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PROJECT SUCCESS FACTORS IN THE WATER SECTOR IN KENYA: A CASE OF RIFT VALLEY WATER SERVICES BOARD

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Abstract

The study sought to find out the factors that affect project success with a case study and focus on the Rift Valley Water Services Board. Recommendation of Four COMs model guided the study. It identifies several factors grouped into four areas of Comfort, Competence, Commitment and Communication. The results revealed that most respondents agreed that Comfort factors (mean of 4.52), competent factors (mean of 4.16), Commitment factors (mean of 4.3) and Communication factors (mean of 4.27) influences project success in the Water Sector in Kenya. Further the inferential analysis indicated that communication and comfort variables had strong positive correlation with success variable (p-value < 0.01, p-value = 0.000); competence variable had a strong positive correlation with success variable (p-value < 0.01, p-value = 0.008); commitment variable had a strong positive correlation with success variable (p-value < 0.01, p-value = 0.002). Regression analysis revealed that communication variable (β = 0.297) has the greatest influence, followed by comfort variable (β = 0.279) then followed by commitment variable (β = 0.239) and lastly competence variable (β = 0.112). In conclusion, the study findings illustrated that there was a strong relationship between project success and

communication (r = 0.788) and comfort variable (r = 0.746). There was a moderate relationship between project success and competence (r = 0.520) and commitment (r = 0.582). The study, therefore, recommends that Rift Valley Water Services Board and all the Water Agencies, as well as all project stakeholders in Kenya, should pay attention to the four COMs to enhance project success.

Keywords: Four COMs, Project Success Criteria, Golden triangle, Project Stakeholders, Kenya

INTRODUCTION

There have been numerous and varied definitions of project management. From a management point of view, Project Management can be seen as a discipline for planning, leading, organizing and controlling resources in such a way as to achieve the intended objectives. Harrison and Lock (2004) defines project management as the attainment of project goals through people and encompassing the organization, planning, and control of resources assigned to the project. Project Management encapsulates such diverse areas such as Integration, Scope, Time, Cost, Quality, Human Resource, Communication, Risk, and Procurement. Project success is at the core of project management. The question has always been what the common understanding of what project success is. Obviously, many factors impact the degree of project success.

The general assumption among Project Managers is that a project completed in time, within the agreed budget and the set quality, then the project is deemed to be successful. Hartman (2000) claims that a successful project is one that makes all stakeholders happy. However, Harrison and Lock (2004) argues that Hartman point of view is a good one that must be borne in mind although, in several instances, real success or failure cannot be measured just by the three primary objectives alone. Each stakeholder group will hold a different point of view as to which objectives should be valued or balanced. Kerzner (2013) asserts that the definition of project success has been modified to include completion within allocated period, within the budgeted cost, at the proper performance or specification level. Also, with the acceptance by the customer with a minimum mutually agreed upon scope changes, without disturbing the main workflow of the organization and without changing the corporate culture.

Toor and Ogunlana (2006) suggest that particular attention should also be paid to other critical success factors besides the golden triangle of time, budget, and quality. Yong and Mustaffa (2012) in their work studied the principle factors that are critical to the success of a construction project in Malaysia. They found out that there is a high consistency in perception between respondents in recognizing the impact of human-related factors such as competence, commitment, communication and cooperation toward the success of a construction project.

Garbharran, Govender and Msani (2012) in their work titled Critical success factors influencing project success in the construction industry in Durban South Africa found out that both project managers and contractors strongly support the identified key success factors of competence, commitment, communication and cooperation as significant in achieving project success.

Shebob, Dawood, Shah, & Xu (2012) in their work entitled comparative study of delay factors in Libyan, and the UK construction industry. The study revealed that critical delay elements are entirely different in Libya and the UK and that it might delay by between 41 to 46 days in Libya and 34 to 38 days in the UK, when the most critical delay factors are considered. Thi and Swierczek (2010) in their work Critical Success factors in project management – implication from Vietnam, find that there is a confirmation that the following success factors are critical to project implementation: External environment, project manager, team members, organization and project characteristics. Their findings also confirm that success is defined uni-dimensionally, including cost, time, technical performance and customer satisfaction.

A small number of studies on this topic have been carried out in Kenya. The few available are found in the roads sector and the energy sector. Wambugu (2013) in his work titled determinant of successful completion of Rural Electrification projects in Kenya a case study of Rural Electrification Authority finds that supply of quality materials, coordination, planning and efficient management of projects contributed to the timely completion of rural electrification projects in Kenya. Ondari and Gekara (2013) in their work titled factors influencing successful completion of roads projects in Kenya find that indeed all the factors studied of management support, design specifications, supervision capacity and contractors' capacity influences successful completion of roads projects in Kenya. In the study, design specifications were found to be the most significant relationship with successful completion of projects in Kenya.

Kenya's Vision 2030 is the new long-term development blueprint for the country. It captures Kenya's collective aspiration for a much better society than it is currently. It aims to transform the country into a newly industrialized middle-income nation providing a high standard of life to every citizen in a secure and clean environment. The Vision is attached to three critical pillars: Economic; Social; and Political Governance. The economic support aims to achieve an economic growth rate of 10 per cent per annum and to sustain the same till 2030 to generate more resources to address the Millennium Development Goals (MDGs). The vision has identified some flagship projects in each sector to be implemented over the vision time to facilitate the desired growth that can support the implementation of the MDGs on a sustainable basis. Also, the vision has flagged out projects addressing the MDGs directly in critical sectors such as health, agriculture, education, water, and the environment. The social pillar strives to

create just, cohesive and equitable social development in a clean and safe environment. The political component aims to realize an issue-based, people-centered, result-oriented and accountable democratic system. Water and Sanitation sector is to be found in the Social Pillar. The visualization for the water and sanitation sector is to ensure water and improved sanitation availability and access to all by 2030. Thus, every the flagship projects; tourism, agriculture, industry, etc. – Will consume additional water. So will the measures envisioned under education, health, urban development and housing in the social sector. Efficient water management will, therefore, not only contribute to sustainable long-term economic growth, but also to poverty reduction, health, and security.

