

Critical Factors Influencing the Implementation of Public Infrastructure Projects in Kenya: A case of Thika Sub-County, Kiambu County Kenya

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Abstract- Infrastructure projects play a big role in societies in terms of meeting the development needs of the economy and more so in transforming the quality of life of citizens. The government is the single largest implementer of public infrastructure projects thus there is need to ensure that these projects are fully implemented and the factors that have the greatest influence identified to ensure their influence is taken into consideration during the project life cycle. It was therefore the purpose of this study to investigate the critical factors influencing the implementation of public infrastructure projects in Kenya, a case of thika-sub county in Kiambu Kenya. The objectives of the study were to assess whether government policies, funding process, and participatory planning process have an influence on the implementation of public infrastructure projects in Kenya, a case of thika sub-county in Kiambu, Kenya. Based on the theories from critical factors influencing public infrastructure implementation, the study developed a conceptual framework. Targeting a population of 650 project consultants and the project direct beneficiaries a sample of size of 242 was drawn using the Krejcie and Morgan table (1970). The study used descriptive survey research design to obtain the data and both qualitative and quantitative research approaches. Data was collected using self-administered questionnaire and analysed using the descriptive and inferential statistics and the results presented using tables. The findings of the study revealed that there is a significant statistical relationship between the critical factors: government policies, funding process and participatory planning process ; and the implementation of public infrastructure projects. The study has also provided the conclusions based on the findings and recommendations on the implementation of public infrastructure projects.

Index Terms- Project Management, infrastructural projects, public infrastructure projects, projects implementation.

I. INTRODUCTION

In order to release economic prosperity and well-being in a developing country like Kenya, it is paramount that the focus should be on infrastructure projects. In less developed countries therefore, public infrastructure development projects have the potentiality to facilitate sustainable development through the application of modern management methods and techniques as a result of ease of interaction with various experts in different

fields. This pivotal role played by public infrastructure projects in sustainable development is recognized in chapter 27 of Agenda 21 of UN (UN charter 1945). Dailami and Klein (1997) while working on a policy paper on government support to private infrastructure projects in emerging markets notes that the role played by public infrastructure projects which includes fighting poverty, opening markets and disposing illiteracy in equal measure cannot be ignored. They further assert that efforts should be put to ensure that every public infrastructure project initiated is fully implemented. Perrot and Chatelus (2000) notes that in financing of major infrastructure and public service projects the government is usually the biggest sponsor. Most public infrastructure in Kenya therefore according to Kenya public infrastructure report of 2015, are funded by the government whilst minority are funded by non-government entities such as the industrialized countries including USA, Canada, and Sweden through their development funding agencies which are United States Agency for International Development (USAID), Canadian International Development Agency (CIDA), and Sweden International Development Agency (SIDA) respectively. Many scholars (Sappington & Stiglitz, 1987; Perrot & Chatelus, 2000; Dailami & Klein, 1997; Reeves, 2004) are of the opinion that public infrastructure projects in emerging economies like Kenya in most common cases are not fully implemented as per their original proposals and targets.

1.1 Statement of the Problem

Njoki (2013) while studying construction projects in Kenya notes that public infrastructure projects have taken a slow pace since independence. The records from the Kenya government 2014 on vision 2030 towards a globally competitive and prosperous Kenya (GOK, 2007) indicates that slow pace in implementation of public infrastructure projects has led to poor road networks; under standardized public amenities which includes schools, hospitals and clinics; non connectivity of the national grid line to industrial potential areas; poor mitigation measures in agricultural areas which is the food basket of the country; and poor mechanization of the once competitive industries that are going under. Waiganjo, Mukulu and Kahiri (2012) observed that the Kenyan government in recent years introduced crucial projects geared towards public infrastructure development through the constituency development fund (CDF), the *KaziKwaVijana* (KKV) initiative, and the national youth service development programme (NYSDP). Even though these

initiatives bore fruits in some quarters, it is the view of Waiganjo, Mukulu and Kahiri that the implementations of these projects were not fully achieved.

