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THE RELATIONSHIP BETWEEN RISK IDENTIFICATION AND THE PERFORMANCE OF NATIONAL IRRIGATION AUTHORITY PROJECTS IN KENYA

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ABSTRACT

Risk and uncertainty are inherent to projects and the incidence of risk in agricultural projects is important to policymakers at national and international levels. Agricultural projects are subject to a wide range of risks due to the variable economic and biophysical environment in which farming operates. The general objective of this study was to investigate the relationship between risk management processes and the performance of National Irrigation Board projects in Kenya. Specifically, the study analysed the relationships between risk identification, on the perfomance of National Irrigation Board projects. The study also examined the moderating effect of stakeholders management on the relationship between risk management processes and the performance of National Irrigation Board projects. The National Irrigation Authority projects in Kenya were chosen as it is mandated to oversee the performance of national irrigation projects in Kenya. This study was anchored on five theories, namely; theory of change, enterprise risk management theory, uncertainty theory, and stakeholder theory. This study adopted a descriptive research design and a positivism research philosophy. The target population of this study was the staff in all the 8 irrigations schemes under National Irrigation Board. The irrigation schemes include Mwea Irrigation Scheme, Bura Irrigation Scheme, Tana hola irrigation Scheme, Perkerra Irrigation Scheme, Ahero Irrigation Scheme, Bunyala Irrigation Scheme, and West Kano Irrigation Scheme. The unit of observation was staff members under managers, deputy managers, supervisors, farm project managers, project team leaders, and farmers representatives. The study used a questionnaire for data collection. Primary data was collected using structured questionnaires and data was analyzed using SPSS. The study used stratified random sampling to select 205 staff from the target population. Proportionate sampling was used to select the number of staff per category. A pilot test was conducted to test the reliability and validity of the data collection instruments. The study conducted various tests including normality tests, multicollinearity, heteroscedasticity, and autocorrelation tests. The test of the hypothesis was done at a 95% confidence interval. The statistics generated were descriptive statistics and inferential statistics. The study found that risk identification positively and significantly relates with performance of NIA projects in Kenya. The study thus recommends management of irrigations schemes under National Irrigation Board to improve the practice of risk identification within their organization in order to improve their performance.

Key Words: risk management processes, risk identification, stakeholders management

Background of the Study

Risk and uncertainty are inherent to projects and the incidence of risk in agricultural projects is important to policymakers at national and international levels. Agricultural projects are subject to a wide range of risks due to the variable economic and biophysical environment in which farming operates (Hopkinson, 2017). While some of these sources of risk are faced in common with other industries, many are specific to agriculture. Their presence affects production choices with implications for the overall economic efficiency of agricultural production. Further, where the realization of the risks leads to falls in incomes, they can adversely affect the economic welfare of those working in such projects, with the potential to constrain future investment and performance of these irrigation projects (Ogunlana, 2014). It is important, therefore, to understand how the presence of risk management processes affects irrigation projects and how the different risks can be mitigated (Harris, 2017).

According to Rooyen *et al*., (2017), attaining effective irrigated agriculture, good management of irrigation schemes involving all the stakeholders including members is vital. Technical performance in the running and design of an irrigation system is an important factor although they still experience the poor performance as a result of flaws in the organization and management of the schemes due to lack of involvement of all stakeholders particularly the community recipients.

Risk management enables the key project participants' for example the farmers, farm managers and the various agricultural experts involved to meet their commitments and lessen negative impacts on National Irrigational Authority projects, which may affect the expected performance in terms of estimated cost and budget, the specific completion time that was set and the expected milestones (Muema, Home & Raude, 2018). For the risk management process in the projects to work, it is a broad and systematic way that enables in identifying, analyzing, assessing and responding to risks, according to their estimated chance of occurring and the impact that they have to achieve the project objectives (Mwatete, Sumukwoa, Kipkorir & Kipkoech, 2018).

It is essential for the project team headed by the project manager and the client to ensure that the use of risk management is done from the project identification phase, that is the project initiation phase and also the project identification, which is where major decisions are discussed which act as a guideline of how the entire Irrigation Authority projects will be influenced (K'akumu, Olima & Opiyo, 2016). Equally, an estimate of 19 million metric tons of maize or roughly $US 1.9 billion were lost in non-temperate areas in the early 1990s (Ngenoh, Kirui, Mutai, Maina & Koech, 2015). As a result of this, the mentality on irrigated agriculture is still important as it improves food production in the country and farmer's livelihood; because they no longer face calamities resulting from heavy/ shortage of rainfall or drought and famine. Also, their income and irrigation schemes can fully benefit them and all the stakeholders if the risk could be reduced and sustained.

In Kenya, Agriculture has been the mainstay business in the national economy as it contributes roughly a GDP of 27 % directly; it boosts Kenya's economy by providing 18% of formal employment and 80% of informal employment in the rural areas. This sector accounts for 65% of the country's exports, and in turn, it reduces imports (Ministry of Agri, Livestock and Fisheries 2017). The agriculture sector currently is a source of employment and income for many Kenyans. WFP (2011) who are Strategy architects, agricultural (growth) experts, and farmers have faith in that irrigation farming is the remedy for improving food production in Kenya.

Risk Management Processes

The risk management process relies on these techniques since they enable them to be sure of the results and opinions from multiple experts hence improving the results of the analysis. For such a procedure to be considered appropriate in decreasing the influences of individual perceptions and biases, the identification and estimation of risks have to be done in the initiation phase first then closely monitored throughout the implementation phase which improves the efficiency of risk management process (Luwesi, Kinuthia, Doke & Ruhakana, 2015).