It is evident from the above ambitious plans that Kenya needs to move from the overarching targets contained in the Vision 2030 to the implementation of projects. The linkage between the ambitious goals and realization of the same is in project implementation. Effective implementation of projects is critical to the attainment of the lofty targets set in the vision 2030.

The Water Sector in Kenya is currently managed by the Ministry of Water and Irrigation. The Sector underwent significant changes in the late 1990s and early 2000s, so that by the enactment of the Water Act, 2002, the Sector had reformed itself in major ways as to separate sector policy formulation from that of implementation. The policy formulation was left to the Ministry headquarters, and project implementation was delegated to some professionally organized institutions. This reform saw the birth of the Regional Water Services Boards that are mandated to implement projects in their areas of jurisdiction. One such regional water services board is the Rift Valley Water Services Board.

Rift Valley Water Services Board is a State Corporation operating under the Ministry of Water and Irrigation. It was established in 2003 and became operational in 2004. Its initial mandate was to take over the ownership of government assets concerning the development of water infrastructure and subsequently develop water infrastructure to provide water and sanitation services within its area of jurisdiction, which are the seven counties of Turkana, West Pokot, Elgeyo- Marakwet, Baringo, Nakuru, Nyandarua, and Narok. Its core mandate is, therefore, to implement projects for water service provision in these areas. Project implementation is, therefore, critical to the attainment of the terms of reference of the Board and by extension the overarching objectives of the country as espoused in various policy documents including Kenya's Vision 2030.

At the time of establishment of the Board, the water coverage in the Rift Valley Region was estimated at 32%, with the rural areas attaining a coverage of only 26% and urban areas in the range of 40%; according to the rapid assessment that was carried out by the Board in 2004. Since then the level of water services coverage has increased to 72% overall with urban

registering a coverage of 75%. Rural standing at 54%, which is slightly above the national average of 75% urban and 50% rural as stated in the annual water sector report of 2012/2013 as released by the Ministry of Environment, Water, and Natural Resources. For the Board to have attained that level of coverage it has implemented some projects all across the seven counties.

Some these projects have been adjudged as successful while others have not been successful. Any project deemed as unsuccessful is a waste of public funds. Moreover, since water projects are public assets, one can, therefore, see that a project that is not successful is a waste of public funds. The issue that this study is attempting to address is to identify some of the factors that need to be taken into account as projects are being implemented so as to increase the chances of success. The study will be confined to Rift Valley Region, and in the Water Sector.

Statement of the Problem

The review of annual reports from various agencies in the water sector and in particular those of the Rift Valley Water Services Board indicated that project success was a significant challenge. Moreover, the criterion used in determining the success or failure of the projects is confined to the golden triangle of the budget, time, and quality. The Performance Contract (PC), evaluation teams' award, marks based on the above and therefore the organization is judged according to the rate of attainment of the above indicators. In the PC report of the 2011/2012 financial year, for example, the Rift Valley Water Services Board set out to implement seven projects during the fiscal year. At the end of the year, 4 of the seven projects were adjudged to be successful when considering the above factors. The evaluation does not take into account other factors such as comfort, competence, commitment and communication factors which researchers elsewhere have deemed to be important, particularly in the developing economies.

This study will, therefore, investigate the factors influencing the success of water projects in Kenya using The 4 COMs Model developed by Nguyen, Ogunlana, and Lan, which is considered suitable for application in emerging economies. To carry out the investigation, the researcher will apply the model to assess the perception of contractors and project managers regarding the factors that influence the success of water projects in Kenya with a particular emphasis on Rift Valley Region as defined in this study.

General Research Objective

To investigate the factors that influence project success in the Water Sector in Kenya.

Specific Research Objectives

i. To determine if Comfort Factors influence project success in the Water Sector in Kenya
ii. To establish whether Competence Factors influence project success in the Water Sector in Kenya
iii. To investigate if Commitment Factors influence project success in the Water Sector in Kenya
iv. To analyze if Communication Factors influence project success in the Water Sector in Kenya.

LITERATURE REVIEW

An overview of Project Success

The subject of project success is core to the general understanding of project management. Project success is understandably a top priority for project managers and project stakeholders. Project Management literature often refers to two main components of project success – project success factors and project success criteria. According to Muller and Jugdev (2012), quoting various project management literature, project success factors are those elements of a project, which when influenced, increase the likelihood of success, these are independent variables that make success more likely. Project success conditions, on the other hand, are those measures used to judge the success or failure of a project; these are dependent variables that measure success. Project Success is widely discussed but rarely agreed by various scholars.

Historical Background of Project Success

Belassi and Tukel (1996) give the following account of the historical significance of the topic of project success in project management: that Rubin and Seeling first introduced the success and failure factors in 1967. They investigated the importance of a project manager's experience on the project's failure or success. Technical performance was used as a degree of success. It was established that a project that experience of a has minimal effect on the fulfillment of the project. Whereas, the magnitude of the previously managed project does affect the manager's performance. After Rubin and Seeling's study, there was a theoretical study by Avots in 1969, who identified causes for project failure and concluded that the unplanned project termination, wrong choice of project manager, and unaccommodating top management were the main reasons for failure. In 1983 Baker, Murphy and Fisher suggested that instead of using cost, time, and performance as measures for project successfulness, perceived performance should be the measure. Hughes, 1986 conducted a survey to identify the factors that affect project performance. He concluded that projects failed because of improper elementary managerial

principles, such as the incorrect focus of the management system, the absence of communication goals, and by rewarding the wrong actions. In their book, Morris and Hough, 1987 studied eight large, complex projects which had an enormous potential economic effect but were poorly managed failed. They identified the failure and success factors for everything. Based on this experience, they suggested seven scopes of project success. They concluded that although their analysis of success factors is aimed at large, complex projects, they are also relevant to projects in general.

