Influence of Risk Transfer on Implementation of Kerra Road Construction Projects between 2019 and 2023 in Migori County, Kenya

Lennard William Bundeh[1]
Janet Auma Wagude[2]
Fredrick Ochieng Owuor[3]
John Ernest Odada[4]

[1]bundeh@rongovarsity.ac.ke
[2]jwagude@rongovarsity.ac.ke
[3]fochiengowuor@gmail.com
[4]johneodada@gmail.com

[1,2,3,4]Rongo University, Kenya

ABSTRACT

The implementation of Kenya Rural Roads Authority (KeRRA) construction projects faces high levels of risk, but these risks are often not adequately addressed, which is reflected in the low quality of work, as well as cost and time overruns. The purpose of this study was to determine the influence of risk transfer on the implementation of KeRRA road construction projects in Migori County, Kenya. Implementation was measured as a function of project completion within the set time frame and staying within budget. This study was anchored on project implementation theory, which provides a foundation for examining the influence of the variables under study. A concurrent triangulation research design was used, as it incorporates both qualitative and quantitative aspects of the research study. The target population for the study consisted of 92 contractors, 459 constituency roads committee (CRC) members, and 2 consultant engineers. Using a sampling size formula, a total of 39 contractors and 193 CRC members were selected through simple random sampling. Two (2) consultant engineers for Migori County were selected using purposive sampling. Primary data was obtained through self-administered questionnaires to contractors and CRC members, while Key Informant Interviews (KII) were conducted with the consultant engineers. The validity of the research instruments was ensured through piloting and expert evaluation. Inferential statistics, specifically Multiple Linear Regression, were applied to determine the influence of risk transfer strategies on the implementation of KeRRA road construction projects, by testing the hypotheses for the study. Statistical significance was assessed at $p<0.05$. Qualitative data obtained from the interviews were analyzed using content analysis. The study found that risk transfer strategies are mostly employed during the construction of roads in Migori County ($M = 3.77$, $SD = 0.86$) and accounted for 70.0% of the variation in the implementation of the projects. The study concluded that improvement in risk transfer strategies leads to an increase in the implementation of KeRRA road construction projects in Migori County. The study recommends that, to ensure risk transfer is properly undertaken, a system of risk reporting and remedial actions should be activated to ensure a smooth and effective road project implementation process. Additionally, KeRRA should ensure that all manpower and machinery used in road construction are insured and properly certified in accordance with occupational safety and health standards and policies.

Key Words*:* Implementation, Risk Transfer, Road Construction

I. INTRODUCTION

Implementation of roads by nature involves many risks and instituting a risk management strategy in road construction projects is always inevitable (Silva & Ricardo, 2019). According to Tyrrel (2020) risk management strategy is an important discipline in project management especially the road construction industry. A robust risk transfer plan can help contractors to lessen their exposure to risks, and enhance the rate of their project implementation success (Tyier & Frost, 2021). Sylwia (2022) term a risk strategy as the trend and scope of an organization to manage uncertainties over the long run, which achieves advantage for the project by its alignment of resources within a perplexing environment, to meet market needs and achieve project objective.

Globally, it is generally evident that road construction projects are vital for economic growth and poverty reduction since they play a vital role in enhancing competitiveness, easing trade and integrating countries to the rest of the world (Miller et al., 2021). The United States of America, targeted efforts to improve implementation of road projects led to significant reduction in highway fatalities through use of risk management strategies at the planning stages of road construction projects. This resulted in improvement in road grade from D to A in 2020 (Joao & Batista, 2020). However, forty-two per cent of America's planned major urban highways remain unimplemented, costing the economy an estimated 101 billion dollars in wasted time and fuel annually (Fan et al., 2020). While the conditions have improved in the short term, especially in the states where risk transfer have been practiced. Hence, federal, state,

and local capital investments increased to 91 billion dollars annually in those states, while in the states which had not embraced risk transfer strategies in their road project implementation, state and local capital investment continues to decline (Keller & Shrar, 2021). The Federal Highway Administration estimated that 170 billion dollars in capital investment could be needed on an annual basis to reverse this trend significantly and kick start the unimplemented road projects. There would also be the need to rope in more road construction firms to embrace risk transfer strategies (Baierlein, 2020).

In China implementation of major roads, housing and highway construction industry has been growing rapidly, driven by China's urbanization, increases in automobile ownership, freight and passenger road transportation turnover volumes hence increasing government investment and involvement of risk management strategies (Shubina et al., 2020). In 2020, industry revenue is expected to amount to 263.2 billion dollars, up 12.1% from 2018. Over the past five years, revenue has been growing at an average annualized rate of 17.0%. The rate of road project implementation has increased twofold from 35% to 74%. The total length of road in China increased from 3.7 million kilometres in 2016 to an estimated 4.3 million kilometres in 2020. Meanwhile, the total length of highways in China rose from 60,300 kilometres to about 108,600 kilometres. By 2019, there were 46 industry enterprises operating 423 establishments and employing 739,696 workers with a payroll of 14.1 billion dollars, however the sector is faced by time and cost overruns due to non-involvement of risk mitigation measures (Mishra, 2022).

A study that focused on project risk management practice of Oromia roads construction Enterprise in Ethiopia showed that risk acceptance is very crucial in the implementation of the road projects and maintenance of the completed roads in the country (Teshome, 2021). This view is supported by Vukawanadi and Mkandawire (2021) who carried out an investigation into risk management practices in road maintenance projects under roads jurisdiction in Malawi and found out that with increased emphasis on project risk management systems, specifically risk acceptance most construction firms had been meeting the project targets in terms of budget, time and quality.

