape and constrain capitalist growth and accumulation. In the year 1932, economist Arthur Cecil Pigou was the first person to establish the concept that would later become known as the theory of regulation. According to this point of view, members of the general public have indicated an interest in having legislation enacted that would put an end to unethical business activities. It is a widely held belief that rather than catering to and serving the interests of certain special interests, rules should cater to and serve the interests of society as a whole.

Some key elements of regulation theory are: regimes of accumulation, which describe that each historical period in capitalism is characterized by a specific regime of accumulation, which describes the dominant way in which surplus value is extracted and circulated. Modes of Regulation, describes that each regime of accumulation requires a specific mode of regulation to maintain stability and prevent crises. This mode of regulation includes the following: State institutions, which describes the role of government in regulating the economy (e.g., monetary policy, social safety nets) Wage-labor nexus which describes the relationship between employers and workers, including wage levels and labor rights. Form of competition: The nature of competition between firms within the market. Crises and Transitions describes that Regulation Theory argues that each regime of accumulation eventually encounters internal contradictions and crises, leading to a period of destabilization and restructuring. This can involve changes in production methods, consumption patterns, social relations, and regulatory frameworks, eventually leading to the emergence of a new regime of accumulation (Al-Hanshi, Ojiako, & Williams, 2022)

2.1.3 Resource Based View Theory (RBV)

The agency theory, which was first developed by Stephen Ross and Barry Mitnick (Mitnick, 1975), places an emphasis on the significance of distinguishing between ownership and control, which results in the emergence of an inherent agency problem. According to Murtaza et al. (2021), the theory places an emphasis on how important it is for boards of directors to be independent in order to protect the best interests of shareholders. As a result, the theory supports the idea that non-executive directors should be included on boards, given that these directors are seen to be the ones who are most equipped to successfully represent the concerns of shareholders. The aforementioned concept is of considerable significance in the field of study because it relates to the complex interaction that exists between those in charge of maintaining roadways and the general populace, who use their democratic right to vote for those in charge of the government. In this scenario, the general populace is the legal owner of road assets, and they are the ones who form road agencies via the proper governmental channels in order to exercise control over the administration of such assets. It is essential that those in charge of roads do their jobs in a manner that is to the greatest advantage of the general public. Nevertheless, due to the possibility of limitations in the general public's knowledge and capability to effectively manage the activities of road agencies, the government assumes the role of a governing body, which is frequently referred to as the "Board," to exercise supervision and ensure that road agencies operate in a manner that is consistent with the public's best interests. This ensures that road agencies operate in a manner that is in line with the public's best interests. As a result, this theoretical framework will act as the basis for the dependent variable in the study, and it will also help in clarifying the phenomena of performance exaptation among road agencies, as seen by the general public and enforced by the authorities of the government.

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2.2 Empirical Literature Review

2.2.1 Project Planning, Government Regulations and the Performance of Completed Road Project

Mariusz, Adnan, Haque, and Isaiah (2019) investigated the moderating effect that risk management plays in project planning and the success of projects in the construction industry of the United Kingdom and Pakistan. A survey form was used to collect responses from 152 different project managers, with 76 respondents coming from each economy. In order to guarantee an accurate representation of the sample size, the purposive sampling method was used, and the RAND formula was applied in order to pick the project managers. The approach of partial least square structural equation modeling was used so that quantitative analysis could be performed. The study by Mariusz et al.'s (2019) hypothesis that the level of preparation put into a project has a substantial bearing on how well it turns out. The study results shows that, despite the fact that the construction enterprises were operating in two distinct economies, risk management served as a substantial moderating factor in the connection between project planning and successful project completion. The purpose of the current research is to investigate the moderating influence that government regulations have on the connection between project planning and the performance of finished road projects in Kenyan counties that are classified as dry or semi-arid.

According to Dan, Wenfeng, and Chuanbin's hypothesis from 2021, the distribution of project control rights has a moderating effect that is counterproductive to the effect that rule governing mechanisms have on the performance of projects. An investigation on the impact of rule governance mechanism on project performance was carried out by Dan et al., (2021), who used control rights as a moderating variable in their research. This investigation focused on public rental housing public private partnership projects in China. Following the completion of the theoretical investigation and the reading of the relevant literature, hypotheses are proposed, and these hypotheses are then put to the test via the application of the structural equation model to the large sample data obtained from the questionnaire survey. Because of the public nature of projects carried out under a public-private partnership arrangement, it is unacceptable for social capital to have an excessive amount of control rights over the project. In the dynamic management process, the degree of project control rights possessed by social capital should be balanced with the rule governance. The research conducted by Dan et al. (2021) investigated the effects of government rules as an independent variable on the success of public private partnership projects for rental housing in China, with control rights serving as a moderating variable. The purpose of this research is to investigate the moderating influence that government restrictions have on the connection between project planning and the performance of finished road projects in Kenyan counties that are classified as dry or semi-arid.