According to Belassi and Tukel (1996), one of the first efforts to classify precarious factors was carried out by Slevin, Schultz, and Pinto (1987). They categorized factors as strategic or tactical. These two groups of factors affect project performance at different phases of implementation. The strategic group includes factors such as; top management support, project mission, and project scheduling. On the other side, the tactical group consists of factors such as; client consultation, personnel selection, and training. In their follow-up work, Pinto and Slevin (1989) identified success factors, and their relative importance, for every stage of a research and development project life-cycle. Finally, in a similar study by Pinto and Prescott (1988), the relative importance of each group (tactical versus strategic) over the project life-cycle was analyzed. It revealed that the relative importance of success factors varied at different stages of the project's life-cycle, depending on the success measure used. When external success measures are employed, planning factors dominate tactical elements throughout the project life-cycle.

Belassi and Tukel (1996) suggest a framework that addresses many of the drawbacks in the literature and groups the factors into the four areas of factors related to the project; factors related to the project manager & the team members; factors related to the organization, and factors related to the external environment. These four groups provide a comprehensive set in that any factor itemized in the literature, or even explicit points of consideration, should belong to at least one group. The framework not only brings advantages by grouping critical factors, but also assists project managers to understand the intra-relationships amongst the factors in different groups.

Muller and Jugdev (2012) in their assessment of the contributions of Pinto and Slevin to the work of determining project success factors point out that Pinto and Slivin (1988) came up with 14 critical success factors which span both the project itself as well as its context. All the factors were related to project success. However, one single project success factor (project mission) was found to be significant across all project stages. By 1988 still in another work was done by the two, Pinot and Slevin, had reduced the critical factors to seven and by 1990, they

had clearly identified that some factors that contributed to the success were within the project team's control and that other factors were not as they were environmental.

Muller & Jugdev (2012) after the review of the historical development of the development of critical success factors, concluded that success continues to have varied meanings to different stakeholders in the project context. The views on project success have changed over the years from definitions that were limited to the implementation phase of the project cycle to current definitions that reflect an appreciation of success over the project and product lifecycle.

Muller & Jugdev (2012) concludes that the perspective of project success developed and broadened from being merely structural in 1974 to being more task oriented in 1988 and team oriented in 2001. The view of project success grew from only hard, measurable factors in 1988 to broadening towards marketing and user orientation in 2002 to a more balanced construct in 2006 with 50% hard dimensions such as measures and 50% soft dimensions such as the satisfaction of those involved.

Senhar et al. (2001) identified general and projected specific success factors. Their study showed that 96 different variables are relevant for successful project implementation. These variables were further clustered into three factors of those independent of project characteristics; those influenced by project uncertainty and those influenced by project scope.

Project Success Criteria

Nguyen, et al. (2004) asserts that a construction project is commonly acknowledged as successful when it is completed on time, within budget, and by specifications and to stakeholders' satisfaction. Functionality, profitability to contractors, the absence of claims and court proceedings and fitness for the aim for occupiers have also been used as degrees of project success (Nguyen, et al. (2004) quoting Takim and Akintoye, 2002). Nguyen et al. (2004) citing Sanvido et al. (1992) remarked that success on a project means that certain expectations for a given participant are met, whether owner, planner, engineer, contractor or operator. The following are a sample of the definitions of "project success in general: Ashley et al. (1987 cited in Sanvido et al., 1992) referred to project success as having results much better than expected or usually observed regarding cost, schedule, quality, safety, and participant satisfaction. De Wit (1988) remarked that a project is considered an overall success if it satisfies the technical performance criteria and mission to be performed. If there is a high level of satisfaction concerning the project's outcome among the major people in the parent organization, key individuals in the project team and key users or clients of the project effort. Regarding construction projects, Sanvido et al. (1992) defined success for a given project participant as the degree of achieving project goals and expectations. They added that these aims and

expectations may include technical, financial, educational, social, and professional aspects. Chua et al. (1999) proposed a hierarchical model for construction project success. The objectives of the budget, schedule, and quality are key measures that contribute to the goal of "construction project success" – the top of the hierarchy. Similarly, the four top project aspects, namely project characteristics, contractual arrangements, project participants, and interactive process, measure influence the success of each of the three distinct objectives.

Obviously, determining whether a project is a success or failure is intricate and ambiguous. There are three main reasons among which Belassi and Tukel (1996) pointed out the first two. Firstly, as mentioned by de Wit (1988) and Pinto and Slevin (1989), it is still not distinct how to measure project success since project stakeholders perceive project success or failure differently. Secondly, lists of factors that influence success or failure of a project vary in numerous previous studies. The Thirdly, as also remarked by de Wit (1988), is that for each project stakeholder, the objectives, and their priorities are set differently throughout the project life cycle and at different levels of the management hierarchy. It is necessary that to make distinctions between project success and project management success and between project success and project performance. Previous studies (de Wit, 1988; Munns and Bjeirmi, 1996; Cooke-Davies, 2002) clarified that project success is measured in comparison with the overall objectives of the project while project management success is measured against cost, time and quality/performance. Cooke-Davies (2002) noted that the distinction between project success – which cannot be measured until after the project is completed, and project performance – which can be measured during the life of the project is also important. However, Baccarini (1999) insists that project success is measured both regarding product (including facilities) success and project management success.

Empirical Literature Review

Here below is a discussion of the four COM factors as it relates to project success factors, understood to mean those inputs that directly increase the likelihood of achieving project success. Garbharran, Govender & Msani (2012) quoting Han, Yusof, Ishmael and Choon (2012:90) advocates the suitability of the Four COMs model proposed by Nguyen, Ogunlana & Lan, which is considered suitable for application in emerging economies. Nguyen, Ogunlana & Lan (2004) identify and group Project Success Factors under four categories which are referred to as ‘the Four COMs', and these are Comfort, Competence, Commitment and Communication.

