

Management

Elixir Mgmt. 106 (2017) 46328-46340

Elixir
ISSN: 2229-712X

Project Based Factors Influencing the Supply of Safe Water in Kenya. (A Case of Mombasa County)

Jackton Omondi Olali and Frida Simba

Jomo Kenyatta University of Agriculture and Technology P.O Box 81310-80100 Mombasa.

ARTICLE INFO

Article history:

Received: 24 March 2017;

Received in revised form:

23 April 2017;

Accepted: 4 May 2017;

Keywords

Evaluation,
Monitoring,
Participation,
Sustainability,
Water Demand.

ABSTRACT

This study was designed to establish the project based factors influencing the supply of safe water in Kenya with Mombasa County as a case study. The Government and private organizations have established many water projects but most of them have been characterized with low levels of sustainability. Some of them have become un-operational requiring rehabilitation. In spite of the existing projects, the water supply is still inadequate. To address the problem, this study identified four specific objectives, namely; to establish the influence of project planning on the supply of safe water, to establish the influence of project risk management on the supply of safe water, to determine the effect of project quality control management on the supply of safe water and to determine the effect of project monitoring and evaluation on the supply of safe water. The hypotheses used were geared towards establishing the influence of water projects' planning, risk management, quality management and monitoring & evaluation, on the supply of safe water. All the variables are interrelated. Project planning includes plans in all the project knowledge areas such as quality and risk management which touch on all deliverables and processes. M&E is also done on deliverables and processes, in reference to the agreement made during project planning. The study sought to assist the national and county governments in the sustained provision of safe water. The theories of sustainability, participation and project management were analyzed in relation to the supply of safe water. The participation theory discussed the unity of the beneficiaries for the sake of water projects. Sustainability theory discussed the long term water benefits. Whereas, the project management theory put emphasis on the water projects' processes.

© 2017 Elixir All rights reserved.

Introduction

The gaps in the key areas such as ICT & supplies chain management were noted for further research. A descriptive design method was used in the study. Self-administered structured questionnaires were used to collect data from a sample of 220 respondents. The target population comprised all the recorded water projects in Mombasa County. A sample size was determined from the established strata in the stratified sampling method. The sample size of two hundred and fifty was drawn using a chosen ratio. Purposive sampling method was used to identify the respondents. The questionnaire was structured, coded and pilot tested to determine the validity, reliability and suitability. Data was analyzed and presented using IBM SPSS 21. Descriptive statistics were used to determine the frequency of responses mean, standard deviation and percentages. Multiple linear regression analysis was used to find out the prediction element in safe water supply increased unit from the independent variables increased unit. The descriptive statistics show that majority of the respondents agreed with all the statements in each variable. The results further show that project planning impacts to a great extent safe water supply as it scored more in correlation coefficient values. The findings through a Pearson coefficient measure showed that the four project based factors have a significant positive

relationship with safe water supply. Based on these findings the study rejected the all null hypotheses and concluded that project planning, risk management, quality management and project monitoring influence the supply of safe water in Mombasa County. The study recommends that more water projects should be formed to alleviate the safe water deficit in Mombasa County. There is also need to replicate the study in other counties with both island and mainland areas. The world population estimated at 7 billion (WB, 2015) makes the provision of water a big challenge because it strains the management system and institutions. By 2050 the world's population will have grown from 7 billion to 9 billion. This enormous upsurge means the need for water will increase by over 50 % if the current consumption rate continues. In a related report from the Organization for Economic Corporation & Development (OECD, 2012) about 1.5 billion people in the world live in areas seriously affected by water scarcity. The number will increase to almost 4 billion by 2050 and will trigger a global food crisis. This is a serious indication that water shortage is one of the greatest global changes in as far as food security is concerned.

Water is less scarce in Europe than in Africa and Asia but there are European regions without clean drinking water, a good example is Romania.

This country has a poor water system in the countryside. According to OECD (2012) a water project subsidized by EU funds was put in place to alleviate the problem. The project's main objective was to boost the water quality and access. Another contradiction can be found in China. It is the biggest developing country and is perceived to be free from water scarcity but her development is still constrained by limited water resources. However, she has managed to reduce the impact through conservancy projects like dams, reservoirs, irrigation infrastructures and water transfer projects (Yong, 2009).

Africa urban areas are growing much faster than the rest of the world and as a result face huge challenges in the water supply. It is estimated that 40 % of the Africans i.e. 400 million live in urban zones and the 60 % of them are in shanty towns where drinking water is inadequate (UN-HABITAT, 2015).

Global water supply benchmark is 1,000 m³/ p.a while Kenya stands at 685 m³/ p.a . This trend is alarming and the areas hard hit by this water shortage phenomenon are the urban areas with the slums bearing the greatest burden. A rapid population growth estimated at 2.46% p.a in 2011 and accelerating urbanization at 4.2% between 2010 and 2015 present growing challenges to the adequate supply of water (MWI, 2015).

The target water supply coverage for urban areas of 80% has not been met by any urban town in Kenya. Lack of access to safe drinking water leaves the people exposed to waterborne diseases such as cholera and diarrhea. This is because they struggle to survive with any available water. New sources of water are difficult to find and if found they are expensive in exploitation thus compounding the water problem MWI (2015). As the ever increasing population continues to rely on existing water sources, depletion occurs since the wells, boreholes and springs dry up. The statistics from WB (2015) indicate that access to improved sources in Kenya urban areas decreased from 92% in 1990 to 82 % in 2015.

The water projects supported by donors, the women group water projects and community water projects have all tried to bridge the supply gap but in vain. This has mainly been attributed to poor project management techniques (Mbata, 2006). The study attempts to understand other management techniques applied with a view to finding a solution. Increased investment in water supply development in the last decade by both Government and development partners has not resulted in the desired levels of service anticipated. Many water projects completed have either stopped operating or are not operating optimally.

The Water Act 2002 provides for groups or firms that own or want to operate water supply projects as Water Service Providers. Such groups or firms operate water projects under license on behalf of user populations. However, many water supply projects do not meet the license criteria and continue to operate without regulation. The sustainability of these water projects, therefore remains a challenge to progress in the Water Sector and has implications for the attainment of the Water Sector objectives, MDGs and Vision 2030 among other policy instruments.

The Government has continued to establish numerous new water projects, while giving little regard to rehabilitating existing non-functional ones. However, these water projects lack funding, especially to improve existing systems (GOK, 2009).

The community management of water supply projects on operation and maintenance (O & M) cannot be successful, if financing resources are not available and frequent supports are not provided (Binder, 2008).

Effective management by competent project managers play a number of different roles in projects. According to Mbata (2006) the sustainability of community based projects require a team of highly competent managers owing to many dynamics of the project implementation. The failure of these projects is largely blamed on lack of professionalism and management skills of the project implementers. In order to establish good rapport, leaders need time, resources and authority to invest in a project. The key causes for the failure include inappropriate policy or legislation; insufficient institutional support; unsustainable financing mechanisms; ineffective management systems; and lack of technical backstopping (Niyi & Felix, 2007).

The Kenya Constitution (2010) Section 43(1)(d) provides that every person has a right to clean and safe water in adequate quantities. However, this has not been adequately met to date. Access to safe water has continued to dwindle both in urban and rural areas, with statistics indicating a decline to 60% in urban areas and in rural areas 40% as indicated in ROK (2015). The government has instituted several measures to address the problem, the major ones being contained in 2002 water act, section 113. This is the official incorporation of the private sector, civil society and communities in the management and development of water resources.

In Kenya, the total amount of water that leaves the sources for distribution to the consumers has never met the arrival threshold of 75% . This shortage has been attributed to leakages on the way. MC just like other counties experience this problem. The company under its jurisdiction (MWSSC) is mandated to supply a population of approximately 1.2 million with adequate supply of safe water estimated at 186 million litres a day. On the contrary, the residents have continued to receive less than 55.8 million litres a day which is less than 30 % of their total demand ROK (2015) .