Ogogo, Omwenga, and Nyangau (2019) conducted a study with the purpose of examining the effects of the moderating effect of government rules on performance of government building projects in Kenya. Their research was published in the journal Scientific Reports. A descriptive research approach was used for this study, and simple random selection was utilized to pick a sample from among the registered architects and project managers working in Nairobi, Kenya, who were engaged in government projects. As a result, government construction projects served as the unit of analysis, while the 728 registered architects and project managers working in Nairobi served as the unit of observation. The number of people in the sample was 251. Both qualitative and quantitative data were produced as a result of the investigation. Questionnaires were used to gather the data, and SPSS was used to do the analysis. The results of the research indicated a statistically significant and favorably correlated link between the moderating effects of government rules and the performance of government building projects in Kenya. This research will investigate whether or not government rules have a moderating influence on the link between project planning and the performance of finished road projects in arid and semi-arid areas of Kenya.

A study by Ochenge et al., (2018) examined on the ways in which government laws influence the connection between project management strategies and the accomplishment of road infrastructure projects carried out by local enterprises in the lake basin of Kenya. The research design for this study was a survey that included descriptive and explanatory elements. The target population consisted of the 41 road infrastructure projects that were constructed in the Lake Basin Region between the years 2011 and 2016 by local enterprises. A questionnaire with a semi-structured format was used to collect the primary data for this study. According to the findings of the research, there was no moderating effect that was exerted by government policy on the correlation that existed between independent and dependent variables. A conceptual void was produced as a result of the focus of the research on methods of project management, despite

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the fact that these methods are relevant to the present investigation. The expansion of the capabilities of the business will serve as the primary focus of this investigation.

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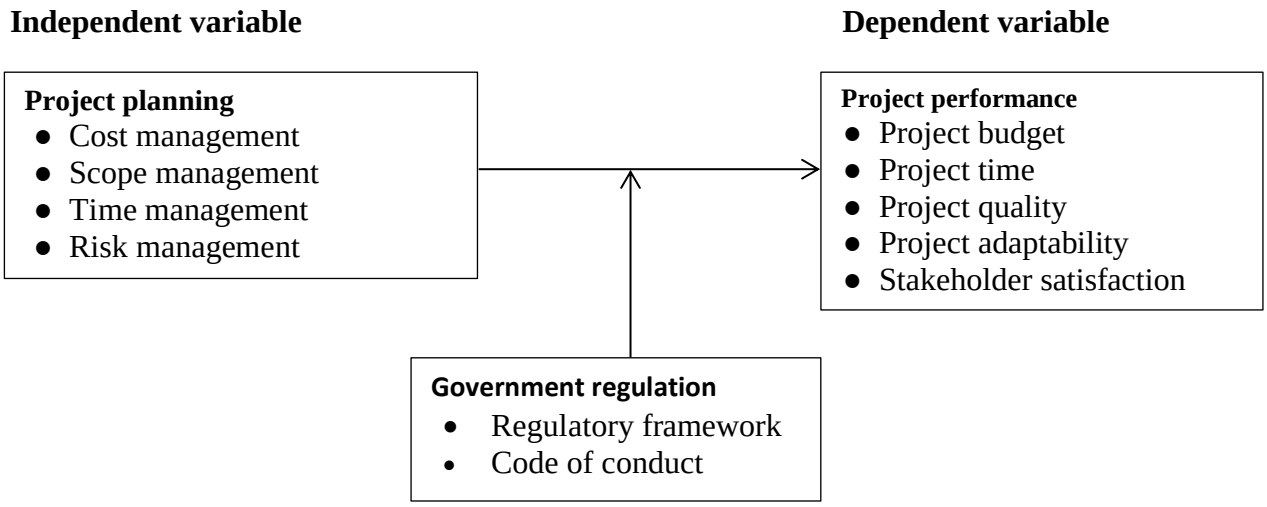
2.3 Conceptual framework



3.0 RESEARCH METHODOLOGY

3.1 Research Philosophy

A research philosophy is a viewpoint on the collection, analysis, and utilization of information regarding phenomena (Saunders et al., 2012). Using a quantitative research approach, this study will make conclusions and take research concerns into account. Three main areas of research philosophy are ontology, epistemology, and axiology (Scotland et al., 2012). The three main approaches to study are positivism, interpretivism, and realism. Depending on the methodology to be utilized for the study, a constructivist or a positivist research philosophy may be appropriate. The guiding principle of a realist research philosophy is that what our senses reveal to be true is that objects have an existence apart from human thought that is there is a reality distinct from thought (Scotland et al., 2012). Ontologically, critical realism makes the assumption that reality exists even though it is frequently incomprehensible. Realism distinguishes between the real world, the real world's actual happenings, and the empirical events that a researcher observes and documents. Furthermore, it is asserted in realism that there are real-world entities with the ability to behave and a propensity to be acted upon by others (Easton, 2010).