According to Kwak, Rodrigues, Mason, Pettit, and Beresford (2018), risk identification is a process for identifying and recording potential project risks that can affect project delivery. This step is crucial for efficient risk management throughout the project. The outputs of the risk identification are used as an input for risk analysis, and they reduce a project manager's uncertainty (Antwi-Agyei, Cairncross, Peasey, Price, Bruce, Baker & Ensink, 2015). The process involves creating a systematic process. The risk identification process begins with project objectives and success factors. Reliable and high-quality information is essential for effective risk management and applying risk identification tools and techniques. Identified risks should be documented in a risk register and a risk breakdown structure, along with their causes and consequences.

Statement of the Problem

Whereas irrigation in Kenya is practiced on about 3% of land used for agricultural production, it accounts for 25% of the value of agricultural exports. A review of the National Irrigation Board quarterly reports (2011 to 2014) on the progress of irrigation projects indicates that it takes longer than planned. The major projects that have missed the targeted implementation deadline for agricultural production over the last five years have risen by 20 %(NIB, 2018). Besides, the cost overruns of the irrigation schemes have increased by 25% over the period 2012-2017 from risk-related costs. Irrigation in Kenya accounts for simply 3% percent of total land area under agricultural production but National Irrigation Authority has been experiencing a lot of risks in implementation, management, and construction of irrigation projects due to human risks, financial risks, market risk, organizational risk as well as climate change risk (heavy destructive rainfalls, famine, and drought, pests, and worms). These risks pose a great threat to food production and incurring of great losses during project implementation in the irrigation schemes.

Some of the studies conducted in these are present gaps; Ondiek and Muathe (2017) conducted a study to establish the extent to which disaster risk management processes affect the performance of small agribusiness firms in Kiambu County. The study did not focus on how risk management planning influences the performance of NIA projects in Kenya. Kamundia (2016) conducted a study on factors influencing the construction of irrigation projects on the National Irrigation Board, Kenya. The study was focused on managerial planning on construction of irrigation projects whereas the current study is focusing on establishing the influence of risk management processes on the performance of NIA projects in Kenya. Mutula (2013) conducted a study on the effects of human resource factors on project performance in Nairobi County in Kenya. The study was limited to human resource factors as a project resource factor but did not look at the frequency of funding, the conditionality of funding, adequacy of financial resources, and the adequacy of human resources.

Further, Kiogora (2013) conducted a study on the influence of local community involvement in project planning on the sustainability of projects in Embu County, Kenya. The study looked at resource mobilization, and hence it did not focus on the frequency of funding, the conditionality of funding, adequacy of financial resources, and adequacy of human resources.

Pervea *et al*. (2016) conducted a study on the management of agricultural risk in Bangladesh. The study focused on establishing risk identification in the process of article information in Bangladesh, and the current study will examine how the risk identification process influences on national irrigation board project performance in Kenya. Therefore, this study investigated the relationship between Project risk management processes and performance of National Irrigation Authority projects in Kenya.

Specific Objectives

i. To analyze the relationship between risk identification and the performance of NIA projects in Kenya
ii. To establish the moderating effect of stakeholders management on the relationship between risk management processes and performance of National Irrigation Authority projects in Kenya

LITERATURE REVIEW

Theoretical review

Enterprise Risk Management Theory

The theory of corporate risk management was initiated in 2007 by the COSO Spikin (2013). Enterprise Risk Management Theory provides a framework to distinguish new risks, monitor the already identified risks, and manage those risks with the various response strategies such as avoidance, accepting the risks, or mitigating them using third parties. This helps in the risk monitoring process since it involves the use of a risk assessment process to evaluate the probability and impacts of certain risks, risk audits which should be done regularly as the project progresses to have the capacity to monitor and evaluate their effect on the project, also the use of technical performance measurement process will enable the project manager to be able to track the project progress and come up with ways of responding to any risks that may occur.

The risk monitoring process will require constant progress tracking in the project, which will enable monitoring of the identified risks and their response strategies to be implemented effectively to avoid schedule delays in the activities which will be completed, but also to the uncompleted project activities. The project manager will ensure that the team is aware of the expected and unforeseen risks which they monitor and control using strategies agreed upon throughout the project, hence ensuring that the entire team is working towards the set goals and objectives. Risk monitoring should be implemented throughout the project and the results well documented for future reference that enables the team to be able to analyze any uncertainties and the impact they have on the project. (Zwikael & Ahn, 2011).

Enterprise Risk Management Theory is relevant as it provides a framework to distinguish new risks, monitor the already identified risks, and manage those risks with the various response strategies such as avoidance, accepting the risks, or mitigating them using third parties. This would help the national irrigation schemes in the risk monitoring process since it involves the use of a risk assessment process to evaluate the probability and impacts of irrigation projects risks which should be done regularly as the project progresses to have the capacity to monitor and evaluate their effect on the irrigation projects. Further, the use of technical performance measurement process in the irrigation schemes could enable the project manager to be able to track the project progress and come up with ways of responding to any risks that may occur.