Lango (2015) while studying the critical success factors of fire safety projects in Kiambu county notes that Thika sub-county which is in Kiambu had one of the lowest implementation rating on public infrastructure development projects. A report by the county assembly notes that infrastructural development projects like roads within the jurisdiction of the county government takes as long as twice the amount of time it ought to take to completion (Lango, 2015; Njoki, 2013).

County governments play an important role in free service delivery offered through public infrastructure development and their full implementation is a catalyst for economic growth. This study therefore was undertaken to fulfill the knowledge gap on comprehending the bigger picture in implementation of public infrastructure projects by looking at the critical factors of consideration. This study therefore was to verify why factors applied in public infrastructure projects does not lead to its full implementation and in essence investigate the critical factors influencing implementation of public infrastructure projects in thika sub-county in Kiambu, Kenya.

1.2 General Objective

To investigate the critical factors influencing the implementation of public infrastructure projects in Thika Sub-County, Kiambu Kenya.

1.3 Specific Objectives

1. To determine the influence of government policies on implementation of public infrastructure projects in Thika Sub-County, Kiambu Kenya.
2. To determine the influence of funding process on implementation of public infrastructure projects in Thika Sub-County, Kiambu Kenya.
3. To determine the influence of participatory planning process on implementation of public infrastructure projects in Thika Sub-County, Kiambu Kenya

1.4 Hypotheses

The research sought to ascertain the validity or otherwise of the following hypotheses:

H₀₁: Government policies do not influence implementation of public infrastructure projects in Thika Sub-County, Kiambu Kenya.

H₀₂: Funding process do not influence implementation of public infrastructure projects in Thika Sub-County, Kiambu Kenya.

H₀₃: Participatory planning processes do not influence implementation of public infrastructure projects in Thika Sub-County, Kiambu Kenya.

1.5 Justifications

This research has documented the critical factors influencing the implementation of infrastructure projects in Thika Sub-county, Kiambu Kenya which in essence could be made available to the county governments in Kenya as a basis for establishing a strong background in ensuring that the

infrastructure projects are implemented fully. The study further provides a structured approach to public infrastructure projects implementation by providing the critical factors to focus on and eliminating the adhoc, haphazard, and obsolete adhoc focus on methods rather than coherent and actionable plans.

1.6 Scope

The study was restricted to Thika Sub-county in Kiambu county Kenya. This study was conducted at the Thika Sub-county because the researcher had easy access to data collection and on-site analysis and the fact that Thika sub-county has been part of selected areas that have implemented major government public infrastructure projects in all sectors of its economy.

1.7 Limitations

The researcher noted that public infrastructure projects are multi-sectorial and multi-disciplinary in nature and involves different county departments including roads and transport; health; sports and culture; labour and social welfare; tourism and recreation; and finance. Therefore the greatest limitation to this study was the cross sectional majority of data to be investigated. To avoid this however, the researcher made sure that the data collected focused on the critical factors influencing public infrastructure projects implementations.

II. LITERATURE REVIEW

This section reviews the literature relevant to the study objective areas and presents a conceptual framework for which the study is based.

2.1 Government Policies

The growing focus on governments to implement public infrastructure projects as a major platform to gain public trust and support has increased policy interests in the same area. Kerr and Newell (2001) while looking at projects dealing with policy induced technology adoption, notes that government departments and projects implementing agencies depend on these policies to ensure that public infrastructure project meets certain pre-conditions and post-conditions. While the policies does not make it mandatory for the project initiators to incorporate the project recipients, Kerr and Newell argues that the policies should cut across the project's sectorial engagement in order to meet the pre-and-post- requirements. Governments develop policies that are geared towards mass implementation of large infrastructure projects with the main aim of pursuing social goals and to correct society failures and promote economic efficiency (Kaiser & Ahlemann, 2010). Further in implementation of projects, policies are developed to achieve the goals of redistribution of resources from one group of people to another group to achieve same level development. This according to Kaiser and Ahlemann (2010) should be done at minimum cost. Otieno et al (2010) opined that an ideal policy on project implementation should focus on the project's effectiveness, where the projects implementation prospects should meet the institutional, regulatory and socio-economic goals of the recipients in a manner that is appropriate to the proponents of the project. Furthermore a good policy should advocate for effectiveness which entails the project to be as cost effective as possible, fair dealing, where the stakeholders