A study by Shah (2020) in Tanzania looked at the myth of community participation in development in Shinyanga and affirmed that risk participation of leaders, farmers, traders and civil servants influences the implementation of various development projects. In this study, respondents were drawn from five projects. These projects were the infrastructural projects implemented in the water and sanitation sector, transport sector, hospitals, schools and communication infrastructure. The contractors (line workers like project managers and consultants) formed the members who were interviewed. In the study, other tenets of risk management strategies were also studied apart from risk transfer, 80% of the respondents strongly agreed with the idea that the risk management strategy adopted was very important since they provided a forewarning for the projects, 87% of the respondents said that the risk transfer was very crucial in alleviation of risk impact on the overall project implementation success. Indeed infusion of risk transfer in road projects implementation is not a new thing in Tanzania and Zanzibar Island (World Bank, 2021). The Tanzanians after independence were motivated by their leader Mwalimu Julius Nyerere to adopt a number of concepts that compelled every community member to participate in one way or the other in bettering their community by engaging themselves in various community development projects implementation, risk transfer was a common feature of Government policy by then (Shah, 2020).

In Kenya, a recent review of road construction projects in Machakos County revealed that when risk transfer strategies were put in place by the County Government few road construction projects fell behind implementation schedule (Wandiri, 2020). According to the budget policy statement, 2022, Machakos County was allocated 10.5 billion shillings from the county revenue allocation fund in the 2021/2022 financial year. The statement notes that in 2019/2020, the county spent 44% on personnel, 29% on operations and maintenance and 37% on development. The development plan for the 2021/2022 financial year for Machakos County states that between 2019 and 2022, over 950 km of roads were graded; over 56 km of roads upgraded to bitumen standards; 1,060 metres of drifts were constructed; approximately 365 metres of culverts installed and approximately Ksh. 12.5 million allocated annually per ward for road maintenance and development. A case in point is the Kenya Rural Roads Authority (KeRRA) annual report for 2019/2020, in the report, Tala-Donyo Sabuk road was expected to cover 70 kilometres in length and was to be completed in 2020, however, it was at 60.29% completion rate and with 51.3 kilometres of road length done during the launch year which was the 2018/2019 financial year. This became possible after risk transfer mitigation was done at the planning stages (Wandiri, 2020). Rambo and Okech (2020) in another study on influence of Risk assessment on implementation of Small and Medium Enterprises projects in Kiambu County concluded that risk transfer at the initial stages of the Small and Medium Enterprises projects in most instances guarantee good implementation in the undertakings. However, during the study it was observed that project planning accounts for about 85% of the total work scope while risk transfer accounted for about 15% of the total work scope and therefore these two practices must combine for project implementation success. The current study wishes to contribute to this area of knowledge and it is against this backdrop that the study aims to establish the influence of risk transfer strategies on implementation of KeRRA road construction projects between 2019 and 2023 in Migori County, Kenya.

1.1 Statement of the Problem

In Kenya, a Price Waterhouse Coopers [PwC] research that covered 1,640 road projects in six counties in the lake region in 2020, found that in Kakamega County the rate of implementation and completion of road projects was at 80%, Kisumu County was at 70%, Busia County 74%, Kisii County 71%, Nyamira County 65% Homabay County 49% and Migori County 43%. Only three Counties completed their projects with a 100% on time and within budget success rate (PwC, 2020). In this category Kakamega County again led with 100% success rate while Migori was last with 49% the rest of the Counties either failed to meet the objectives and/or scope or did not meet the deadlines and budget. In another similar research study, Klynveld Peat Marwick Goerdeler [KPMG] consulting firm carried out an analysis of road infrastructure in Migori County and the Neighbouring Kisii County in 2021, both Kenya Urban Roads Authority (KURA) and KeRRA roads were included in the study. According to the report, approximately 70% of KeRRA roads had suffered at least one project implementation failure within the year of study, on the other hand KURA road projects implemented in the same year had posted 98% completion rate. Major studies conducted and done based on critical success factors of project management (Fan et al., 2020; Fapohunda & Stephenson, 2020; Egan, 2021) have shown that risk transfer is an important part of project implementation success. Formulating a consistent risk management strategy is a difficult task for any road construction firm, however, if the right strategy is identified, making that strategy work by employing it throughout the lifetime of the project guarantees implementation success. A recent review of road construction projects in Kisumu County by National Transport and Safety Authority revealed that when risk transfer strategy is put in place by the county government few road construction projects fall behind implementation schedule. Most studies conducted in this area have dwelt majorly on building construction industry, few of the studies conducted have focused on road construction. Added to the above, the area of risk transfer and its relationship with road construction projects implementation have largely been ignored. It is against this backdrop that this study aimed to establish the influence of Risk transfer on implementation of KeRRA road construction projects in Migori County, Kenya.

1.2 Research Objective

To establish the influence of risk transfer on implementation of KeRRA road construction projects in Migori County.

1.3 Research Hypothesis

H_{O1}: Risk transfer has no significant influence on implementation of KeRRA road construction projects in Migori County.

II. LITERATURE REVIEW

2.1 Theoretical Review

This study was guided by the theory of Project Implementation developed by Fugate and Knapp (1996). The theory was used by Assaf and Al-Heijji (2022) who argued that Road Project Contractors employ project implementation theory to make planned changes in organizations by creating environments in which successful project implementation can be rooted. Kaliba et al. (2020) refers to implementation as a series of steps taken by responsible organizational agents to plan change process in order to bring out successful realization of project objectives. The current study focused on the stage of project implementation. Fugate and Knapp (1996) asserted that overreliance on the theoretical aspects is the single most important factor distinguishing a successful project from a non-starter.

This theory is relevant for the study because it covers fundamental issues surrounding road project implementation which is lined up for empirical analysis in this study. Nima and Keyvan (2022) assert that to successfully implement a project is usually difficult and intricate and procedural steps in project implementation have been difficult to follow since project implementation is complex. In line with project implementation theory, the project manager has to devote more time and energy on human and technical variables as the key to the success of project. It is further argued that it is apparent that a number of determinants are capable of affecting project implementation if not handled with great care early. Such determinant factors include risk transfer strategies put in place. Asaf and Al-Heijji (2019) argue that the theory as practiced today rests on an implicit and wide argument that explains the other concerns of project management methods.