Stakeholder Theory

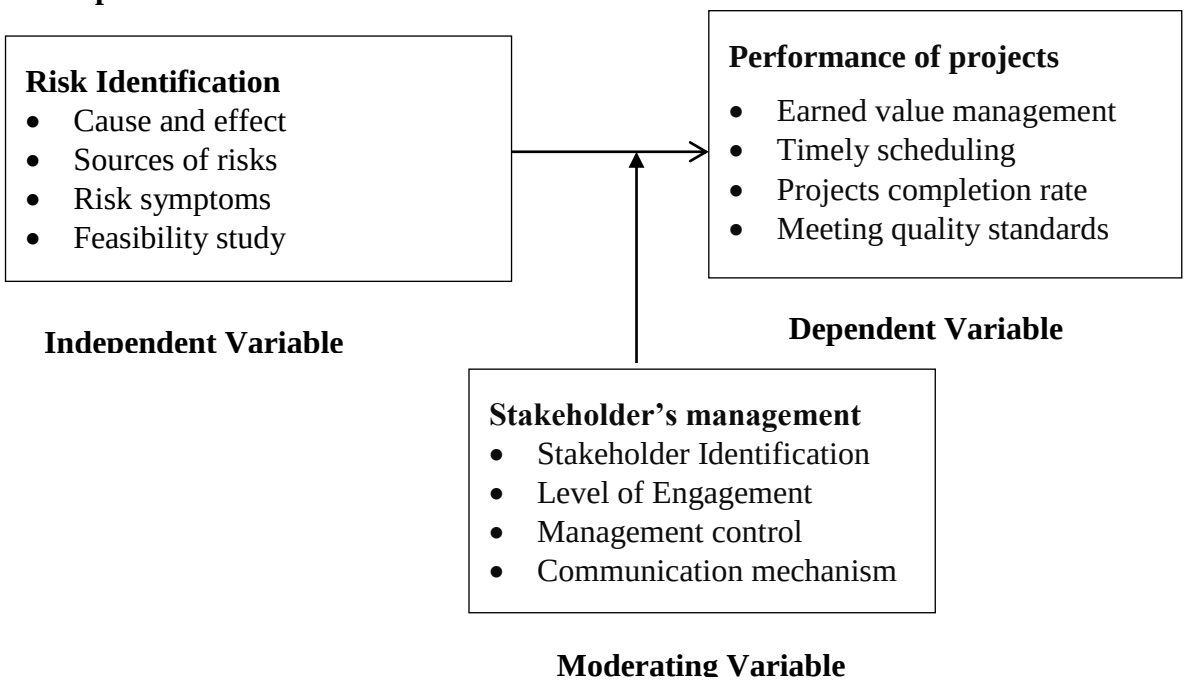
Stakeholder theory was first coined in 1963. This theory declares that organizations ought to consider the worries of people and groups that can influence or are influenced by their activities while settling on choices and accomplishing organizational goals (Jones, Wicks & Freeman, 2017). Stakeholder theory takes a look at the connections between an organization and others in its internal and external environment (Miles, 2017). It likewise takes a look at how these connections influence how the organization leads its activities (Filippone, 2012). Bourne (2009) clarifies that stakeholders can emerge out of inside or outside of the organization.

For example, stakeholders of a project incorporate clients, employees, suppliers, government, and the local community among others. The main idea of stakeholder theory is that organizations that deal with their stakeholder relationships adequately would endure longer and perform superior to those organizations that don't Freeman, (2010). Hill and Jones (2012) state that stakeholder theory can be used to buy in the community trust in a project. The same view is supported by Walumbao (2011) established that stakeholder theory provides principles in which community interests as a stakeholder are identified, analyzed, and can be fulfilled.

Danny (2014) opined that depending on how the community interests are identified and analyzed; choices can be made by a firm that assists the community or if nothing else keep harm from going to the community. These choices might be to play by the rules of the game, clinging to legal contracts, or act on complaints or pressure brought as a powerful influence for the firm. Of more intrigue, trust is an essential part of the ethical treatment of the community inside the organization-stakeholder relationship. Community confides in the organization to return benefits or protection from harm similar to their contributions or stakes (Andriof & Waddock, 2017).

Stakeholder Theory is relevant as it provides principles in which stakeholders' interests are identified, analyzed, and how they are fulfilled. It further takes a look at the connections between an organization and others in its internal and external environment and how these connections influence how the organization conducts its projects. Organizations undertaking irrigation Projects must guarantee the stakeholders willfully and effectively partake in the projects from the beginning. Organizations undertaking irrigation Projects need to guarantee all stakeholders to take an interest in decision making, communication is well done, and their interests are considered. This theory consequently controls in the understanding the moderating variable of stakeholders management on the independent and dependent variable.

Conceptual Framework



Risk Identification

Risk identification is the process of finding, recognizing, and describing risks including deciding on the important values and risks to those values. According to Antwi-Agyei, Cairncross, Peasey, Price, Bruce, Baker and Ensink (2015), risk identification involves risk screening, risk register, weakness, and threats identification. The appropriate identification of risk largely depends on ensuring the appropriate people are included in the risk identification process. In the risk identification process, the various tool and techniques will be used on the projects is determined by the type of activities will be carried out in the project, the type of the project since it directly affects the scope. Another factor to consider in risk identification is the project phase since it enables the project manager will be able to implement the set strategies. The project also will consider the resources available since they may limit the type of technique or tool to be used. It is also very important to consider the expected desired outcome of the project during risk identification. In project management, the required level of detail in any project is considered very crucial since special approaches exist to analyze major risks in complex projects (Cagno et al. 2007).

The risk identification process enables the project team to have a layout of the expected risks through tools like the probability impact matrix. This ensures that the risks are well identified and the chances that they might happen are recorded. This information is used in calculating the impact that those risks have on the expected success of the project. A risk register also enables the project manager to be able to identify new risks and any other that may occur and list them according to their order of expected occurrence. In risk identification, the risk register ensures that the project manager has a layout of what is expected throughout the project.