3.2 Research Design

A research design serves as the guide for gathering, measuring, and analyzing data (Cooper & Schindler, 2014). The credibility of the research findings might be impacted by typical types of research designs. Case studies, polls, action research, and experimental design are some of them (Bryman & Bell, 2011; Farquhar, 2012).The experimental design gives statistical inference a high degree of confidence, ensuring that the significant link found increases reliability and, as a result, achieves an internal validity that shows cause-and-effect relationships between the two variables (Maxwell, 2010). Because of the experimental design's intimate ties to laboratory research, this study will not use it. The desire to investigate a phenomenon in its actual setting led to the requirement for this design (Saunders et al., 2012).

3.3 Target Population

The target population was all completed road projects in ASAL Region, Kenya from 2016 to2020 and therefore the study adopt a census research method. Most road projects in Kenya take 3-6 years to finish hence the choice of 6years (GoK, 2010). The study unit of analysis will be the 88 road projects constructed and completed by contractors during the 6 years period as per KeNHA, KURA, and KeRRA annual reports of the years 2016, 2017, 2018, 2019, and 2020 as shown in appendix V. The units of observation for the study were the contracted company's project managers,county

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public works officers and the local community leaders in all 88 completed road projects. Therefore the target population of the study will be 198 respondents.

Table 3: Population Distribution

Category	Unit No.
Contracted company's project managers	88
Local community leaders	88
County public works officers	22
Total	**198**

Source: KURA,KenHA,KeRRA, 2021

3.4 Sample Size and Sampling Design

A sample is a smaller, more representative group of individuals that is chosen from a larger population. Through the analysis of the sample, one may derive findings that can be applied to the broader population of interest (Sekaran & Bougie, 2011). This research utilized convenience sampling. Sekaran and Bougie (2011) also define convenience sampling as judgment sampling, which is suitable for selecting subjects who are strategically positioned or in the optimal position to supply the necessary information. In order to fulfill the main aim of this study, which is to examine the effect of project planning, government regulations, and community participation on the effectiveness of finished road projects in arid and semi-arid counties in Kenya, the most valuable participants are the project managers from the contracted company, the public works officers from the county, and the leaders of the local community. Therefore, convenience sampling will be employed. The research will have a sample size of 198.

3.5 Data Collection Procedures

This research utilized primary data in order to answer the study's specific aims. A questionnaire was employed for this purpose due to its ability to allow respondents to fill it out without assistance, anonymously, and being relatively cheaper and faster than other methods while reaching a bigger sample size (Creswell, 2009).

3.6 Pilot Testing

A pilot test is an investigation which is carried out on a small group of respondents to make sure the questions being asked in the questionnaire are reliable (Marczyk, DeMatteo & Festinger, 2005). Pilot testing also helps in ensuring viability before rolling out large scale and also avoids costly errors and therefore, the questionnaire will be tested for reliability and validity. The questionnaire will be pre-tested in a pilot study before actual data collection begins. For high precision and due to time, cost and practicality of the pilot study, 1% to 10% of the sample will constitute the pilot test size (Arain, Campbell, Cooper & Lancaster, 2010). This study will use 20 questionnaires for pilot study, representing 10% of study population, which will be sent to the respondents via e-mail because this is faster, cheaper and reliable.

4.0 DATA ANALYSIS AND RESEARCH RESULTS

4.1 Demographic Characteristics

The study found that a total of 88 respondents, including 65 project managers and 22 county public works officers, represented 40.3% of the total response rate. This indicates that the opinions of project managers and county public works officers were well captured and represented in the study. The sample size for the project managers category was 88 respondents, indicating a well-representation of their opinions. The results also indicate that all county public works officers in all 22 arid and semi-arid counties in Kenya were well represented. The majority of respondents (49.1%) had diploma qualifications, followed by undergraduate bachelor's degree (24.8%) and postgraduate Master's degree (14.9%). Certificate qualifications were 5%, and Basic Education (Primary or Secondary) qualifications were 6.2%. The study found that 36.6% of respondents had 10-14 years of work experience, while 51.1% had 5-9 years of experience. The majority had more than 14 years of experience, with 25.5% of respondents having more than 14 years, and 6.8% having less than 5 years of experience.

