



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

¹ **Kabutiei Gladys Jerotich**, ² **Dr. Nyang'au Samson Paul**, ³ **Dr. Wanjala Muchelule
Yusuf**

¹ PhD Student, Jomo Kenyatta University of Agriculture and Technology

^{2,3} Lecturers, Jomo Kenyatta University of Agriculture and Technology

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 relationships between risk planning on the performance 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 planning positively and significantly relates with performance of NIA projects in Kenya. The study thus recommends management of irrigations schemes to invest more in risk planning activities. This can be achieved if they develop clear goals and objectives, risk breakdown structure.

Key Words: risk planning, performance, risk management processes, stakeholders management

INTRODUCTION

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.

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 determine the relationship between risk planning and the performance of NIA projects in Kenya.
- ii. To establish the moderating effect of stakeholders management on the relationship between risk planning and performance of National Irrigation Authority projects in Kenya.

LITERATURE REVIEW

Theoretical review

Theory of Change

Theory of Change (ToC) developed by Weiss (1995) is a specific type of methodology for planning, participation, monitoring, and evaluation that is used to promote social change. The theory of Change defines long-term goals and then maps backward to identify necessary preconditions. Theory of Change explains the process of change by outlining causal linkages in an initiative. Theory of Change is essentially a comprehensive description and illustration of how and why the desired change is expected to happen in a particular context. It is focused in particular on mapping out or “filling in” what has been described as the “missing middle” between what a program or change initiative does (its activities or interventions) and how these lead to desired goals being achieved (Davies, 2018). It does this by first identifying the desired long-term goals and then works back from these to identify all the conditions (outcomes) that must be in place (and how these related to one another causally) for the goals to occur. These are all mapped out in an outcomes framework. The outcomes framework then provides the basis for identifying what type of activity or intervention will lead to the outcomes identified as preconditions for achieving the long-term goal (McGilloway & O'Brien, 2017). Through this approach, the precise link between activities and the achievement of the long-term goals are more fully understood. This leads to better planning, in that activities are linked to a detailed understanding of how change happens. It also leads to better evaluation, as it is possible to measure progress towards the achievement of longer-term goals that go beyond the identification of program outputs.

Theory of Change is relevant as it specifies various methodologies for planning, participation, monitoring, and evaluation that is used to promote social development in the communities. This includes identifying the desired long-term goals in the irrigation projects and then working back from these to identify all the conditions (outcomes) that must be in place for the desired performance to occur. This is by defining long-term goals and then maps backward to identify necessary preconditions and comprehensive description and illustration of how and why the desired change is expected to happen in these irrigation projects.

Enterprise Risk Management Theory

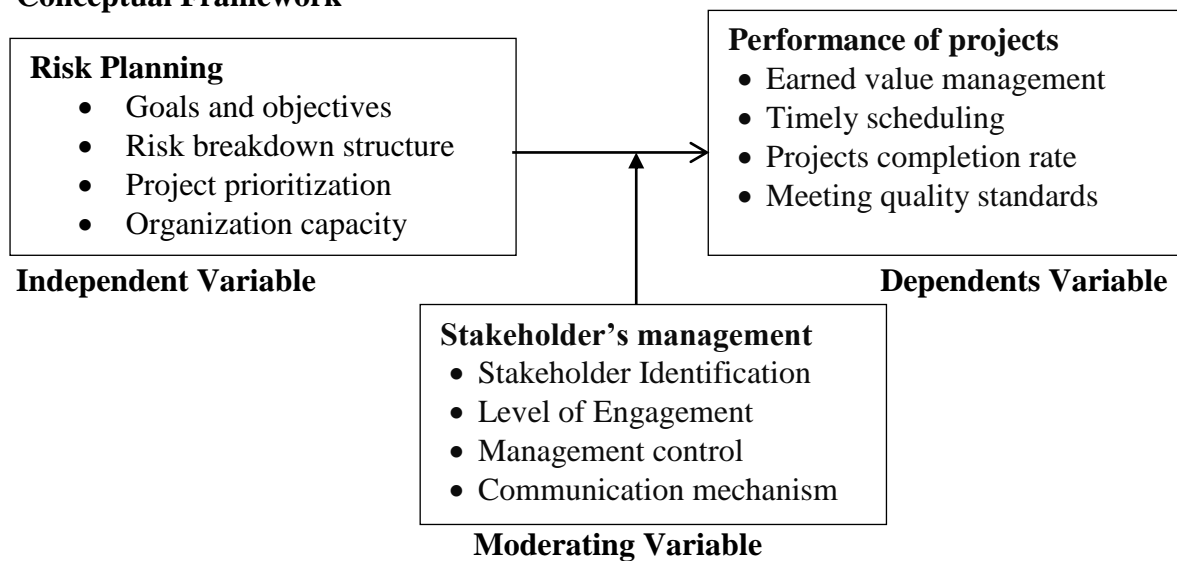
The theory of corporate risk management was initiated in 2007 by the COSO Spikin (2013). Enterprise Risk Management Theory provides a framework to distinguish new risks, monitor the already identified risks, and manage those risks with the various response strategies such as avoidance, accepting the 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.