2.2 Empirical Review

Risk Transfer strategies encompasses risk sharing strategy which allocates risk ownership of an opportunity to another party who is best able to maximize its probability of occurrence and increase the potential benefits if it does happen (Khameneha & Mahmood, 2020). Moving threats and sharing opportunities are similar in that a third party is used, those to whom the threats are transferred take on the liability and those to whom opportunities are allocated are

allowed to share in the potential benefits. When the project team themselves are not fully capable of taking advantage of the opportunity, they might call in another company to partner with. The expertise of another company may be used to leverage to maximize the returns on the investment (Mandala, 2020).

Risk transfer strategy often commences with the identification of potential risks which is then followed by the risk response phase, where the potential impact of risk is assessed, and risk reduction measures are formulated. Sebestyen and Tamas (2020) did a research study on broader view of risk management process in projects in Hungary, their study employed panel research design. They discovered in their study that when conducted, risk management helps quantify and place risks in some order of priority and highlights corrective decisions to be made early enough, hence increases the possibility of successful project implementation. They added that the effectiveness of subsequent stages of risk management usually depends on the evaluation of the likelihood and magnitude of risk. Panel research design is non experimental in nature hence may not yield conclusive results, moreover the study mainly focused on the risk management processes which only gives a broad view of the problem at hand as opposed to the current study which has narrowed on the risk management strategies. The current study also used concurrent triangulation design which converged both qualitative and quantitative data in order to give a comprehensive analysis

Dandage et al. (2020) conducted a similar study in India on analysis of interactions among barriers in project risk management. The study used cross-sectional survey research design and found that to totally maintain a strategic distance from dangers; hazard shirking requires the discarding of the entire mission. The study found out that by and by, it is not important to dismiss the entire task; and that risk transfer can be performed by changing the venture design or technique to avoid inadmissible dangers. Undertaking destinations can be separated from the negative hazard impacts by varying the venture targets, for instance broadening the timetable, shrinking the task scope or changing the project procedure. Further, the study noted that risk transfer does not take out the dangers, but rather essentially hand over the obligation regarding hazard administration and risk for chance introduction to different entities with expertise. The findings of this study cannot be generalized to the current study due to disparity in the research design; however, Dandage et al. (2020) used cross-sectional survey research design whereas the current study used descriptive survey research design which seeks information that describes existing phenomena.

Major pronounced development projects in the world are infrastructure projects that include: roads, railway line, airports, water ways and pipeline (Catalao et al., 2020). In a study that has given in-depth road implementation programme in London, Howe and Richards (2020) indicated that risk transfer as a risk management strategy plays an important role in successful road project implementation, they noted that passive risk transfer goes beyond implementation and incorporates the concept of sustainability of these programmes by taking advantage of the positive risk as it happens but not actively pursuing it by handing it over to third parties. In the study the target population was 120. The researchers have indicated that, project leaders ensure robust risk management strategies are instituted to ensure that all the community development projects including roads are implemented with greater success. A report by National Audit Office [NAO] (2020) indicates that roads infrastructure in England's capital is among the best roads in the world and their durability is only comparable to two G7 countries USA and Germany as a result of instituting risk management strategies at the planning stages of the road projects. These studies (Richards, 2020; NAO, 2020), though pronounced on advantages of risk transfers, the study is not clear on the methodologies used; the target population used is also not commensurate to the magnitude of the entire population. The current study used a target population of 553 which is deemed inclusive for such a research study.

Some factors attributable to the poor implementation of projects in the road construction industry are the undesirable managerial techniques (Kotb & Ghattas, 2020); there is recurrence of projects delivered on over-budgeted costs, time overruns and often not at the expected client's satisfaction levels (Rwelamila, 2020). However, these projects are predisposed to a high degree of risks; a reoccurring phenomenon in construction that, if it materializes, can deviate the project from its pre-established objectives. The materialization of time and cost risks can, in extreme cases, undermine the economic look of a project, thereby turning a potentially lucrative project into an abortive undertaking (Mafundu & Mafini, 2020). The effects thereof may be quantified using many terms: cost and time overruns, destruction of property and injury to people. It follows that management of risk, which might endanger successful implementation of a project is very necessary to achieve Project success, this calls for Risk management where development of effective risk mitigation strategies whereby risk transfer is a crucial component. Although the construction industry is unquestionably known for its importance in economic development through employment provision and infrastructure development (Nawaz et al., 2020; Mwangi & Ngugi, 2020), it has also been criticised for its poor implementation (Osuizugbo, 2020; Muzondo & McCutcheon, 2020). A study in Nigeria by Simota et al. (2020) concluded that risk transfer, when applied assists in placing risks in some order of priority and highlights decisions to be made towards project success. Similar conclusions were drawn in Naude and Chiweshe's (2020) research on SMEs in South Africa; the sampling procedure applied was multistage sampling which achieved 384 respondents. The sampling design used on the study was purposive sampling method. Primary and secondary data was collected using questionnaires and document review respectively. Data was descriptively analyzed and revealed that

risk transfer was effective in the road construction sector. According to a Kenya National Highways Authority [KeNHA] report (2020), road construction sector accounts for 7% of global employment and contributes 10% to the global Gross Domestic Product hence emphasizing its significance. Apart from research design difference, these studies were conducted in other countries whose culture and policies on managing projects are not the same as Kenya hence the results cannot be generalized to the current study.