Stakeholder management

Stakeholders are the originator of the project management organization that is in charge of the delivery of stakeholders' expectations and satisfaction. According to Sherman and Ford (2014), stakeholder management should involve engagement, proper communication, and stakeholder mapping. The fruitful delivery of any project expectations depends on stakeholder engagement and management (Chang et al., 2013), and the compelling commitment and the stakeholder management depend on the project manager's capacity to distinguish stakeholders' expectations from the earliest starting point to closing point. Researchers depicted project stakeholder management as a procedure in which the project team encourages the needs of stakeholders to recognize, discuss, agree, and contribute to accomplishing their targets (Brammer& Millington, 2014; Pajunen, 2016; Rowlinson & Cheung, 2018). Essentially, Kerzner (2011) depicts stakeholder relationship management through six processes, including "identifying stakeholders, analyzing, engaging, identifying information flow, enforcing stakeholder agreement, and stakeholder debriefing." Additionally, from the base-association perspective, Eskerod and Jepsen (2013) proposed three processes stakeholder identification, assessment, and prioritization. Stakeholder interest will be portrayed as a social process in which groups with shared necessities living in a specific geographical area actively distinguish needs, decide, and will set up mechanisms to accomplish objectives (Adesina, 2010).

Notwithstanding, heterogeneous groups and individuals will become a stakeholder and all in all will make a move to accomplish shared and explicit objectives. Stakeholders will upgrade involvement in monitoring and evaluation can engage in tendering and supplies, some measures will be set up to encourage smooth and straightforward implementation of projects. These measures will include enrollment of temporary workers/suppliers and artisans, provision of data on tendering and supplies rules, and development of a subcommittee for confirming and suggesting suppliers (Achoka, 2013).

Stakeholders will be included to utilize and organize their resources of personnel, time, cash/ money, products, and services in a broad scope of strategies. Furthermore, community and people-based organizations will regularly partake at various dimensions in the usage of urban advancement projects, thus giving helpful data to M&E of the project's funds. There will be limited access to resources than government agencies and organizations (Otieno, 2007). Inadequate stakeholders' participation at the beginning of a project will lead to project activities that are not well thought of and structured hence lead to the failure of the community objective.

Project Performance

According to Kemps (2012), several measures that can be taken into consideration when measuring project performance include the use of completion rate, budget variance, time of completion, and project quality. Performance can also be described as the attainment of a particular goal calculated based on identified or set standards of accurateness, completeness, speed, and cost and measured by the absorption rate of the development budget and performance contracting (Javed, 2014).

The completion rate measures the percentage of projects that are completed on-time. The goal is to get a completion rate of as near as possible to 100% (Floricel, Michela & Piperca, 2016). Budget variance aids in evaluating the financial performance of your project. Cost variance compares your budget set before the project started and what was spent. Quality is entailed what the customer or stakeholder needs from the project deliverables. Project managers oversee implementing a project quality management plan. The main idea, again, to deliver a product or service to the specifications of the customer or stakeholder (Kerzner, 2017).

Empirical Review

Risk Identification and Performance

In Sweden, a study conducted by Hopkinson (2017) on the construction industry indicated that on risk identification while identifying and analyzing risks within the projects, the more structural techniques were used to evaluate the impact and probability of those risks. The professionals involved in these projects used checklists and manuals to document the various forms of risk identification on the organizational level. They used historical data regarding previous projects, not well-executed being which the respondents treated as a source of potential risks. The study also indicated that considering the future consequences already in the early stages of the project since all projects are unique and the project team might have varying opinions. Due to the nature of projects being different depending on the scope, the use of checklists and other manuals was considered as essential the team of experts dealing with risk management implementation used discussions as the most common technique to identify risks and problems. The project team also used group discussions which were more appropriate since they encourage more ideas that assist to identify and manage risks.

In the South African construction industry, (Makombo, 2011) carried out a study to identify the risk management frameworks in the construction industry, he stated that obstacles related to risk management were found to be the skills gap amongst the professionals dealing with such issues, poor scope management and a lack of focus on risk management in the project initiation phase. Most of the respondents stated that they had proceedings of the project management, which is not planned risk management activities, there was no formal risk management structure in place, and intuition and experience were used for risk decision making.

Project Performance

Studies have been undertaken which indicates that the construction projects are facing delays in their completion. In project management, when there are delays in projects, this leads to the project team compromising on some of the set regulations to save on time without the project sponsor finding out. This can be done by ensuring that the fast track some activities on the Gantt chart by combining activities that should be done individually. Sambasivan and Soon, (2017) conducted a study in Malaysia and concluded that cost overruns affected the progress of the projects due to the various changes and delays in the disbursement of funds. This is caused by the fact that when project financiers delay in payment, it may lead to projects stalling or being terminated (Hanna *et al.* 2015). There is also a need to ensure that a contingency reserve is set which enables to overcome the construction mistakes committed during the construction work. Rework cost can be 10-15% more as compared to that of estimated cost (Sun & Meng, 2019). Due to these factors cost overruns can be said to be one of the most common effects of delays (Smith *et al.* 2010).

Contractors also indicated that cost overruns affect the overall expectation of the projects regarding delivery on milestones in the construction industry. This also leads to time overrun that in return is the main reason for cost overruns (Memon *et al.*, 2011). This is also supported by Sun and Meng, (2019) who concluded that the various delays in terms of schedule and cost overruns are mutually exclusive since form the previous studies are done, it was found out that cost overruns affect the project timeline hence requiring more time than anticipated since the project sponsor has to approve those changes.

Another effect of delay in the construction industry is that of time overrun which the project will experience and leads to the project extending its timeline. The factors that are responsible for project extension include, financial delays by the project sponsor that leads to problems such as delayed payment for the completed work as agreed in contracts, another factor is inadequate contract management, limited resources for the project, and inadequate planning. In their study, Sambasivan and Soon (2017) used an integrated approach and linked the causes and effects of delay through systematic analysis. The study concluded that client-related and contractor related factors are very important for time overrun.

