

# INSTITUTIONAL FACTORS INFLUENCING SUSTAINABILITY OF ROAD CONSTRUCTION PROJECTS IN KENYA: A CASE OF KENYA RURAL ROADS AUTHORITY PROJECTS IN NYERI COUNTY, KENYA

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**Abstract:** Despite many rural roads being in a terrible state, Kenya Rural Road Authority is authorized to control their construction, repair and maintenance and the government has spent considerably to guarantee it has competent people certified in their field of operations. The goal of the research was to investigate the institutional elements impacting sustainability of KERRA (Kenya Rural Road Authority) projects in Nyeri County, Kenya. The research aimed to determine what factors such as resource availability and human resource efficiency on the long-term viability of KERRA initiatives. The research was conducted using a descriptive survey method that used both qualitative and quantitative techniques. Forty respondents were selected using stratified random sampling from a target of 45. Questionnaires were the major means of information gathering besides interview schedule. Quantitative data was examined using statistical approaches such frequency distribution, percentage, and mean. The data was analyzed using SPSS 25.0. From the regression findings, the study revealed that there existed a significant positive relationship between human resource efficiency and sustainability of rural road projects as indicated by  $\beta=.635$ ,  $p=0.03<0.05$ ,  $t=8.347$ . Resource availability has a significance positive influence on sustainability of rural road projects ( $\beta= 0.433$ ,  $p = 0.01<0.05$ ,  $t=7.882$ ). The study recommends that the management should eliminate human resource efficiency in all its processes to allow for faster decision making in approval, disbursement, procurement and supervision. Management should allocate adequate financial resources, promote timely disbursement and enhance procurement to ensure all resources required for project implementation are provided just in time.

**Keywords:** Institutional Factors, Sustainability of Road Construction Projects, Resource Availability, Human Resource Efficiency.

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## 1. INTRODUCTION

The productivity, welfare, and security of both rural and urban people are greatly influenced by the level of road infrastructural development in their communities and its links to market, health center, schools and other Centre's of Administration and Commerce. Infrastructural services are social overhead capital facilities and activities that share techno

economic features which enhance productive capacities of firms and households. This is because they interact with nearly all fields of human endeavor.

Road construction is an important part of the economical backbone in many countries (Ngai, Drew & Skitmore, 2013). However, all over the world, road construction has attracted criticism for inefficiencies in outcomes such as time and cost overruns, low productivity, poor quality and inadequate customer satisfaction (Chua, Chan & Ho, 2013). A road construction project is completed as a result of a combination of many events and interactions, planned or unplanned, over the life of a facility with changing participants and processes in a constantly changing environment.

Road infrastructure has been the responsibility of National governments as well as County governments in Kenya. Road construction and maintenance is funded by the government from fuel levies, government allocation raised from taxes, loans and grants. The governments have also considered adopting the public private partnership system of giving the construction work to private concessionaires who build the roads and later recover their invested funds and profit through a tolling system. They run the tolling system for a number of years until they recover the agreed value of money invested (Austin, 2012). However, this have not been experienced in Kenya as motorist says they will be taxed twice through fuel levies and at toll stations. Major roads in Africa had been funded through loans and grant from multinational banks like the World Bank, African development bank, Chinese development bank amongst others. They have funded road projects in Countries such as Kenya, Ethiopia, South Sudan, Sudan, and South Africa among other Countries. These African Countries have formed regional blocks which marks the international routes that every Country must complete the construction work (ADB, 2012). Some Countries have been progressing with regard to road infrastructure development. These countries include Uganda, South Africa, Ghana, Nigeria, Egypt, and Tanzania.

