INFLUENCE OF PROJECT APPRAISAL TECHNIQUES ON SUSTAINABILITY OF COUNTY GOVERNMENT ROAD PROJECTS IN KENYA: A SURVEY OF COUNTY ROAD PROJECTS IN BUNGOMA COUNTY

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Abstract: Project appraisals are necessary for the determination of the projects to be selected and implemented in an organization. A number of factors have been reported to influence sustainability of development projects including capital budgeting decisions. The purpose of the study was to establish the influence of Net Present Value, Payback Period, Internal Rate of Return and Profitability Index appraisal techniques on sustainability of County Government road projects in Kenya: A survey of road projects in Bungoma County. The study was guided by the following study objectives: To determine the influence of net present value, payback period, internal rate of return and profitability index on sustainability of county government road projects in Bungoma County. The study was anchored on; the Present Value Theory, Payback Period Theory, Internal Rate of Return Theory, and the Profitability Index Theory while adopting a descriptive survey research design covering a population of 300 management staff in the categories of County executive Committee members, Accounting officers, County directors, Sponsor, Project teams, contractors, functional managers, Customer/ users from the study population. The sample size was considered small and hence a census method was adopted for data collection with the questionnaires used as the instruments for data collection. Multiple regression analysis was used to determine the model and the significant perceived relationship between study variables as determined by a two tailed Pearson correlation matrix. Net Present Value, Payback Period, Internal Rate of Return and Profitability Index were found to be significant factors of sustainability of County government road projects in Bungoma County with each having a positive effect on the dependent variable according to the Regression model. The study findings revealed a regression effect that was statistically significant among the variables. The F-test (F=11.358 which was greater than the .05 significance level) was used in predicting the dependent variable by indicating an overall statistically significant model with Net Present Value explaining 69.7% (at t~4.971) of sustainability of county road projects, Payback Period at 28.2% (t~3.362), Internal Rate of Return at 73.3% (t~6.621) and Profitability Index at 35.3% (at t~3.309) of Sustainability of county road projects in Bungoma County. This study was significant to county governments in Kenya as they struggle with economic expansion. In particular the County Government of Bungoma appreciated the significant role played by project appraisal techniques in ensuring project efficiencies, profitability and project planning.

Keywords: Net present value, payback period, internal rate of return, profitability index and sustainability of county road projects.

1. INTRODUCTION

Background of the study

Project appraisal techniques also known as capital budgeting techniques or investment appraisal techniques play a crucial role in sustainable and controlled growth of development projects of in Kenya. Various different techniques that cannot be assumed have been designed to ensure that any investment meets a certain degree of viability before it is blindly implemented. These techniques include Net present Value(NPV), Internal Rate of Return(IRR), payback period, discounted payback period, profitability index(PI).Projects such as Rural Roads are integral in the connection of the communities' functions within Bungoma County in Kenya. In Bungoma, only 14,000 km of road network that has been tarmacked out of more than 300,000Km total roads network in Kenya from year 1900. This implies that, in the past more than 100 years, only 5% of road network are paved, and 70% of these tarmacked roads are in dilapidating state and therefore not sustainable as per KeNHA (CIDP, 2017).

Roads, which are one of the major investments of both County governments and the national government, yield County governments considerably huge revenues depending on the traffic and the area they are connecting. Up to date the road sector in Kenya has not developed its manual or Kenya roads standards (KRS). The road sector still uses the British standards (BS) which are almost obsolete and have been overtaken by new designs and new road construction technology. The designs construction and functions of these roads are somewhat difficult from a sustainability perspective. This also implies the significance of project planning that involves implementation of skills, practices, and comprehension of tools to the activities of a project to outlive the expectations and needs of the stakeholders in a project and ensure sustainability. Other project ventures that have potential to earn County government huge daily revenues if properly appraised and implemented include County hospitals, bus stations(stage), municipal houses, Municipal markets water and sewerage services. This can be achieved through proper cost management that involves cost control, cost budgeting, resource planning and cost estimation. The contribution of the project appraisal guarantees success and long-term sustainability as expounded by (Filicetti, 2009).

Successful organizations across major sectors and geographic borders have been steadily embracing project appraisal techniques as a way to control expenditures and improve results of project. When the recession began, this practice became even more important. Executives from all facets discovered that adhering to project management methods and strategies reduced risks, reduced costs and improved success rates; all vital to surviving the economic crisis. When project management through appropriate project appraisal is not involved, project overruns hence the issue of unsustainability is common feature in County government projects as a case of Bungoma County government. Therefore, to ensure no cost overruns and projects remain viable and sustainable; project appraisal should be well involved (Hobbs, 2013).

Global Perspective of Project Appraisal

Recent international studies have revealed the significance value organizations can derive from the projects they implement. Organizations would like to receive good value for the funds it invests whilst meeting its objectives and reason for existence. In the global outlook today, organizations such as state agencies, corporate and not for profit organizations are increasingly aware of their very existence with regards to their mission, vision and objectives. In this context, delivery of products and services must be aligned to the organizational goals and objectives. Projects and programs instituted by these organizations are to be assessed to ascertain the progress made and whether they are aligned to the mission and the overall organizational objectives (Thomas, 2009).

Project appraisals are necessary for the determination of the projects to be selected and implemented in an organization. In organizations, many are the competing issues in allocation of resources, the balance between different projects and the impacts of these projects and programs on the company's performance. Project appraisal approaches may assist the organization in making decisions that may achieve a more efficient level of allocating resources in the organization. Project Appraisal has been described as a process in which review of different projects and their evaluation of their content to approve or reject the project is carried out by analyzing the need to be addressed by the project. Thereafter, solutions are generated with options to address the problem and selection of the most practical option is done (Burg, 2012).

According to Ribeiro, (2011), one also conducts a feasibility study of those options, create a solution statement, and identify the persons and institutions that are concerned with the project and its anticipated outcomes. This can be said to be an endeavor to defend the project by carrying out studies that is a concerted way to determine a project's feasibility. Project appraisal has also been defined as an elaborate method of measuring and interrogating proposals before committing the organization's resources. According to Burg (2012), it was pointed out that project appraisal is an essential tool for effective determination of projects to be executed. This meant that organizations and communities could choose the best projects to help them achieve their mission, vision and objectives. Project appraisal management has been described as an integral phase of a project cycle, notwithstanding the size, type or its nature (Khatua, 2011). It has also been a widely held view that project appraisal is oriented towards the assessment of the project and if it can be worthy or not for the management to proceed with it. The main purpose of the appraisal stage in the cycle was to establish the viability of the project with regards to its technical, market, institutional, financial and economic value in the organization (McConnel, 2011).

Aligning an organization's projects and programs to get the most out of their benefits to its objectives takes a concerted effort. In many instances companies have a significant number of projects underway. These include projects to transform the operations of the organization, continuous improvement programs and expansions, upgrading or replacement of equipment, maintenance works, staff restructuring and resizing, outsourcing, and quality-of-life projects. Given that projects have been said to be the way in which organizational strategies are executed, it follows that it is critical for the benefits of investing in these projects be demonstrated and they are channeled by the organization's strategy, its corporate philosophy and management intention to implement them. (American Management Association, 2016).Although it is a fact that projects are managed since ancient times, a thorough knowledge reveals that the theoretical cornerstones of project management methodologies are not yet agreed upon by all the Organization. The success project depends on a successful project management and a successful end-product. This will draw attention to the micro and macro perspective of project success, the boundary of which inspires polarized reactions. The success of a project is influenced by many different factors, some of which may lie outside the control of project management(Al-Hajj and Zraunig, 2018).

Project appraisals are crucial for the determination of the projects to be selected and executed in a given organization. In most organizations, there are many competing items in allocation of resources, the balance between different projects and their impacts on company performance can only be achieved through a careful investment appraisal. Project appraisal techniques assist the organization in decisions making that in order to achieve more efficient level of allocating resources in the organization (Mullay, 2012).

Organization's projects need to be aligned in order to get the optimal benefit out of them. In many cases companies have several projects to be undertaken. Some of these projects might include set up new business units through expansions, improvement on the current operations under maintenance actions, setting up patents, Staff restructuring and many more. Having in mind that projects are a way of executing business strategies it is critical to analyze which path an organization follows at any given moment in terms of investments (American Management Association, 2016).

Access to good Infrastructure in developing countries such as Kenya has been one of the main concerns with international Financing institutions including the IMF and the World Bank. This has been facilitated though periodical grants and donations to support construction of these important facilities (World Bank, 2016).

Regional Perspective of Project Appraisal.

Project management has been hailed as one of the most monumental and auspicious skills in recent and current times because of how organizations and management can use it to help in controlling costs, reducing the probable risks and improving set outcomes (Aubry *et al.*, 2014). Project management has been defined as the activities involving the planning, organizing, and executing of a pre-established set of steps in order to maximize the use of resources and achieve specific objectives (PMI, 2013). The Project Management Institute (PMI), an organization created in 1969 to promote the discipline of project management, acclaims the process with helping businesses to save time and money, improve their Return on Investment (ROI) and reduce risk. It also highlights many benefits to an organization's staff members including improved collaboration and decreased stress as a result of teamwork.

When deciding which projects an organization intends to implement, an organization must institute an appraisal of the potential project to make sure the project was actually effective and that it supports the right solution and solves the problem that hampers the organization's performance. In this context, project appraisal management serves as the major

process of analyzing and approving the project. According to Harris (2012), projects to be implemented must undergo screening to determine their viability before being implemented. He further noted that by using the more common financial appraisal and ignoring non-financial criteria, organizations were bound to implement projects that are not aligned to their mission, vision and objectives.