Comfort factors

The Comfort component grouping comprises of five sub-components of involvement of stakeholders, competent project manager, and availability of resources, adequate funding, and comprehensive contract documentation. Stakeholder management is critical to the success of every project in every organization. It is important, therefore, to conduct out a stakeholder analysis to determine the importance and influence that each stakeholder brings to the project. Garbharran, Govender and Msani (2012) quoting Swan and Kaflan (2007) suggest that the needs of stakeholders have to be guided and influenced in a manner that ensures project success.

A competent project manager is critical to the success of any project. Garbharran, Govender and Msani (2012) quoting Malach-pines, Dvir and Sadech (2009) indicates that project managers should possess both technical skills directly related to the project as well as soft skills relating to team management among other skills. Availability of resources is another critical factor for the success of any project. Garbharran, Govender, and Msani (2012) suggests that a resource management plan needs to be developed in conjunction with all stakeholders so as to avoid diverting of budgeted funds as the project is being implemented. Adequate funding must be made available throughout the project duration to ensure the success of the project. Garbharran, Govender, and Msani (2012) suggests that a financial plan is taking into account the project activity schedule needs to be developed.

Finally, there must be comprehensive contract documentation, particularly among the key stakeholders. This arrangement ensures that there is proper management of expectations. Garbharran, Govender and Msani (2012) quoting Johnson, Scholes & Willington (2006) suggests that costs, time and quality parameters need to be specified and contracted for performance assessment.

Competence factors

The competence grouping of components comprises of four sub-components of utilization of up-to-date technology, proper emphasis on experience, competent project team as well as awarding bids to the best or most qualified contractors, consultants, and project managers.

Firstly, it is to be noted that construction industry has witnessed tremendous technological advances in recent years just like many other sectors of society. Garbharran, Govender, and Msani (2012) suggests that selecting the appropriate technology and utilization is key to the successful implementation of projects. Secondly, experience in project management cannot be gainsaid. The emphasis is also on the documentation and management of tacit knowledge to prevent mistakes in subsequent projects. Thirdly, there must be a team of

competent staff in place. Garbharran, Govender and Msani (2012) quoting Melkonian and Picq (2010) suggests that there must be a deliberate effort to carry out a comprehensive skills analysis and identify the gaps and address them to enjoy the success of the project.Lastly, the awarding of the bids to competent contractors, consultants, and project managers is emphasized. The granting of the bids seems to be obvious, yet it still needs to be emphasized. Garbharran, Govender and Msani (2012) quoting Philips, Martin, Dainty and Price (2008) stress that it is important to look at the previous record, quality management, and technical proficiency when selecting contractors, consultants, and project managers.

Commitment factors

The commitment grouping of components comprises of four sub-components of top management support, commitment to project, clear objectives as well as political support.Firstly, the need for top management support is emphasized. It involves not only the provision of funds and resources but also a sense of collectivism, rather than individualism as advocated by Kerzner (2006) as quoted in Garbharran, Govender, and Msani (2012). It is also crucial to create an environment in which team members experience job satisfaction and get motivated to perform. In this respect, Garbharran, Govender, and Msani (2012) advocate for the setting of clear objectives in a simple style so as to avoid the possibility of delays occurring due to misunderstandings. Secondly, commitment to the project is emphasized. Thirdly the setting of clear objectives is also highlighted. Finally, political support is essential to project success. Depending on the implementation environment of the project, it is important to map precisely out the necessary political support needed to get a successful project.

Communication factors

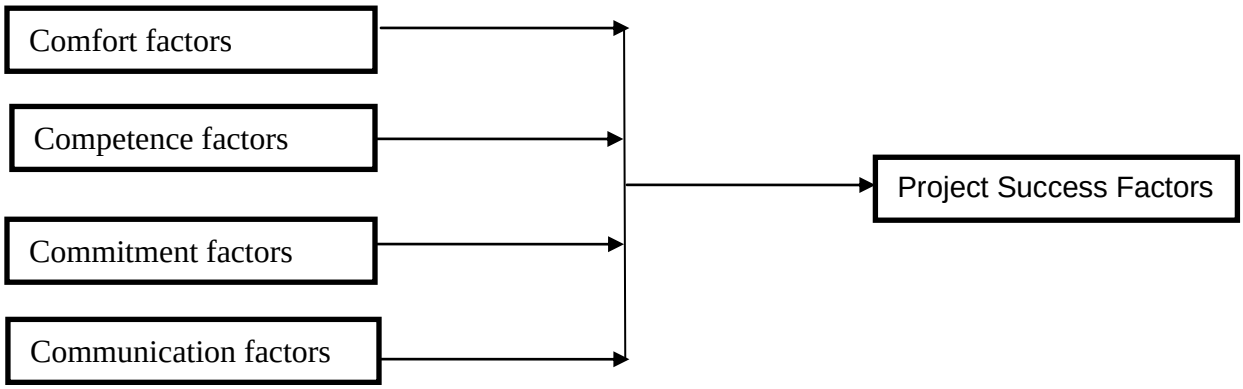
The conversation grouping of components comprises of five sub-components of shared project vision, regular updates of plans, frequent project meetings, community involvement and handover procedures. Firstly, communication as Garbharran, Govender and Msani (2012) point out plays an important function in integrating, leading people and taking decisions to make a project successful. For this to happen, there must be a deliberate effort to develop a shared project vision and the interests of stakeholders to ensure that there is buy-in to the project as advocated by Yang, Shen and Ho (2009). Further, Garbharran, Govender and Msani (2012) quoting Zwikael (2009) support that there must be constant update as the project progresses. For this to take place systematically, it is necessary to develop a communication plan. Garbharran, Govender and Msani (2012) further suggest that where possible, materials should be sourced from local sources as a measure to get buy-in from the community. Further, local

influential community members are given access to the project through the project manager as advocated by Teo (2010) as quoted by Garbharran, Govender, and Msani (2012).Secondly, community involvement is another factor in the communication component. It has been found to be a significant factor in previous studies (Morris and Hough, 1987; Yeo, 1995; Awakul and Ogunlana, 2002).Finally, proper handover schemes need to be developed and embraced by all stakeholders.