should be treated equally without discrimination or prejudice including protection of confidentialities of the project where necessary (Otieno et al., 2010). Njoki (2013) asserts that policies should aid project implementation by upholding the integrity of the project to ensure informed decision making which requires public infrastructure projects to base their implementation on accurate information and ensure basic requirements are met. World Bank (2002) on the other hand requires transparency to enhance public infrastructure projects openness and clarity. The main objectives of government policies therefore is to link public infrastructure projects planning, budgeting, and achieving financial requirements during the implementation process. Macharia and Ngugi (2014) while studying the determinants of successful completion of power projects in Kenya power and lighting company notes that government policies on mega projects plays a greater role as it influences the size, structure, conduct and performance of the government entity during implementation process.

2.2 Funding Process

Njoki (2013) notes that the funding and funding process is vital in the implementation of the public infrastructure projects in Kenya and a process that is clearly not outlined within the structure of the funding agency may well interfere with the implementation of projects that are scheduled to be executed. Macharia and Ngugi (2014) also asserts that the funding process in any public infrastructure project is usually hampered by the contractors who do not have adequate funds for the project. This, according to Macharia and Ngugi, is the major hindrance to a structured detailed process in funding of public infrastructure projects. The major funding process according to Otieno et al. (2010) encompasses the funding for the construction materials, labourers, salaries and remuneration, and equipment to be used during the work processes. Otieno et al. therefore contends that key in public infrastructure project is its funding processes and without which can lead to the project facing financial difficulties. This is also supported by Kaiser and Ahlemann (2010) who argue that without a clear funding process in any public infrastructure implementation may lead to the project contractor applying poor materials and also leads to inefficient communication, unreliable suppliers, and late project deliveries. Wanjiku (2012) while studying the factors influencing performance of contractors of government funded building projects notes that the implementation of public infrastructure projects is heavily influenced by funding process and if not structured systematically then this leads to financial issues, poor human resources, wrong designation of site characteristics and poor design qualities.

Public infrastructure project funding, according to Esty and Christoy (2002), is one where the funds must include its reliance on the project's ability to cover costs related to its interest and debt repayment, the risk sharing principles, the non or limited recourse financing, off-balance sheet financing, and the involvement of various forms of other sources of capital during the implementation process. This fact is supported further by Daube, Vollrath and Alfen (2008) in their comparison study of project financing and the forfeiting model as financing forms for Public-Private-Partnership (PPP) projects in German where they opined that the key ingredient that ensure a project's

implementation is the assets, contracts, and cash flows obtained from the funding entities to sustain the project to completion. Further, they note that any project funding structure should ascertain the that there will be adaptability to the various needs of the public infrastructure project demands during the implementation process. From the authors and others including Hainz and Kleimeier (2006), project funding in public infrastructure projects plays an important role in the implementation process.

2.3 Participative Planning Process

Reeves (2004) defines participative planning process in public infrastructure projects as all the activities by which members of the public including citizens, users and consumers contribute to shaping the decisions taken by public organizations. Further the purpose and methods of fostering the participative process must be in scale or spectrum with the level of consultations at one end and more deliberative techniques on another end. This according to Reeves is to ensure that participative planning process promotes deliberate public infrastructure projects but necessarily a prescription on the method to use. Njoki (2013) notes that participative planning process occurs in infrastructure projects at the government level and the local county governments where the projects are implemented. Njoki further notes that these participatory activities should be mapped to eliminate the bureaucratic participative processes that are traditional including written consultations to include more modern approach that includes the focus groups and opinion polls. Dailami and Klein (1997) opined that the public appetite for participation and involvement in public infrastructure projects is mixed although there is not much literature on the involvement of the public on participatory planning processes during public infrastructure projects. The demand for participation, according to Dailami and Klein, depends on several factors which includes: whether the project is national or county government originated; what the law prescribes as enough public participation; and whether proof of public participation will eventually make much difference. Perrot and Chatelus (2000) believe that the reforms of public structures and governing systems is the key to public infrastructure projects development implementation however there is still a debate amongst the stakeholders' of how vast the participatory public processes in public infrastructure projects should be attained in policy making and the major role of the elected representatives. Sappington and Stiglitz (1987) on the hand argue that the major enablers of public participations includes capacity and resources of the projects, the social capital and the attitudes of political players in the project area of implementation, and the managerial and civil society leaders engaged in the project processes. It however believed that the level of participation in a public infrastructure project relies so heavily on those on power and the process is never considered so important (Dailami and Klein, 1997).