Organizations that aspire to achieve their organizational objectives and exceed stakeholder expectations must initiate project appraisal techniques in order to assess the projects that would best fit the organizational strategy to achieve its objectives (Almeida and Duarte 2011). Larson, Honing, Gray, Baccarini and Dantin (2013) opine that organizations can fail to achieve their organizations' goals and objectives due to poor or failure to have in place a water tight appraisal mechanism. Despite of this noble idea, majority of the county government projects especially in Bungoma county road projects in the last seven years have shown undesirable outcomes and in some cases the projects have failed to achieve their objectives. Some of the road projects implemented by the county government of Bungoma have either not fully been implemented and in cases where they are completed, they do not live long enough to leap their economic and social value. As a result, the consumers of the projects end up not leaping the true value of their money hence, failure to enjoy the economies of scale. Most of the development projects have been characterized with inefficiencies, unprofitability, and poor project planning.

Project inefficacies has been resulted from county government undertaking less viable and complex development projects on the cost of simple and profitable projects. These poorly appraised projects usually face bottlenecks on raising the initial outlay. In such case the projects are compelled to take unexpected longer and unplanned time frames. Projects running out of the planned time frames are inefficient when it comes to capital budgeting since they extend the payback periods and slow economic growth of county governments such as the case of Bungoma County government (San, 2013).

Local Perspective of Project Appraisal

According to the World Bank report (2019), Kenya is one of the great beneficiaries in East Africa of its financial support. The support is aimed at reducing the poverty levels through attainment of the blue print Vision 2030.Through the power of devolution different Counties including Bungoma county continue with projects under the big four agenda such as agriculture, affordable housing, universal health coverage and manufacturing. All these projects seem to be important, however, the order at which they should be implemented is important when it comes to project appraisals.Project appraisal techniques also known as capital budgeting techniques or investment appraisal techniques play a crucial role in sustainable and controlled growth of development projects of in Kenya. Various different techniques that cannot be assumed have been designed to ensure that any investment meets a certain degree of viability before it is blindly implemented. These techniques include Net present Value (NPV), Internal Rate of Return(IRR), payback period, discounted payback period, profitability index(PI).

Projects such as Rural Roads are integral in the connection of the communities' functions within Bungoma County in Kenya. In Bungoma, only 14,000 km of road network that has been tarmacked out of more than 300,000Km total roads network in Kenya from year 1900. This implies that, in the past more than 100 years, only 5% of road network are paved, and 70% of these tarmacked roads are in dilapidating state and therefore not sustainable as per KeNHA website (www. Kenha.co.ke).

Other project ventures that have potential to earn County government huge daily revenues if properly appraised and implemented include County hospitals, bus stations(stage), municipal houses, Municipal markets water and sewerage services. This can be achieved through proper cost management that involves cost control, cost budgeting, resource planning and cost estimation. The contribution of the project appraisal guarantees success and long-term sustainability as expounded by (Filicetti, 2009).It is very important to consider the initial cost of investment as well as the period it will take for the project to plough back returns in form of profits to continue to sustain it. Projects with short payback periods should be prioritized when making decisions on undertakings. In projects that involve development of infrastructure such as roads in Bungoma County, consideration should be based on the usefulness and the size of traffic that use the routes. By such consideration, the projects become sustainable in that revenue is ploughed by the County government to recover the cost of the constructions. Technical appraisal of project will be critical in project assessment. The county government needs to establish the cost benefit of a project, its financial viability and market demand but if technical aspect is missing the investment has a high potential of failing (Khatua, 2011).

ISSN 2349-7807

International Journal of Recent Research in Commerce Economics and Management (IJRRCEM)
Vol. 7, Issue 3, pp: (1-24), Month: July - September 2020, Available at: www.paperpublications.org

However how big or small a project might be, all projects have cycle which is similar, that involves; commencing the project, organizing and preparing for the project, executing the project work and closing the project. Sustainability of these projects will mean that the projects pass through all the stages successfully (PMI, 2013).Whereas short-lived projects, that are projects with short maturity period, are suitably gauged using payback period, long-lived projects are usually appraised using the discounted cash flow techniques of net present value (NPV) and Internal Rate of Return (IRR) (Mehari, 2010). County government development projects should be well appraised to ensure their viability and sustainability. The projects should be able to finance their activities when they become operational and should not paralyze other important functions during implementations due to poor appraisals on capital requirements. Projects should not cause hindrance on payment of other crucial functions such as salaries, wages and other utilities because of project inefficiencies. There should be also well procurement procedures to support county government projects. This may include awarding development contracts to reputable companies rather than fraudsters. This will help in project control in terms of cost and time resources. (Bedanand *et al.,* 2014).

Statement of the problem

There is an alarming crisis on sustainability of county government development projects due to lack or sometimes poor application of investment appraisal techniques. This is evidenced in Bungoma County and other Counties in Kenya. Most of the development projects including road projects have been characterized with inefficiencies, unprofitability, and poor project planning. Project inefficacies has been resulted from county government undertaking less viable and complex development projects on the cost of simple and profitable projects. These poorly appraised projects usually face bottlenecks on raising the initial outlay. In such case the projects are compelled to take unexpected longer and unplanned time frames. Projects running out of the planned time frames are inefficient when it comes to capital budgeting since they extend the payback periods and slow economic growth of county governments such as the case of Bungoma County government (San, 2013).

Another common challenge facing most counties including Bungoma County is undertaking development projects which are unprofitable and censoring projects that have potential to generate high revenues. One of the objectives of devolution was to develop regional blocks that will contribute to higher generation of revenues through diversified regional advantages. County governments have not been able to take a careful analysis of the NPV of most of their projects to ascertain their profitability before they are launched especially those taking long maturity periods. As a result these projects have turned out to be unsustainable since they cannot even yield sufficient revenues to cater their costs. At the extreme end most counties are forced to seek costly debts to run the projects. These problems lower the living standards of the residents since they cannot access important services and infrastructure such as good roads, hospitals, learning institutions and social needs (Babie, 2015).

There is also a need to have a set required rate of return when setting a development project. It is important determine the interest rate at which the net present value of all the cash flows (both positive and negative) from a project or any investment equals to zero. This will assist the County governments in Kenya to evaluate the attractiveness of a project. This is a crucial aspect for sustainably and responsibly growth and expansion of projects of development in Kenya. If the IRR of a new project exceeds the county's required rate of return, then that project is desirable but if the IRR falls below the required rate of return then the county should clearly reject that project. A consideration should be put when using this appraisal method to ensure that the project being appraised does not generate interim cash flows and when there is a need to consider the cost of capital. This technique can't compare the projects with different maturity periods. The method is best suited when analyzing venture capital, private equity investments; which typically entails multiple cash investments over the life of the business followed by a single out flow at the end (Shyam, 2009). From the above challenges there was need to determine the effect of project appraisal techniques on sustainability of county government road projects.

Study objectives

The study was guided by following general and specific objectives:

General Objective

The general objective of the study was to establish the influence of project appraisal techniques on sustainability of Bungoma County government road projects in Kenya.

Specific Objectives

The study was guided by the following objectives;

I. To determine the Influence of Net Present Value on Sustainability of County Government Road Projects in Bungoma County.

II. To assess the Influence of Payback Period on Sustainability of County Government Road Projects in Bungoma County.

III. To identify the Influence of Internal Rate of Return on Sustainability of County Government Road Projects in Bungoma County.

IV. To determine the Influence of Profitability Index on Sustainability of County Government Road Projects.

Research Questions

The study sought to answer the following questions:

I. What is the Effectiveness of using Net Present Value technique to determine the Sustainability of Road Projects in Bungoma County?

II. What is the Effectiveness of using of Payback Period technique to determine the Sustainability of Road Projects in Bungoma County?

III. What is the Influence of Internal Rate of Return on Sustainability of Road Projects in Bungoma County?

IV. What is the Influence of Profitability Index on Sustainability of Road Projects in Bungoma County?

Significance of the Study

There is an upward trend in the desire for sustainability by stakeholders in donor, national government and county government funded projects. To ensure sustainability, there is need for project planners and implementers to understand the relationship between various appraisal techniques and sustainability of a particular project. This study specifically provided information on the relationship between appraisal techniques (Net Present Value (NPV), Payback Period (PBP), Internal Rate of Return (IRR) and Profitability Index (PI) appraisal techniques) and sustainability of County road projects. Development practitioners (Government Institutions; Counties, State corporation, state department, semi-autonomous government agencies),Project managers, users/customers university professors, lecturers and students of Development projects and Project Management were expected to benefit from the resourcefulness of this study on the major issues facing the sustainability of road projects. This gave a true picture of being realistic and uncompromising on the importance of appraising investments before they are undertaken by contracted companies. Otherwise there will be a negative impact on the element of devolution and the general economic blueprint of vision 2030. The study was expected to arouse new interest among scholars, development practitioners and students of research about re-mapping the traditionally established paths towards influence of project sustainability. This was through coming up with new project sustainability models that propagate responsible Leadership/governance. Further, the study contributed to global knowledge on the sustainability issues facing roads projects from the perspective of developing economies.