In Kenya it is the responsibility of the National government to develop and maintain all national marked trunk roads. The government of Kenya constructs this road through its various bodies such as the Kenya urban roads authority (KURA), the Kenya rural roads authority (KeRRA), the Kenya national highways authority (KeNHA). Each authority has its network of roads which it must maintain and or rehabilitate the rest are under the County government. Our country Kenya, still lags behind schedule. Some of the roads that have been earmarked for development are yet to be made passable while most of the road network especially in the rural areas is still of temporary nature. Despite increased funding in construction, repair and maintenance of road infrastructure project, implementation timeline end up being extended leading to increase in cost, time and resources. This has been attributed to both internal and external factors on project identification, funding, resource mobilization, management, environmental factors, process systems and technology among others. A lot of resources have to be pooled to undertake road construction in Kenya if the Country is truly to achieve the much anticipated vision 2030 (Muhu, 2012).

Infrastructure has been given the second highest priority in Nyeri County to ensure that the main road projects under the economic pillar are implemented (Nyeri county investor guide second edition, 2015) There has been a need for improvement of roads to a motorable condition because the road transport (mode of transport) carries about 80% of all cargoes and passengers in the County. Due to the importance of roads in socio-economic development of the rural areas. The Government has been aggressive in fulfilling its infrastructural development promises and economic empowerment to its residence through identification and funding of various rural roads projects and is keen on creating an enabling infrastructural system that links various pillars of development to enable timely access of services and market at minimal cost (Nyeri County investor guide second edition, 2015) As a result of these initiatives, there has been a need to study various determinants which affect the implementation and sustainability of rural road projects with a view to sharing knowledge, skills and experiences which will enable an efficient implementation process. This study sought to analyze institutional factors influencing sustainability of KeRRA funded rural road projects in Nyeri County.

#### *Problem of Research*

Many of the major road infrastructure projects in developing countries are so large and costly that they can only be accomplished by direct government involvement. The government generally set the rules for the development of contractual relationships, thereby influencing the public construction sector. Due to the importance of this sector to a nation, the following researchers have studied this sector and their findings have indicated that most projects are never completed on time due to management operational delays. According to Faridi et al. (2006), delay is considered one of the most frequent problems in the construction industry and they have an adverse impact on project sustainability in terms of time, cost, quality and safety.

Studies have been done on rural roads projects sustainability. Musa (2012) did a study on effects of total quality management on performance of rural roads projects in Kenya. He found that human resource management and resource management affects performance of the rural roads projects to a great extent. Bundi (2013) did a survey on challenges in the management of road construction resources within Kenya Rural Roads Authority. She found that political interferences and inadequate allocations of funds hinder sustainability of KeRRA activities even though the authority fully implements procurement policies. Nyamwaro (2012) did a study on analysis of challenges facing rural road project sustainability a case study of Ministry of Roads Projects. The study deduced that poor communication and lack of awareness were the main challenges facing rural road project implementation.

Despite immense study focusing on rural roads, most of the studies have focused on challenges of rural road sustainability rather than the institutional challenges in implementation and sustainability of rural roads. This has created a research gap in literature concerning rural roads projects. Therefore, this study attempts to fill this knowledgeable gap by evaluating the institutional factors influencing sustainability of KERRA funded road projects in Nyeri County, Kenya.

### *Research Objectives*

The specific objectives were to:

- i. To examine how resource availability influences the sustainability of KERRA projects in Nyeri County, Kenya
- ii. To establish the extent to which human resource efficiency influences the sustainability of KERRA projects in Nyeri County, Kenya

## **2. LITERATURE REVIEW AND RESEARCH FOCUS**

This section discusses the theoretical framework, empirical review and conceptual framework of this study. This presents reviewed theories which clarify the relation between mortgage financing and economic growth. Covered theoretical reviews include theory constraints.