Conceptual Framework



Risk planning

According to Klijn, Kreibich, De Moel and Penning-Rowell, (2015) risk management planning is an intellectual process which lays down objectives and develops various courses of action, by which the organization can achieve those objectives. Risk management planning minimizes risk and uncertainty, by looking ahead into the future. It entails risk assessment, developing project scope and schedule, setting and prioritize goals, and management policies.

A risk assessment is a thorough look at the organization to identify those things, situations, processes that might pose risks (Hopkinson, 2017). The Project Scope and schedule provides the documented basis for making all project decisions and is used to direct the project effort and communicate the project scope to the project team and other project stakeholders. Prioritization is one of the key abilities leaders must have to carry projects toward success. To know how we can sort all of the activities we need to have done in order to finish a project, we must have a good understanding of the business we are in especially knowing what the project drivers.

There could be a lot of project drivers that encourage project execution and lead an organization to assign the necessary budget. The main thing to keep in mind when prioritizing tasks and goals is to align the project drivers with the strategic drivers underlined by the organization (Harris, 2017). Different participants with various experiences and abilities more often than not have diverse expectations and interests (Ogunlana, 2014). The project managers and farmers should ensure that they develop management policies for them to be able to anticipate risks and initiate the proper mitigation techniques available.

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% (Floriciel, 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

Pervez, Uddin, and Gao (2016), in their article on management of agricultural risk in Bangladesh, found out that there are five groupings of risks which include: marketing, institutional factors, financial, personal factors, and production. Agricultural risks have a long-lasting and far searching for undesirable impact on farmers' life. They said that peasant farming in Bangladesh deserves enough attention to extension systems to ensure sustainable management and ways in which farmers can handle these risks. This study will not handle it broadly, but it will be narrowed to risk identification, risk management planning, risk monitoring, and risk analysis. These categorized risks will add value to the objectives even though the study only engrossed the Management of Agricultural risks in Bangladesh, whereas the current will handle risk management on performance on NIBs Projects in Kenya.

Mahamid (2013) indicated that various risks that affect time and schedule invade the construction industry specifically in road projects in Palestine are, the financial status of the contractors that they might have not indicated in the bidding process, payment delays by the owner which affects the entire project schedule which may force the project team to enforce heavy fines, the political situation of the country which is highly unforeseeable, lack of equipment efficiency, poor communication between construction parties which can be avoided through proper communication plans in the project and enormous competition in bids.

Rabbani et al. (2011) stated that external factors are the utmost request factors that lead to construction delays in Pakistan. They cannot be controlled due to their nature of occurrence which is a natural disaster such as earthquakes and floods. These extreme factors are hard to control, and there is nothing that the project team can do to mitigate them when they occur. Likewise, Bramble and Callahan (2010) realized that unanticipated problems, for example, acts of a natural phenomenon that are beyond human control also cause the project delays hence leading to most stalled or terminated projects. Additional factors that have been known to cause delays in Pakistan are issues in financial payment which are caused by delay in disbursement of funds by the project sponsor, poor planning by the project team that is involved directly in the project, poor site management by the resident engineers and the supervisors, inadequate experience in the project professionals, lack of adequate materials and specific equipment which affect the expected performance of the project milestones.