2.4 Theoretical Review

The theoretical framework considered various theories for this particular study which are discussed below.

2.4.1 Institutional Theory

Zucker (1987) view institutional theory as one providing a rich but complex view of an organization and observed that in most cases these organizations are influenced by normative pressures either arising internally or externally such as the state policies or policies from the county and sub-county governments. Further these policies which are essentially pressures, lead a county government to be guided by legitimated elements which may include standard operating procedures, procurement rules, disposal and compensation procedures and state requirements which may often have an effect on directing attention away from public projects implementations. Macharia and Ngugi (2014) however note that the institutional theory is inherently difficult to explicate as it taps public projects taken-for-granted assumptions at the core of the social habour. The main aim of this study therefore is to make the institutional theory more accessible and understood in terms of government policies. Robey and Holmstrom (2001) while studying transforming municipal governance in global context taking a case study of the dialectics of social change, notes that institutional theory tenders to focus on the more resilient aspects of social structure and considers processes by which structures, schemas, rules, norms, and routines become more established as the authoritative guidelines for public infrastructure implementation.

2.4.2 Systems Theory

System theory tends to explain why many public infrastructure projects tends to fail and according to Bertalanffy (1972) the failure is mostly attributed to the various processes in place that the system must adhere to in order to be completed. One of these processes includes the funding process of the project and Bertalanffy hypothesises that everything is part of a larger independent arrangement and most importantly centered on clarifying the whole of the project, its parts, and the relations between them. Public infrastructure project at the sub-county government incorporates many funding agencies which take into consideration the local, county, national, public, private and non-profit units within the project's implementation area of jurisdiction. Bertalanffy suggests that the systems theory acknowledges that successfully implemented projects requires a streamlined funding process, outlines the stages of funding and states while describing the project activities for implementation to be funded. The funding system therefore should be one that is open for project variances during the implementation process

either in the upward or downward during the project period (Otieno et al., 2010). Further the interactions between the various funding agencies of the project affect the implementation of project. Nudurupati, Garengo and Tuner (2007) while studying the dynamics of performance measurement and organizational culture while applying systems theory found out that it is the best model in studying the critical factors influencing public infrastructure implementations due to its specialization in organization systems, the availability of researched material data, its uses on measurements of psychometric in nature and the fact that it is the dominant model for investigating service delivery in the public arena.

2.4.3 Participatory Development Theory

Chambers (1997) opined that participatory development theory seeks to ensure the inclusion of local beneficiaries of a public infrastructure project into the activities of the project implementations. Further that the project's participatory planning must take into consideration the local population which in this case the sub-county residents to the enable the public infrastructure development implementation success. Mohan (2008) on the other hand observes that participatory development theory promotes the improvement of efficiency and effectiveness of formal public infrastructure development programmes and the external and the local actors of the project must be involved. This theory according to Chambers (1997) therefore devices a means of planning in development at the sub-county level which must involve the local sub-county communities and uses various planning tools which includes the Participatory Rural Appraisal (PRA) as one of the formal planning tools. Chambers add that by planning for projects and especially in devolved systems of governance causes a shift in power relations by valorizing voices that usually go unheard by political development groups as it seeks to include the illiterate, poor, marginalized people and all groups to represent own lives and livelihoods affected by the projects. Participatory Development theory therefore, according to Mohan (2008) increases the sub-county population, who are also the local recipients of the projects, ability to be self-determining in the implementation of the public infrastructure projects.