The theory of constraints, developed by Eliyahu Goldratt, is a technique used to identify the primary limiting factor or constraint that impedes the achievement of a goal. The theory of constraints (TOC) is a management paradigm that views any manageable system as being limited in achieving more of its goals by a very small number of constraints. TOC uses a focusing process to identify the constraint and restructure the rest of the organization around it. TOC adopts the common idiom a chain is no stronger than its weakest link (Eriksson, 2013). This suggests that the most vulnerable individual or portion may always destroy or break the process, organization, or other element, or at least negatively impact the output. According to the theory of limitations, changes in four factors—project management, resource availability, technology development, and human resource efficiency—determine the long-term viability of rural road projects. Diminished employee efficiency will make processes more efficient, promote imagination, and improve interaction; decentralized governance of the leadership structure and tailoring it to suit the undertaking; timely availability of the necessary resources (funding and materials); and use of suitable technology and experts; all contribute to increased efficacy and decreased complications. If any of these is lacking, the system as a whole will fail to produce a high-quality product on time. The researcher may use this hypothesis to better understand the factors that affect the longevity of roads built using KeRRA money. By doing so, the researcher may get insight into the factors that influence the road industry's decision-makers when allocating funds, including organizational design, resource availability, technical progress, and the effectiveness of human resources.

### *Resource Availability and Sustainability of Rural Road Projects*

Resources required to carry out the project tasks can be classified as people, equipment, facilities, funding, or anything else capable of definition required for the sustainability of a project activity. Unavailability of all resources will therefore be a constraint on the sustainability of the project within the timelines. Resource scheduling, availability and optimization are considered key to successful project management. Allocation of limited resources are based on the priority given to each of the project activities. Their priority is calculated using the Critical path method and heuristic analysis.

For a case with a constraint on the number of resources required, the objective is to create the most efficient schedule possible - minimizing project duration and maximizing the use of the resources available (Meredith et al, 2013). Efficient and effective use of resources can often make or break a project. This is because resources are limited, some hard to obtain, expensive or both. Resource availability can have a major influence on project schedules. Delays in their supply would extend the period of the projects which in turn increases project cost. When planning a project, managers first decide on the

deliverables of the project and the activities needed to produce them. Then resources needed are estimated. Combination of resource needs and availability, help to determine the time needed for entire project. Resources are estimated in term of activities so that they can be deployed in the most effective manner.

The Government has the ultimate responsibility to provide access to services and to ensure that public private partnership does not alter the basic responsibility of government. It therefore has to provide guidelines on funding, sourcing of material, technology and manpower engagement to caution the public against cartel and other interested parties that supplies resources to the project against overpricing, supplying substandard materials and workmanship remuneration and compensation. All these will ensure quality delivery of resources at the appropriate cost and time. According to Kelechi (2004), policy making requires a strong legitimate institutional structure for decision making and policy enforcement. Kelechi further observes that policy formulation, among other things, requires a strong representative government which is seen as legitimate and relevant to the masses which will result in a strategy for domestic revenue mobilization through acceptable taxation policies that the citizen will be willing to comply with because they appreciate and relate to it. It also requires that policies be made on the basis of strategic options and choices be rooted in the states realistic efforts at internal resource mobilization.

All this have either direct or indirect influence on the timely delivery of road construction projects. Gupta (2011) stated that infrastructure projects are complex, capital intensive, having long gestation period and involve multiple risks to the project participants. Due to this, the task of providing infrastructure is traditionally that of the government as the government is able to utilize its planning and administrative capabilities in undertaking infrastructure development. According to Bonnafous and Jensen (2004) public authorities were generally in charge of financing and building new infrastructures. However, infrastructure development is also financially taxing to the government. That is why even when infrastructure development has a positive effect on the economy, no government can afford to concentrate all its resources towards the provision of infrastructure.

Any government in the world will have to balance between the need for developing infrastructure such as road and highways with other requirement such as providing healthcare and education since the economic rule of resource scarcity will limit its capability to do so. A lot of progress has been made in repairing vital road links in the country despite critical challenge in funding. Though the World Bank and the IMF has already given their seal of approval to progress made, the institutions are yet to unlock the funding required to complement Government efforts. The country's economic ranking has improved to 3.7 points, qualifying the country for more funding from the donor agencies. Available figures indicate that the Government's expenditure on road construction has increased from the allocated Sh10 billion budgeted for the 2006/07 financial years to Sh17 billion for the 2007/08 financial years. Funding for the road sector is from the exchequer, loans, donors and fuel levy