Conceptual Framework

A conceptual framework is a group of concepts that are broadly represented and systematically organized to give a focus, a rationale, and a tool for the integration and interpretation of information (Mosby, 2009). The interconnection of these concepts completes the framework for certain expected outcomes. In this study, the theoretical framework indicates the relationship between the dependent variable i.e. Project Success Factors and the independent variables which are; Comfort, Competence, Commitment, and Communication. These variables affect the success or otherwise of the projects. The following is a diagrammatic representation of the above relationship.

Figure 1: Conceptual Framework



RESEARCH METHODOLOGY

Research Design

Research Design is defined as to the overall strategy that is chosen to integrate the several components of the study in a unified and logical way thereby ensuring that there is effective address of the research problems. The study used an explanatory research design. Project success factors were examined concerning the Rift Valley Region of the Water Sector in Kenya. Rubin, et al. (2009) asserts that when doing explanatory research, we look for underlying causes and explanations of events. Explanatory research encompasses what is referred to as

interpretive studies, as a way of making sense of events. Sarantakos (2005) asserts that explanatory research moves beyond description and seeks to explain the patterns and trends observed. Adler E and Clark R (2001) argues that explanatory research is involved in explaining why something happens, and assessing causal relationships between variables.

Target Population

The target population of the subject constituted of Contractors found in the registers of the Rift Valley Water Services Board numbering 215 and Project Managers operating in the Rift Valley Region numbering 63, all employed by the Board as found in the register at the Human Resources Department of the Board. A sample was drawn from the combined database of the above two groups bringing the total target population to 278.

Sampling Frame& Sample Size

A sample is a small portion of a target population **(**Orodho, 2002**)**. In this study, the frame consists of all Contractors registered with the Rift Valley Water Services Board for the financial years 2014/2015 and Project Managers operating in the Board area. Dattalo, 2007 asserts that the ultimate goal of sample design is to select a set of components from a population in such a way that descriptions of items accurately portray characteristics of the populations from which they were selected. As stated above the target population is 278. And so at a confidence level of 95% and a 5% margin of error, the sample size of the study has been calculated using various on-line tools to be 162. The central limit theorem states that the sampling distribution of any statistic will be normal or almost normal if the sample size is big enough. Simple random sampling technique was used. Types of tests to be carried out will include z-test, t-test and regression analysis.

Data Collection Instruments and Procedure

Both questionnaires and interviews were employed for the study. Questionnaires were administered to the selected sample while interviews and observations were carried out on the top management of the organizations/departments. Questionnaires are considered appropriate as it is convenient in terms of time required. It is also cost-effective as compared to other data collection tools. The questionnaire was in two parts; with part 1 being to gather information on the respondents and part 2 dealt with the perception of the respondent on the factors that affect project success. The responses were recorded using the 5 point Likert-type scale (Not Very Important, Somewhat Important, Moderately Important, Very Important and Extremely Important).

An introductory letter was obtained from Jomo Kenyatta University of Agriculture and Technology to enable the researcher to collect the necessary data. Contact information on the respondents was found at the Rift Valley Water Services Board offices, and appointments were sought to administer the questionnaires at convenient times for the respondents and the researcher. The questionnaires were administered within a period of two weeks in November/December 2015.

Pilot Testing

The questionnaires were pilot tested with a few members of the population to ensure that the format adopted were appropriate to use regarding validity and reliability. Content validity was established by use of a few experts in this field of research, primarily to determine if indeed a representative sample of the skills and traits that comprise the area to be measured have been taken into account. A pre-test was carried out on ten questionnaires and thereby the data obtained was analyzed to deliver a judgment on the suitability of the research instruments, and modifications made as appropriate.

Data Processing and Analysis

The data gathered was first analyzed using simple descriptive statistics. Multiple and correlation analysis was also carried out to determine the relationship between the various variables. SPSS 22 was used to analyze quantitative data. A reliability test was carried out, using the Cronbach's alpha test. It was meant to determine the internal consistency of the study components thus enabling the researcher to see how closely related as a set of components are as a group.

RESEARCH FINDINGS AND DISCUSSIONS

Out of a population of 278 made up of 215 contractors and 63 project managers, a sample size of 162 was obtained using the various on-line calculators. The proportion of contractors and project managers arrived at using the ratio of each group to the total sample size so that the sample contained 126 contractors and 36 project managers.

Table 1: Response Rate

Category	Response	Percentage
Response	138	85
Non – Response	24	15
Total	162	100

Table above shows the relationship between the sample size and the actual number of respondents who actively participated in the study. The sample size mirrors the number of respondents issued with the questionnaires, and the response depicts the number of respondents who filled and returned the questionnaires. The table thus shows that out of a sample size of 162, responses from 138 persons were obtained which represents about 85% overall response rate. The breakdown of the response rate was as follows: 34 project managers and 104 contractors representing 94% for project managers and 83% of contractors respectively. According to Mugenda and Mugenda (2009), a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good, and a response rate of 70% and over is excellent. The response rate was good in the study. High response rate in any study gives more confidence to the study as the results are likely to be more accurate and representative of the research group.

Respondents' Profiles

Gender of Respondents

Table 2: Distribution of Respondents by Gender

Category	Response	Percentage
Female	17	12%
Male	121	88%
Total	138	100%

Table 2 shows the gender of the respondents who participated in the study – overall, the majority of the interviewees were male which was 88% of the total response and 12% of the respondents were female. It illustrated that there was more male than females who participated in the study. The breakdown of the response rate was as follows: 31 men and three women representing 91% and 9% respectively among the project managers. Among the contractors, the breakdown is 90 males and 14 females, representing 87% and 13% respectively.