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Table 2: Demographic Characteristics

Demographic Profile		Frequency	%
Job Category	Project managers	65	40.3
	Local Community leader	74	46.0
	County public works officer	22	13.7
Level of Education	Basic Education (Primary or Secondary)	10	6.2
	Certificate	8	5.0
	Diploma	79	49.1
	Undergraduate	40	24.8
	Masters	24	14.9
Work Experience	Less than 5 years	11	6.8
	5- 9 years	50	31.1
	10- 14 years	59	36.6
	More than 14 years	41	25.5

The study findings in Table 2, findings indicate that majority of the respondents were experienced and in a good position to give credible information and feedback sought. These findings indicate that respondents who have longer working period in a given organisation, projects and areas have a greater experience of how to carry out the duties effectively.

4.2 Hypothesis Testing

4.2.1 The Moderating effect of government regulations on the relationship between project planning and performance of completed road projects in arid and semi-arid counties in Kenya.

The objective of this study was to evaluate the degree to which government regulations serves as a moderator in the association between project planning and performance of completed road projects in arid and semi-arid counties in Kenya. This was done through testing the hypothesis $H0_1$: *There is no moderating effect of government regulations on the relationship between project planning and performance of completed road projects in arid and semi-arid counties in Kenya.* To test this null hypothesis, a hierarchical multiple regression analysis was conducted. The test for moderation was checked and tested using the regular linear regression menu item in SPSS using the methodology outlined by Baron and Kenny (1986). This was attained by examining the regression pathways of project planning, government regulations and performance of completed road projects. Regression analysis was carried out in a hierarchical process with an interaction term, which is a product of project planning and government regulations, introduced as an additional predictor. The hierarchical models applied are discussed below:

Table 3: Adjusted R-squared for the moderating effect of government regulation on the relationship between project planning and performance of completed road projects

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
.697[a]	.485	.479	.44537	.485	74.526	2	158	.000
.738[b]	.545	.536	.42024	.059	20.462	1	157	.000

a. Predictors: (Constant), Government regulations, Project planning
b. Predictors: (Constant), Government regulations, Project planning, Interaction Term

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Table 3 presents the percent of variability in the performance of completed road projects in arid and semi-arid counties in Kenya (dependent variable) that *Project planning* and *Government regulations* (predictors) can account for. In model two, with the introduction of the interaction term in model, the adjusted R squared (R^2) changes positively from 0.479 to 0.536 an increase of 0.059 with standard error of the estimation decreasing to 0.42024, hence there was a positive change in adjusted R-squared and thus the change was significant given p-value = 0.000 <0.001.

Table 4: ANOVA for the moderating effect of government regulations on the relationship between project planning and performance of completed road projects

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.566	2	14.783	74.526	.000[b]
	Residual	31.341	158	.198		
	Total	60.906	160			
2	Regression	33.179	3	11.060	62.624	.000[c]
	Residual	27.727	157	.177		
	Total	60.906	160			

a. Dependent Variable: Performance
b. Predictors: (Constant), Government regulations, Project planning
c. Predictors: (Constant), Government regulations, Project planning, Interaction Term

The analysis of variance depicted in table 4 was intended to evaluate if Government regulations and Project planning in model 1 and if Government regulations, Project planning and Government regulations multiplied by Project planning (interaction term) in model 2 are significant. The ANOVA was also intended to determine whether the amount of variance that model 1 and model 2 accounted for (with the interaction term) is registering more than model 1 (that is characterized without the interaction term). The Findings of the analysis indicate that the model in its entirety is significant given that F = 74.526, p-value = 0.000 < 0.001 for model 1, and F = 62.624, p-value = 0.000 < 0.001 for model 2.

Table 5: Model Coefficients for the moderating effect of government regulations on the relationship between project planning and performance of completed road projects

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.704	.371		-1.897	.060
	Project planning	.773	.087	.546	8.895	.000
	Government regulations	.342	.076	.276	4.497	.000
2	(Constant)	.578	.450		1.283	.201
	Project planning	.509	.101	.359	5.056	.000
	Government regulations	-.097	.121	-.078	-.804	.423
	Interaction Term	.099	.022	.518	4.523	.000

a. Dependent Variable: Performance

In table 5 we are interested in the coefficient (Beta) values of project planning, government regulations and interaction term (project planning and government regulations). From model 1 the impact of project planning to performance of completed road projects is significant with a coefficient (β) = 0.546 and p-value = 0.000 < 0.001. The impact of the moderating variable (government regulations) on performance of completed road projects is also significant with a coefficient (β) = 0.276 and p-value = 0.000. In model 2, the model results show that the interaction term (project

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planning and government regulations) is significant with a coefficient (β) = 0.518 and p-value = 0.000< 0.001. This means that government regulation affects the strength of the relationship between project planning and performance of completed road projects. Therefore government regulations moderate the relationship between project planning and performance of completed road projects in arid and semi-arid counties in Kenya.