World Vision Kenya (2020) has shown that risk transfer component in projects implementation has gained popularity in Kenya over the past two decades. However, the report showed that a number of projects proposers and implementers; more specifically, projects designed by government have completely ignored the inputs of the risk management strategies. World Vision Kenya (2020) observed that this has led to delays in the construction of various road projects in Kenya that are initiated by both the County and National Governments making the local population feel that their interests like jobs creations have been ignored. Hassan and Kisimbii (2020) in a study of influence of Stakeholder participation on Projects Implementation in Arid and Semi-Arid Regions, a case of road construction projects in Garissa County found out that most construction projects implemented in Kenya fail because, apart from disregard for use of risk management strategies like risk transfer, the communities feel that the projects are imposed on them by either the government or development partners with some hidden agendas. They have concluded that Kenya technocrats need to understand the importance of risk management and the community in development since project success depends on managing risk and it is these community members whose interests are targeted by the various projects implemented. It further adds that there seems to be little attention on risk management in project implementation from various researchers and other scholars, an issue that has been addressed by this study. Kirira et al. (2020) asserts that failure to employ a risk management strategy like risk transfer has escalated conflicts in relation to water projects implemented in Wajir County in Kenya. Though the two studies (Hassan & Kisimbii, 2020; Kirira et al., 2020) have revealed project implementation challenges and influence of stakeholder participation, they did not explicitly expound the contribution of risk transfer on project implementation which is the primary focus of the current study.

Ochenge (2021) explored project management practices and implementation of road infrastructure projects done by local firms in the lake basin region of Kenya. The study area encompassed Migori County. The results indicated that project risks management specifically risk transfer had significant effects on the implementation of road infrastructure projects. Apart from the fact that the area of study is too extensive with varying climatic and geographical differences hence its results may not mirror the exact situation in Migori County in particular, the study employed a two pronged approach since the researcher infused the role of the community and risks, this might be confusing and it had not clearly shown the interconnect between the community in the risk management strategy mix and risk transfer, the current study has specifically focused on the influence of risk transfer as a risk management strategy in road project implementation in Migori County.

III. METHODOLOGY

3.1 Research Design

A concurrent triangulation design was adopted for this study. Concurrent triangulation method is where the researcher converges or merges quantitative and qualitative data in order to provide a comprehensive analysis of the research problem. In this design, the investigator collects both forms of data at the same time and then integrates the information in the interpretation of the overall results. Triangulation of data is where data are collected through multiple sources to include interviews, observations and document analysis; thereafter, results from qualitative data are compared to the outcomes from quantitative data (Creswell, 2023).

Data for this study were collected through use of a questionnaire and an interview schedule. These two data sets are then analyzed and compared to determine convergence or divergence on the influence of risk transfer and implementation of KeRRA road projects in Migori County.

3.2 Target Population

The target population for this study was 553. Out of this 92 comprised of 51 road contractors and 41 sub-contractors with construction projects listed in the Department of Roads, Transport and Public Works register in Migori County as having been awarded contracts between 2020 and 2023. Also targeted were sub county roads committee members who normally carry out monitoring of roads projects. There are nine members per project hence, the 51 projects give a total of 459 respondents. Two Consultant Engineers who are KeRRA employees in the county were key informants for the study; therefore, the accessible target population for the study involved 553 respondents. Most of the road projects targeted for study take between 1 to 5 years to complete hence, the choice of the 5 year period maximum (Republic of Kenya [RoK], 2020). According to information obtained from County Public Works Offices in Migori and confirmed from available reports, a total of 300 road contractors were prequalified and registered to perform road works in the county, though only 92 have been awarded contracts within the specified period, 51 of them to work on roads as main contractors and 41 as sub-contractors (County Integrated Development Plan [CIDP], 2020).

Table 1

Target Population

No	Respondent	No. * Sub Counties	Total
1	Road contractors (companies)	51 Contractors and 41 Subcontractors	92
2	Sub County Roads Committee members	51 projects * 9 members of SBRC	459
3	Consultant Engineers	2 engineers for the County	2
	Total		**553**

Source: *Migori County Public Works Office* (2022)

3.3 Sample Size and Sampling Procedures

Yesemin and Dan (2020) explain that sampling size is the process of selecting individuals from the target population to act as representatives in a research study. Considering the population of CRC and contractors is high, a sample was selected from the target population; however, consultant engineers were purposively selected to participate in the study. The study employed Yamane (2023) formula for sample size determination. The sample size was calculated based on 5% margin of error/ level of precision and 95% level of confidence. The formula is as follows:

$$n = \frac{N}{1 + N(e^2)}$$

Where,

n is the desired sample size

N is the finite population, which are 551 respondents

e is the margin error/ level of precision taken as 0.05

The formula gives:

$$n = \frac{551}{1+551(0.05^2)} = 231.75$$

The breakdown of the sample size per contractors and members of CRC based on their proportion in the population is provided in Table 2 below.

Table 2

Sample Size

No	Respondent	Target	Computations	Sample size
1	Road contractors (companies)	92	92/551*232	39
2	Sub County Roads Committee members	459	459/551*232	193
3	Consultant Engineers	2	All (100%)	2
	Total			**234**

Source: *Migori County Public Works Office* (2022)

The respondents were sampled as follows; 39 road contractors, 193 Sub County Road committee members and 2 consultant engineers.

3.4 Sampling Procedures

Sampling is the process of choosing a section of the accessible population from which the study is done through use of various techniques (Saunders et al.,, 2020). The sampling procedure guarantees that the inferences of the study can be generalised to the whole population, which was not selected (Segal, 2020). In selecting respondents for the investigation, probability and non-probability sampling methods were used. Simple random sampling method was applied in selecting Sub County Roads Committee members and KeRRA road contractors. This sampling technique allows each object or element in the sample frame to have an equal chance of being selected based on the proportion of their number in the target population. This design involved identifying a suitable sample frame, deciding on a suitable sample size, choosing the most appropriate sampling method and ensuring that the sample represents the whole population under investigation (Hodges, 2020).