This finding shows the dominance of men in the sector. In a report by OECD, it is noted that Kenyan women are still under-represented in the water sector governance structures at all levels. This finding is, therefore, consistent with other findings from other publications.

Age of Respondents

Table 3 below shows the age of the respondents who participated in the study. Overall, 33% of the respondents were in the age bracket of 20 – 35 years; 20% were in the age bracket of 36 –

45 years; 38% were in the age bracket of 46 – 60 years and 9% were in the age bracket of 61 years and above.

Table 3: Distribution of Respondents by Age

Category	Response	Percentage
20 – 35 years	46	33%
36 – 45 years	27	20%
46 – 60 years	53	38%
61 years and above	12	9%
Total	138	100%

The breakdown of the age distribution was as follows: For the contractors, 33% were in the age bracket of 20 – 35 years; 12% were in the age bracket of 36 – 45 years. While, 44% were in the age bracket of 46 – 60 years and 12% were in the age bracket of 61 years and over. On the other hand, for the project managers, 35% were in the age bracket of 20 – 35 years; 44% were in the age bracket of 36 – 45 years; 21% in the age bracket of 46 – 60 years and none in the 60 years and above. The difference in the distribution of the two groups was because there was an age limit in retirement age for the project managers since they were in public service, and there were no such limits for the contractors, being in the private sector.

Overall, the majority of the respondents were in the age bracket of 46 – 60years. Once again this is an indication of the age distribution and may lead to some recommendations on the need to develop appropriate strategies to ensure continuity of the sector functionality despite the aging population.

Level of Education of Respondents

Table 4: Distribution of Respondents by Level of Education

Category	Response	Percentage
Secondary	4	3%
College	46	33%
University	67	49%
Postgraduate	21	15%
Total	138	100%

Table 4 shows the level of education of the respondents who participated in the study. 3% of the respondents had attained secondary schooling; 33% college school; 49% university level and

15% postgraduate education. The majority of the respondents had attained the university educational attainment, followed by those who had post-secondary college training.

The breakdown of the level education distribution was as follows: For the contractors, 4% had attained secondary education; 35% had attained college schooling; 50% had attained university education and 12% postgraduate schooling. On the other hand, for the project managers, no one was in the secondary schooling, 29% were the at the college level, 44% at the university level and 26% at the postgraduate level.

Area of Specialization of Respondents

Table 5: Distribution of Respondents by Area of Specialization

Category	Response	Percentage
Social Sciences	14	10%
Engineering	86	62%
Accounting	24	17%
Others	14	10%
Total	138	100%

Table 5 shows the area of specialization of the respondents who participated in the study. 10% of the respondents were the social scientist; 62% were engineers; 17% accounting and 10% others. The results revealed that the bulk of the respondents were engineers.

The breakdown of the area of specialization distribution was as follows: For the contractors, 10% were social scientists; 66% were engineers; 17% were accountants and 10% others. On the other hand, for the project managers, 12% were social scientists; 50% were engineers; 26% accountants and 12% others.

Years of Experience of Respondents

Table 6: Distribution of Respondents by Years of Experience

Category	Response	Percentage
Less than one year	0	0
1 – 2 years	5	4%
3 – 5 years	28	20%
6 – 10 years	31	22%
Ten years and above	74	54%
Total	138	100%

Table 6 shows the years of experience of the respondents who participated in the study. None of the respondents had an experience of 1 year or less; 4% had attained the experience of between 1 and two years. While, 20% had attained the experience of between 3 and five years; 22% had attained the experience of between 6 and ten years, and 54% had achieved the experience of 10 years and above.

The breakdown of the years of experience distribution was as follows: For the contractors, 4% had experience of 1 to 2 years; 24% had the experience of 3 to 5 years; 24% had the experience of 6 to 10 years, and 48% had the experience of over ten years. On the other hand, for the project managers, 3% had the experience of 1 to 2 years; 9% had the experience of 3 to 5 years; 18% had the experience of 6 to 10 years, and 71% had the experience of over ten years.

Descriptive Statistics

Comfort Factors

The researcher intended to know how stakeholder involvement, the competence of project manager, availability of resources, funding of the project and comprehensive of contract document as measures of comfort factor on the success of a water project in Kenya (Table 7).

Table 7: Distribution of Respondents Views on the Comfort Factors

	N	Min	Max	Mean	Std. Deviation
Stakeholder Involvement	138	3	5	4.32	.690
Competent Project Manager	138	3	5	4.60	.577
Availability of Resources	138	4	5	4.60	.500
Adequate funding	138	4	5	4.72	.458
Comprehensive Contract Document	138	3	5	4.36	.638

The study revealed that most respondents agreed that stakeholder involvement (mean=4.32), project manager competence (mean=4.60), availability of resources (mean=4.60), adequate funding (mean=4.72) and comprehensive contract document (mean= 4.32) were very critical for project success.

Competence factors

The research aimed to know the impact of up-to-date utilization of technology, Experience emphasis, the competence of project team and qualified bidder as measures of competence on project success. Results are indicated in Table 8.

Table 8: Distribution of Respondents Views on the Competence Factors

	N	Min	Max	Mean	Std. Deviation
Up to date utilization of technology	138	3	5	3.72	.678
Experience emphasis	138	3	5	4.08	.640
Competent Project team	138	3	5	4.44	.651
Most Qualified bidder wins	138	3	5	4.40	.707

The study revealed that most respondents were in agreement that competence of the project team (4.44) and quality of the winning bidder (mean=4.40) are compelling aspects that need to be considered for a project success. The respondents agreed that update utilization of technology (mean 3.72) is an import but not very crucial compared to the experience of the project managers and contractors (mean= 4.08).

Commitment factors

The research sought to establish the effects of top management support, commitment to project, clear objectives and political support as aspects that influence the success of a water project in Kenya. Table 9 show the findings.