Scope of the study

The study was limited to the influence of project appraisal techniques on sustainability of county government road projectsinBungomaCounty.Thepurposeofthestudywastodeterminetheinfluenceofprojectappraisaltechniquesonsustainability of road projects in Bungoma County. The study has four independent variable: Net present value, payback period, internal rate of return and Profitability index.This study sample involved county executive members, accounting officers, county directors, sponsors, project teams, planners, contractors, functional managers, and residents/consumers of Bungoma County.

Limitations of the Study

Data collection encountered a number of challenges due to the fear of the corona virus outbreak that was slowly becoming a global pandemic by the time of collecting the data. The other challenge was the respondents' skeptism on any person

who seemed like trying to collect some data from them (county personnel) "disguising" themselves as students yet they were anti-corruption officers on a mission of fact finding on the water tanks scandal in the county.The challenges were however mitigated through the presentation of introduction letters which proved that the researcher was a master's student at Jomo Kenyatta University of Agriculture and Technology and was actually collecting data for academic purposes only.

2. LITERATURE REVIEW

Introduction:

This chapter covered the theoretical framework, conceptual framework, and review of variables, critics of the existing literature, research gaps and finally the summary of the chapter.

Theoretical Review

Theoretical review presents theories and ideas that exist regarding the influence of project appraisal techniques on sustainability of county government development projects in Kenya. It is a set of interrelated concepts that guides the research. These theories include;

Present Value Theory

This is a project appraisal technique that is applied to projects that are long-lived whereby they are appraised using the discounted cash flow techniques of net present value (NPV).It is the present value discounted at firm's rate of return on the sequence of net cash flows from the project minus the projects net investment. It uses the formulae for discounting non-uniform or uniform series of payments to value the projected cash flow for each investment alternative at one point in time (Baker, 2011)A project would be accepted if the Net Present Value is greater than zero i.e. positive NPV and it will be rejected if Net Present Value is less than zero i.e. negative NPV. This is because the cash being invested on the project is greater than the present value of the net cash flow. If Net Present value is equal to zero, the decision maker would be neutral. The Net present value technique assures that cash may be reinvested at the firm's interest rate (Mbothu, 2012)

Payback Period Theory

Payback period is simply the period it takes for a project to recover its cost. It is a simple method that takes estimations of the length of time required for an investment to generate revenue that equal its cost; that is the number of years required for a company or an investing organization to cover its original investment from the net cash inflows. Although under this method it is easy to calculate the period, it can lead to erroneous decision making in some cases. As it usually tend to ignore income beyond the payback period of the project. Therefore it might tend to be biased towards projects with shorter maturity periods. The payback period is in many cases used by investors who are short of cash and would wish to reinvest the cash flows that is generated in early stages of the projects. Risk averse investors often use payback period technique in evaluating projects before undertaking .Risk averse investors would want to receive cash at the early stages of projects since the future is full of uncertainty. Payback period method is somewhat better reflection of liquidity than profitability (Macharia, 2017).

Payback period technique can display how efficient the project is to a Risk averse investor in terms cost recovery to allow more investment on the same line or on alternative projects. Projects with longer maturity period can be less preferable to invest huge amount of cash that may paralyze other developments that require the same money (Evans, 2016).To accurately determine the payback period, analysis on the Critical Path should be done under project scheduling to ensure timely completion and optimal utilization of resources. Under the method all the project activities are described by a network. The project network can either apply activity-on-node(AON) model where nodes are activities and arrows (arcs) shows the precedence relationship or use the activity-on-arc (AOA) model in which arcs for activities with nodes marks the starting and ending points.AON is used frequently in practical and non-optimization situations whereas AOA is mainly applied in optimization settings. The main reason for both is to determine the critical path, for instance, tasks whose delay will result to a delay for the whole project (Steven, 2009).

The main purpose of Critical path method (CPM) is to determine the "critical path". The critical path of a project network is the minimum completion time for the project. It uses forward and backward pass routines to analyze the project network. It helps in network control to monitor the progress of a project on the basis of the network schedule. Corrective actions such as "crashing" the project or penalty/reward approach can be taken. This method is important in project planning since it allows optimization of resources including material, time and also human resource required to complete a given project (Arabu, 2016).

Internal Rate of Return Theory

Horngren *et al*., (2009) noted the internal Rate of Return as the discount rate at which an investment yields Net present value of all its expected cash inflows equal the Net expected present value of all its cash out flows. This can be achieved through the use of trial and error method or computerized mechanisms. Ascertaining, through the use of trial and error method, the rate of interest equates the terminal value with the initial cost.According to Kierulff, (2008) the internal rate of return is the annualized effective rate of return that makes the net present value of both the negative and positive cash flows from a particular project equal to zero. It provides the discount rate at which the net present value of the costs (which are the negative cash flow of an investment) equals to the net present value of the benefits of the investment (positive cash flows)(Thum, 2013).The drawback of this theory of project appraisal includes its multiple rates, the assumption that cash flows are reinvested at the internal rate of return. Also the scale effect; whereas in the case of Net Present Value the limitation relate to the choice of the measurement units and the project scale's scale effect (Pierru, 2010).

Profitability Index Theory

Profitability index (PI) is an appraisal technique that refers to the ratio of the present value of cash inflows (benefits) and outflows (costs). Profitability index makes an attempt to make the Net present value more meaningful for management. In fact, it is more popular compared to Net present value because it is easier to calculate and understand. A positive net present value has a profitability index greater than one while a negative net present value has a profitability index less than one. The determination of profitability index and net present value would result to same decision regarding the acceptance or rejection of the potential project (Harris, 2012).According to Boddy (2012) ignoring technical appraisal of a project cripples the launch of the project itself since the implementation heavily relies on the technical aspects of the project. Hence, this theory is revenant to the study as the study will endeavor to find out the influence of financial appraisal on county government projects in Bungoma County.

Conceptual Framework

The conceptual framework of the study comprised of building blocks of the study which were the independent variables and the dependent variable. The independent variables of the study included Net Present Value, Payback period, Internal Rate of Return and profitability index. The dependent variable was sustainability of county government road projects in Kenya. The figure below illustrated the conceptual framework:
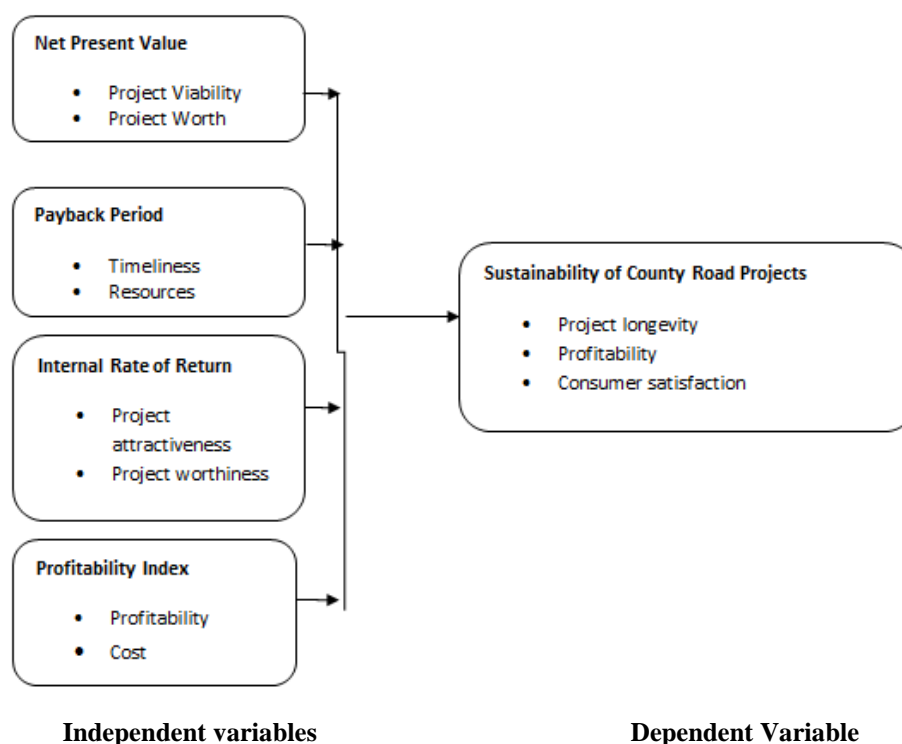

    Independent variables   **Dependent Variable**

Figure 2.1: Conceptual Framework

Review of variables

Net Present Value

The most common of the discounted cash flow techniques is known as the net present value (NPV) which is used to calculate the present value of cash flows associated with an investment and goes a step further to deduct these cash flows with the initial cost (Cimasi, 2014); the higher the NPV the better. This calculation uses a discount rate to show how the value of money decreases with time. A fundamental issue that is often quite contentious is the discount rate that is to be used when carrying out the cash flow analysis (Stoudt, 2013). In the private sector, many firms use their own cost of capital or weighted average cost of capital as the preferred discount rate (Baker & Powell, 2009). Government bodies typically prescribe a discount rate for use in the organization's planning and decision support calculations. In the United States, for instance, Brealey *et al.,* (2011) noted that the Office of Management and Budget (OMB) published a quarterly circular with prescribed discount rates for Federal Government use. In Kenya, commercial banks continue to use the treasury bill rates as the discount rate since this is the risk free rate of putting their funds (Maingi, 2011). Mbothu (2012), noted that the adoption of capital budgeting practices such as the NPV in private hospitals in Nairobi County enhanced financial performance.