Several water projects have attempted to bridge the gap but the deficit is still glaring, oscillating at around the same figure of 30%. It is necessary to carry out a study so as to get down to the root cause of the problem. Nevertheless water projects have been seen as a solution since they have improved access to water in terms of affordability, coverage, quality and customer services. It is estimated that water projects have provided access to piped water for more than 24 million people living in developing countries since 1990 (Marin, 2009). The Kenya government in collaboration with development partners has also invested in water projects alongside the water companies.

(Olowu & Wunsch, 2008) suggest that the counties / local governments have contributed to the water supply crisis by condoning corruption. This has in effect resulted into poor service delivery. This study seeks to identify more causes of the water supply shortage. The water projects operate within counties and are therefore affected by the administration of the County Governments. The project based factors influencing the supply of safe water will be studied *vis a vis* the administration.

Hypotheses of the study

The study was guided by the following hypotheses:

Hypothesis one

H₀₁: Project planning has no influence on the supply of safe water in Mombasa County.

H_{a1}: Project planning has an influence on the supply of safe water in Mombasa County.

Hypothesis two

H₀₂: Risk management has no influence on the supply of safe water in Mombasa County.

H_{a2}: Risk management has an influence on the supply of safe water in Mombasa County.

Hypothesis three

H₀₃: Quality management has no effect on the supply of safe water in Mombasa County.

H_{a3}: Quality management has an effect on the supply of safe water in Mombasa County.

Hypothesis four

H₀₄: Project monitoring has no effect on the supply of safe water in Mombasa County.

H_{a4}: Project monitoring has an effect on the supply of safe water in Mombasa County.

Related Literature**Theoretical framework**

(Leedy & Orsmond, 2007) explain that the theoretical framework consists of concepts, definitions and existing theories used in a particular study. They proceed to say that theories are formulated to explain, predict and understand phenomena. In the academic field they are meant to challenge and extend the existing knowledge. The theoretical framework in this study will focus on three theories; stakeholders' participation theory, project sustainability theory and project management theory.

Stakeholders' participation theory

According to Coles and Wallace (2006) participation is a means to educate citizens and to increase their competence. They note that it is a vehicle for influencing decisions that affect the lives of citizens and an avenue for ensuring success of WPs. However, it can also be a method to co-opt dissent, a mechanism for ensuring the receptivity, sensitivity, and even accountability of social services to the consumers. On the other hand, Binder (2008) defines citizen participation in WPs as a process whereby citizens act in response to public concerns of the strong need for water, they voice their opinions about decisions that affect them and take responsibility for changes to their community. Keen (2007) goes further and introduces the term 'effective participation' for WPs. He explains it by linking the society's attitudes and cultural values to socio-cultural environment. He observes that when an organization conducts its business, it will need to do so in a way that respects and bears in mind the fact that the socio-cultural environment is characterized by different people. He asserts that the environment will be well accommodated when a cross-section of the society members is allowed to participate in WPs.

Mclvor (2008) suggests that stakeholders' support could be a response to the traditional sense of powerlessness felt by the general public when it comes to influencing government decisions especially on WPs. They stress that, participation is crucial to the success of a WPs. According to Lockwood and Smitts (2011) the stakeholders' support in WPs brings together individuals, families and communities who assume responsibility for their own welfare and develop a capacity to contribute to their own development.

According to Mushtaq (2006) with reference to WPs, participation refers to an active process whereby beneficiaries

influence the direction and execution of WPs rather than merely waiting to see water flowing. (Ingle, 2006) notes that through participation in WPs the community shares project costs in either money or labor during the WPs implementation or operational stages. This saves the WPs money and contributes to financial sustainability.

Project sustainability theory

According Harvey and Reed (2006) the term "sustainable" refers to something which can be kept going. But, it also refers to resource use and lifestyles which do not damage resources. They also suggest that sustainable development refers to the design of human and industrial systems. This ensures that humankind's use of WPs benefits does not lead to diminished quality of life as a result of future economic opportunities loss. Ingle (2006), suggests that sustainability in WPs encompasses conventional approaches while adding a longer-term perspective of unlimited benefits. He further highlights that, for WPs to achieve sustainability, the PM needs to be implemented through a strategic approach which involves to strategic plan. McCommon et al (2009) link the society's participation to sustainability. They argue that. sustainability rate of WPs increases as a result of communities' owning and managing them. According to Jansz (2006) for three decades, literature in the water supply sector has shown that sustainability of WPs structures has become positively associated with small-scale initiatives, which maintain public participation. He explains that through participation, the users enhance sustainability since they are involved in planning, implementation, operation, protection and maintenance of WPs.

Binder (2008) suggests that there are several determinant factors for the sustainability of WPs. He categorizes them into two namely; The pre-implementation factors and post-implementation factors. Community participation, technology selection, site selection, demand responsiveness, construction quality, population and training are some of the pre-implementation factors in WPs. Whereas the post-implementation factors are technical support, community satisfaction, institutional and financial management, training and willingness to sustain WPs. According to Harvey and Reed (2007) there are four aspects of WPs sustainability, which are needed to be recognized and analyzed, namely; societal influence, which measures the impact a society makes upon the corporation in terms of the social contract and stakeholder influence; environmental impact, which is the effect of the actions of the corporation upon its geophysics environment; organizational culture, which is the relationship between the corporation and its internal stakeholders and finances an adequate return for the level of risk undertaken in pursuit of sustainable WPs development and financial sustainability.

Project management theory

According to Olowu and Wunsch (2008) the PM is the application of knowledge, skills, tools and techniques to project activities to meet project requirements. They state that, PM applies well as an organizational approach to the management of water projects and is accomplished through processes of initiating, planning, executing, monitoring, controlling and closing. Binder, (2008) notes that, PM is the art of managing a project and its deliverables for the end product/ service which is fresh water supply. PM is also the way to carry out execution of project management plans. According to Young (2009) the PM in water projects involves defining and achieving a set of goals while

optimizing the use of allocated resources (time, money, people, space). He suggests that, it includes planning, scheduling and progress maintenance of the project activities. He argues that, well executed PM leads to the provision of safe water. He continues and states that, PM in water projects can only succeed by having; deliverables on schedule/ within budget, a comprehensive planning data, early definition of quality criteria, planned implementation and early risk analysis data. Jansz (2006) notes that, water projects need PM so as to have effective processes of achieving project objectives, schedule, budget and performance. He argues that, to produce quantifiable and qualifiable deliverables, a structured process under PM is required. PM brings tasks, resources and people together to achieve goals and objectives with time constraints and monetary allowance.

According to Coles and Wallace (2006) the water projects should have PM because it deals with identifying requirements, establishing clear and achievable objectives, balancing demands from stake holders and achieving commodity purpose. They state that, PM is structured and scientific hence necessary for WPs. They stress that, PM handles triple constraints of time, space, quality and scope. They argue that effective PM looks at productivity, budget, communications, monitoring status, risk, product quality, decisions and strategic objectives.

According to Binder (2008) PM is both art and science. Science in the sense that it is a systematic approach which uses a standard methodology. The art is in the soft skills such as; leadership qualities, trust, credibility, problem solving and managing expectations. He explains that, art is obtained from experience, practice and intuition. For the WPs he indicates that, the project manager should possess both art and science skills. McCommon, et al., (2009) suggest that, a project manager should be able to take on the leadership role with respect to not only managing the WPs but also leading the technological initiatives. They stress that, WPs management involves planning, organizing, staffing, directing, controlling and O&M. According to Ingle (2006) the project manager is the most influential member in WPs. He notes that, PM involves effective implementation of a strategy and there is need for adequate leadership in the project. The project manager sets the organization values as the team leader. This ensures that all the project efforts are united and directed towards achievement of the project goals. Young (2009) also puts emphasis on the manager and suggests that the positive reception and implementation of the strategic plan lies with him/her. According to Lockwood and Smitts (2011) the manager is the head and so he/she is the sounding board for technical and architectural decisions made for the project.