Table 9: Distribution of Respondents Views on the Commitment Factors

	N	**Min**	**Max**	**Mean**	**Std. Deviation**
Top Management Support	138	3	5	4.68	.557
Commitment to Project	138	3	5	4.52	.586
Clear Objectives	138	3	5	4.60	.577
Political Support	138	1	5	3.40	1.354

The respondents were in agreement that the top management support (mean=4.68), clear objective (mean = 4.60) and commitment to project (mean = 4.52) were important factors to considered for a fruitful and functional water project in Kenya. Political support (mean 3.40) is also important but not as much as the other three factors. The findings indicate that involvement of stakeholders is also essential to project success. Various literature reviews stated that inclusion of all stakeholders is crucial for the successful implementation of projects.

Communication factors

The research sought to establish the effects of communication on project success through aspects of shared vision, regular updates of plans, frequent meetings, community involvement and handover procedures. Findings are presented in Table 10.

Table 10: Distribution of Respondents Views on the Commitment Factors

	N	Min	Max	Mean	Std. Deviation
Shared vision	138	2	5	4.04	.841
Regular update of Plans	138	3	5	4.40	.707
Frequent Project Meetings	138	3	5	4.40	.577
Community Involvement	138	3	5	4.20	.816
Handover procedures	138	3	5	4.32	.690

The respondents agreed that aspects of communication contributed significantly to the success of a water project in Kenya. Frequent meetings (mean=4.40) and regular updates (mean=4.40) were paramount for the success of a project followed by handover procedures (mean=4.32), then Community involvement (mean=4.20) and finally sharing of the project vision (mean=4. 04).

Inferential Statistics

Inferential analysis was used to determine the relationship between independent factors and the dependent variable of project success. Correlation analysis was carried out using SPSS to establish the degree of relationships of "Four COMs" factors with the dependent variable.

Correlation Analysis

Comfort independent variable was correlated with the success dependent variable. The findings are presented in the Table 11.

Table 11: Comfort Correlations

			Comfort Variable	Success Variable
Spearman's rho	Comfort Variable	Correlation Coefficient	1.000	.746**
		Sig. (2-tailed)	.	.000
		N	138	138

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

Comfort variable has a strong positive correlation with the success variable (p-value < 0.01). The implication is that comfort variable are crucial for the success of a water project, and this is consistent with previous research of Garbharran, Govender and Msani (2012) who quoted Swan and Kaflan (2007) suggesting that the needs of stakeholders have to be managed and

influenced in a manner that ensures project success. A competent project manager is critical to the success of any project.

Table 12: Competence Correlations

			Competence Variable	Success Variable
Spearman's rho	Competence Variable	Correlation Coefficient	1.000	.520**
		Sig. (2-tailed)	.	.008
		N	138	138

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

As indicated in the Table 12, competence variable has a strong positive correlation with the success variable (p-value < 0.01, a p-value is 0.008). It implies that competence variables are crucial for project success, and this is consistent with previous research of Garbharran, Govender and Msani (2012) who quoted Swan and Kaflan (2007) suggesting that the need to have qualified bidders awarded the project implementation and a competent project team influences project success.

Table 13: Commitment Correlations

			Commitment Variable	Success Variable
Spearman's rho	Commitment Variable	Correlation Coefficient	1.000	.582**
		Sig. (2-tailed)	.	.002
		N	138	138

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

As indicated in the Table 13, commitment variable has a strong positive correlation with the success variable (p-value < 0.01, a p-value of 0.002). The relationship implied that competence variables are crucial for project success, and this is consistent with previous research of Garbharran, Govender and Msani (2012) who quoted Swan and Kaflan (2007) suggesting that the top management support and clear objectives significantly influences project success.

Table 14: Communication Correlations

			Communication Variable	Success Variable
Spearman's rho	Communication Variable	Correlation Coefficient	1.000	.788**
		Sig. (2-tailed)	.	.000
		N	138	138

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

As indicated in the Table 14, competence variable has a strong positive correlation with the success variable (p-value < 0.01, a p-value was 0.000). The association implied that competence variables are crucial for project success, and this is consistent with previous research of Garbharran, Govender and Msani (2012) who quoted Swan and Kaflan (2007) suggesting that the frequent meetings and regular updates of plans influenced in a manner that ensures project success.

Comfort Factor and Success Variable Regression Analysis

Table 15: Model Summary for Comfort factor and success variable

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.754[a]	.568	.549	.21969

a. Predictors: (Constant), Comfort factor

The *R* value indicated a high degree of correlation at 0.754. The R^2 value indicated the total variation in the dependent variable, project success, could be explained by 56.8 % 0f the independent variable, comfort factor, which was moderate.

Table 16: ANOVA[a] for Comfort factor and Success Variable

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.459	1	1.459	30.239	.000[b]
	Residual	1.110	137	.048		
	Total	2.570	138			

a. Dependent Variable: Success Variable1

b. Predictors: (Constant), Comfort Variable

The regression model predicted the dependent variable, success variable, significantly well as p-value < 0.01; hence, it was a good fit for the data.

Table 17: Coefficients for Comfort factor and Success Variable

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.186	.564		2.104	.047
	Comfort Factor	.684	.124	.754	5.499	.000

a. Dependent Variable: Project Success Variable1

The coefficient of 0.684 indicated that comfort factor predicted significantly to project success.

Competence Factor and Success Variable

Table 18: Model Summary for Competence Factor and Success Variable

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.499[a]	.249	.216	.28975

a. Predictors: (Constant), Competence Variable

The *R* value of .499 indicated a moderate degree of correlation. The R^2 value indicated the total variation in the dependent variable, project success, could be explained by only 24.9 % of the independent variable, competence factor, which was low.

Table 19: ANOVA[a] for Competence Factor and Success Variable

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.639	1	.639	7.607	.011[b]
	Residual	1.931	137	.084		
	Total	2.570	138			

a. Dependent Variable: Project Success Variable1

b. Predictors: (Constant), Competence Variable

The ANOVA model predicted the dependent variable, project success variable, fairly significant with a p-value of 0.011; hence, it was a relatively good fit for the data.