In Singapore, Mahamid (2011) found that from the field survey which included 40 consultants, the main factors affecting project success from the consultant's view are materials price fluctuation which cannot be controlled but project team, size of contract which could be mitigated at the initiation phase and also incomplete drawings from the professionals involved which leads to schedule delays. According to Beckers (2013), the members of the project who participate during the implementation of projects face challenges such as trying to limit the number and impact that certain risks have on the project, the potential occurrence of such risks throughout the project, and the need to ensure that they are well documented to enable flexibility of response to various changes that were not expected over the life cycle of a project.

Kamundia (2016) researched Factors Influencing Construction of Irrigation Projects: A case of National Irrigation Board, Kenya, four specific objectives guided the study. These were; to establish the influence of managerial planning on construction of irrigation projects; to determine the influence of financial resources on the construction of irrigation projects; to examine the influence of equipment on the construction of irrigation projects and to establish the influence of project staff on construction of irrigation projects. The study was helpful since it aided the current study in the literature review, however, the focus of the current research is on the influence of Risk Management on the performance of NIBs projects in Kenya.

Miruri (2017) studied the Determinants of Performance of Irrigation Projects: A Case of Nthawa Irrigation Project of Mbeere North Sub County, Embu County, Kenya. This study was a case study whereas the current study is not. Though, both studies are looking at the performance of irrigation schemes. Therefore, it contributed to the literature review data Odede (2016) The major objective of the research was to determine the influence of strategic management practices of the National Irrigation Board of Kenya on the organizational performance of the government agency. This was a case study of the National Irrigation Board of Kenya whereas this current study focuses on the influence of risk management on the performance of national irrigation board projects in Kenya.

Kamundia (2016) investigated the factors influencing the construction of irrigation projects a case of national irrigation board whereas the current study investigates the influence of risk management on the performance of NIB projects in Kenya. However, information on NIBs was useful in the current study. The risk management concept varies based on how the relevant agencies or the project team identifies and analyzes them, and also according to how they view risks. Hence it creates a difference in their attitude towards risks Belel and Mahmood, (2012). It is widely accepted across the construction management society that project risk is any event or series of events, whether motivated internally or externally, that when occurred will negatively affect the project objectives such as the project performance, the estimated schedule time, and budgeted cost. Risk management is a comprehensive and systematic way of identifying, analyzing, and responding to risks to achieve the project objectives (Banaitiene & Banaitis, 2012).

A study in the Nigerian construction industry indicated that the risk management process is not well implemented and the agencies involved do not follow up. There was also a need to ensure that the individuals involved in the knowledge of risk management and best practices are hired to facilitate the implementation in the projects. Changes in the pricing of the required project materials was a problem that led to a difference in the actual budget compared to the estimated budget. Financial risk by the project financiers not paying on time as agreed in the contracts was also a problem (Belel & Mahmood, 2012).

In the South African construction industry, a study carried out revealed that over half of the organizations surveyed, lacked formal risk management policies and procedures and there was a lack of risk management training (Krige & Pierre, 2008). The most significant risks that plague the industry were found to be a shortage of critical resources, poor business and project risk management, risk exposure during the tendering process, and government interference risk. In the Ghanaian construction industry, (Kumi, 2012) found out that the majority of professionals who participated in a survey related to risk management in the construction industry did not know regarding risk management theories and techniques.

RESEARCH METHODOLOGY

This study adopted the correlative design and a positivist research philosophy. The target population of this study was the staff in all the 8 irrigation 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 personnel 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 behalf 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 Planning

In this section, respondents were asked to indicate their level of agreement with various statements on risk planning. Based on the findings presented in Table 1, all the mean value were above 3.5 an indication that on average the respondents agreed with the statements on risk planning and the performance of NIA projects in Kenya. The findings specifically show that the respondents agreed that they identified and assessed internal environment factors (M= 4.007, SD= 1.251); they identified and assessed external environment factors (M= 3.994, SD= 1.476); and they understands the internal environment, which concerns all factors influencing the manner in which firms manage risks (M= 3.994, SD= 1.343). Respondents also agreed tat they defined the project's focus, i.e. project objectives and strategy (M= 3.988, SD= 1.475); they defined the objectives and methodology of the risk management process (M= 3.961, SD= 1.674); and they defined the responsibility and accountability for the risk management process (M= 3.955, SD= 1.546). In addition, they agreed that they considered personnel availability and know-how (M= 3.836, SD= 1.426); they considered time requirement in terms of scheduling risk meetings/workshops (M= 3.83, SD= 1.441); they considered information system requirement in identifying risks, implementing controls and follow-up activities (M= 3.777, SD= 1.275). Also, they agreed that they considered risk communication mechanism, e.g., informal discussions, organization newsletter (M= 3.738, SD= 1.32); and that they considered technology requirements, e.g., use of spread sheets, risk profile (M= 3.698, SD= 1.331).