Project viability is the predetermined expected ability of a given project to recover its cost and also to generate additional profit. Determining viability of any project requires a realistic evaluation of a number of several factors. In that context, viability potential of different projects will vary from one project to another. A project is not typically considered viable if its value exceeds its cost (Macharia, 2017).

 The NPV is a numerical calculation for determination of the present value of a project based on the expected income from that investment in future years minus the project cost. It is calculated by dividing the project expected income in each future year(uniform and non-uniform) by a term equal to one plus a discount rate raised to a power equal to the year. The totals for each year are added together and the initial project cost subtracted from that sum. Under the NPV model a project is accepted only when its net present value is greater than zero. When the net present value is negative the project is rejected since it is not viable and when the value of net present value is zero the investor is deemed indifferent (Amgad, 2015).

A fundamental issue that often arise in NPV method is the discount rate that is to be applied in the calculations of cash flows (Stoudt,2013). For instance, in private sector many firms use their own cost of capital or the weighted average capital cost as their preferred discount rate(Baker and Powell,2009). Government bodies including county governments typically administer a discount rate for use in the organizations' planning and decision making support calculations. In Kenya, Commercial banks continue to apply the Treasury bill rates as the discount rate since the rates represents risk free rate of investing funds (Maingi,2011).

In other cases the cost viability of a project can change over the course of the project's development or implementation due to the dynamic nature of the market. An increase in the cost of materials can cause an overall rise in project cost. On the other hand a fall in the cost of raw material can reduce the overall project cost. In addition to that, changes in technology also have an impact on the project costs.

Payback Period

The most simple financial appraisal technique is known as the payback method. The payback period is defined as the time it takes for net cash inflow and the net cash outflows to equal the cash investment in a project or investment (Brealey, *et al.*, 2011). It is the period of time required to recoup the funds spent in an investment, or to reach the break-even point (Higgins, 2015). The payback period is expressed in years or yearly fractions such as months. The payback period is calculated by aggregating the yearly cash inflows and cash outflows of a project and comparing this with the initial investment to estimate how long the project will take to recover the initial investment (Cimasi, 2014). The payback period however does not consider the time value of money when applied to a set of cash flows. In fact, the time value of money is completely disregarded in the payback method and the cash flows are summed up to determine the point at which they become neutral or positive.

The time value of money is the idea that cash in hand today would be worth more than it would be in the future because it may be invested immediately and make some earnings due to that investment (Baker and Powell, 2009). According to

Harris and Mongiello (2012), if one would pay an investor tomorrow, then the payment or the return it would ordinarily include the opportunity cost consideration for that period the investor has parted with his funds. The time value of money can therefore be described as a concept that therefore assigns a monetary value to this opportunity cost.

The other financial measures are more reliable as compared to the payback period method since they account for the time value of money (Baker and English, 2011). These measures include discounted cash flow method which measures the expected future cash flows to arrive at a present value and if the value is higher than the current cost of the project, then the opportunity was considered to be a good one (Baker and Powell, 2009). The discounted cash flow analysis uses future free cash flow projections and discounts them to arrive at a present value estimate, which is used to evaluate the potential for investment (Brealey,*et al.*, 2011).

Different projects have varying maturity or payback periods. Some take longer period of time pay their initial cost of investments while others take shorter period to start realizing profits. When investing in a project most investors especially the risk averse investors or investors with short amount of cash will prefer projects that have short maturity period so that they can reinvest the funds generated. To achieve this it will depend on how efficient the project .When appraising project the projects their real picture concerning their time requirements and the amount to be injected should be considered. This is very important to prevent the issues of a single project paralyzing other projects because of the additional time and cash requirements (Amgad, 2015).

Project management is aimed at achieving desired outcome within certain time parameters. County government project management practices should target completion of the project as intended by getting it done most efficiently .This is done by minimizing project cost and achieving external goals related to consumer needs. Project goals usually appear straightforward and achievable. However, projects continuing to run late exceed their budgets and fail to meet their objectives. The modern n project management was introduced during the Manhattan project in the early 1950's, but certainly, projects have been realized before that time. It is accepted that thenowadays commonly used bar chart was developed by Henry Gantt the in1916.Successful project management is where a group of people working as teams are able to accomplish tasks within given timeframes using given amount of resources as inputs. Projects that have been undertaken by different County government have posed issues in terms of completion within the set time frames and also their resource requirements. Most development projects have taken more time and resources in terms of material and personnel than initially planned. This implies a problem in terms of project efficiencies in county government development projects in Bungoma County (blog.mavenlink.com).

Under project management, different kinds of projects it can be described by processes since project-based organizations including Bungoma County government are often struggling with the balance between time, cost and quality; they are often interested in doing it in the most efficient way possible.

After determining the payback period, a project a charter which provides the layout of all the information concerning the project should be developed. This document is reviewed by the team members whenever they have questions concerning roles of individuals in the project, reason for the project, goal of the project among others. A project charter is the lone place that contains truth for reference by all the team members. It should be used to keep information organized. Other important facets include project schedule and also project budget (Parast, 2011).

Internal Rate of Return

The Internal rate of return (IRR) is also a common measure which presents the discount rate that makes the present value of all future cash flow equal to the initial investment or, in other words, the rate at which an investment breaks even (Brealey *et al.*, 2011). Where a project has a higher internal rate of return, then the management finds it more desirable it is to embark on the project. According to Morris, Pinto and Soderlund (2012), in ranking projects that are relatively even, the IRR could be used to consider the project with the highest rate since that project shows a potential of generating higher returns over time as compared to the others. IRR can also be compared against prevailing rates of return in the stock market. If an organization cannot find any projects with IRR that is greater than the returns that can be generated in the financial markets, then it may decide to choose and invest its money into the market (Baker and Powell, 2009).IRR however must be used carefully as it may misguide one in judging the project to be selected during an appraisal. Dayananda (2002) noted that a project may have a low IRR but a high NPV, meaning that while the pace at which the company sees returns on that project may be slow, the project may also be adding a higher monetary value to the company. Stoudt (2013) thus recommended that an organization should use both IRR and NPV valuations simultaneously to safeguard this anomaly.

The internal rate of return is the return rate used in investment appraisal to measure and compare the profitability of the outlays. It is also referred as the discounted cash flow rate of return (DCFROR) or the rate of return (ROR).In another context of loans and savings IRR is simply the effective rate of interest.The word internal is used to refer the fact that its calculation does not involve environmental factors such as the rate of inflation(Osborne, 2010).

Kierulff (2008) views the internal rate of return as the annualized effective rate of return that make the net present value of both the negative and positive cash flows from a particular project equal to zero. It provides the discount rate at which the net present value of the costs (which are the negative cash flow of an investment) equals to the net present value of the benefits of the investment (positive cash flows) (Pierru, 2010).

According to Ben-Horin and Kroll(2012) IRR can well be used to evaluate the desirability of projects. High internal rate of return of a project implies more desirability and thus the benefits to undertake the project. Low internal rate of return signals that the project should be rejected assuming all projects require the same amount of capital investments. Firms and organizations such as County governments should theoretically undertake all projects available that have IRR exceeding the cost of capital. Investments may be constrained to insufficient funds of the organization or the capacity of the organization to manage multiple projects(Stucchi, 2010).Other problems that can be witnessed in a project is when it has no real valued IRR, a circumstance that may occur in projects which require shutting costs or imply an initial positive cash flow in a case such as down payment made by a client. The paradoxical case of this kind can be achieved through application of adjusted IRR in which any project that is associated with a unique return function that maps an aggregate internal rate of return is solved using the Average Internal Rate of Return (AIRR).In such a case a twin project that has a unique Internal rate of return and same Net Present Value is introduced as the original projects. This is attained through appropriate minimization of the distance between the original project's cash flow stream and the twin projects return function. This represents the AIRR of the original project. Although this is not the real IRR of the project, it is almost the actual IRR of the project and it is termed as the quasi –IRR.

According to Hazen (2009), IRR is a good indicator of the efficiency, quality,or yield of a project since it is a rate of quantity. This supplements the net present value technique that is best used as an indicator of the value or magnitude of a project. There should been established minimum required rate of return or simply cost of capital. In a situation where the organization is using equity, the minimum rate is the cost of capital of the investment. This will ensure that the development project is supported by equity holders, where additions on the IRR add value to the investing firm (Presacco, 2013).

It is important to note that IRR should not be entirely relied in decision making process. There is a need to consider important key performance indicators together with the IRR. When the IRR is high and a project also has a positive NPV then the project can be accepted. In addition, the higher number of considered key performance indicators provides a better platform for prediction (Magni, 2013).The method should not be used to rate projects which are mutually exclusive. It is used to decide whether a single project qualifies worth of investing in to it. In such case assuming there is no capital constraints where one project has high initial costs than the second mutually exclusive project, the first might have lower expected rate of return but a higher increase in shareholder's wealth (NPV) (Lindblom, 2009).

Profitability Index

Profitability Index (PI) is another common technique in financial appraisal and it denotes the present value of future cash flows of a project in relation to initial investment required for the project (Harris and Mongiello, 2012). A profitability index of "1" signifies a breakeven while a value lower than that shows that the project's present value is less than the initial investment. It follows that as the value of the profitability index increases, the financial allure of the proposed project is reflected and the desire to invest in such a project increases (Carayannis, Kwak and Anbari, 2005). Combining the PI valuation with the NPV and IRR methods yields an even better appraisal as it covers the ranking of potential projects in a more precise manner (Baker and Powell, 2009).