The study reported that ten factors affected project success changed in the anticipated completion time that led to the project extends beyond the allocated time in the project charter while six factors were identified relating to the clients' and contractor's fault. Other factors such as inadequate site management, low-level project handling experience of contractors, and late payment of work completed by the project financiers are the main reasons of time overrun in the constructions. Wei et al, (2010) found out that out of ten factors causing time delays, five of them are responsible for the extension of the project time in the project. They include the various delays such as delay in revision and approval of design documents by the respective professional, delays in subcontractors' work, delay in approving major changes in the scope of work by the project financiers, and conflicts in sub-contractors schedule in the execution of the project.

According to Fugar and Agyakwah (2010), projects are propelled by the financial resource in that other resources like human, land, and equipment are acquired and mobilized using financial resources. Trying to implement a project without money is like driving a car without fuel or energy. Insufficient cash flow hurts humans as well as any other resource required to propel a project. Fugar and Agyakwah (2010) studied thirty-two factors influencing construction projects in Uganda and placed a delay in honoring the certificate first. In their conclusion, the finance factors were found to be the most influencing factors causing project delays. In this study consultant ranked poor design highest, client ranked underestimation of construction cost highest and contractors ranked lack of skills highest (Fugar & Agyakwah, 2010).

RESEARCH METHODOLOGY

This study adopted the correrlational design an positivism research philosophy. The target population of this study was the staff in all the 8 irrigations schemes under National Irrigation Board. The irrigation schemes include Mwea Irrigation Scheme, Bura Irrigation Scheme, Tana hola irrigation Scheme, Perkerra Irrigation Scheme, Ahero Irrigation Scheme, Bunyala Irrigation Scheme, and West Kano Irrigation Scheme. According to the National Irrigation Board (2017) report, there are 421 key project risk personel which includes: staff members under managers, deputy managers, supervisors, farm project managers, project team leaders, and farmers representatives, representatives from government and development agencies, these constituted the target population of the study. They were chosen as the unit of observation on the basis that they are the persons making decisions on behave of the NIBs Projects.

The sample size was determined using Yamane (1967) Formula. The study used stratified random sampling to select 205 staff from the target population. This study used primary data using questionnaires encompassed both closed-ended and open-ended questions. The statistics generated were descriptive statistics and inferential statistics. The specific descriptive statistics included percentages and frequencies while the inferential statistics included a multiple linear regression model and Pearson correlation. The multiple linear regression models were used to measure the relationship between the independent variables and the dependent variable that are explained in the model. Pearson Correlation was used to show the relationship between the independent and the dependent variables

RESEARCH FINDINGS AND DISCUSSION

All selected respondents (205) were issued with questionnaire for data collection. However, the researcher was able to collect back only 184 questionnaires having been dully filled; the response rate was 89.8%. According to Mugenda and Mugenda (2013), a response rate of 50% and above is adequate for analysis and reporting, a response rate of 60% and above is good while that of 70% and above is excellent. Based on this assertion, our response rate was considered excellent.

Descriptive Statistics

Risk Identification and the Performance

In this section the study was interested in respondents' views on risk identification in organization. The respondents were expected to indicate their level of agreement with the various statements provided using a 5-point likert scale. Table 1presents the findings obtained. Based on the findings, all the mean values were above 3.5 and indication that the respondents agreed with the various statements on sensing capabilities. The findings specifically show that the respondents agreed that the respondents agreed that risk identification is vital for effective risk management (M=3.982, SD= 1.370); that through information sharing irrigation projects can be able to identify various risk the face in lending to the borrower (M= 3.961, SD= 1.476); that risk identification helps to sort risk according to their importance (M= 3.948, SD= 1.263); that risk can be identified and sorted based on cause and effect to help prioritise and prevent them (M= 3.915, SD= 1.343). They also agree that risk screening of projects help to identify whether there are any risk symptoms (M= 3.889, SD= 1.381); that new activities are reviewed during the planning stage to identify and address risks (M= 3.863, SD= 1.326); and that analysis of strengths and weakness of the project help identify risks (M= 3.856, SD= 1.525).

The study findings are in agreement with those of Cagno et al. (2017) risk identification process enables the project team to have a layout of the expected risks through tools like the

probability impact matrix. This ensures that the risks are well identified and the chances that they might happen are recorded.

Table 1: Descriptive Statistics for Risk Identification

Statement	Mean	Std. Dev.
Risk identification is vital for effective risk management	3.982	1.370
Through information sharing irrigation projects can be able to identify various risk the face in lending to the borrower,	3.961	1.476
Risk identification helps to sort risk according to their importance	3.948	1.263
Risk can be identified and sorted based on cause and effect to help prioritise and prevent them	3.915	1.343
Risk screening of projects help to identify whether there are any risk symptoms	3.889	1.381
New activities are reviewed during the planning stage to identify and address risks	3.863	1.326
Analysis of strengths and weakness of the project help identify risks	3.856	1.525
Aggregate Score	**3.916**	**1.383**

The study also sought to other ways in which risk identification process influenced performance of irrigation schemes. Risk management enables project success; this is because risk managers can help employees succeed with their projects. Just as they assess risks and develop strategies to maximize organizational success, they can do the same for individual projects. Employees can reduce the likelihood and severity of potential project risks by identifying them early. If something does go wrong, there will already be an action plan in place to handle it. This helps employees prepare for the unexpected and maximize project outcomes.

They also explained that risk management reduces unexpected events. A risk manager's goal is to map out all potential risks and then work to prevent them or best manage them. Risk management creates financial benefits. The risk department should not be viewed as a cost centre for the organization. In fact, it directly creates value. With trend analysis, risk managers can spot high-frequency events and work to minimize repetitive losses. Incidents will be less likely to occur and have less of an impact when they do, potentially saving the organization thousands if not millions of dollars. Risk managers are also the experts who procure the appropriate levels of insurance to maximize the financial impact of the risk management program.