With reference to Table 1, each category was selected. In order to select 39 out of 92 contractors, simple random sampling method was applied to select the respondents through use of lottery technique. This involved writing the contractors codes in sheets of paper (92) and thoroughly mixing the codes after which only 39 selections were made as representatives of the whole population. The procedure was repeated for CRC members. The advantage of this method is that it allows the researcher to obtain a sample that best represents the entire population under study (Lincoln et al. 2020). This method ensures that each respondent has equal chance of being selected based on the proportion of their representation in the target population. On the part of KeRRA officials, purposive sampling method was used in their selection to collect information from them with regard to how they ensure that set standards of road constructions are followed and implemented by all stakeholders involved in KeRRA road construction projects.

3.5 Data Collection Procedures

A research approval letter was obtained from the Graduate School of Rongo University. This letter was forwarded to the National Commission for Science, Technology and Innovation (NACOSTI) which granted the research authorisation and permit. Primary data was collected using a structured questionnaire and an interview schedule to solicit information on government policies, risk transfer strategies and implementation of KeRRA road projects. A questionnaire was used because it is easy to administer and the respondents filled the required data even in the absence of the researcher. Tserng et al. (2021) suggest that it is appropriate to collect data from samples using structured questionnaires.

3.6 Data Analysis Techniques

Considering the paradigm and methodology of this study, analysis and presentation of data collected from the field are analysed using qualitative and quantitative approaches.

Quantitative Data Analysis

Quantitative data are analysed by using descriptive and inferential statistics. Inferential statistics was used to analyse data from the Likert scale. In descriptive analysis, frequencies, means and standard deviations are used to answer the research objectives. Coding and entry of quantitative data were assisted by use of Statistical Product and Service Solutions (SPSS) Version 25.0 computer software. Quantitative analysis begun by editing, coding, cleaning and transforming data. Once data were properly entered, analysis of data was undertaken. Regression analysis was done to determine the effect of each independent variable on the implementation of road infrastructure projects (Gujarati, 2020). This was to establish the specific form and strength of the relationship between risk transfer strategies and stakeholder participation, on one hand and implementation of KeRRA road construction projects on the other hand. This was tested at 95% level of confidence, implying that 95 times out of 100 we can be sure that there is a significant influence between two sets of variables, and a 5% chance that the relationship does not exist. This error margin of 5% is used to test the null hypotheses. For the variables whose calculated p value were less than 0.05, the null hypothesis that corresponds to it is accepted. $H_{05,}$ which tested the combined relationship of four independent variables and the moderating variable on the dependent variable, was analysed using multi-linear regression analysis.

Qualitative Analysis

In this study, key informant interviews were used to collect qualitative data from two Consultant Engineers employed by Migori County Government. Key informant interview questions were used to gather primary data that were measured thematically, by classifying the responses into broad categories. The data collected were compared and consistencies present were noted. The consistency that was deemed to be thematic was identified and coded. A theme was considered present in the data if it occurred at least three times across all interviewees. This cut-off point of three was used because it represents a 10 percent endorsement which is the lowest permissible effect based on Hair (2021) non-linear arcsine transformation criteria. A value 2 was assigned when a theme appears, or is deemed present, and 1 when the theme does not appear (was deemed to be absent) on a respondent responses. Hence, all interviews had a series of 1s and 2s for all themes determined to have occurred at least three times.

3.7 Hypothesis Testing

The study has utilized the t-statistic to test the hypothesis that a coefficient is equal to zero. The t-statistic is interpreted on the basis of the absolute values and the probability values assuming that the coefficient is equal to zero. The decision on whether the t-statistic is significant or not is made in reference to the probability value. According to Williams et al. (2020) the probability value measures the strength of evidence in support of the null hypothesis and refers to the probability of observing a test statistic as extreme as the t-statistic assuming the null hypothesis is true. It can also be defined as the lowest significance level at which a null hypothesis can be rejected (Gujarati, 2020). If p value is less than the significance level, the null hypothesis is rejected. This is to say that if the estimated t-value is greater than the theoretical t-value in absolute terms ($|t| > |t_{05}|$), we accept the alternative hypothesis as we reject the null hypothesis. If the estimated t-value is less than the theoretical t-value in absolute terms, the alternative hypothesis is rejected as we accept the null hypothesis. An explanatory variable is significant when $|t| > |t_{05}|$ and insignificant when $|t| < |t_{05}|$.

IV. FINDINGS & DISCUSSION

4.1 Response Rate

Responses in this study was obtained from road contractors, sub county roads committee members and consultant engineers from Migori County KeRRA office. Data for the study came from 229 out of 232 questionnaires which was distributed to roads committee members and contractors. Three questionnaires were excluded from analysis because of incompleteness and problems of outliers, making the total response rate for questionnaires to be 229 which is 98.7%, this was deemed sufficient for analysis. Mugenda and Mugenda (2019) classify response rate of above 75.0% to be extremely good in survey studies.

Table 3

Response Rate

Sampled	Responded	Response rate (%)
232	229	98.7

The study focused on establishing the degree to which risk transfer strategies are being implemented during construction of KeRRA road projects in Migori County. Nine statements of risk transfer were developed in a Likert scale of five to determine how they were taken into consideration during road constructions. A summary of the responses is presented in Table 3.