It is always important to determine the ratio of the present value of cash inflows (benefits) and outflows (costs).Profitability index makes an attempt to make the Net present value more meaningful for management. In fact, it is more popular compared to Net present value because it is easier to calculate and understand. A positive net present value has a profitability index greater than one while a negative net present value has a profitability index less than one. The determination of PI and NPV would result to same decision regarding the acceptance or rejection of the potential project.

ISSN 2349-7807

International Journal of Recent Research in Commerce Economics and Management (IJRRCEM)
Vol. 7, Issue 3, pp: (1-24), Month: July - September 2020, Available at: www.paperpublications.org

However, the Profitability Index will show how much can be lost or gain from the project (Onuma, 2017).The advantage of using profitability index lies on its ability to address the objective framework around which discussions, decisions, corrections and amendment can take place. However its greatest risk is that hard numbers will tend to drive soft and therefore great care must be taken that roughly quantifies or quantifies effects be given their proper weight (Zerbe, 2006).

Sustainability of County Government Road Projects

Sustainability is one of the main objectives for every project that is undertaken by any organization irrespective of the operational scale. Every undertaking by either governmental or non-governmental bodies should be gauged with their potential to run smoothly financially, economically, socially and politically. All these can be attained through proper financial and non-financial project appraisal. According to Alta (2016), financial sustainability is how the financial support required for the project will continue after the grant has come to an end. Financial appraisal is selecting a project on the basis of financial viability which may include project profitability and cost advantages. On the other hand non-financial appraisal is based on non-financial aspects such as social factors, legal, cultural setup, environmental, adaptability etc. (Harris, 2012).

Generally, in determination of sustainability of a project, certain metrics and standards need to be set from the project identification stage through feasibility studies, project formulation, project design, appraisals, funding, project implementation, monitoring and evaluations. It is also very necessary to develop a comprehensive analysis of the social, legal, cultural, economic, educational and political environments for project implementation. The involvement of all the stake holders and advocates of the County development project is also crucial since it will enhance some logistical preparation. The stake holders might include the community in which the projects is being conducted not only the financers or implementers of the project (Morfaw, 2014).

Sustainability analysis determines the relevance of the project, its acceptability especially by the community, political expediency, project viability and its adaptability. There are other factors that help to determine project sustainability including risk and financial analyses, communication and network, training, operational plan, human resource development and capacity building, community and environmental analysis. The financing requirements have to be analyzed to determine whether the project is a case of franchise, cooperative, independent project, governmental or non-governmental organization etc.

Critique to Existing Literature

There have been several critiques on the research work that has been done by the earlier researchers. One of the main critiques is failure to clearly establish circumstances or a uniform appraisal technique that can aid on proper decision making irrespective of project irregularities. There have been so many project appraisal techniques that can result in conflicting decisions during investment choice (Magni, 2009).

The inflationary interest rate also keeps changing from time to time especially with the economic conditions of developing countries such as Kenya. This might have a huge impact when determining the internal rates of return of the investment. There should always be provision of adjustments on some of these techniques during their appraisal to bring a more accurate picture of the investment. These external factors both marketing and economic factor should be put into consideration by the researchers (Osborne, 2010).Other than applying the capital budgeting techniques the earlier studies fail establish the importance of risk analysis on investments as part of project appraising method. The variances including the downside semi-variance and the expected returns should be determined to supplement the various project appraisal techniques (Shephard, 2009).

There has also a case of arbitrage opportunities that has not been clearly addressed by most of the studies in project and appraisal techniques. Many companies are benefiting from arbitrage opportunities through trading in stocks, as they exploit price differences of identical or similar financial instruments on different markets or in different forms. Arbitrage exists due to market inefficiencies. It has been facilitated with the growth of sophisticating technology (Roman, 2015).

Research Gap

In his examination on projects, Nicholas (2012) noted that the footprint of the world's economic activity exceeded the earth's bio-capacity by 50% in the year 2007 according to WWF (2010).For instance in the United Kingdom, construction and demolition of buildings marks one of the main source of pollution (Royal commission on environmental pollution

2007). This is exactly what is happening in the country like Kenya in the recent days especially in the city where buildings are being demolished from public land, near water sources and also the sub-standard constructions. Environmental pollution amongst other emerging issues has a very huge impact on project sustainability and therefore research study need to address the impact of environmental pollution on project sustainability in the respective County governments such as Bungoma and others in the country (NEMA, 2018).Kenya has been marred by a demon of corruption that is cropping all over the country in a highly increasing rate. According to the Corruption Perception Index 2018, countries were ranked on a scale of Zero (most corrupt) to 100 (very clean). In this ranking Kenya scored 27 which are below 43 the average world score. The country was at position 144 tying with Nigeria out of 180 countries in the world. There is a need to determine the effect that corruption has on sustainability of development projects in Kenya (CPI, 2018).

According to the report by UNISEF (2017) Political Sphere has a role it plays when it comes to National or County development projects. The political instability and poor politics has been suspected to bring retardation on economic growth of the country and development projects. This is seen to draw weakness from appointments of less or unqualified personnel to approval of non-profitable projects. Thus there is a need to determine the impact of political aspect on sustainability of development projects in Kenya (Kenya Political Economy Analysis 2017).

These research gaps can be addressed by more research studies by researchers that will find the study useful in their areas of project sustainability with relation to pollution effects, corruption and negative politics.

Chapter Summary

The chapter contained the literature review of the study.This comprised of the theoretical framework of the study, the conceptual framework; Independent and dependent variables, and the empirical of review of the variables, critics of the existing literature, and the research gaps that exist. Theoretical review presents theories and ideas that exist regarding the influence of project appraisal techniques on sustainability of county government development projects in Bungoma County. It is a set of interrelated concepts that guides the research. These theories included Present Value Theory, Payback Theory, Internal Rate Theory, and Profitability Theory.

The most common of the discounted cash flow techniques is known as the net present value (NPV) which is used to calculate the present value of cash flows associated with an investment and goes a step further to deduct these cash flows with the initial cost (Cimasi, 2014); the higher the NPV the better. The payback period is defined as the time it takes for net cash inflow and the net cash outflows to equal the cash investment in a project or investment (Brealey, *et al*., 2011); the shorter the better. The Internal rate of return (IRR) is also a common measure which presents the discount rate that makes the present value of all future cash flow equal to the initial investment or, in other words, the rate at which an investment breaks even. Where a project has a higher internal rate of return, then the management finds it more desirable it is to embark on the project (Morris, 2012).Profitability Index (PI) is another common technique in financial appraisal and it denotes the present value of future cash flows of a project in relation to initial investment required for the project. A profitability index of "1" signifies a breakeven while a value lower than that shows that the project's present value is less than the initial investment (Mongiello, 2012).Some of the critiques on the research work that has been done by the earlier researchers include is failure to clearly establish circumstances or a uniform appraisal technique that can aid on proper decision making irrespective of project irregularities. The inflationary interest rate also keeps changing from time to time especially with the economic conditions of developing countries such as Kenya. There should always be provision of adjustments on some of these techniques during their appraisal to bring a more accurate picture of the investment. Other than applying the capital budgeting techniques the earlier studies fail establish the importance of risk analysis on investments as part of project appraising method (Osborne, 2010).There has also a case of arbitrage opportunities that has not been clearly addressed by most of the studies in project and appraisal techniques. Many companies are benefiting from arbitrage opportunities through trading in stocks, as they exploit price differences of identical or similar financial instruments on different markets or in different forms. Arbitrage exists due to market inefficiencies. It has been facilitated with the growth of sophisticating technology (Roman, 2015).

Research gaps of these study include need to address the impact of environmental pollution on project sustainability in the respective County governments such as Bungoma and others in the country, effect that corruption has on sustainability of development projects in Kenya (CPI, 2018), and also need to determine the impact of political aspect on sustainability of development projects in Kenya. These gaps can be filled by more research studies by researchers that will find the study useful in their areas of interests.

3. RESEARCH METHODOLOGY

Introduction

This chapter contained the Research design of the study, target population, sample size and sampling technique, sampling frame/sample size, instruments of data collection, and procedure for data collection, pilot study, the reliability and validity of the research instrument and finally data analysis and presentation.

Research Design

A research design is a strategy for data collection and analysis. This study used a mixed methods research design approach which involves philosophical assumptions that guide the collection and analysis of data using a mixture of qualitative and quantitative approaches (Bryman, 2013). The study adopted a descriptive survey research design. This approach was appropriate for this study because it simultaneously addressed both exploratory and confirmatory questions, thereby gathering information that resulted in conclusions or explanation or meta-inferences about the phenomenon under study.

Target population

A target population is the total collection of all units of analysis which a researcher wishes to consider for specific study (Babbie, 2015). The target population which is also equal to the accessible population of the study was 300 consisting of the management staff in the categories of County executive member, Accounting officers, County directors, Sponsor, Project teams, Contractors, Functional managers, Project teams and Customer /users.

Table 3.1: Target Population

Staff Categories	Numbers
County executive member	10
Accounting officers	15
County directors	30
Sponsor	10
County planners	50
Contractors	50
Functional managers	35
Project teams	50
Customer /users	50
Total	**300**

Sample size and sampling technique

Sample size refers to the number of observations or replicates to include in a statistical sample, Orodho (2015). The sample size is an important feature of any empirical study in which the goal is to make inferences about a population from a sample. Sampling technique refers to a procedure of selecting a part of population on which research can be conducted, which ensures that conclusions from the study can be generalized to the entire population. According to Mugenda and Mugenda (2013), 30% of the target population is a good representation of the population in data collection process. Therefore, the study used 30% of 300 which was 90 respondents as the sample size for the study. The sample was then randomly distributed to target population cluster in the ratio of the population.