Risk management improves communication. Horizontal and vertical communication are essential for organizational and employee well-being. They promote understanding of internal and external issues and help everyone work together effectively. While many employees know this, it can be difficult to put into practice if some parties don't understand the impact it can have. Risk managers can help. They aid horizontal communication by providing a centralized touchpoint for all risk data and providing reports and analysis. Risk managers promote vertical communication by setting expectations and relating data to organizational goals. Each additional method of communication benefits employees.

Risk management prevents reputational issues. Many risks involve a reputation factor: something happens that causes the public to negatively view the organization. Reputational issues could impact individual employees as well, even if they weren't actually involved. A formal risk department greatly decreases the likelihood of this fallout. When an incident inevitably occurs, a formal risk management program and processes will quickly contain the event and lower the chance of escalation and widespread negative consequences.

Stakeholders Management

In this section, the statements in the table describe practices that project managers undertake to management stakeholders in projects. Respondents were requested to rate the statements as they apply to their irrigation scheme's project risks identification activities and practices. Table 2 presents summary of findings obtained. The findings show that the mean value for each statement was above 3.5 an indication that they all agreed with the statements about risk monitoring, control and the performance of NIA projects in Kenya. The findings show that the respondents specifically agreed that conducts stakeholder mapping to clearly identify and understand the roles in the projects (M= 3.988, SD= 1.142); the scheme undertakes stakeholder holder analysis to determine their level of influence of projects (M= 3.909, SD= 1.235) and that they actively engage stakeholders in all project activities according to their identified roles and level of influence (M= 3.902, SD= 1.168); and that they regularly consults stakeholders during decision making and project implementation (M= 3.902, SD= 1.182).

The findings also show that the respondents agreed that they establish a communication process for interactive (two-way) consultation with stakeholders (M= 3.85, SD= 1.235); they establish a communication process for two-way consultation with external stakeholders (M= 3.836, SD= 1.313); they established a crisis communication strategy facilitating immediate information exchange (M= 3.81, SD= 1.220); and that develop a communication evaluation mechanism (M= 3.738, SD= 1.359).

The findings agree Sherman and Ford (2014) that stakeholder management should involve engagement, proper communication, and stakeholder mapping. It also concurs with Otieno, (2007) that inadequate stakeholders' participation at the beginning of a project will lead to project activities that are not well thought of and structured hence lead to the failure of the community objective.

Table 2: Descriptive Statistics for Stakeholders Management

Statements	**Mean**	**Std. Dev.**
Conducts stakeholder mapping to clearly identify and understand the roles in the projects	3.988	1.142
Undertakes stakeholder holder analysis to determine their level of influence of projects	3.909	1.235
Actively engages stakeholders in all project activities according to their identified roles and level of influence	3.902	1.168
Regularly consults stakeholders during decision making and project implementation	3.902	1.182
Establishes a communication process for interactive (two-way) consultation with stakeholders	3.85	1.235
Establishes a communication process for two-way consultation with external stakeholders	3.836	1.313
Establishes a crisis communication strategy facilitating immediate information exchange	3.81	1.220
Develops a communication evaluation mechanism	3.738	1.359
Aggregate Score	**3.867**	**1.232**

The researcher also sought to determine other way in which stakeholder management has influenced performance of irrigation schemes. Stakeholder management is important since it is the lifeline of effective project relationships. This needs to involve establishing a sound

relationship and understanding how their work is contributing to project success. You need to establish trust and maintain relevance. Important stakeholders can provide constraints or requirements based on information from their industry. This will help you understand the project risks (positive and negative) and constraints. The more you involve and engage stakeholders, the more you will uncover and reduce risks on your project.

They help in: Providing Expertise: Remember some stakeholders will have a wealth of knowledge. This could be on current processes, industry insight, or historical knowledge. Project managers may not be experts. Hence it is critical to have people who can provide expert advice. Reducing Risks: The more you involve stakeholders the lesser risks you will have. During discussions on project requirements or constraints, they may come up with issues or concerns about meeting certain targets or needs. Uncovering such risks and discussing a strategy to mitigate them will dramatically increase the success of your project

Ensure Project Success (Increase Probability): By involving stakeholders in project requirements, you will get their "buy-in". This will in turn help increase the probability of project success. Now, what if you can partially meet the requirements or say not meet certain stakeholders' needs? These could be due to conflicting needs or priorities. Here is the chance to set expectations early in the project life cycle. Try some workaround if that helps. This will avoid any last-minute surprises. Will help you manage the relationship throughout the project, creating a Win-Win situation

Getting Project acceptance: Regularly engage and involve stakeholders from the start. This will ensure you have a positive project conclusion. With this, the team members would have already known the delivery expectations, risks, and how to mitigate the risks. They would have reviewed draft deliverables in the process. The final acceptance will be smooth during the project closure phase.

Project Performance

In this section, the researcher sought to understand the performance of some of the projects in irrigation scheme whose implementation was completed in the last 5 years. While various projects may have been completed during this period, the researcher selected one main project in whose implementation respondents actively participated and feels that they had adequate information about.

Respondents were required to respond to all the subsequent questions based on the information they had on the selected project. On a scale of 1 - 5 (strongly disagree to strongly agree), they were required to indicate their level of agreement on each statement as it applies to the selected project. The statements relate to various performance aspects of the project that they had selected to provide information about. The findings obtained were as summarised in Table 3. The findings show that all the mean values were above 3.5 an indication that the respondents agreed on average with the statements about performance of NIA projects in Kenya. The findings show that the respondents specifically agreed that project met operational performance goals (M= 3.975, SD= 1.169); that project earned value management (M= 3.836, SD= 1.207); and that there is timely scheduling of projects (M= 3.83, SD= 1.3). They also agreed that there is efficient completion rate of projects (M= 3.817, SD= 1.142); that project results met stakeholder expectations (M= 3.764, SD= 1.168); that stakeholders were satisfied with projects results (M= 3.896, SD= 1.21); and that in their scheme projects were completed within budget (M= 3.836, SD= 1.234).