#### *Human resource efficiency and sustainability of KERRA funded road projects*

Human resource efficiency is found in both the government offices and the donor organizations. Studies by Bartholomew and Lister (2002) indicate that donors' lengthy and cumbersome procedures at the project preparation stage often cause delays and have resulted in projects taking longer to come to fruition. Also government processes in developing countries are generally bureaucratic in nature which leads to challenges like weak information flow and reporting overload, weak Monitoring and Evaluation (M&E) in the Project Implementation Units (PIUs), weak implementation autonomy for PIUs; and high staff turnover. The characteristics of bureaucratic institution reflect Weber's legal-relational model, which describes human resource efficiency as hierarchical, rule enforcing, impersonal in the application of laws, and constituted by members with specialized technical knowledge of rules and procedures. Despite the pressure to be accountable on the tax payer's funds for a public project there is need for a corrupt free decentralized and flexible professional decision making in all the activities of the projects. This flexibility is essential to drive institutions to develop the capacity to respond to rapidly changing markets and consumer preferences by establishing decentralized organizational structures and processes.

In order to properly utilize knowledge of workers, greater employee autonomy is required, and is facilitated through employee participation in decision making and teamwork rather than centralized controlled and planning (Merton and Dwyer, 2005). There has been increased interest in management approaches that are regarded as more suited to the increasingly competitive global economic environment. There is also a recognized need for public sector institution like KERRA to be more flexible and responsive in their dealings with the public and to be more sensitive to the diverse needs of the citizens that they service. One of the well-known criticisms over the idea of human resource efficiency says that this idea reduces the flexibility and active efficiency of organizations. This means that growing of the corpus of human resource

efficiency (its laws and rule) may affect the efficiency of a system and reduce the flexibility of it by getting larger and larger (Merton and Dwyer, 2005). Bureaucracies' cause reduction of creativity among employees as specific action has previously been designed to follow a certain process. It follows that there would be no room to have a creative way of doing routine tasks. It is also important to note that the mechanical thinking from the idea of human resource efficiency leads to the thinking mechanistically not only about the organization but also about peoples who work in such an organization. This according to Morgan (1995) leads to employees spending many hours on work they neither value nor enjoy.

KeRRA gets it finding from government exchequer and it is generally claimed that public institutions are more bureaucratic than the private due to the ownership, funding and control. In the Government of Vietnam, the decision making process on Official Development Assistance (ODA) is lengthy as approvals go through many government departments. This also applies to signing of loan agreements and subsidiary agreements with the project implementing units. Boyne (2002) showed that the internal characteristics of public agencies can be viewed more bureaucratic because of the government inherent sovereign state, political authority and breath of mission. According to Crozier (1964) there is a vicious circle of human resource efficiency dysfunctions, and its effects include inflexibility, red tape, indifference, insensitivity, officiousness and blockage of information flow. Further Assaf, et al. (1995) while studying the causes of delays in large building construction projects in Saudi Arabia concluded among other factors slow decision making and executive human resource efficiency in organizations impacted on the sustainability of projects. In India, the execution of infrastructure projects requires active cooperation of several departments within as well as among various ministries.

An article in the Business Daily Newspaper of April 16, 2012 reported that government human resource efficiency might delay development of the infrastructural project in the country. In addition, the World Bank report ICR (2005) indicates that the Ministry of Finance countersigns contracts and this is reported to contribute to delays in commencement of contracts. It is evident from the discussion above that due to the hierarchical nature of government departments; there is inherent weakness in inducing the desired efforts from the people involved. Hence, infrastructure projects face the consequences of organizational failures within the sponsoring ministry itself. As these projects need joint efforts of several other organizations, they face both intra-organizational and inter-organization failures. Several reports, including the official ones, corroborate these claims (Bolton & Dewatripont, 2005).

### **3. METHODOLOGY OF RESEARCH**

#### *General Background of Research Methodology*

The study used the descriptive survey design using both qualitative and quantitative approaches. This research design was chosen since it enabled the researcher to explore a wide range of factors influencing road construction projects sustainability. The reason for this choice was based on the knowledge that descriptive design is the most appropriate for examining the effects of an independent variable on a dependent variable without any manipulation (Bell, 2007).