Table 3.2: Sampling Frame

Staff Categories	Population	Total Sample
County executive member	10	3
Accounting officers	15	5
County directors	30	9
Sponsor	10	3
Contractors	50	15
Functional managers	35	10
Project teams	50	15
Customer users	50	15
County planners	50	15
Total	**300**	**90**

Data Collection Instruments

The primary methods of data collection consisting of Questionnaires were used. In this method a set of research questions relating to the study was asked and using a Likert scale, the respondents attended to the questions as appropriate. The Likert Scale of 1-5 was utilized in the shut end polls where the respondents were required to pick among the accompanying decisions: Strongly agree, agree, neutral, disagree, or strongly disagree (Kothari, 2014). It was organized in a sensible way to such an extent that the respondents had unmistakable comprehension of the exploration from the general inquiries, autonomous factors, and ward variable. The questions were set to capture on the objectives of our study to help in coming up with the right recommendations and conclusion. The questionnaires were randomly distributed to respondents to be filled and thereafter collected for analysis.

Data Collection Procedure

The procedure to be followed involved: Preparation of questionnaires where structured and semi-structured approaches applied. The prepared questionnaires were then distributed to different respondents randomly for them to be dully filled. The questionnaires were then collected from the respondents who were issued with them to fill and the collected data was tabulated and analyzed accordingly.

Pilot Study

There was preliminary study conducted by the researcher in order to evaluate feasibility, ascertain time, adverse events, cost estimation, and statistical variability in an attempt to predict an appropriate sample size and improve upon the design of the study prior to performance of a complete research project. In this case the researcher provided twenty (20) questionnaires to be filled for a pilot test.

Reliability of instrument

The reliability of a research instrument is the degree of consistency with which the research instrument measures whatever it is intended to measure and yield consistent results Mugenda and Mugenda (2013). It refers to the extent to which findings can be replicated by another researcher (Kiprotich, 2017).The reliability of the instrument was determined using Cronbach alpha coefficient and found to be approximately 81% which satisfied a coefficient value of 0.7 and above in determination of internal consistency of the set of items (Mugenda,2011).

Validity of Instrument

Boudreau *et al.*, (2014) saw validity as the extent to which the inferences made based on scores from an instrument are appropriate meaningful and useful. Dwivedi (2015) defined validity as the accuracy and meaningfulness of inferences, which are based on the research results. The purpose of validity in the study was to seek relevant evidence that confirmed the results of the study. The validity of the research instrument was based on the experts' opinions.

Data analysis & Presentation

To address the objectives and draw conclusions, data was analyzed both quantitatively and qualitatively. The Statistics Package for Social Sciences (SPSS) was used to statistically analyze quantitative data. Presentation of results was carried out in form of tables. ANOVA and multiple Regressions model (multiple linear regression) were adopted for the analysis of the data at a significance level of .05 between variables.The multiple linear regression model was as follows:

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

Where:

Y	-	Sustainability of County Government Road Projects
$\beta_1 ... \beta_4$	-	Variables' Coefficients
X_1	-	Net Present Value
X_2	-	Payback period
X_3	-	Internal Rate of Return
X_4	-	Profitability Index
ε_i	-	Error term

4. RESEARCH FINDINGS AND DISCUSSIONS

Introduction

The chapter comprises of presentation and interpretation of the data collected for the study. The opening section of the chapter presented the introduction, response rate, coefficient of reliability and demographic characteristics of the respondents.The second section presents the findings of the study based on the objectives that the study sought to achieve.

Response Rate

Out of the total 90 questionnaires that were distributed amongst the respondents, 85 of them were dully filled and returned by the respondents; 3 were, although returned, not fully filled, while 2 questionnaires were not returned. This feedback yielded a response rate of 90%. This provided reliable response rate for generalizations of study findings since the response rate of 70 percent and above is said to be a reliable response rate according to Zikmund *et al.*, (2010). This information was as represented in table 4.1 below;

Table 4.1: Response Rate

	Frequency	Percent
Dully Filled & Returned	85	95
Not Fully Filled	3	3
Not Returned	2	2
TOTAL	**90**	**100**

Respondents' Gender

Data on the gender of the respondents was collected and tabulated as presented in table 4.2 below;

Table 4.2: Respondents' Gender

Gender	Frequency	Percent
Male	59	69
Female	26	31
Total	**85**	**100**

The study established that majority of the respondents (69%) were male while 31% of them were female. This study finding depicted a good representation of both gender at Bungoma County with each gender having at least 30% representation which is in line with the new Constitution of Kenya.

Respondents' Age

Age of the respondents was considered an essential part of the study and hence included in the questionnaire. The data collected was as tabulated below;

Table 4.3: Respondents' Age

Respondents' Age Brackets	Frequency	Percent
18 – 25	10	12
26 – 33	28	33
34 – 41	34	40
42 and above	13	15
TOTAL	**85**	**100**

Majority of the respondents (40%) were found to be between the age intervals of34-41 years, 33% belonged to the age group between 26-33 years, and 18-25 years had 12% which represented the minority, while 15% had an age above 42 years. This implied that the county had an energetic work force of between 18 and 40 years of age.

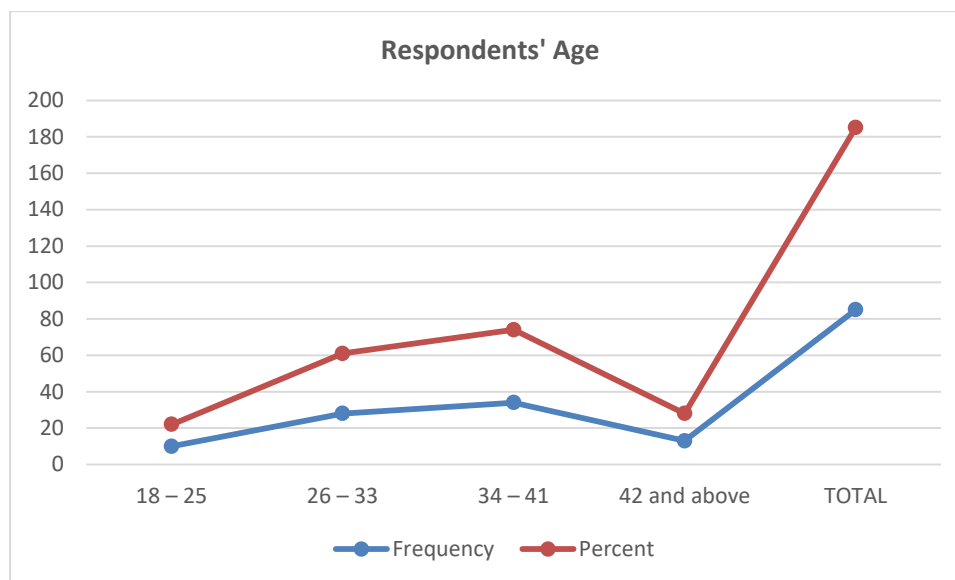This data was also presented in form of a chart as shown in figure 4.1 below;

Figure 4.1: Respondents' Age

Respondents' Education Level

The study sought to establish the education levels of the respondents and the results were as shown in table 4.4 below;

Table 4.4: Respondents' Education Level

Level	Frequency	Percent
Ph.D	3	4
Masters	12	14
Degree	30	35
Higher Diploma	10	12
Diploma	21	25
Others	9	10
Total	**85**	**100**

The study findings showed that majority of the respondents at 35% had degree qualifications, 25% of the respondents were diploma holders,14% of the respondents were master's degree holders, 12% were higher national diploma holders, 10% of the respondents had other qualification falling outside the categories listed above while the minority category had 4% of the respondents being Ph.D holders. Respondents that fell under the others category professional qualifications like Certified Public Accountants, Certified Secretaries while others had certificates in others course not listed in the questionnaire.

Respondents' Experience

The experience of the employees was also included in the demographic information of the study. This was because experienced staff/respondents give more reliable information, ceteris paribus, due to the period of time they have been within the system. The data collected was as shown in table 4.5 below;

Table 4.5: Respondents' Work Experience

Period in Years	Frequency	Percent
<1	5	06
1 ~ 4	21	25
5 ~ 7	37	43
>7	22	26
TOTAL	**85**	**100**

Table 4.5 above showed the period of years the respondents had served in their respective departments/occupations. From the period of service the respondent has been in the department or section implied some sort of experience and hence a reservoir of the required data for the study. Majority of the respondents had been in service between 5 and 7 years, this being 43% of the total. 26% represented the respondents who had served for over 7 years while those who had served between 1 and 4 years constituted 25%. The minority group of respondents had served for less than a year at 6%.