The study findings agrees with Klijn, Kreibich, De Moel and Penning-Rowsell, (2015) that risk management planning lays down objectives and develops various courses of action, by which the organization can achieve those objectives. Risk management planning minimizes risk and uncertainty, by looking ahead into the future. It also agrees with Hopkinson (2017) that project Scope and schedule provides the documented basis for making all project decisions and is used to direct the project effort and communicate the project scope to the project team and other project stakeholders.

Table 1: Descriptive Statistics for Risk Planning

Statement	Mean	Std. Dev.
Identified and assessed internal environment factors	4.007	1.251
Identified and assessed external environment factors	3.994	1.476
Understands the internal environment, which concerns all factors influencing the manner in which firms manage risks	3.994	1.343
Defined the project's focus, i.e. project objectives and strategy	3.988	1.475
Defined the objectives and methodology of the risk management process	3.961	1.674
Defined the responsibility and accountability for the risk management process	3.955	1.546
Considered personnel availability and know-how	3.836	1.426
Considered time requirement in terms of scheduling risk meetings/workshops	3.83	1.441
Considered information system requirement in identifying risks, implementing controls and follow-up activities	3.777	1.275
Considered risk communication mechanism, e.g., informal discussions, organization newsletter	3.738	1.32
Considered technology requirements, e.g., use of spread sheets, risk profile	3.698	1.331
Aggregate Score	3.889	1.414

The study also sought to determine other ways in which risk planning influenced performance in their irrigation schemes. They explained that effective risk management strategies allow you to identify your project's strengths, weaknesses, opportunities and threats. By planning for unexpected events, you can be ready to respond if they arise. To ensure your project's success, define how you will handle potential risks so you can identify, mitigate or avoid problems when you need to do. Successful project managers recognize that risk management is important, because achieving a project's goals depends on planning, preparation, results and evaluation that contribute to achieving strategic goals.

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 stakeholder 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 planning has strong positive and significant relationship with performance of NIA projects in Kenya ($r=0.872$, $p=0.010$). Significant relationship was considered since the p-value was less than selected level of significance (0.05). The findings agrees with those of Klijn, Kreibich, De Moel and Penning-Rowsell, (2015) that risk management planning minimizes risk and uncertainty, by looking ahead into the future.

Table 4: Correlation Analysis

		Performance	Risk planning
Performance	Pearson Correlation	1	
	Sig. (2-Tailed)		
	N	184	
Risk planning	Pearson Correlation	.872**	1
	Sig. (2-Tailed)	.010	
	N	184	184

Regression Analysis

Risk Planning on Performance

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

H₀₁: There is no statistically significant relationship between risk planning and the performance of NIA projects in Kenya

The R-Squared shows the amount of variation in the dependent variable that can be explained by changes in 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. The R value (correlation coefficient) on the other hand shows the strength of the relationship between the variables in the model. As indicated in Table 5, the r-squared for the relationship between risk planning and performance of NIA projects in Kenya was 0.529; this is an indication that at 95% confidence interval, 52.9% variation in performance of NIA projects in Kenya can be attributed to changes in risk planning. Therefore risk planning can be used to explain some changes in performance of NIA projects in Kenya. The findings also show that risk planning and performance of NIA projects are strongly related as indicated by correlation coefficient value of 0.727.

Table 5: Model Summary for the Risk Planning on Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.727 ^a	.529	.527	.22923

a. Predictors: (Constant), risk planning

The analysis of variance is used to determine whether the regression model is significant; that is if its 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 0.010 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 from the anova table was greater than the F critical value from f-distribution table ($204.404 > 3.893$), an indication that risk planning 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 Planning on Performance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.923	1	8.923	204.404	.010 ^b
	Residual	7.945	182	0.044		
	Total	16.868	183			

a. Dependent Variable: Performance

b. Predictors: (Constant), Risk Planning

From the results the regression model was;

$$Y = 0.920 + 0.782 X_2 + \epsilon$$

The above regression equation revealed that holding risk planning to a constant zero, performance of NIA projects in Kenya will be at a constant value of 0.920. The findings also show that risk planning is statistically significant in explaining performance of NIA projects in Kenya ($\beta = 0.782$, $P = 0.010$). This indicates that risk planning positively and significantly relates with performance of NIA projects in Kenya. The findings also suggest that a unit increase in risk planning would lead to an increase in performance of NIA projects in Kenya by 0.782 units. The findings concurs with Mahamid (2011) who found that the main factors affecting project success from the consultant's view are materials price fluctuation which cannot be controlled but project team, size of contract which could be mitigated at the initiation phase and also incomplete drawings from the professionals involved which leads to schedule delays.