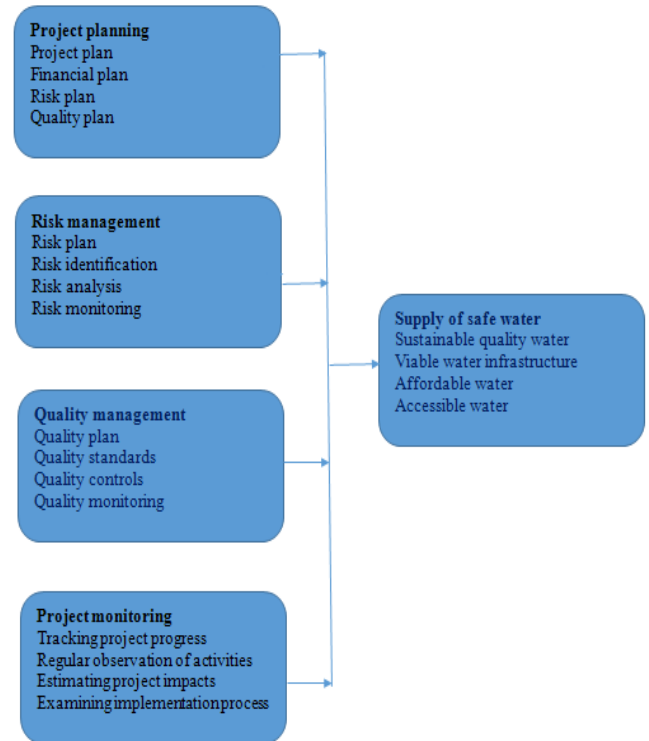
Conceptual framework

This section provides a structural narrative description of the relationship between the variables forming the concepts of the study, on the supply of safe water. (Bridget & Lewin, 2006) define CF as a diagrammatical representation, that shows the relationship between the independent and dependent variables. The CF for this study in figure 2.1, shows the linkage between the dependent variable - the supply of safe water and the independent variables - PP, RM, QM, and M&E.

Review of the variables on conceptual framework

Project planning

The project charter lays out major milestones while project plan defines detailed schedule, budget, resources,



Independent variables
Source: Researcher (2016)

Dependent variable

Figure 2.1 Conceptual framework of the study

risks, assumptions and roles and responsibilities to/ for all stakeholders (Chatzoglou & Macaulay, 2006). They explain that, a project plan is a major project management tool because it keeps project on track and on budget. The main purpose of the plan is to; identify stakeholders, prepare/ plan a budget for the identified resources, identify risks and set a quality plan. All the activities should be highlighted during project planning and this is the basis for scheduling budget, labor, communication, estimated time completion and the start and finish dates (Turner, 2012). He goes ahead and suggests that project planning is the process of setting goals, developing strategies, outlining implementation arrangements and allocating resources to achieve the project goals. He proceeds and says PP involves; identifying vision, goal/ objectives, strategies formulation, determining and allocating resources and outlining implementation arrangements which include project monitoring processes.

Project planning refers to the preparation of a sequence of action steps to achieve a specific goal. It is how to finish a project within a stipulated/ planned time frame with the execution of management plans (Veim, 2010). He goes and suggests that, PP is about; setting objectives, identifying deliverables, planning schedules, planning for resources, planning quality standards and planning for risks. He continues that, PP identifies activities and the end product, how to perform and how to accomplish them. According to Chatzoglou and Macaulay (2006) PP defines each task, time and resources. It involves how a project is executed, monitored, controlled, evaluated and closed. They explain that, it is a process of creating/making management plans that involves the developing of strategies, outlining of tasks and preparing of schedules to accomplish project goals.

The work plan is a guide to implementation and a basis for monitoring Turner (2012). He proceeds and notes that, project planning should indicate what is to be measured/ monitored, who should monitor and how monitoring should be done.

He suggests that the work plan prepared during project initiation should have monitoring activities well spelt out. According to Veim (2010) project planning describes ways which implementation and monitoring are done. He explains that, there is a relationship between project monitoring and PP, since the monitoring process is guided by project work plan. Monitoring provides information for the review of the current PP or the next PP. He argues that, PP is an advance decision on what to do, how to do it and who to do it or in simple terms - the making of decisions to guide future actions.

Risk management

Risk management is the formal process by which risk factors are systematically identified, assessed and provided for. RM helps an organization to gain and access better control of; time - planning/scheduling, money/expenses, quality controls, communication channels, risk monitoring, minimization of adverse impact on scope, cost, schedules and quality (PMBOK, 2016). Risk management is the systematic process of identifying and analyzing and responding to project risks, maximizing probability and consequences of the positive events/ minimizing probability of adverse events (Cleland & King, 2009). They go ahead and explain that, RM uses a risk plan to; approach all possible risks, identify risks and their characteristics, have qualitative risk analysis and prioritize their effects on project objectives, quantitative measures on probability and consequences for implication on objectives, response planning procedures and M&E specific for effectiveness evaluation. Risk management is a process by which risks are identified, quantified and managed (Cleland, 2010). He goes ahead and notes that, a risk may be identified at any stage by completing a risk form and recording risk details in a register. He explains that RM through a risk plan identifies risks, evaluates and quantifies them, executes that plan while applying project monitoring techniques.

The purpose of risk management is to implement a risk plan document (Wang & Huang, 2006). They proceed and suggest that, the document is a guide, prepared during the initial project planning stage. To explain that, the plan describes how risks will be managed and indicates clearly the responsibilities to the project staff/stakeholders, efforts, time, costs and how to communicate the risks. They further note that, in RM efforts are made to; evaluate the risk consequences and their probability of occurrence, reduce the risk threats, mitigate the risks, identify risk levels and update the risk plan. Risk has significant effect on the project outcome and as result RM is required to assist in risk analysis (Yu & Bowers, 2006). They further note that, risk management assists in the determination of probability of an occurrence and if it does occur – assess the impact. They explain that, the risks are identified during PP; when the project develops scope, schedule and budget. PP ensures that, risks well are analyzed and recorded in a risk plan. They suggest that, project monitoring is applied to report progress with a view to; checking on the occurrence of residual risks, determining new risks, tracking activities and responses. They continue and explain that, the purpose of RM is to ensure that the risk plan is implemented as agreed upon during project planning.

According to Cleland (2010) the purpose of RM is to identify and develop strategies to prevent occurrence of risks or minimize the impact. He notes that, RM involves determining risk and designing counter measures and as

result must strive to; eliminate risks, reduce risks likelihood, reduce impact, have early warning checks, avoid risks, share/transfer to insurance companies/ sub- contractors or accept the risks and move on. Cleland and King (2009) inform us that, RM ensures that; a track of risks is kept, new risks are identified, risks are monitored, controlled and evaluated. They suggest that, the risk plan should guide the management on the development of programs. For the purposes of RM, the plan should be prepared during PP and should contain; mitigation strategies, contingency plans, risk avoidance details, risk acceptance details and risk transfer details.

Quality management

The overall quality management ought to be well defined in order to understand the project's quality aspects (Atkinson, 2009). He proceeds and points out that, this overall or total quality management deals with achieving superior quality and customer satisfaction. It looks at quality of business practices and products. He also emphasizes that, the quality must be planned during project planning since everything related to quality is taken into account. He further explains that, this all- inclusive work done in PP is through management processes and quality management features greatly. Quality management is the extent to which the final deliverable conforms to the customer requirements or fitness of use (Cleland et al 2006). They further explain that, QM is a process by which quality is assured and controlled using quality assurance and quality control techniques. They proceed and suggest that QM is the process of ensuring that all activities for design, plan and implementation are effective and efficient. They also note that, QM is a continuous process from the start to the end and it involves project monitoring along the way. They argue that, the purpose of monitoring here, is to check on the implementation progress of quality plan and processes.