Table 4

Risk Transfer and Implementation of KeRRA Road Construction Projects in Migori County

Statement	N	Mean	Std. Dev.
There are many other risk transfer reports and set actions undertaken during construction of roads	229	3.8821	1.39833
System for risk reporting and action to be taken are active during road project implementation process	229	3.4498	1.32233
Tender documents are clear that financial risks are transferred to contractors in case they delay in executing the project to save taxpayers money	229	2.5983	1.22302
Road projects have fixed budgets to reduce cost overruns	229	4.0961	.79991
Some functions / activities after budgeting are outsourced to reduce incidents of project delays	229	4.2009	.94303
Forward contracts which fix material supplies prices are used to address cost overruns and reduce price volatilities	229	3.7729	.81701
Legal agreements are instituted in order to protect the project from legal disputes arising from project cost changes due to lack of weak transfer agreements that may cause project delays	229	3.7293	.86149
Every person, machine & the entire project is properly monitored and insured (through payment of regular premiums) to shield government on costs associated with injuries, theft, fire or breakages	229	3.9913	.95049
Projects are regularly monitored and project costs changes are reported during project lifetime to avoid cost overruns	229	3.7773	.86258
Valid N (listwise)	**229**	**3.7220**	**1.0198**

In table 4 respondents agree (M=3.88, SD=1.39) that there are many other risk transfer reports and set actions undertaken when constructing KeRRA roads in Migori County. This means that there exists documented evidence of how risk transfer occurs during road constructions. They also appear to be undecided (M=3.44, SD=1.32) on whether the system of risk reporting and action to be taken is active during road construction project implementation process. This means that some roads have while others do not have a system for risk reporting and actions to be taken during

road construction processes in Migori County. Nevertheless, the Key Informant number two stated the following with respect to risk identification and reporting:

> *"Continuously monitor identified risks and assess the effectiveness of mitigation strategies. Regularly report on risk status to project stakeholders and project management."*

On whether tender documents are clear and that all financial risks are transferred to contractors in case of delays in the execution of projects, most respondents appear to be unsure (M=2.59 with higher standard deviation scores SD=1.22) suggesting that tender documents are not clear at times on financial risk transfer. The failure to include how financial risks can be transferred to contractors in case of their failure to complete the projects puts taxpayers at a loss as the contractors normally end up transferring the risks to taxpayers hence increasing the cost of road constructions. However Key Informant number one clarifies that they do undertake risk transfer activities as testified here:

> *"Risk transfer by clear indications on the tender documents showing that contractors to bear financial risks due to their own delays in project execution."*

This action tends to save taxpayers money by ensuring that contractors perform and execute the projects without delay once money for construction has been disbursed to their accounts according to the tranches agreed in the deed of contract. It is also agreed by most respondents (M=4.09, SD=0.79) that KeRRA road projects have fixed budgets which help to reduce cost overruns. This means that contractors have to put in place robust risk prevention practices to ensure that cost overruns are addressed during road construction.

Another strategy of transferring risks is where the respondents agree (M=4.20, SD=0.94) that some activities of road construction after budgeting are outsourced to reduce incidents of project delays. This means that as a way of transferring the risks, road contractors outsource and sub contract various tasks in order to minimise risks and ensure that the issue of projects cost overruns or delays are addressed. Most respondents agree (M=3.77, SD=0.81) that forward contracts which fix material supplies prices are utilized to address the cost overruns and reduce price volatilities. This helps contractors to negotiate with suppliers and other entities at the beginning of the contract on prices of supplies to be purchased at a future date. The use of forward contractors helps to address price volatilities shocks in case of increased inflation and product price surge.

The statistics in table 4 also reveals that respondents agree (M=3.72, SD=0.86) that legal agreements are signed so as to protect road projects from court disputes coming from roads project construction which may cause cancellation, abandonment or delays in project implementation. Therefore, risks associated with disputes that could arise and lead to court litigation processes are always avoided at the beginning by sealing all loopholes that can be used, this is done by having all agreements in the tendering, process and set standards of construction of roads by KeRRA legally instituted.

The statistics further show that respondents agree (M=3.99, SD=0.95) that every person and machine used during KeRRA road construction projects is always monitored to ensure that they are insured in order to shield the government from extra costs associated with injuries, theft, breakages and fire. As a way of transferring risks, the Constituency Roads Committee members ensure that all road construction equipment and workers are insured.

Lastly, respondents agree (M=3.77, SD=0.86) that KeRRA road construction projects are often monitored and project cost changes are reported to the concerned authorities during project lifetime to avoid cost overruns. Composite scores show that respondents agree (M=3.7220, SD=1.0198) that risk transfer strategies are implemented during construction of KeRRA road projects in Migori County. This means that as part of risk management strategy, risk transfer is a common occurrence in KeRRA road projects in the county.

Implementation of KeRRA Road Construction Projects in Migori County

The dependent variable of the study is the implementation of road construction projects financed by KeRRA in Migori County. The respondents were asked to state the degree to which different aspects of projects were implemented with statements measured on a Likert scale of five. The descriptive results are provided in table 5.

Table 5

Implementation of KeRRA Road Construction Projects in Migori County

Items	N	Mean	Std. Dev.
The project is implemented according to the set budget.	229	3.4323	1.60071
Project is implemented according to the details in the bill of quantities.	229	2.6463	1.43324
The road construction is being implemented according to the planned timelines.	229	2.4891	1.33315
Project supervisors have a way of ensuring that the project is always on track.	229	3.1747	1.40646
The road project being implemented meets value for money returns for on road and off-road users.	229	2.1397	1.53544
The project is being implemented according to the quality specifications in the road contract.	229	2.1092	1.59807
Valid N (Listwise)	**229**	**2.6652**	**1.4845**

Statistics in table 5 indicate that respondents are neutral (M=3.43, SD=1.60) on the statement that road projects are implemented based on set budgets. It suggests that a significant number of respondents appear to disagree that the road projects are done according to the set budgets. This implies that there is constant variation in road projects costs since the budget approved at the tender award stage is changed until the project is finished. This could explain the delays in completion of KeRRA road construction projects and escalation of their costs regularly. Key Informant number two stated that the issue of cost is mainly influenced by shift in government priorities and changes in the availability of funds which affects money availability for project execution. According to the other Key informant, road projects in Migori County often rely on national government budgets and at times on external funding. Such sources of funding can be unpredictable, at times leading to delays, scope reductions and compromised quality.