Plotted on a chart, the data was as shown below;
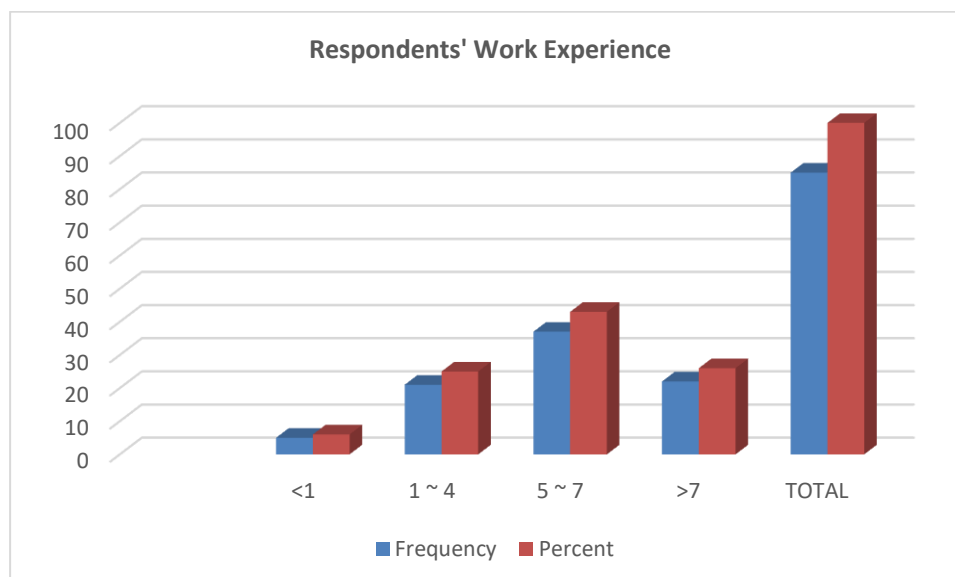
Figure 4.2: Respondents' Work Experience

Pilot Results

The study carried out a pilot study for purposes of fine tuning the data collection instruments before the final data collection exercise for analysis purposes.

Validity of the Research Instrument

McMillan and Schumacher, (2015) saw validity as the extent to which the inferences made based on scores from an instrument are appropriately meaningful and useful. Mugenda and Mugenda (2015) defined validity as the accuracy and meaningfulness of inferences, which are based on the research results. The purpose of validity in the study was to seek relevant evidence that confirmed the results of the study. The validity of instrument was based on the experts' opinions. The research instruments for the study were rated according to their effectiveness in sampling significant aspects of the study purpose and fulfilment of the study objectives.

Analysis of Sustainability of County Government Road Projects

The study collected data on the dependent variable (Sustainability of County Government Road Projects) and presented it as shown in table 4.6 below;

Table 4.6: Sustainability of County Government Road Projects

Item	SA %	A %	N %	D %	SD %
Road projects in Bungoma County are completed within the predetermined specified period	18	23	34	5	20
Road projects in Bungoma County are Profitable investments that should be considered more.	11	50	25	9	5
The road users are satisfied with the quality and the extent to which road projects have been conducted	20	21	22	19	18

The respondents were asked whether road projects in Bungoma County are completed within the predetermined specified period. The distribution of the responses indicated that 18% strongly agreed to the statement, 23% of them agreed, and 34% of them were neutral, 5% of them disagreed while 20% of them strongly disagreed to the statement. These findings implied that application of project appraisal techniques speed up completion time of projects.

The respondents were further asked whether road projects in Bungoma County are Profitable investments that should be considered more. The distribution of the responses indicated that 11% strongly agreed to the statement, 50% of them agreed, 25% of them were neutral while 9% and 5% of them disagreed strongly and disagreed to the statement respectively. These findings implied that road projects are beneficial to the county.

Finally, the respondents were asked whether road users were satisfied with the quality and the extent to which road projects had been conducted.The distribution of the responses indicated that 20% strongly agreed to the statement, 21% of the respondents agreed and 22% were neutral. 19% of the respondents disagreed while 18% of the respondents strongly disagreed to the statement respectively. These findings implied that completion of projects as intended through application of various investment techniques results to satisfactory results.

Analysis of Specific Variables

Influence of Net Present Value on Sustainability of County Road Projects

Data on the influence of the NPV on Sustainability of county government projects was collected and presented in form of table as shown below;

Table 4.7: Influence of Net Present Value on Sustainability of County Road Projects

Statements	SA %	A %	N %	D %	SD %
The County government project management teams usually analyze the future value of the projects today before investing	9	45	28	12	6
Projects are only accepted on the basis of higher Net Present Values	5	30	32	22	11
NPV technique allows the County government of Bungoma to reinvest its cash at the given interest rate	8	46	26	8	12
Ranking projects using NPV of various projects provides the County a fundamental basis to determine projects to be selected	9	24	38	19	10

From table above, the respondents were asked whether the County government project management teams usually analyze the future value of the projects today before investing. The distribution of findings showed that 9% of the respondents strongly agreed, 45% of the respondents agreed, 28%were neutral, 12% disagreed while 6% of the respondents strongly disagreed. These findings implied that NPV is a critical ingredient in sustainability of road projects in County governments.

The respondents were also asked whether projects are only accepted on the basis of higher Net Present Values. The distribution of the responses indicated that 5% strongly agreed to the statement, 30% agreed, 32% were neutral, 22% disagreed while 11% of the respondents strongly disagreed to the statement. These findings implied that indeed projects with the highest NPV were selected and that selecting projects with high net present values enhanced sustainability of the road projects in Bungoma County.

The respondents were also asked whether NPV technique allows the County government of Bungoma to reinvest its cash at the given interest rate. The distribution of the responses indicated that 8% strongly agreed to the statement, 46% of the respondents agreed, 26% were neutral, 8% disagreed while 12% strongly disagreed that NPV technique did not allow the County government of Bungoma to reinvest its cash at the given interest rate. With majority of the respondents returning positive feedbacks, these findings implied that the NPV method allows the county government of Bungoma to be able to reinvest is cash at prevailing interest rates.

The respondents were asked whether ranking projects using NPV of various projects provided the County with a fundamental basis to determine projects to be selected. The distribution of the responses indicated that 9% strongly agreed to the statement, 24% of the respondents agreed, 38% were neutral while 19% and 10% disagreed strongly and disagreed to the statement respectively. These findings implied that ranking projects using NPV technique enhanced sustainability of County road projects in Bungoma County.

Coefficient of Determination (R^2)

Table 4.8below showed that the coefficient of correlation (R) was .825. This meant that there was a positive correlation between project appraisal techniques and sustainability of County government road projects. The coefficient of determination (R-Squared) indicated that .681 (68.1%) of sustainability of County road projects were influenced by these study project appraisal techniques. The adjusted R^2 however, indicated that .589 (58.9%) of sustainability of County road projects was influenced by appraisal techniques leaving .411 (41.1%) to be influenced by other different factors not captured in this study.

Table 4.8: Model Summary

Model	R	R-Squared	Adjusted R-Squared	Std. Error of the Estimate
1	.825[a]	.681	.589	3.0321

a. Predictors: (Constant), Net Present Value, Payback period, Internal Rate of Return and Profitability Index

Analysis of Variance

The Analysis of Variances was measured and results presented in Table 4.9below;

Table 4.9: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	301.701	1	301.701	11.358	.000[b]
1	Residual	2231.234	84	26.562		
	Total	2532.935	85			

Table 4.9 above showed the Analysis of Variance (ANOVA). The p-value.000 which was< .05 indicated that the model was statistically significant in predicting how project appraisal techniques influenced sustainability of County Road projects. The F – test was 11.358. These results also indicated that the independent variables were predictors of the dependent variable since the $F_{critical}$ value was less than the $F_{calculated}$ value of 11.358.

ISSN 2349-7807

International Journal of Recent Research in Commerce Economics and Management (IJRRCEM)
Vol. 7, Issue 3, pp: (1-24), Month: July - September 2020, Available at: www.paperpublications.org

5. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

The purpose of the study was to analyze the influence of project appraisal techniques on sustainability of county government road projects in Bungoma County. The study was guided by the following specific objectives as follows; to establish the effect of Net present Value on sustainability of county government road projects in Bungoma County, to establish the effect of Payback period on sustainability of County government road projects in Bungoma County, to determine the effect of Internal Rate of Return sustainability of county government road projects in Bungoma County and to determine the effect of Profitability Index sustainability of county government road projects in Bungoma County. This chapter presents the summary of the findings, conclusions made from the same, its recommendations and recommendations for further studies.

Summary of the findings

Influence of Net Present Value on Sustainability of County Road Projects

The findings revealed that that NPV is a critical technique in appraising projects in the County including roads to ensure that such development projects are sustainable. The findings also revealed that ranking of projects using the Net present value of various projects provides the County a fundamental basis to determine projects to be selected rather than venturing blindly in to projects that are not viable.Net present value technique allows the County government of Bungoma to reinvest its cash at the given interest rate to plough more returns and be sustainable. On the statement of whether the project would only be accepted if its Net Present Value is greater than zero or positive, the distribution of the responses indicated that higher net present values greater than zero are attractive for sustainability of County road projects.

Conclusion

Based on the findings from the analyzed data, the study arrived at the following conclusions;

The correlation results indicated the existence of significant, positive and reasonable relationship among the predictor variables (Net Present Value, Payback Period, Internal Rate of Return and Profitability Index) and also with the predicted variable (Sustainability of County Road Projects in Bungoma County).The correlation results reflected strong relationship between the specific variables and the dependent variable as follows: Net Present Value (r=.780, p<.05) being a strong and positive correlation;Payback Period(r=.583, p<.05) being average but positive correlation; Internal Rate of Return(r=.793, p<.05) being a strong and positive correlation; and Profitability Index (r=.735, p<.05) being also a strong and positive correlation to the Sustainability of county road projects in Bungoma County.Together with the study regression results, the correlation results were utilized in measuring the strength of the relationship among the variables and arriving at the recommendations herein. The regression results indicated that; a unit increase in Net Present Value resulted in a .697 increase in sustainability of road projects in Bungoma County;Payback period would result in a .282 increase; Internal Rate of Return, .733; and a unit increase in Profitability Index would result in an increase of .353 increase in the sustainability of road projects in Bungoma County.The sustainability of road projects in Bungoma County will however be at 55.703, *ceteris paribus* at Zero.