Quality management refers to a repetitive cycle of measuring quality, updating processes and measuring until the management gets the desired quality (Gardiner & Stewart, 2009). They continue and explain that, QM is about quality control, improvements and quality standards that will be acceptable to stakeholders. QM includes implementation of processes to satisfy customer needs as planned. They suggest that, quality assurance is a component of QM and is planned for during PP. They explain that, QM ensures that the product meets the standards during implementation and as a result must be subjected to continuous monitoring. According to Cleland et al. (2006) Quality management is about project quality definition, assurance, control and improvements. They describe QM as the processes and activities planned during PP to achieve project quality in all aspects for stakeholders' satisfaction.

According to Atkinson (2009) quality management is better understood through a quality plan which is a set of activities in PP, meant to achieve quality control in activities, deliverables and the end product. He goes ahead and notes that, the plan defines activities / tasks to deliver quality products, states quality requirements, procedures and describes how processes will be implemented / measured. He explains that, this plan is a management tool for QM.

The plan; defines policies, procedures, standards, reviews, verifies and validates activities prepared during PP. According to Gardiner and Stewart (2009) QM; identifies relevant quality standards and how to satisfy them, evaluates overall project performance to ensure that the project meets quality standards, monitors results for compliance with

standards and identifies ways to eliminate causes of unsatisfactory performance. They suggest that, quality itself should be inherent in everything that the project produces and hence thorough work should be done during PP.

Project monitoring

According to (Bryde, 2008) monitoring is the regular observation and recording of activities. He notes that it is a process of routine gathering of information on all project aspects. He goes to say that monitoring is the checking on how activities are progressing against what is contained in project planning document. He suggests that it is a systematic and purposeful observation and it involves feedback to donors, implementers and beneficiaries. He notes further that, monitoring is crucial to planning and implementation. According to Yu & Bowers (2006) monitoring is a regular systematic collection and analysis of information to track the progress of implementation against pre-set targets and objectives in PP. They further suggest that, monitoring compares results with targets made during PP, reports progress to managers and alerts them on problems for corrective actions. They note that, there is a strong relationship between PP and monitoring since the later links activities in PP to their resources and objectives.

According to Veim (2010) monitoring; gives information on where a policy, program or project is at any given time, focuses on efficiency and use of resources and provides progress reports of the activities in PP. He argues that, monitoring signals problems along the way for remedy but cannot explain why a problem exists or why it has failed. He notes that it is descriptive in nature and gets more effective when combined with evaluation. Evaluation answers the 'why' question based on what PP contains. The purpose or function of monitoring is to provide data and evidence for evaluation (Bamberger, et al.,2007)). They explain that, evaluation is the objective assessment of an ongoing or recently completed project, program or policy, its design, implementation and results. Without monitoring it is difficult to know whether the intended results in PP are achieved (Baker, 2008). He continues and explains that, monitoring relate to pre-identified results in PP, through a project plan document.

The progress to achieve results stated in project planning, require monitoring whose information can be used for improvement or reinforcement of plans (Shenhar, Dvir & Levy, 2007). They further note that monitoring is a critical input for evaluation. They explain that, for evaluation to be successful a program ought to be well planned, designed and have its progress monitored. During project planning, all management processes should be recorded to enhance smooth monitoring of the implementation exercise (Chan & Chan, 2007). They also note that, the indicators to be monitored are determined at project planning stage. Monitoring therefore, ensures that work is implemented as per the schedule in PP.

Methodology

The study was descriptive in nature. A descriptive design is a method of collecting information by interviewing or administering a questionnaire to a sample of individuals (Brayman & Bell, 2011). They move ahead and state that, this design type assists in the description of the situation without any manipulation of variables. It mainly focuses on the; formulation of objectives, data collection instruments' design, data collection, data processing and analysis and reporting findings. They conclude that, the design provides

a framework for gathering and presenting data. The researcher applied purposive sampling method to obtain the sample frame and to identify interviewees. The stratified sampling method was used to arrive at the sample size, mainly because the water projects in the target population are located in four different areas of Mombasa county. These areas; island, north mainland, west mainland and south mainland formed the researcher's sub- group for the strata. From the target population of 250,000, the researcher used a sample ratio of 0.001 in every stratum to arrive at sample size

Data Analysis, Results and Discussions

Project based factors influencing the supply of safe water in Kenya a case of Mombasa County.

Project planning

To determine the relationship between project planning and the supply of safe water, the respondents were requested to indicate strongly disagree, disagree, neither agree nor disagree, agree and strongly agree for their chosen answers. The answers were rated on a 5 point Likert scale where strongly disagree= 1 disagree= 2 neither agree nor disagree= 3 agree = 4 strongly agree= 5. The mean and standard deviations were generated from SPSS v. 20. The results are in table 4.9.

Table 4.9. Project planning results.

Statements	Number	Mean	Standard deviation
The project plan has clear objectives.	220	3.45	1.078
The project activities are documented in the plan.	220	3.64	1.160
The project managers are transparent during planning.	220	3.87	1.035
All the stakeholders are represented during planning.	220	3.73	1.173
The project operates as per the planned schedule.	220	3.72	1.143
The resources are utilized as per the plan	220	3.77	1.026
The budget is prepared on the basis of the project plan.	220	3.47	1.255
The project activities are completed as per the plan.	220	3.65	1.162

According to Yin (2007) more concentration of data around the means provides balanced and consistent information. Chandran (2008) on the other hand notes that the smaller the standard deviation the better for research work since that confirms less volatility in the sample. In table 4.10 the respondents agreed that project planning influences the supply of water since the means from the statements drew closer to 5.00 i.e. 3.45, 3.64, 3.87, 3.73, 3.72, 3.77, 3.47 and 3.65 respectively. These values are concentrated around the means of 3.0 and that is an indication of support to the questions. The support to the questions therefore, indicates that project planning influences the supply of safe water in Mombasa county.

The standard deviations are small ranging from 1.026 to 1.255. This implies the data values are clustered around the means and most of the respondents rated the questions in the middle of the scale. The standard deviations values in each of the questions also point to the influence of project planning on the supply of safe water.

Risk management

To determine the relationship between risk management and the supply of safe water, the respondents were requested to indicate strongly disagree, disagree, neither agree nor disagree, agree and strongly agree for their chosen answers. The answers were rated on a 5 point Likert scale where strongly disagree= 1 disagree= 2 neither agree nor disagree= 3 agree = 4 strongly agree= 5. The mean and standard deviations were generated from SPSS v. 20. The results are presented in table 4.10.

Table 4.10 . Risks management results.

Statements	Number	Mean	Standard deviation
The project has a risk management plan	220	3.28	1.202
The project identifies and documents the risks.	220	3.38	1.227
The project analyzes all the risks.	220	3.61	1.086
All possible risks are documented.	220	3.67	1.136
The risks are monitored.	220	3.65	1.111
The risks are budgeted for.	220	3.49	1.305
The risks are quantified and ranked.	220	3.73	1.058
The project risks should be passed to an insurance company.	220	3.64	1.192

According to the table the respondents agreed that risk management influences the supply of safe water since the means draw closer to 5.00 i.e. 3.28, 3.38, 3.61, 3.67, 3.65, 3.49, 3.73 and 3.64 respectively. These values are concentrated around the means of 3.0 and that is an indication of support to the questions. The support to the questions therefore, indicates that risk management influences the supply of safe water in Mombasa county. The standard deviations are small ranging from 1.058 to 1.305. This implies the data values were clustered around the means and most of the respondents rated the questions in the middle of the scale. The standard deviations values in each of the questions also point to the influence of risk management on the supply of safe water.

Quality management

To determine the relationship between quality management and the supply of safe water, the respondents were requested to indicate strongly disagree, disagree, neither agree nor disagree, agree and strongly agree for their chosen answers. The answers were rated on a 5 point Likert scale where strongly disagree= 1 disagree= 2 neither agree nor disagree= 3 agree = 4 strongly agree= 5. The mean and standard deviations were generated from SPSS v. 20. The results are presented in table 4.11 below.