#### *Sample of Research*

This study targeted 45 staff working in KERRA office in Nyeri County who were Engineers, Constituency Road officers from Kenya rural roads authority, Nyeri County Office and contractors implementing KeRRA funded rural road projects in Nyeri County making a total of 45 respondents. The present research used the stratified sampling strategy to choose 40 respondents, using a basic random sample approach. The sample size for the investigation was established using Taro Yamane's formula for proportional sampling approach.

#### *Instrument and Procedures*

The study utilized primary data collection methods. The primary data was collected using questionnaires and interviews. Questionnaires were prepared for respondents to fill and availed data for the purpose of study as a qualitative approach to obtain data. All the data collected through the questionnaire was analyzed to identify any inconsistencies and institute the necessary corrective measures. The researcher also collected data using interviews from the beneficiaries of the constructed road projects in regards to their sustainability. Before the main research, the study did a pre-test of the instrument to enhance its validity and reliability. The pilot study was done in Laikipia County. A 10% of the population 4 respondents were chosen for pilot study. This aimed at enhancing the validity and reliability of the instruments where a necessary correction of the instrument was made before the actual research



*Data Analysis*

The study generated both qualitative and quantitative data. Information obtained from the questionnaires was processed through editing and coding and then entered into a computer for analysis using descriptive statistics with the help of Statistical Package for Social Sciences (SPSS) version 20. The software offers extensive data handling capabilities and numerous statistical analysis procedures that analyze small to very large data statistics (Bell, 2007). Descriptive statistics data analysis method was applied to analyze both quantitative and qualitative data. Descriptive statistics helped to compute measures of central tendencies and measures of variability (Bell, 2007). The significance of descriptive analyses lies in their role as the basis for the development of correlational and experimental investigations. Additionally, they provide valuable insights into the areas that need additional investigation, hence guiding subsequent research endeavors (Mugenda & Mugenda, 2003).”

#### 4. RESULTS OF RESEARCH

*Resource Availability and Sustainability of Rural Roads Projects*

The respondents were requested to indicate the extent to which they agreed on the given variables regarding resource availability and sustainability of rural roads projects as indicated in Table 1.

**Table 1: Descriptive Statistics of resource availability and sustainability of rural roads projects**

Statement	Extent Moderate	Great Extent	Very Great Extent	Mean	Standard Deviation
Budget allocation and disbursement process impact on project timeliness	4	3	30	4.70	0.65
Resource scheduling, availability and optimization are considered key to successful project sustainability	6	11	20	4.47	0.35
Red tape in Procurement cycle has a negative impact on project timeline	2	4	31	4.60	0.51
Efficient and effective use of resources can often make or break a project	3	2	32	4.61	0.60
Delays in the supply of resources would extend the period of the projects implementation which in turn increases project cost	11	14	12	4.11	0.24

From the findings in Table 1, majority of the respondents strongly agreed that budget allocation and disbursement process impact on project timeliness, efficient and effective use of resources can often make or break a project and red tape in procurement cycle has a negative impact on project timeline and influences sustainability of rural roads projects M=4.70, 4.61 and 4.60. Most of the respondents agreed that resource scheduling, availability and optimization are considered key to successful project sustainability and that resources are estimated in term of activities so that they can be deployed in the most effective manner M=4.47 and 4.37 respectively. Most of the respondents were neutral on whether delays in the supply of resources would extend the period of the project’s sustainability rate which in turn increases project cost M=4.11.

The results in Table 5 revealed that resource availability has a significance positive influence on sustainability of rural road projects as indicated by  $r = 0.433$ ,  $p = 0.01 < 0.05$ ,  $t = 7.882$ . This implied that resource availability has a significant impact on sustainability of rural road projects. This implies that efficient and effective use of resources can often make or break a project. The findings concurred with Ngesa (2012) who observed that inadequate financial resources affected timely sustainability of road projects funded by World Bank in Rwanda. The findings are also supported by Kelechi (2004) who argue that combination of resources needed and availability helps to determine the time needed for the sustainability of the entire project.