On the other hand, the coefficient of determination (R-Squared) indicated that 68.1% of sustainability of County road projects were influenced by the project appraisal techniques forming the study variables. With the adjusted R^2 indicatinga58.9% of sustainability of County road projects being influenced by appraisal techniques, this indicated that41.1% of the influenced changes in the dependent variable (sustainability of road projects in Bungoma County) were by other different factors not captured in this study.

Recommendations

The study came up with the following recommendations from the study findings:

Influence of Net Present Value on Sustainability of County Road Projects

From the findings, the county government of Bungoma should ensure that road projects are constantly appraised, using NPV as a critical technique in appraising projects in the County to ensure their sustainability. That the road projects ranking using the Net present value technique is critical and should therefore be utilized as a fundamental basis to

determine projects to be selected rather than venturing blindly in to projects that are not viable. And finally, the project acceptability should be investigated using the Net Present Value method that can only be compared to the IRR method where the decisions are conflicting to ensure sustainability of County road projects.

Areas for further investigation

This study only focused on one county out of the forty seven counties in the republic. Similar studies should be carried out in a number of other counties in the country for comparison purposes. Furthermore, this study concentrated on the road projects only, it is therefore suggested that other sectors of the county economy should also be targeted for this kind of study. Since the coefficient of determination indicated that a number of other factors not covered by the study influenced the sustainability of county road projects to the tune of 41.1%, it is hereby suggested that future scholars carry out studies using these other variables within or without the study scope for comparison purposes too. Finally, similar studies should be carried out on the sustainability of projects in non-governmental organizations.

ACKNOWLEDGEMENT

REFERENCES

[1] Ali Askar, S. M., Jagadeesh, P., &AbdHalim, S. (2009). Implementation of Photovoltaicsin Malaysia. *Proceedings 3rd International Conference on Energy and Environment.*Malacca: ICEE.

[2] Altshuler, D., &Magni, C., A. (2012). Why IRR is not the Rate of Return for your Investment: Introducing AIRR to the Real Estate Community. *The Journal of Real Estate Portfolio Management,* 18(2), 219–230.

[3] American Management Association. (2016). *Aligning Projects with Strategy.* Retrieved May 22, 2020, from http://www.amanet.org/training/articles/Aligning-Projects-with-Strategy.aspx

[4] Amgad, B. (2015). The Impact of Project Management (PM) and Benefits Management (BM) Practices on Project Success: Towards Developing a Project Benefits Governance Framework. *International Journal of Project Management.*11-15

[5] Ang, E. (2010,). *The Star Online*. Retrieved May 1, 2020, from http://biz.thestar.com.my/news/story.asp?file=/2010/8/28/business/6921425&sec=business

[6] Aubry, M., Richer, M.-C., Lavoie-Tremblay, M., Aubry, M., Richer, M. C., & Lavoie-Tremblay, M. (2014). Governance Performance in Complex Environment: The Case of a MajorTransformation in a University Hospital. *International Journal of Project Management*, *8*(32), 1333–1345.

[7] Babbie, E., R. (2015). *The Practice of Social Research*. Nelson Education

[8] Baker, H., K.& Powell, G. (2009).*Understanding Financial Management: A Practical Guide*.John Wiley & Sons.

[9] Ben-Horin, M., &Kroll, Y., (2012).The Limited Relevance of the Multiple IRRs. The Engineering Economist, 57, 101–118.

[10] Beringer, C., J, D., &Kock, A., (2013). Behavior of Internal Stakeholders in Project Portfolio Management and its Impact on Success.*International Journal of Project Management,*31(6), 830–846,

[11] Bernal-Agustin l., &Dufo-Lopez, R. (2006).Economic and Environmental Analysis of Grid Connected Hhotovoltaic Systems in Spain.*Renewable Energy, 31*, 1107-1128.

[12] Besner, C., &Hobbs, B., (2013). Contextualized Project Management Practice: ACluster Analysis of Practices and Best Practices. *Project Management Journal*, 44(1), 17–34.

[13] Brealey, R. A., Myers, S. C., & Allen, F. (2011).*Principles of Corporate Finance*.McGraw-Hill/Irwin

[14] Bryman, A. (Ed.) (2013). *Doing Research in Organizations*.Routledge.

[15] Burge, T. Van Der. (2012). *Project Appraisal and Macroeconomic Policy*. Springer Science & Business Media.

[16] Carayannis, E. G., Kwak, Y.-H., &Anbari, F., T. (2005). *The Story of Managing Projects: An Interdisciplinary Approach*. Greenwood Publishing Group.

[17] Dayanada, D. (2002). *Capital Budgeting: Financial Appraisal of Investment Projects*. Cambridge University Press.

[18] Dayananda, D. (2009). *Capital Budgeting: Financial Appraisal of Investment Projects*. Cambridge University Press.

[19] Gitman, L., J., &Zutter, C., J. (2012). *Principles of Managerial Finance.*13th Ed.PrenticeHall, USA.

[20] Goh, J. &Hall, N., G. (2012).*Total Cost Control in Project Management via Satisfying. Working Paper, Revised for Publication, Fisher College of Business.* The Ohio State University, Columbus, Ohio.

[21] Harris, E. (2012). *Advances in Project Management: Strategic Project Risk Appraisal and Management*. Farnham, GB: Gower. Retrieved from   http://site.ebrary.com/lib/alltitles/docDetail.action?docID=10331430

[22] Harris, P.&Mongiello, M. (2012).*Accounting and Financial Management*.Routledge.

[23] Hazen, G., B. (2009). An Extension of the Internal Rate of Return to Stochastic Cash Flows. *Management Science*, 55(6) (June), 1030–1034.

[24] Kerzner, H.(2009).*Project Management.A Systems Approach to Planning, Scheduling, and Controlling*, 10th Ed. Wiley, Hoboken, NJ

[25] Khatua, S. (2011).*Project Management and Appraisal*.Oxford University Press.

[26] Lindblom, T., &Sjögren, S., (2009).Increasing Goal Congruence in Project Evaluation by Introducing a Strict Market Depreciation Schedule.*International Journal of   Production Economics*, 121, 519–532.

[27] Macharia, D. (2017). *Influence of Project Appraisal Approaches on an Organization's Performance*.A Case of Aga Khan University Hospital, Nairobi, A Private Teaching and Referral Hospital in Kenya

[28] Magni, C., A. (2013). The Internal-Rate-of-Return Approach and the AIRR Paradigm: A Refutation and a Corroboration. *The Engineering Economist*, 58(2), 73−111.

[29] Magni C., A. (2010). Average Internal Rate of Return and Investment Decisions: A New Perspective. *The Engineering Economist*, 55(2), 150–181.

[30] Magni, C., A. (2009). Splitting up Value: A Critical Review of Residual Income Theories.*European Journal of Operational Research*, 198(1), 1–22.

[31] McConnel, E. (2011). Project Appraisal – Definition and Steps.Retrieved March 22, 2020, from http://www. mymanagementguide.com/project-appraisal-definition-and-steps/ McKinsey & Co., January 2010. Results based on a survey of 1,440 senior executives.

[32] Morfaw, J. (2014). Fundamentals of Project Sustainability.*Paper Presented at PMI Global   Congress* 2014- North America, Phoenix, AZ. Newton Square, PA: Project Management Institute.

[33] Morris, P., W., G., Pinto, J., K.&Söderlund, J. (2012).*The Oxford Handbook of Project Management*.OUP Oxford.

[34] Nelson,V. (2010). Climate Change and Agricultural Adaptation: Identifying the Challenges and Opportunities for Fair Trade. Fair Trade Foundation, London Participatory Ecological,*Lna Use Management Association IJenya.*

[35] Osborne, M. (2010).A Resolution to the NPV-IRR Debate? The Quarterly Review of Economics and Finance, 50(2) (May), 234−239.

[36] PM Solutions(2010). Results Based on a Survey of 291 Management Employees. State of the PMO.

[37] PMI, (2013).*A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*.Newtown Square: Project Management Institute, Inc.

[38] Souza, R., Jose, C. & Roberto, F. (2016).Modified Profitability Index and Internal Rate of Return. *Journal of International Business and Economics,*4(2), 13-18.

[39] Pierru, A. (2010). The Simple Meaning of Complex Rates of Return.*TheEngineeringEconomist*, 55(2), 105–117.

[40] Percoco, M.& Borgonovo, E. (2012).A Note on the Sensitivity Analysis of the Internal Rate of Return.*International Journal of Production Economics*, 135, 526–52.

[41] Ribeiro, J., M. (2011). *International Development Project Appraisal, Execution Planning and Monitoring*. Presses inter Polytechnique.

[42] Rothaermel, F. (2009). Strategic Management: Concepts and Cases. 12th ed. FT Prentice Hall, 36-37.

[43] Thomas, J., &Mullaly, M. (2009).*Researching the Value of Project Management*.Newtown Square: Project Management Institute.

[44] World Bank (2016).Projects the World Bank Group. Retrieved from http://www.worldbank.org/projects.