The findings agree with Floricel, Michela and Piperca (2016) that budget variance aids in evaluating the financial performance of your project. Cost variance compares your budget set before the project started and what was spent. Quality is entailed what the customer or stakeholder needs from the project deliverables. Project managers oversee implementing a

project quality management plan. The main idea is to deliver a product or service to the specifications of the customer or stakeholder.

Table 3: Descriptive Statistics on Project Performance

Statement	Mean	Std. Dev.
Project met operational performance goals	3.975	1.169
Project earned value management	3.836	1.207
Timely scheduling of projects.	3.83	1.3
There is efficient completion rate of projects	3.817	1.142
Project results met stakeholder expectations	3.764	1.168
Stakeholder were satisfied with projects results.	3.896	1.21
In our scheme projects were completed within budget	3.836	1.234
Aggregate Score	**3.851**	**1.204**

Correlation Analysis

Correlation analysis was used to establish the strength and direction of the relationship between study variables. Correlation analysis calculates the level of change in one variable due to the change in the other. If the variables are not related, then that would mean that the correlation coefficient is zero. The closer the correlation coefficient is to 1, the greater the relationship, whereas the closer the correlation coefficient is to 0, the weaker the relationship (Hair et al., 2010). The correlation strengths were interpreted using Cohen and Cleveland decision rules where 0.1 to 0.3 indicate weak correlation, 0.3 to 0.5 indicate moderate correlation strength and greater than 0.5 indicate a strong correlation between the variables.

Based on the findings in Table 4, risk identification had strong positive relationship with performance of NIA projects in Kenya (r=0.786). The relationship between the two variables was significant since the p-value obtained (0.000) was less than the selected level of significance (0.05). The study findings agree with findings of Cagno et al. (2007) that the risk identification process enables the project team to have a layout of the expected risks through tools like the probability impact matrix. This ensures that the risks are well identified and the chances that they might happen are recorded.

Table 4: Correlation Analysis

		Performance	Risk identification
Performance	Pearson Correlation	1	
	Sig. (2-Tailed)		
	N	184	
Risk identification	Pearson Correlation	.786**	1
	Sig. (2-Tailed)	.000	
	N	184	184

Simple Regression Analysis

Risk Identification on Performance

A univariate analysis was conducted to analyse the relationship between risk identification and the performance of NIA projects in Kenya. The null hypothesis stated:

H_{02}: There is no statistically significant relationship between risk identification and the performance of NIA projects in Kenya

The R-Squared tends to depict the variation in the dependent variable that can be explained by the independent variables: the greater the value of R-squared the greater the effect of independent variable. The R Squared can range from 0.000 to 1.000, with 1.000 showing a perfect fit that indicates that each point is on the line. As indicated in Table 5, the r-squared for the relationship between risk identification and performance of NIA projects in Kenya was 0.579; this is an indication that at 95% confidence interval, 57.9% variation in performance of NIA projects in Kenya can be attributed to changes in risk identification. Therefore, risk identification can be used to explain some changes in performance of NIA projects in Kenya. The findings also show that risk identification and performance of NIA projects are strongly related as indicated by correlation coefficient value of 0.761.

Table 5: Model Summary for the Risk Identification on Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.761[a]	.579	.338	.58746

a. Predictors: (Constant), risk identification

The analysis of variance is used to determine whether the regression model is a good fit for the data. It also gives the F-test statistic; the linear regression's F-test has the null hypothesis that there is no linear relationship between the two variables. From the analysis of variance (ANOVA), the study found out that the regression model was significant at 0.000 which is less than the selected level of significance (0.05). Therefore, the data was ideal for making a conclusion on the population parameters. The F calculated value was greater than the F critical value (250.304 > 3.893), an indication that sensing capability significantly influences performance of NIA projects in Kenya. The significance value was less than 0.05 indicating that the model was significant in predicting performance of NIA projects in Kenya.

Table 6: Analysis of Variance on Risk Identification on Performance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.029	1	9.029	250.304	.000[b]
	Residual	6.565	182	0.036		
	Total	15.594	183			

a. Dependent Variable: Performance

b. Predictors: (Constant), risk identification

The coefficients or beta weights for each variable allows the researcher to compare the relative importance of each independent variable. In this study the unstandardized coefficients and standardized coefficients are given for the multiple regression equations. However, discussions are based on the unstandardized coefficients.

From the results the regression model was;

$Y = 0.988 + 0.326\ X_1 + \varepsilon$

The above regression equation revealed that holding risk identification to a constant zero, performance of NIA projects in Kenya will be at a constant value of 0.988. The findings also show that risk identification is statistically significant in explaining performance of NIA projects in Kenya ($\beta = 0.326$, $P = 0.000$). This indicates that risk identification positively and significantly relates with performance of NIA projects in Kenya. The findings also suggest that a unit increase in risk identification would lead to an increase in performance of NIA projects in Kenya by 0.326 units. The findings agree with Hopkinson (2017) that they used historical data regarding previous projects, not well-executed being which the respondents treated as a source of potential risks. Also, the use of checklists and other manuals was

considered as essential the team of experts dealing with risk management implementation used discussions as the most common technique to identify risks and problems which helped improve project performance.

Table 7: Beta Coefficients for Risk Identification on Performance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.988	0.219		4.511	.000
	Risk identification	0.326	0.058	0.338	5.621	.000

a. Dependent Variable: Performance

Moderating Effect Regression Analysis

Risk Identification

A stepwise regression analysis was conducted to examine the moderating effect of risk identification on the relationship between risk identification and the performance of NIA projects in Kenya.