Secondly, respondents appear to disagree (M=2.64, SD=1.43) on the question of construction projects by KeRRA being done according to the details in bills of quantities. Whereas it is the expectation that all projects are properly designed and details included in the bill of quantities before it is awarded to the contractor, a significant number of respondents felt that this is not the case as some project details are changed from the original bill of quantities which could affect the final outcome of the project once completed. This information was supported by Key Informant number two who stated the following:

> *"Sometimes the road is completed within the specified timelines; however, contract documents are doctored by county officials so as to downgrade the specifics in road while the contract sum is maintained. This is the latest method being used to siphon money from counties. This gives a raw deal to the road users."*

It is therefore clear that details on a project contract are at times changed by the officials in charge of supervision which results to construction of sub-standard road networks.

Many respondents appear to disagree (M=2.48, SD=1.33) that KeRRA road construction projects are being implemented according to the planned timelines. This means that issue of delays is a common feature associated with KeRRA road projects in Migori County. To get the clear picture of this situation, Key Informant number one stated that time overrun was factored in through establishing deadlines according to phases by contractors. Nevertheless, these time overruns cost burden is often borne by the taxpayer.

Further, the respondents seem to disagree (M=2.66, SD=1.48) with the assertion that KeRRA road projects being implemented in Migori County are done based on the quality specification in the road contracts. This means that low quality roads are constructed because the contractors appear to be the ones left to implement the projects as KeRRA personnel appear not to be keen on details. Composite values show that the mean values were 2.66 with standard deviation of 1.48 which suggest that respondents neither agree nor disagree fully on the level of implementation. It can be concluded that the performance of KeRRA road project implementation is at below average level in Migori County, Kenya.

The empirical analysis also involved carrying out the following diagnostic tests:

H_0: Risk transfer has no significant influence on implementation of KeRRA road construction projects in Migori County.

Implementation of KeRRA road construction projects = f (risk transfer, random error)

$$y=\beta_{02}+\beta_2 RT_+ \varepsilon \qquad (1.1)$$

Considering that Model 1 adjusted R-squared values failed to show the predictive value, Risk transfer was added in the equation while other variables were assumed to be constant. The results are provided in Table 6.

Table 6
Model Summary on RT and IP

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.047[a]	.002	.007	1.00330883

a. Predictors: (Constant), RT

The model results show that correlation coefficient is 0.047 with an adjusted R squared of 0.007 which means that only 0.7% of change in implementation of KeRRA roads projects could be explained by risk transfer. This means that the influence of risk transfer on the implementation of rural roads projects is very low. To establish the fitness of the model, an f-test was computed and results provided in Table 7.

Table 7
ANOVA[b] on RT and IP

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.502	2	.251	.249	.780[a]
	Residual	227.498	226	1.007		
	Total	228.000	228			

a. Predictors: (Constant), RT, RA
b. Dependent Variable: IP

The prediction model (1.1) is not statistically significant from the results F (2, 226) =0.249, p =0.780. The result suggests that there is no sufficient evidence to conclude that the regression model fits the data. Hence, the predictor variables in the model do not actually improve the fit of the model. This means that none of the predictor variables in the model are statistically significant. Further, Table 8 presents the regression coefficient results for the model 1.1.

Table 8
Coefficients[a] on RA, RT and IP

Model		**Unstandardized Coefficients**			
1		β	Std. Error	T	Sig.
	(Constant)	8.219	.066	.000	1.000
	RT	.013	.078	.162	.871

a. Dependent Variable: IP

The equation 1.1 can be written as:

$$y=8.219 + 0.013RT$$

The results, therefore, show that risk transfer do not explain the implementation of KeRRA road construction projects in Migori County when other variables of risk management strategies are kept constant. Therefore, risk transfer strategies do not have a significant impact ($p>0.05$) on the implementation of KeRRA road projects in Migori County, Kenya.

Table 1.9: Coefficients[a] on, RT, SP, RMS*SP and IP

	Model	**Unstandardized Coefficients**			
		β	Std. Error	T	Sig.
1	(Constant)	.052	.034	1.514	.131
	RT	.132	.036	3.703	.000
	SP	.586	.048	12.175	.000
	RMS*SP	.096	.037	2.584	.010

a. Dependent Variable: IP

Equation (1.2) can be written as:

$$y= 0.052 + 0.132RT + 0.586SP + 0.096RT*SP \quad (1.2)$$

Where: y = Implementation of road construction projects, RT = Risk transfer; SP = Stakeholder Participation; RT*SP = Represents interaction between risk transfer and stakeholder participation. The result in Table 1.9 show that there exist significant relationships between risk transfer ($\beta = 0.132$, $|t| = 3.703$, $p=0.001$) and implementation of road

construction projects by KeRRA in Migori County on the other hand. The estimated t-statistic values for risk transfer (df = 227, |t| = 3.703) is higher than the critical t-statistic value ($|t_{05}| = 1.943$). Therefore, the null hypothesis is rejected and the alternative hypothesis accepted leading to the conclusion that there is significant relationship between risk transfer and implementation of KeRRA road projects in Migori County.

With respect to the interaction of the RT and SP, it can be seen that the introduction of stakeholder participation indicates that the moderation is significant (β=0.096, |t| = 2.584, p = 0.010). The estimated t-statistic value (df = 225, |t| = 2.584) is higher than the critical t-statistic values (df = 225, $|t_{05}| = 1.943$). This implies that the introduction of stakeholder participation positively moderates the relationship between risk transfer and implementation of KeRRA road projects.

4.2 Discussion

The study findings reveal that risk transfer activities are undertaken (M=3.72, SDv 1.01) during implementation of KeRRA road construction projects in Migori County. The t-statistic indicates that there is a significant relationship (β=0.132, |t|=3.703, p=0.001) between risks transfer interventions and implementation of KeRRA road projects in Migori County resulting to rejection of the second null hypothesis (H_{02}). In conformity to the study results, Kimani (2017) also found out that risk transfer strategies (β=.114, t=1.982, *p*=0.050) have significant influence on performance of public secondary schools construction projects in Murang'a County. Similarly, Mukamwezi (2022) regression results revealed that risk transfer had a significant positive effect on road construction performance in Rwanda. When the moderating variable; stakeholder participation was introduced, the influence remained significant (p<0.05). This means that introduction of stakeholder participation in risk transfer activities enhances the implementation of KeRRA road construction projects in Migori County.