Table 7: Beta Coefficients for Risk Planning on Performance

Model	Unstandardized Coefficients			t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.920	.137		6.715	.000
1 Risk planning	.782	.155	.727	5.045	.010

a. Dependent Variable: Performance

Moderating Effect Regression Analysis

Risk Planning

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

The null hypothesis stated:

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

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

The R squared for the relationship between risk planning and performance of NIA projects in Kenya was 0.529, which implied that 52.9% of performance of NIA projects in Kenya can be explained by risk planning. However, in the second model, in Table 8, which constituted risk planning, stakeholders management, risk planning * stakeholders management, the r-squared was 0.588. 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 relationship between risk planning, stakeholders management and performance of NIA projects in Kenya. The findings also show that the variables risk planning, stakeholders management, risk planning * stakeholders management and performance of NIA projects are strongly related as indicated by correlation coefficient value of 767.

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

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.727 ^a	.529	.527	.22923
2	.767 ^b	.588	.575	.08498

a. Predictors: (Constant), risk planning

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

From the findings, the F-calculated for the first model, as shown in Table 4.35, was 204.412 and for the second model was 85.631. 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 planning and the performance of NIA projects in Kenya.

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

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.923	1	8.923	204.412	.000 ^b
	Residual	7.945	182	0.044		
	Total	16.868	183			
2	Regression	6.523	3	2.174	85.631	.000 ^c
	Residual	4.570	180	0.025		
	Total	11.093	183			

a. Dependent Variable: Performance

b. Predictors: (Constant), risk planning

c. Predictors: (Constant), risk planning, stakeholders management, risk planning * 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 modeling would be as follows:

$$Y = 0.920 + 0.782 X_2 + \epsilon$$

The findings show that risk planning has a statistically significant effect on performance of NIA projects in Kenya as shown by a regression coefficient of 0.782 (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 modeling was as follows:

$$Y = 1.055 + .833 X_2 + .638 M + 0.406 X_2 * M$$

The model indicated that risk planning had a positive and statistically significant effect on performance of NIA projects in Kenya as shown by a regression coefficient of .833 (p-value=0.001). Stakeholders management had a positive and significant effect on performance of NIA projects in Kenya as shown by a regression coefficient .638 (p-value= 0.005). On the other hand, risk planning * stakeholders management also had a positive and significant effect on the performance of NIA projects in Kenya as shown by a regression coefficient of

0.406 (p-value=0.001).

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

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.920	.137		6.715	.000
1 Risk Planning	.782	.155	.727	5.045	.000
(Constant)	1.055	0.142		7.430	0.000
Risk Planning	0.833	0.183	0.731	4.552	0.001
2 Stakeholders Management	0.638	0.224	0.694	2.848	0.005
Risk Planning *	0.406	0.077	0.535	5.272	0.000
Stakeholders Management					

a. Dependent Variable: Performance

Conclusions

Risk Planning

The study found that risk planning is statistically significant in explaining performance of NIA projects in Kenya. This indicates that risk planning positively and significantly relates with performance of NIA projects in Kenya. The study therefore concludes that improving risk planning would lead to an improvement 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. The interaction between risk planning and stakeholders management has statistically significant effect on performance of NIA projects in Kenya. In addition, the interaction between risk analysis and stakeholders management had statistically significant effect on performance of NIA projects in Kenya. Furthermore, the interaction between risk monitoring and control and stakeholders management had statistically 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 Planning

Improvement in risk planning was found to result in improved performance of projects. The study thus recommends irrigations schemes to invest more in risk planning activities. This can be achieved if they develop clear goals and objectives, risk breakdown structure. It is also important that the management considers project prioritization and also ensure that the organization has the capacity to conduct proper risk planning.

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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