*Human resource efficiency in institution and Sustainability of Rural Roads Projects*

Respondents were requested to indicate the effects of human resource efficiency on rural road projects under the given parameters. From the findings, respondents stated that human resource efficiency leads to delays in project implementation and has a negative impact on projects sustainability schedule.

**Table 2: Human resource efficiency in institution and Sustainability of Rural Roads Projects**

Statement	Disagree	Agree	Strongly Agree	Mean	Standard Deviation
Long Procurement Procedures and efficiency influences sustainability of the rural road projects	4	5	28	4.72	0.75
Long Financial Management Procedures leads to delays in road project implementation and sustainability.	11	6	20	4.67	0.75
Steps involved in disbursements from contract signing to the actual disbursement impact negatively to project timelines.	10	6	21	4.63	0.51
Lengthy approval of rural road project fund.	3	2	32	4.65	0.63
Slow decision making and executive human resource efficiency delay project sustainability.	8	14	15	4.51	0.44
Number of administrative procedures required in approvals, disbursement, and procurement and supervisory influences rural road sustainability.	5	11	21	4.71	0.83

Respondents were requested to indicate the extent to which they agreed on the given statements regarding institutional human resource efficiency and rural road project sustainability. From the findings, majority of the respondents strongly agreed that procurement procedures and efficiency influences sustainability of the rural road projects  $M=4.72$ , number of administrative procedures required in approvals, disbursement, procurement and supervisory influences rural road sustainability  $M=4.71$ . Most of the respondents strongly agreed that financial management Procedures leads to delay in road project implementation and sustainability  $M=4.67$ , steps involved in disbursements from contract signing to the actual disbursement impact negatively to project timelines  $M=4.63$ , lengthy communication on the fund flow process, slow decision making and executive human resource efficiency influence project sustainability  $M=4.65$ .

From the regression findings in Table 5, the study revealed that there existed a significant positive relationship between human resource efficiency and sustainability of rural road projects as indicated by  $r=.635$ ,  $p=0.03 < 0.05$ ,  $t=8.347$ . This implied that human resource efficiency would impact negatively on sustainability of rural road projects. The findings concurred with Bolton and Dewatripont (2005) who indicated that road projects sustainability time was affected by intra-organizational and inter-organization Bureaucracies leading to failures which hinder project staff creativity. Respondents were requested to suggest ways through which institutional human resource efficiency can be improved to facilitate faster project sustainability rate. From the findings, respondents indicated that the approval process and decision making be decentralized. This was supported by Bartholomew and Lister (2002) who indicate that donors' lengthy and cumbersome procedures at the project preparation stage often cause delays and have resulted in projects taking longer to complete

#### Multiple Linear Regression

R-Squared is the proportion of the variance in the dependent variable R-Squared indicates the correlation between the observed and predicted values of implementation of rural road projects implying that there existed a significant correlation between institutional factors and timely sustainability of rural road projects in Nyeri county in Kenya with a correlation factor = 0.474 at significant level of 0.000. Adjusted  $R^2$  is called the coefficient of determination and indicates variation in institutional factors influencing sustainability of rural road projects in Nyeri County in Kenya. The value of adjusted  $R^2$  is 0.461. This implies that, there was a variation of 46.1% of institutional factors influencing sustainability of rural road projects in Nyeri county.

**Table 3: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.688 <sup>a</sup>	.474	.461	.80424

The Total variance (104.992) was the difference into the variance which can be explained by the independent variables (Model) and the variance which was not explained by the independent variables (Error). The study established that there existed a significant goodness of fit of the model  $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \epsilon$ .