The findings correspond well to. Sebestyen and Tamas (2020) study on broader view of risk management process in projects in Hungary, their study employed panel research design which is non experimental in nature. They discovered in their study that when conducted, risk transfer as a risk management strategy, helps quantify and place risks in some order of priority and highlights remedial decisions to be made early, hence increases the likelihood of successful project implementation. They added that the efficacy of subsequent stages of risk management usually depends on the evaluation of the likelihood and magnitude of risk. Equally, Dandage et al. (2020) also conducted a study in India on analysis of interactions among obstacles in project risk management. The study used cross-sectional survey research design and found that to totally maintain a strategic distance from dangers; hazard shirking requires the abandoning of the entire undertaking. By and by, it isn't important to dismiss the entire task; and that risk transfer can be performed by changing the venture design or technique to keep away from inadmissible dangers. Undertaking destinations can be separated from the negative hazard impacts by changing the venture goals, for instance broadening the timetable, diminishing the task scope or changing the venture procedure, and so forth (Deloach, 2020). Risk transfer does not take out the dangers, but rather essentially hand over the obligation regarding hazard administration and risk for chance introduction to third party agents.

The findings of Aduma and Kimutai (2020) on project risk management strategies and project implementation at the national Hospital Insurance Fund is in agreement with the findings of this study. The objective of the NHIF study was to establish the effect of project risk transfer, risk avoidance and risk acceptance management techniques on project implementation at National Hospital Insurance Fund (NHIF) in Kenya. The study sought to analyze the influence of risk transfer in project implementation at NHIF projects in Kenya. The study revealed that risk transfer influences implementation of NHIF projects to a great extent. The study also revealed that to a great extent, use of outsourcing, high cost of risk premium and stakeholder involvement in risk transfer influence successful implementation of NHIF projects. The study found out that use of insurance policy and contractual agreements to transfer risks influences implementation of NHIF projects to a great extent. The study concluded that risk prevention has the greatest effect on NHIF project implementation followed by risk transfer then risk acceptance, while risk control has the least effect on NHIF project implementation. The current study therefore lends empirical validation of the effectiveness of risk transfer on successful road projects implementation. The findings support Kirira et al. (2020) study which revealed that transfer of risks influenced performance of KenHA road constructions projects in the Coast region of Kenya to a great extent.

A study by World Vision Kenya (2020) carried out on infrastructure projects is also in agreement with this study findings as it revealed that risk transfer component in project implementation has gained popularity in Kenya over the past two decades. However, the report has shown that a number of projects proposers and implementers; more specifically, projects designed by government have completely ignored the inputs of the risk management strategies like risk transfer. This has led to delays in the construction of various road projects in Kenya that are initiated by both the county and national governments making the local population feel that their interests like job creations have been ignored. Hassan and Kisimbii (2020) studied influence of stakeholder participation on project implementation in arid and semi-arid regions, a case of road construction projects in Garissa County. The study found

out that most construction projects implemented in Kenya flop because of disregard for use of risk management strategies like risk transfer, the communities feel that the projects are imposed on them by either the government or development partners with some hidden agendas. They concluded that Kenya technocrats need to understand the importance of risk management and the community in development since project success depends on managing risk and it is these community members whose interests are targeted by the various projects implemented. Kirira et al. (2020) asserts that failure to employ a risk management strategy like risk transfer has intensified conflicts in relation to water projects implemented in Wajir County in Kenya. Additionally, a study by Ochenge (2021) explored project management practices and implementation of road infrastructure projects done by local firms in the lake basin region of Kenya also conformed to the study findings. The results indicate that project risk management, specifically risk transfer have significant influence on the implementation of road infrastructure projects.

In a contrasting view, Dikman (2020) in a study, asserted that success of implementation of road construction projects depends on the competence of the key players such as the owners, the consultants and the contractors at project scope management level and not necessarily on observing risk management strategies like risk transfer. Corresponding to this, Project Management Institute (PMI, 2021) asserts that project scope management is "the processes required to ensure that the project includes all the work required, and only its observance is crucial to complete a project successfully" disregard for other processes have little consequence on project implementation success. In a similar observation, Abdul-Rahman et al. (2021) demonstrate the relationship between the dependent variable, road project implementation delays and the independent variables. The independent variable issues include late payment, disregard for risk transfer, poor cash flow management, insufficient financial resources and financial market instability. The results of the study indicate that risk transfer has the least influence on project implementation.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

As a way of transferring risk, some activities and functions are outsourced by contractors and KeRRA in order to spread risks across many parties hence effective project implementation. The transfer of risks also ensures that project cost overruns are addressed through fixed budgeting. The respondents indicated that many risk transfer reports were produced and which set out actions to be taken when constructing roads. The study also found out that all road project workers and machineries are properly insured in order to shield the Government from cost related to breakages, thefts, injuries and fire. Further, there exists significant influence of risk transfer strategies on implementation of KeRRA road construction projects in Migori County ($p<0.05$). When a moderator is introduced, the outcome becomes more significant. It is deduced that improvement in risk transfer strategies results to increase in the implementation of KeRRA road construction projects in Migori County.

5.2 Recommendations

As a way of ensuring risk transfer strategies are properly undertaken, there is need for activation of a system of risk reporting and remedial actions placed in order to ensure smooth and effective road project implementation process. All tender documents need to clearly specify the risks (including time and finances) that should be borne by different actors in the road construction projects including KeRRA, contractors, sub-contractors, other Government agencies and utility service providers in order to save taxpayers' money.

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