According to the table the respondents agreed that quality management influences the supply of safe water since the means drew closer to 5.00 i.e. 3.39, 3.56, 3.7, 3.71, 3.57, 3.74, 3.57 and 3.56 respectively. These values are concentrated around the means of 3.0 and that is an indication of support to the questions. The support to the questions therefore, indicates that quality management influences the supply of safe water in Mombasa county. The standard deviations are small ranging from 1.082 to 1.239. This implies the data values are clustered around the means and most of the respondents rated the questions in the middle of the scale. The standard deviations values in each of the questions also point to the influence of quality management on the supply of safe water.

Table 4.11. Quality management results.

Statements	Number	Mean	Standard deviation
The project has a quality Management plan	220	3.39	1.239
The project quality techniques are always reviewed.	220	3.56	1.111
There is a quality assurance department	220	3.70	1.082
The quality processes are strictly adhered to.	220	3.71	1.138
The stakeholders have an input on the quality of deliverables.	220	3.57	1.220
The project operates within the international quality standards.	220	3.74	1.083
The project resources are always inspected for quality purposes.	220	3.57	1.197
The project quality management is budgeted for.	220	3.56	1.224

According to the table the respondents agreed that quality management influences the supply of safe water since the means drew closer to 5.00 i.e. 3.39, 3.56, 3.7, 3.71, 3.57, 3.74, 3.57 and 3.56 respectively. These values are concentrated around the means of 3.0 and that is an indication of support to the questions. The support to the questions therefore, indicates that quality management influences the supply of safe water in Mombasa county. The standard deviations are small ranging from 1.082 to 1.239. This implies the data values are clustered around the means and most of the respondents rated the questions in the middle of the scale. The standard deviations values in each of the questions also point to the influence of quality management on the supply of safe water.

Table 4.12 .Project monitoring results.

Statements	Number	Mean	Standard deviation
The project has an effective monitoring process.	220	3.69	.949
The project observes and records project's activities regularly.	220	3.64	1.160
The project incorporates all stakeholders in project monitoring.	220	3.87	1.043
The project usually invites donors for observation during monitoring.	220	3.88	1.046
The project takes note of pre-set targets and objectives during monitoring.	220	3.77	1.109
The project progress reports are documented and availed to the management for action.	220	3.77	1.022
The project indicators for monitoring are available in the initial project plan document.	220	3.59	1.177
. The project monitoring is budgeted for.	220	3.66	1.157

Project monitoring

To determine the relationship between project monitoring and the supply of safe water, the respondents were requested to indicate strongly disagree, disagree, neither agree nor disagree, agree and strongly agree for their chosen answers. The answers were rated on a 5 point Likert scale where strongly disagree= 1, disagree= 2, neither agree nor disagree= 3 agree = 4, strongly agree= 5.

The mean and standard deviations were generated from SPSS v. 20. The results are presented in table 4.12.

According to the table the respondents agreed that project monitoring influences the supply of safe water since the means drew closer to 5.00 ie 3.69, 3.64, 3.87, 3.88, 3.77, 3.77.3.59 and 3.66 respectively. These values are concentrated around the means of 3.0 and that is an indication of support to the questions. The support to the questions therefore, indicates that project monitoring influences the supply of safe water in Mombasa county. The standard deviations are small ranging from .949 to 1.177. This implies the data values are clustered around the means and most of the respondents rated the questions in the middle of the scale. The standard deviations values in each of the questions also point to the influence of quality management on the supply of safe water.

Correlation analysis

According to Saris and Galloper (2014) correlation is a measure of the relationship strength between variables. It focuses primarily on association as opposed to regression which focuses on prediction. Correlation involves looking at a relationship between two or more variables. It is mainly used to study relationship between variables. Holborn (2007) on the hand notes that, in-order to quantify the strength of the relationship between two variables, Karl Pearson's coefficient of correlation method should be adopted. He defines Pearson product-moment correlation coefficient as a measure of the strength of a linear association between two variables and is denoted by r . He proceeds and explains that, the Pearson correlation coefficient, r , can take a range of values from +1 to -1. A value of 0 indicates that there is no association between the two variables. A value greater than 0 indicates a positive association, that is, as the value of one variable increases so does the value of the other variable. A value less than 0 indicates a negative association, that is, as the value of one variable increases the value of the other variable decreases. Each variable is perfectly correlated with itself and so $r = 1$.

When the Sig (2-Tailed) value is less than or equal to .05, we can conclude that there is a statistically significant correlation between the two variables. It means that, increases or decreases in one variable do significantly relate to increases or decreases in the second variable. The study results are presented in table 4.13.

In Table 4.13 results, there is a positive relationship

that, an increase in one project based factor units correspond to an increase in safe water supply units or a decrease in one project based factor units corresponds to a decrease in safe water supply units. Planning has the largest correlation of .488, so it is the best predictor of safe water supply among the four project based factors. The positive relationship in all, suggests that there is a correlation between the four project based factors and the supply of safe water in Mombasa county.

In the table intersections the Pearson's r is also positive for example between risk and planning .410, quality and planning .404, quality and risk .613 planning and monitoring .460 planning and risk .494 monitoring and quality .466. This means that in each pair when units of one project based factor increase the units of the other project based factor also increase and the same applies to decrease since the opposite situation takes place. These positive values of r indicate that, the project based factors have a relationship and are correlated. Quality management and risk management pair is leading all the other pairs in correlation, at .613. This suggests that, there is a strong positive relationship between quality and risk management. It implies, for example that, an increase of poor quality deliverables leads or corresponds to an increase of risks and decrease in poor quality deliverables corresponds to decrease in risks. The positive correlations confirm the relationship in project based factors and their influence on the supply of safe water in Mombasa county.

Table 4.13 shows Sig. (2-tailed) value of 0.00 in all the cases. For example, project planning the Sig. (2-tailed) value is 0.00. This value is less than .05 which implies that, there is a statistically significant correlation between project planning and safe water supply.

The same applies to the rest of the variable pairs with the safe water supply variable. The four null hypotheses are rejected due to the Sig. (2-tailed) value of 0.00 in all the pairs. As a result, the four alternative hypotheses are accepted. The study therefore, submits that; project planning, risk management, quality management and project management influence the supply of safe water in Mombasa County.

In Table 4.13 results, there is a positive relationship between safe water supply and the four variables since each of their Pearson's r is positive. Project planning r is 0.488, risk management 0.471, quality management 0.421, and project monitoring 0.258 respectively.

Table 4.13 Correlations.

	Safe water	Planning	Risk	Quality	Monitoring
Pearson correlation Safe water: Sig. (2 tailed)	1				
N	220				
Pearson correlation	.448*	1			
Planning: Sig. (2 tailed)	.000				
M	220	220			
Pearson correlation	.471**	.410**	1		
Risk: Sig. (2 tailed)	.000	.000			
N	220	220	220		
Pearson correlation	.421**	.404**	.613**	1	
Quality: Sig. (2 tailed)	.000	.000	.000		
N	220	220	220	220	
Pearson correlation 1	.258**	.460**	.494**	.466**	1
Monitoring Sig. (2 tailed)	.000	.000	.000	.000	.000
N	220	220	220	220	220

** . Correlation is significant at the 0.01 level (2-tailed).

This is an indication that, an increase in one project based factor units correspond to an increase in safe water supply units or a decrease in one project based factor units corresponds to a decrease in safe water supply units. Planning has the largest correlation of .488, so it is the best predictor of safe water supply among the four project based factors. The positive relationship in all, suggests that there is a correlation between the four project based factors and the supply of safe water in Mombasa county.

In the table intersections the Pearson's r is also positive for example between risk and planning .410, quality and planning .404, quality and risk .613 planning and monitoring .460 planning and risk .494 monitoring and quality .466. This means that in each pair when units of one project based factor increase the units of the other project based factor also increase and the same applies to decrease since the opposite situation takes place. These positive values of r indicate that, the project based factors have a relationship and are correlated. Quality management and risk management pair is leading all the other pairs in correlation, at .613. This suggests that, there is a strong positive relationship between quality and risk management. It implies, for example that, an increase of poor quality deliverables leads or corresponds to an increase of risks and decrease in poor quality deliverables corresponds to decrease in risks. The positive correlations confirm the relationship in project based factors and their influence on the supply of safe water in Mombasa county.