**Table 4: ANOVA**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	12.120	2	49.3	9.763	.000
	Residual	92.872	37			
	Total	104.992	39			

a. Predictors: (Constant, resource availability and Human resource efficiency)

b. Dependent Variable: Sustainability of rural road projects

Based on the findings, in Table 5 the results indicate the  $F_{Cal} = 9.763 > F_{Cri} = 7.662$  at confidence level 95 % and sig is  $0.000 < 0.05$ . This implies that there was a goodness of fit and the model fitted for this study:

$$Y = 6.429 + 0.433X_1 + 0.635X_2$$

**Table 5: Regression Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	T	
1 (Constant)	6.429	0.972		2.522	.015
Resource availability	0.433	0.111	0.363	7.882	.010
Human resource factors	0.635	0.143	0.369	6.585	.030

a. Dependent Variable: Financial Performance

## 5. DISCUSSION OF THE FINDINGS

The study established that resource availability has a significant impact on sustainability of rural road projects. Budget allocation and disbursement process impacted on project timeliness, efficient and effective use of resources can often make or break a project and red tape in procurement cycle hindered timely sustainability of rural roads projects  $M=4.70, 4.61$  and  $4.60$ . The results further indicated that resource scheduling, availability and optimization are considered key to successful project sustainability and ineffective resources deployed affected sustainability of project to a very great extent. Regression findings indicated that resource availability has a significance positive influence on sustainability of rural road projects ( $r=0.433, p=0.01 < 0.05, t=7.882$ ). The results from Ngesa (2012) study indicated that inadequate financial resources affected timely sustainability of road projects funded by World Bank in Rwanda. The findings are also supported by Kelechi (2004) who argue that combination of resources needed and availability helps to determine the time needed for the sustainability of the entire project.

The results revealed that recruitment, selection and training of personnel influence faster project sustainability rate. Increase in knowledge advancement, skills development and promotion of integrity, multi-functionality and enhances conflict resolution during project implementation phase. The findings indicated that human resource efficiency leads to delays in project implementation and has a negative impact on projects sustainability schedule. Procurement procedures and efficiency, administrative procedures required in approvals, disbursement, procurement and supervisory influences timely rural road sustainability. Other institution factors such as financial management procedures, disbursements from contract signing to the actual disbursement, lengthy communication on the fund flow process, slow decision making and executive human resource efficiency affected rural road project timely sustainability. From the regression findings, the study revealed that there existed a significant positive relationship between human resource efficiency and sustainability of rural road projects as indicated by  $r=.635, p=0.03 < 0.05, t=8.347$ .

The findings concurred with Bolton and Dewatripont (2005) who indicated that road projects sustainability time was affected by intra-organizational and inter-organization Bureaucracies leading to failures which hinder project staff creativity. This was supported by Bartholomew and Lister (2002) who indicate that donors' lengthy and cumbersome procedures at the project preparation stage often cause delays and have resulted in projects taking longer to complete.



## 6. CONCLUSIONS AND RECOMMENDATIONS

The study concluded that resource availability can have a major influence on project schedules. Efficient and effective use of resources can often make or break a project. The institutional resource availability at Nyeri County has a significant impact on sustainability of rural road projects in the area. Budget allocation and disbursement process at Nyeri County impacted on rural road project timeliness, efficient and effective use of financial and other resources can often make or break a project and red tape in procurement cycle hindered timely sustainability of rural roads projects at Nyeri County. The study concluded that human resource efficiency in administrative procedures, approvals, financial disbursement, procurement procedures and project supervisory hindered sustainability of rural road projects in Nyeri. The study concluded that financial management procedures, disbursements from contract signing to the actual disbursement, lengthy communication on the fund flow process, slow decision making and executive human resource efficiency affected rural road project sustainability.

The study recommends that the management should eliminate human resource efficiency in all its processes to allow for faster decision making in approval, disbursement, procurement and supervision through decentralization of processes and resources, selection and training of qualified personnel and promotion of ethics and anti-corruption culture within the institution. The study recommends that management should allocate adequate financial resources, promote timely disbursement and enhance procurement to ensure all resources required for project implementation are provided just in time. The study recommended that policies should aim to create a conducive regulatory environment that supports sustainable practices and encourages private sector involvement to enhance resource availability. This involves eliminating bureaucratic obstacles and aligning regulations with international best practices.

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