Table 20: Coefficients for Competence Factor and Success Variable

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.429	.673		3.612	.001
	Competence factor	.444	.161	.499	2.758	.011

a. Dependent Variable: SuccessVariable1

The coefficient of 0.444 indicated that comfort factor predicted moderately to project success.

Commitment Factor and Success Variable Regression Analysis

Table 21: Model Summary for Commitment Factor and Success Variable

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.734[a]	.539	.518	.22706

a. Predictors: (Constant), Commitment Variable

The *R* value of 0.734 indicated a high degree of correlation. The R^2 value reported the total variation in the dependent variable, project success, could be explained by 53.9 % of the independent variable, commitment factor, which was moderate.

Table 22: ANOVA[a] for Commitment Factor and Success Variable

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.384	1	1.384	26.839	.000[b]
	Residual	1.186	137	.052		
	Total	2.570	138			

a. Dependent Variable: SuccessVariable1 b. Predictors: (Constant), Commitment factor

Table 23: Coefficients for Commitment Factor and Success Variable

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.461	.354		6.958	.000
	Commitment factor	.423	.082	.734	5.181	.000

a. Dependent Variable: Success Variable1

The coefficient of 0.423 indicated that comfort factor predicted significantly to project success.

Communication factors and success variable regression analysis

Table 24: Model Summary for Communication Factor and Success Variable

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.836[a]	.698	.685	.18354

a. Predictors: (Constant), Communication factor

The *R* value of 0.836 indicated a very high degree of correlation. The R^2 value reported the total variation in the dependent variable, project success, could be explained by 69.8 % of the independent variable, communication factor, which was high.

Table 25: ANOVA[a] for Communication Factor and Success Variable

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.795	1	1.795	53.276	.000[b]
	Residual	.775	137	.034		
	Total	2.570	138			

a. Dependent Variable: Project Success Variable1

b. Predictors: (Constant), Communication factor

The regression model predicted the dependent variable, project success variable, significantly well with a p-value < 0.01; hence, it was a good fit for the data.

Table 26: Coefficients for Communication Factor and Success Variable

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.317	.407		3.235	.004
	Communication factor	.684	.094	.836	7.299	.000

a. Dependent Variable: Success Variable1

The coefficient of 0.684 indicated that comfort factor predicted significantly to project success.

Multiple Regression Analysis

Table 27: Model Summary Multiple Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.950[a]	.903	.883	.11182

a. Predictors: (Constant), Communication Variable, Commitment Variable, Competence Variable, Comfort Variable

b. Dependent Variable: SuccessVariable1

The results in Table 27 yielded an R-value of 0.95. This model indicated that Communication variables, Commitment variables, Competence variables and Comfort variables explained 95% of project success. R-square of 0.903 obtained showed that the data closely fitted the regression line.

Table 28: ANOVA[a] Multiple Regression Analysis

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.319	4	.580	46.374	.000[b]
	Residual	.250	133	.013		
	Total	2.570	137			

a. Dependent Variable: SuccessVariable1

b. Predictors: (Constant), Communication Variable, Commitment Variable, Competence Variable, Comfort Variable

The ANOVA test shown in Table 28, illustrated that the entire model was highly significant with p-value < 0.01. Since the value was 0.000. It was, therefore, concluded that Communication variables, Commitment variables, Competence variables and Comfort variable jointly have a significant influence on project success.

Table 29: Coefficients Multiple Regression Analysis

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	.236	.357		.662	.516
	Comfort Variable	.279	.095	.308	2.924	.008
	Competence Variable	.112	.074	.126	1.502	.149
	Commitment Variable	.239	.046	.415	5.247	.000
a	Communication Variable	.297	.098	.363	3.038	.006

a. Dependent Variable: SuccessVariable1

From the regression model in Table 29, the regression equation was obtained. The beta coefficients of the model developed the following regression equation.

$Y = 0.236 + 0.279 X_1 + 0.112X_2 + 0.239X_3 + 0.297X_4$

From the full regression model, the beta values were obtained which explain the regression equation. The beta coefficients gave a measure of the influence of each variable on the model. Regarding the influence of factors affecting project success, the study revealed that communication variable (β = 0.297) has the greatest impact, followed by comfort variable (β = 0.279) then followed by commitment variable (β = 0.239) and lastly competence variable (β = 0.112).

CONCLUSIONS AND RECOMMENDATIONS

Comfort

Based on the survey results, there was a strong relationship between comfort variable and project success (r = 0.746). This finding led to the conclusion that all Water Project Managers and other key stakeholders in Kenya should consider Comfort factors when planning and implementing projects.

Competence

Based on the study findings, there was a moderate relationship between competence variable and project success (r = 0.520). This finding led to the conclusion that all Water Project Managers and other key stakeholders in Kenya should consider Competence factors when planning and implementing projects.

Commitment

Based on the study findings, there was a positive relationship between commitment variable and project success (r = 0.582). This finding led to the conclusion that all Water Project Managers and other key stakeholders in Kenya should consider Commitment factors when planning and implementing projects.

Communication

Based on the study findings, there was a strong positive relationship between communication variable and project success (r = 0.788). This finding led to the conclusion that all Water Project Managers and other key stakeholders in Kenya should consider Communication factors when planning and implementing projects.

It is recommended that Rift Valley Water Services Board and all the Water Agencies, as well as all project stakeholders in Kenya, should pay serious attention to the four COMs to enhance project success to utilize the scarce resources in increasing water and sanitation coverage in Kenya, as well as use public resources prudently.

SUGGESTIONS FOR FURTHER STUDIES

It is recommended that further research to be conducted to investigate other factors that may influence project success in other regions of the country, albeit still in the Water Sector. Hence, lead to a better understanding of the factors that lead to project success in the water sector country-wide. It is also recommended that similar studies be carried out to other areas so that a more standardized list of factors can be arrived at for many sectors to enhance project success in the entire country as this will lead to fewer project failures hence less wastage of public funds.

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