Table 4.13 shows Sig. (2-tailed) value of 0.00 in all the cases. For example, project planning the Sig. (2-tailed) value is 0.00. This value is less than .05 which implies that, there is a statistically significant correlation between project planning and safe water supply. The same applies to the rest of the variable pairs with the safe water supply variable. The four null hypotheses are rejected due to the Sig. (2-tailed) value of 0.00 in all the pairs. As a result, the four alternative hypotheses are accepted. The study therefore, submits that; project planning, risk management, quality management and project management influence the supply of safe water in Mombasa County.

Multiple linear regression

According to Kothari (2007) multiple linear regression assesses the relationship between two or more independent variables against a single continuous dependent variable. He further notes that it is a predictive analysis used to explain the relationship between one continuous dependent variable from two or more independent variables. He suggests that, multiple linear regression model assists in predicting the value of dependent variable when an independent variable increases by a unit but while holding other variables constant. It allows estimation of association between dependent and independent variable while holding other variables constant. (Steven, 2009) notes that, the basis of multiple linear regression is to assess whether one continuous dependent variable can be predicted from a set of independent variables. It is used to predict unknown values of a dependent variable from another known value of two or more independent variables. It helps to study individual influence of the independent variables on the dependent variable. The multiple regression equation used is:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where:

Y = Dependent variable

β_0 = Constant Term;

$\beta_1, \beta_2, \beta_3$ and β_4 = Beta coefficients;

X_1, X_2, X_3 and X_4 are for each independent variable
 ϵ = Error term.

Model summary

According to Saunders (2011) model summary is a table that provides R and R square values. R is correlation between variables. It is explained as the multiple correlation coefficient that tells us how strongly the multiple independent variables are related to the dependent variable. R squared shows how much of the total variation in dependent variable water can be explained by the independent variables. Adjusted square removes variability that is likely due to chance. The model summary is most useful when performing multiple regression analysis. Table 4.14 shows the study results.

Table 4.14. Model summary.

Mode	R	Adjusted R	Std Error of the
R 1	Square	square	Estimate
1	.639	.398	.88285

a. Predictors: (Constant) Project planning, Risk management, Quality management, Project monitoring.

In the table the correlation of .639 means the independent variables have a positive relationship with the dependent variable. In the study, it implies that the project based factors have a relationship with the supply of safe water and therefore influence the supply. The value of R square of .409 reveals that 40.9 % of the variations are explained by regression model. In the study, R square of .409 means that 40.9 % of the variation in the supply of safe water can be explained by the four project based factors of project planning, risk management, quality management and project monitoring. The balance 59.1 % can be attributed to some other variables not included in the study.

ANOVA

According to Osborne (2010) the ANOVA is used to establish the significance of the regression model. The ANOVA table reports how well the regression equation fits the data which implies that it helps to predict the values of the dependent variable. He further notes that, ANOVA is very useful because it informs us whether the regression equation is explaining a statistically significant portion of the variability in the dependent variable, from variability in the independent variables. The study findings are presented in table 4.15.

Table 4.15 . ANOVA.

Model	Sum of squares	df	Mean square	F	Sig
Regression	115.805	4	28.951	37.144	.000
Residual	167.577	215	.779		
Total	283.382	219			

a. Dependent Variable: Supply of safe water

b. Predictors: (Constant) Project planning, Risk management, Quality management, Project monitoring.

The ANOVA table indicates that the test of significance of the regression model is 0.000 and this value is less than .05. This value indicates that, the model is fit and statistically significant. It is applicable for prediction of the supply of water in Mombasa county. The regression results are significant for use in explaining the four project based factors influence on safe water supply. With the low sig. value of .000 the model has a confidence level of above 95% which provides high reliability of results obtained. As a result, there are adequate indications that, the regression results are significant enough to be used in explaining the influence of

Table 4.16 . Coefficients.

Model	Unstandardized B	coefficients Std. error	Standardized coefficientsBeta	t	Sig.
(Constant)	.677	.261		2.597	.010
Project planning	.328	.066	.320	4.991	.000
Risk management	.182	.068	.173	2.665	.008
Quality management	.177	.067	.169	2.626	.009
Project monitoring	.148	.059	.159	2.505	.013

a Dependent Variable: Supply of safe water.

project planning, risk management, quality management and project monitoring on the supply of safe water.

Coefficient of correlation

According to Thomas (2006) coefficients part gives us the values that we need in order to write the regression equation. The Standardized Beta Coefficients give a measure of the contribution of each variable to the model. A large value indicates that a unit change in the predictor variable has a large effect on the criterion variable. The t and Sig (p) values give a rough indication of the impact of each predictor variable. A big absolute t value and small p value suggests that a predictor variable is having a large impact on the criterion variable. The sig. column values help us to determine if the independent variables are statistically significant. The Coefficients part of the output gives us the values that we need in order to write the regression equation. The sig. in the coefficient table help us to determine if the independent variables are statistically significant. The researcher sought to establish the correlation coefficient of each independent variable. The purpose was to be in a position to predict dependent variable values in relation to increase in the independent variable values. Table 4.16 shows the study results.

Each of the four values in sig. column has a value that is less than .05 which indicates that the model has a confidence level of above 95%. This high % contributes to high reliability of results obtained. The sig. values obtained of .010, .000, .008, .009 and .013 respectively, make all the predictors statistically significant. The overall model is statistically significant. Project planning has the biggest absolute t value and smallest p value therefore; it is having the largest impact on the supply of safe water in Mombasa County.

The results in the table also imply that, other factors held constant, for every one-unit increase in each of the project based factors the supply of safe water increases by an equivalent unit. The obtained results in the table imply that: when other factors are held constant, for every one-unit increase in project planning, the predicted scores for safe water supply increase by .328 units. Other factors held constant for every one-unit increase in risk management the predicted scores for safe water supply increase by .182. Other factors held constant for every one-unit increase in quality management the predicted scores for safe water supply increase by .177. Other factors held constant for every one-unit increase in project monitoring the predicted scores for safe water supply increase by .148. These values can be substituted in the multiple regression equation as follows:

$$Y = .677 + .328X_1 + .182X_2 + .177X_3 + .148X_4 + .261\epsilon$$

Summary

This chapter has provided the questionnaire response and analysis of the answers together with presentation through SPSS. The 88 % response rate contributed to adequate data for analysis.

The strong Cronbach's alpha values obtained from the samples of the four variable response values, indicated that the chosen Likert scale was reliable. The high number of educated respondents 92.7 % contributed to consistent and reliable data. The high number of respondents who had stayed in the project/location 72.7 % brought in more valid information as it reflected experience and knowledge. The mean values oscillated around the value of 3.0 in all the statements while the standard deviation around 1.0. The values showed the clustering of data around the means.

Project based factors were found to be correlated amongst themselves and with the supply of safe water variable. Each of them had a positive Pearson's r as follows: project planning .488, risk management .471, quality management .421 and project monitoring .258. As a result, there was an indication that, an increase in one project based factor values leads to an increase in the other's values. Project planning emerged the best predictor variable for the supply of safe water in Mombasa county since its r was the highest at .488. All the pairs of variables had positive Pearson's r as: risk and planning .410, quality and planning .404, quality and risk .613 planning and monitoring .460 planning and risk .494 monitoring and quality .466. These results suggest that, the four project based factors have a positive relationship and in essence influence the supply of safe water. All the sig. (2-tailed) values were .00 each. This indicated a statistically significant correlation and confirmed the relationship amongst the study variables.