The moderating model can be summarized as:
(iii).....Performance of completed road projects = 0.578 + 0.509 (Project planning) - 0.097 (Government regulations) + 0.099 (project planning and government regulations).
The researcher therefore, Rejects the null hypothesis three ($H0_1$) and consequently concludes that there is significant moderating effect of government regulations on the relationship between project planning and performance of completed road projects in arid and semi-arid counties in Kenya.

Result Discussions

The present research aligns with the findings of Mariusz, Adnan, Haque, and Isaiah (2019) as it investigates the moderating influence of risk management on project planning and project success within the construction industry of the United Kingdom and Pakistan. According to Marius et al. (2019), project planning was shown to have a statistically significant influence on the success of projects. Moreover, the influence of risk management on the association between project planning and project performance in the construction industry remains strong, even when considering the distinct economic contexts of the two industries.

The findings of the current study are consistent with the research undertaken by Ogogo, Omwenga, and Nyangau (2019), which sought to examine the influence of government regulations as a moderating variable on the efficacy of government construction projects in Kenya. The findings of the research revealed a significant and positive association between the moderating impact of governmental regulations and the implementation of government infrastructure projects in Kenya. The results of this study are consistent with the research carried out by Mariusz, Adnan, Haque, and Isaiah (2019), which examined the moderating effect of risk management on project planning and project success in the construction sector in the United Kingdom and Pakistan. The study conducted by Marius et al. (2019) revealed a substantial correlation between project planning and project success. Furthermore, it has been shown that the relationship between project planning and project performance within the construction sector is significantly influenced by risk management, even when examining two separate economies.

The current study is different from what Ochenge et al. (2018) found because it looks into how government rules affect the link between project management methods and how well road infrastructure projects in Kenya's lake basin area are completed by local businesses. The study revealed that the influence of government policy on the association between the independent and dependent variables was not found to be significant. Furthermore, the researchers Dan, Wenfeng, and Chuanbin (2021) say that the distribution of project control rights negatively affects the link between systems that enforce rules and project performance. Dan et al. (2021) performed recent research to investigate the impact of rule governance systems on project performance within the context of public-private partnership (PRHPPP) projects in China. The researchers also aimed to ascertain if control rights serve as a mitigating component in this association.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The conclusions drawn from the research indicate a significant and strong positive correlation ($r = 0.477$, $p < 0.001$) between government regulations and the performance of completed road projects in arid and semi-arid counties in Kenya. This highlights the critical role that government regulations, including a regulatory framework and a code of conduct, play in influencing project outcomes in these regions. The study aimed to assess the moderating impact of government regulations on the relationship between project planning and project performance, ultimately rejecting the null hypothesis that suggested no such moderation effect exists. The results confirm that government regulations substantially moderate the association between project planning and the performance of completed road projects. Additionally, project planning emerges as a significant predictor of project performance in these areas. This underscores the necessity for effective governance and regulatory measures to enhance road project efficacy in arid and semi-arid regions. The findings emphasize the importance of integrating robust regulatory frameworks within

project planning processes to optimize outcomes. Overall, the research underscores the interconnectedness of government regulations, project planning, and successful project execution in challenging environments..

Based on the research findings, several key recommendations emerge to enhance the performance of road projects in arid and semi-arid counties of Kenya. First, it is essential to strengthen and implement comprehensive government regulations, including a robust regulatory framework and a clear code of conduct, to guide project planning and execution effectively. Policymakers should prioritize the integration of these regulations into the project planning process to ensure that they serve as a foundation for successful project outcomes. Additionally, training and capacity-building programs should be established for stakeholders involved in road construction to ensure they understand and adhere to these regulations. Furthermore, regular assessments and updates of the regulatory framework are necessary to adapt to the unique challenges presented by arid and semi-arid environments. Collaboration between government agencies and local communities should be fostered to ensure that community needs and grievances are considered in project planning. Moreover, investment in monitoring and evaluation systems will enable ongoing assessment of project performance and regulatory compliance. By enhancing the relationship between government regulations and project planning, overall project efficacy can be improved, leading to more successful road infrastructure development in these regions. Ultimately, these recommendations aim to create a more transparent, accountable, and effective framework for managing road projects in challenging environments.

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