The null hypothesis stated:

H_{05}b: There is no significant moderating effect of stakeholders' management on the relationship between risk identification and the performance of NIA projects in Kenya.

The first model (Table 8) shows the relationship between risk identification, stakeholders' management, and performance of NIA projects in Kenya.

The R squared for the relationship between risk identification and the performance of NIA projects in Kenya was 0.579, which implied that 57.9% of performance of NIA projects in Kenya can be explained by risk identification. However, in the second model, in Table 8, which constituted risk identification, stakeholders management, risk identification*stakeholders management, the r-squared was 0.584. This implies that the introduction of stakeholders management in the second model led to an increase in r-squared, showing that stakeholders management positively moderates the relationship between risk identification and the performance of NIA projects in Kenya. The findings also show that the variables risk identification, stakeholders management, risk identification*stakeholders management and performance of NIA projects are strongly related as indicated by correlation coefficient value of 767.

Table 8: Model Summary for Risk Identification, Stakeholders Management and Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.761[a]	.579	.458	.58746
2	.764[b]	.584	.473	.08615

a. Predictors: (Constant), Risk Identification

b. Predictors: (Constant), risk identification, stakeholders management, risk identification*stakeholders management

From the findings, the F-calculated for the first model, as shown in Table 9, was 250.304 and for the second model was 84.231. Since the F-calculated for the two models were more than the F-critical, 3. 893 (first model) and 2.655 (second model), the two models were good fit for the data and hence they could be used in predicting the moderating effect of stakeholders management on the relationship between risk identification and the performance of NIA projects in Kenya.

Table 9: ANOVA for Risk Identification, Stakeholders Management and Performance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.029	1	9.029	250.806	.000[b]
	Residual	6.565	182	0.036		
	Total	15.594	183			
2	Regression	12.198	3	4.066	84.708	.000[c]
	Residual	8.689	180	0.048		
	Total	20.887	183			

a. Dependent Variable: Performance
b. Predictors: (Constant), risk identification
c. Predictors: (Constant), risk identification, stakeholders management, risk identification *stakeholders management

In the first model, as shown by Table 10, by substituting the beta values as well as the constant term, model 1 emanating from the first step in regression modelling would be as follows:

$Y = 0.988 + 0.326 X_1 + \varepsilon$

The findings show that risk identification has a statistically significant effect on performance of NIA projects in Kenya as shown by a regression coefficient of 0.326 (p-value=0.000).

In the second regression model, by substituting the beta values as well as the constant term, model 2 emanating from the second step in regression modelling was as follows:

$Y= 1.689 + .564 X_1 + .542 M + 0.289 X_1*M$

The model indicated that risk identification had a positive and statistically significant effect on performance of NIA projects in Kenya as shown by a regression coefficient of .564 (p-value=0.010). Stakeholders management had a positive and significant effect on performance of NIA projects in Kenya as shown by a regression coefficient .542 (p-value= 0.013). On the other hand, risk identification*stakeholders management also had a positive and significant effect on performance of NIA projects in Kenya as shown by a regression coefficient of 0.289 (p-value=0.000).

Table 10: Coefficients for the Relationship between for Risk Identification, Stakeholders Management and Performance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.988	0.219		4.511	.000
	Risk identification	0.326	0.058	0.338	5.621	.000
2	(Constant)	1.689	0.215		7.856	.000
	Risk identification	0.564	0.124	0.559	4.548	.010
	Stakeholders Management	0.542	0.216	0.590	2.509	.013
	Risk identification* Stakeholders Management	0.289	0.045	0.195	6.422	.000

a. Dependent Variable: Performance

Conclusions

Risk Identification

The study found that risk identification is statistically significant in explaining performance of NIA projects in Kenya. This indicates that risk identification positively and significantly relates with performance of NIA projects in Kenya. Based on the findings, the study

concludes that improving risk identification would lead to an increase in performance of NIA projects in Kenya.

Stakeholders' Management

The study established that the interaction between risk identification and stakeholders management has a direct significant effect on performance of NIA projects in Kenya.

Based on the findings, the study concludes that stakeholders' management significantly moderate on the relationship between risk management process and the performance of NIA projects in Kenya.

Recommendations

Risk Identification

The study found that improvement in risk identification will result to improved project performance. The study thus recommends management of irrigations schemes under National Irrigation Board to improve the practice of risk identification within their organization in order to improve their performance. They should consider hiring experts in risk management to help in identifying cause and effect of risk, sources of risks, risk symptoms and also conduct a feasibility study.

Stakeholders Management

Stakeholder management was found to have positive significant moderating effect on risk management processes and the performance of NIA projects in Kenya. The study thus recommends management of irrigations schemes to consider properly managing all the project stakeholders. From project initiation, they need to first identify all the stakeholders that are involved in the project and therefore involve them from the start. They also need to involve stakeholders in all the activities and also improve the communication mechanism among the stakeholders.

Recommendations for Further Studies

The main focus of this study was to investigate the relationship between risk management processes and the performance of NIA projects in Kenya. The study was limited to four risk management processes (risk identification, risk planning, risk analysis, risk monitoring and control) which explained 75.9% variation in Performance of National Irrigation Authority projects in Kenya. The study thus recommends a study to be conducted on other risk management processes that can explain the remaining 24.1% variation in performance of NIA projects in Kenya. The study was also limited to 8 irrigations schemes under National Irrigation Board; the study recommends replication of research study in other irrigations schemes not registered under National Irrigation Board to facilitate comparison and generalization of research findings. Also, the study recommends a study to be conducted on other sectors of the economy such as manufacturing industry to facilitate comparison of research findings.

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