The multiple regression equation: $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$ was applied due to the four independent variables in the study. The model summary had R square of .409 which implied that, 40.9 % of the variations in the supply of safe water could be explained by the four project based factors of project planning, risk management, quality management and project monitoring. The balance 59.1% was attributed to variables not covered in the study. The Anova results showed the test of significance of the regression model as .000 which was less than .05 and as a result suggests that, the model was fit and statistically significant. The results could therefore be used in explaining the influence of project planning, risk management, quality management and project monitoring on the supply of safe water in Mombasa county.

In the coefficient results, each of the sig. values was less than .05: project planning .000, risk management .008, quality management .009 and project monitoring .013. These values contributed to high reliability of the results and made all the factors statistically significant. This confirmed their influence on the supply of safe water. The correlation results were all positive; project planning .328, risk management .182, quality management .177 and project monitoring .148. Each one of the four implied that, the units in the safe water supply would increase by the same units as the correlation values.

This also led to the confirmation of the multiple regression model as fit for application. The values together with that standard error of .261, were inserted for use in the prediction of safe water supply values as: $Y = .677 + .328X1 + .182X2 + .177X3 + .148X4 + .261e$.

Conclusions

The study first concluded that, project planning is the most popular management technique applied by Mombasa county water projects. The study established that, planning was documented in each of the four management areas covered in the study namely: project planning, quality management, risk management and project monitoring management. The increase of the plans from the initial project plan and their implementation contributed to the increased safe water supply. The plans facilitated the safe water increase because they had the intended results which had to be implemented.

Secondly the study concluded that, Mombasa water projects had more risk management techniques since the water supply increased without major hitches. Had there been failures due to unmanaged risks, the amount of safe water supplied would have dropped. The water projects put up more efforts in risk management leading to more safe water supplies to Mombasa.

Thirdly the study made a conclusion that the water projects in Mombasa county had increased quality management techniques. This was evidenced by the increase of safe water supplied to the Mombasa residents, by the water projects. The sustained improved quality controls under quality management in project deliverables contributed to more supply of safe water in Mombasa county.

Fourthly the study concluded that Mombasa water projects had increased frequency of project monitoring. There was more tracking of implementation progress against the targets. The water projects had more progress reports submitted. The increased number of reports and consequent budget review contributed to more supply of safe water in Mombasa county.

Recommendation

Policy recommendations

The water projects' s management should ensure that at the project planning stage, there are clear and elaborate plans for each of the project management knowledge areas. The management should also ensure that risks are mitigated and proper funds allocated with a possibility of upward review. The water projects' management should ensure that, quality management plan is implemented as per the plan. The management should ensure that there are frequent quality control checks with update being embedded in quality management undertakings, thereafter. The management should enhance the frequency of project monitoring coupled with progress reports, for corrective action and achievement of the targeted results.

Managerial recommendations

The water projects' s management should ensure that the projects plans at the initial stage have indicators for safe water supply. The management should make constant efforts to monitor all the identified risks with a view to proper management. The water projects' management should also identify all possible risks and document them for analysis and evaluation. The management should also put up more quality control techniques in order to achieve higher standards of safe water.

The management should invest more in project monitoring with a view to tracking the implementation progress.

Suggestions for Further Studies

There is need for research on other project based factors that might also influence the supply of safe water in Mombasa county. Further research on water quality as a specific objective should be undertaken to add impetus to safe water supply initiative. There is also need for research on the level of stakeholders' participation in water projects management for improved safe water supply. The study should also be replicated in other counties along the Indian ocean, with both island and mainland areas.

References

- Adler, P. A. & Adler. P. (2008). *Context and Social inquiry meaning*. Boston: United Press.
- Andersen, E.S., Grude K.V., & Haug, T. (2007) *The goal directed project management*. (2nd ed.) London: Sage Publications.
- Arthur, Q. (2009). *Conceptual framework as a guide to study. The case of quantitative study in experimental work, USA*: California Press.
- Atkinson, R. (2009) *Project management: cost, time and quality, two best guesses and phenomenon, time to accept other success criteria*. *International journal of project management*. 17 (6), pp.337-342.
- Baker, B.N., Murphy D.C., & Fisher, D. (2008). *Factors attesting project success*. *Project management handbook*. New York: Van Nostrand.
- Baker, J.L. (2008). *Evaluating the impact of development projects on poverty: A Handbook for Practitioners*. Washington: WB. Evaluation group.
- Bamberger, M. (2006). *Conducting Quality Impact Evaluations under Budget, Time, and Data constraints*. World bank independent evaluation group: Evaluation Capacity Development Publication.
- Bamberger, M., I. Rugh, M., Church, & Fort, L. (2007). *Shoestring evaluation: Designing impact evaluations under budget, time, and data constraints*. *American Journal of Evaluation* 25 (1): 5-37.
- Baur, P., & Woodhouse, N. (2009). *Enhancing private sector in water supply*: NY: Oxford University Press.
- Bhandari, B., & Grant, K. (2007) *Rural appraisal: Rapid relaxed and participatory*. University of Sussex Press. London, UK: Sussex University Press.
- Binder, (2008). *User Satisfaction and Sustainability of Drinking Water Schemes in Rural Communities of Nepal*. Nepal: Nepal Press.
- Birnbaum, B. (2008). *Strategy Implementation: Six Supporting Factors*. Retrieved from <http://www.birnbaumassociates.com>
- Bloom, F. (2006). *Understanding qualitative data: A framework text analysis method*. *Journal of Management information system*, 11(1), 137-160.
- Brayman, P. & Bell, V (2011). *Business research methods (3rd ed.)*. New York: Summit Books.
- Brager, Specht, & Torczyner (2001). *The ecology of place: Planning for environment, Economy and community*. Washington, DC: Island Press.
- Bridget, S., & Lewin, C. (2006) *Research methods in social sciences*. London: Sage publications.
- Bryde, D. (2008) *Perceptions of the impact of project sponsorship practices on project success*. *International Journal of Project Management* 26 (8) pp. 800-809.

- Burns, A., C. & Bush, R., F. (2010). Marketing research. Upper saddle river, N J: Pearson Education.
- Carl, B. (2006). Data processing in a research study. How to carry out data processing and analysis in a research study (10th ed.). London: Sage Publication.
- Chandran, E. (2008). Research methods: A quantitative approach with illustrations from Christian ministries. Nairobi, Kenya: Daystar university.
- Chan, A. P., & Chan, A. P. L. (2007). Key performance indicators for measuring construction success; Benchmarking; An International Journal. 11 (2) pp.203-221.
- Chatzoglou, P.D., & Macaulay, L.A., (2006) A review of existing models for project planning and estimation. International Journal of Project Management. 30(3) pp.120-140.
- Cleland, D.I., & King, W.R. (2009). Systems analysis and project management. New York: Van Nostrand.
- Cleland, D. I. (2010). Measuring Success: The owner's viewpoint. Proceedings of the annual seminar/symposium (Montreal/Canada), 6-12. Upper Darby, PA: Project Management Institute.
- Cleland, D. I. (2006) Factors affecting project success. Project management handbook, (2nd ed.) pp. 902 - 909. New York: Van Nostrand Reinhold.
- Creswell, J. W. (2007). Research design: qualitative, quantitative and mixed approaches. Thousand and Oaks, CA: Sage Publications.
- Coles, A., & Wallace, T. (2006) Gender, water and development. New York: Biddles Ltd.
- Cooper, D. R., & Schindler, P. S. (2007). Business research methods (8th ed.) Boston: United Press.
- Cooper, R.G., & Kleinschmidt, E.I. (2008) New Products: What separates Winners What separates Winners and losers? International journal, 32 (3), 265
- Creswell, J. W. (2007). Research design: qualitative, quantitative and mixed approaches.
- Davies, T, C. (2009) The real success factors on projects. International journal of project management. 20.pp.185-190.
- Dvir, O., Lipovetsky, S., Shenhar, A., & Tishler, A. (2009) Common managerial factors Attesting project success. Tel Aviv University: School of Management magazine.
- Duncan, W.R (2007) A guide to the project management body of knowledge. London: Sage publications
- Dunning, A & Lundan, B. (2010) Low- Cost Sanitation, a survey of practical experience. London, UK: Intermediate technology publications.
- Field, M. Keller, L. (2007). Project Management Bedford, Thomson-TheOpen University. Retrieved from For Urban Water Utilities-PhMarin.pdf?
- Fielmua, N. (2011). The role of the community ownership and management strategy towards sustainable access to water in Ghana A case of Nadowli district. Journal for sustainable development 4 (3)
- Franckel, G., M. & Wallen, H., J. (2009). How to design and evaluate research in education. NY; Mc grow- hill higher education.
- Franklin, M.I. (2012). Understanding research: Coping with the quantitative qualitative divide London, UK: Intermediate Technology Publications.
- Gardiner, P.D., & Stewart, K. (2009). Revisiting the golden triangle of cost, time and quality: the role of NPV in project control, success and failure. International journal of project management. 18, pp. 251-256.
- Gillhan, B. (2008). Developing a quantitative research (2nd ed.) London; UK: Continuum Group.
- Gizachew, G. (2007) Innovation: The Attacker's Advantage, New York: Summit Books.
- Gray, D. E. (2009). Doing research in the real world (2nd ed.). London: Sage Publications.
- GOK, (2009) Water Privatization in Kenya, Issue Paper Government Printer Nairobi. Retrieved from <http://www.ppiaf.org/sites/ppiaf.org/files/FINAL-PPPs>.
- Gray, J. C., Clifford, F. M., & Erik, L., M. (2008) Project management. The managerial process (4th ed.) New York: Oxford University Press.
- Harvey, P. C., & Reed, S. L. (2007) Community managed water supplies in Africa: sustainable or dispensable? Community development journal, 42 (3), 365.
- Holborn, A. (2007). Doing and writing qualitative research, (2nd ed.) London: Sage Publications
- Hunter, S. K. (2007). Influence of the External Environment on the Organization's Business. Retrieved from <http://www.associatedcontent.com/Ingle>,
- B.E. (2006). Ensuring Sustained Beneficial Outcomes for Water and Sanitation Programmes in the Developing World. IRC International Water and Sanitation Centre: Occasional Paper Series.
- Institute of Economic Affairs, (IEA, 2007). A rapid assessment of Kenya's water, sanitation and sewerage framework. Nairobi: Institute of Economic Affairs.
- Jansz, S.F. (2006) A study into rural water supply sustainability in Niassa Province. Mozambique: Water Aid Publications.
- Kanupriyam, M. (2012). Research study as a means of gaining knowledge. Publication on research and knowledge gain. 23(34):123-128.
- Kaplan, R., M. & Saccuzzo, D., P. (2009). Psychological testing: principles, applications and issues. Belmont, CA: Wadworth.
- Keen, J.J. (2007) Methods of initiating community participate -on in water supply and sanitation programs. San Francisco, CA: Chronicle Press.
- Kerzner, V. G., & Harold, D. J. (2006). Project management; a systems approach to planning, scheduling and controlling (9th ed.) New Jersey: United Press.
- King, W. R., & Cleland D. I. (2008) Lifecycle management. Project management handbook. New York: Van Nostrand.
- Kothari, C. R. (2007). Research methodology: New age international (3rd ed.). London: Longman publishers.
- Leeddy, P., D. & Orsmond, J. E. (2007) Practical research: planning and design (8th ed.) New Jersey: Pearson, Merrill, Prentice Hall.
- Lockwood, H. & Smits, S. (2011). Supporting Rural Water Supply. Moving towards a Service Delivery Approach, Warwickshire UK: Practical Action Publishing Ltd.
- Majory, R. (2009) Resource guide to concepts and methods for community based and collaborative problem solving. Johns Hopkins university.
- Marin, P (2009). Public-Private Partnerships for Urban Water Utilities: A Review of Experiences in Developing Countries. The International Bank for Reconstruction and Development, Washington, DC: The World Bank.
- Mbata, J. (2006) Estimating Household Willingness for Water Services in Rural economy: The Case of Kanye in Southern of Southern Africa, 23 (1), 29-43.

- Mccommon, C., Maehr, M. L., Hruda, L. Anderson, E. M., Freeman, K. E, Green, M., .Urda Tal (2009). Community management of rural water supply and sanitation services, Washington DC: Author.
- McIvor, C. (2008). Community participation in water management experiences from Zimbabwe. Harare: Harare publishers. Minar, W. A., & Greer, H. L (2007). The concept of community: Readings with interpretations. New Jersey: Aldine Transaction. Ministry of Water and Irrigation (2015) Annual water sector review report, Nairobi: MWI Report.
- Mugenda, O.M., & Mugenda, A.G. (2007). Research methods: Quantitative Approaches. Nairobi: Acts Press.
- Mushtaq, A., M. (2006) Community participation in water supply and sanitation schemes Around Hyderabad, Pakistan. Lahore: Lahore Printing Press.
- National Water Services (2016). Water sector progress report, Nairobi: NWSS Report.
- Niyi, G., & Felix, O., (2007) Assessment of Rural Water Supply Management in Selected Rural Areas of Oyo State, Nigeria. ATPS Working Paper, Series No. 49: African Technology Policy Studies.
- Oakley, B. P., & Marsden, Y. N. (2007) Low-Cost Sanitation. A Survey of Practical Experience London: Intermediate Technology Publications.
- OECD. (2012): 'Environmental outlook to 2050'. Retrieved from www.oecd.org/enviroment/outlook2050.
- Olaf, P. (2007) Project management. Horizons University: Ventus Publishing House.
- Olowu, B., & Wunsch, M., (2008) Water scarcity in Nigeria. Lagos. Victory Press. Osborne, A., G. (2010) Research instruments management in a research study. Publications on the use of research instruments. 12(23):123-234.
- Pinto, J.K., & Slevin, D.P. (2011) Project success: definitions and measurement techniques. Project Management Journal. 12, pp. 221-246.
- PMBOK (2016) Project management book of knowledge.
- ROK (2015) Supply of water - A status report of Kenya 2015. Nairobi: Government Printers.
- Saleh, S. & Abu, S. (2008). Factors affecting the performance of projects in the Gaza Strip, University of Gaza.
- Saris, W., E. & Gallhofer, I., N. (2014). Design, evaluation and analysis of questionnaires for survey research. (2nd ed.) Hoboken: Wiley.
- Saunders, M. N. K. (2011). The Management researcher. Issues from interface. 15 pp. 243-250.
- Schwalbe, P. C., & Cathy, M. L. (2009) Introduction to project management (2nd ed.) Boston: United Press.
- Shenhar, A. J., Dvir, D., & Levy, O. (2007) Mapping the dimensions of project success. Project Management Journal. 15, pp. 121-206.
- Steven, J. P. (2009) Applied multivariate statistics for social sciences (4th ed.). London: Sage Publications
- Thomas, D. R. (2006) Designing and managing your research project. New York: Oxford University Press.
- Turner, I.R. (2012) The handbook of project-based management. London: McGraw hill. UN-Habitat (2015). Water and Sanitation in the Worlds' Cities: Local Action for Global Goals Earth scan Publications, London: Earth scan Publications.
- UN Water (2010) The Africa water vision for 2025: equitable and sustainable use of water for socio economic development. United Nations Publications.
- Wang, X., & Huang, J. (2006). The Chinese construction supervising engineers. International Journal of Project Management 24 (3) pp. 13, pp. 101-106.
- WB. (2015). Water for Development. United Nations Publications. Wretman, H. (2008) Sampling frame in research: The use of sampling frame. 45(3) pp. 450-670
- Yin, W. (2007). Quantitative techniques. Quantitative techniques in research. 26 pp. 245-251.
- Young, J (2009). China's water challenges. Beijing, China: Environmental Publishing.
- Yu, A., Flett, P., & Bowers, I. (2006) Developing a value-centered proposal for project success. Project Management Journal 23(6) pp. 428.