2.5 Conceptual Framework

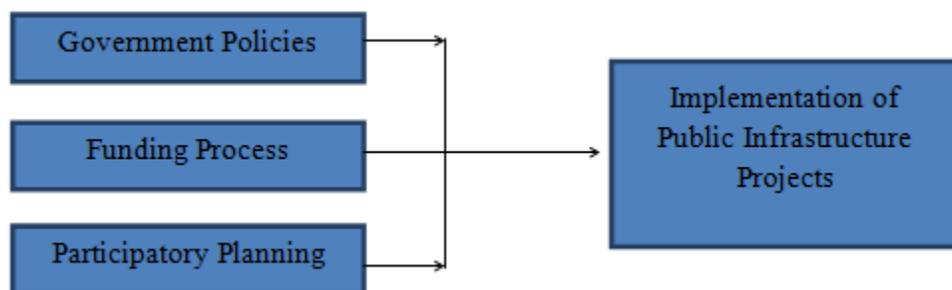


Figure 1: Conceptual Model on Critical Factors Influence on Implementation of Public Infrastructure Project

The conceptual framework, adapted from Macharia and Ngugi (2014), illustrates the influence of the critical factors which includes government policies, funding process and

participatory planning process on the implementation of public infrastructure projects.

2.6 Summary and Research Gaps

Wanjiku (2012) notes that in 2003 the Government of Kenya initiated a change implementation process aimed at reforming the public sector that specifically focused on the use of public resources and the implementation of public infrastructure development projects. This process according to Wanjiku gave birth to oversight institutions such as the Anti-Corruption authority, the financial management departments, the public procurement and oversight authority among other that were charged with the responsibilities of ensuring that public infrastructure projects are implemented as per the required standards. In particular, Otieno et al. (2010) opined that the public procurement oversight authority ensured that the procurement process of public infrastructure projects were transparent, with accountability and reduced wastage of public resources. However Lango (2015) while quoting an independent procurement review by the Government of Kenya (GoK) and the European Union (EU) noted that there were still weak oversight institutions, lack of transparency in projects acquisitions, poor linkages between procurements and expenditures, delays and inefficiencies and poor records management of public infrastructure projects. Macharia and Ngugi (2014) indicate that one of the major challenges in public infrastructure implementation is the corruption levels being experienced in different levels of governments. Macharia and Ngugi indicates that in 2004 Kenya was selected to receive the Threshold Programme (TP) by the Millenium Challenge Corporation (MCC) but noted that Kenya failed four of the six MCC indicators including the control of corruption that hampers the implementation of public infrastructure projects. Wanjiku (2012) notes that Kenya has continued to fail in its infrastructure projects implementation and to improve indicates that a focus must be on the critical factors that influence the implementation process.

As noted by various authors (Wanjiku, 2012; Macharia and Ngugi, 2014; Lango, 2015; Njoki, 2013) urban areas in Kenya including thika sub-county in Kiambu are growing rapidly as rural dwellers migrate in search of opportunities presented by the heavy infrastructure development in these towns. The devolved government and the central government are having difficulties in responding to the infrastructural needs of these urban areas with the recent development policies giving local politicians with no prior background in development the financial and decision-making power to plan and implement major public infrastructural development projects (Lango, 2015). This in essence according to Wanjiku (2012) the politicians and their proxies inflate the project funding costs and further in collusion with the contractors use shoddy materials and inefficient project materials during implementation resulting to low-quality completed public infrastructures. Njoki (2013) while studying construction projects in Nairobi Kenya opined that construction infrastructure projects fail due to poor considerations on the project costs, its documentation and the stakeholders involved. The study however did not focus on other infrastructure development projects and the factors of considerations only looked at the project in its entity without considering the external contributing factors that includes government policies, project funding, and participatory procedures. Other studies also follow a similar script albeit with a different logical conclusion and it is therefore the objective of

this study to assess the influence of critical factors on the implementation of public infrastructure projects.

III. METHODOLOGY

3.1 Research Design

The research employed a descriptive survey research design to obtain data that helped to determine the critical factors influencing public infrastructure projects implementation and specifically to determine the characteristics of a large group. According to Creswell (2005) this design involves collecting original data in form of questionnaire for describe a population which was too large to observe directly. The research used quantitative approach because the research collected information from a large population of public infrastructure project consultants and consulting beneficiaries in order to answer the research questions.

3.2 Target Population

Creswell (2005) describes the target population as all the members of a real or hypothetical set of people, objects or events to which a researcher intends to generalize their results of the study. The study target 650 projects consultants and project direct beneficiaries within thika sub-county. Table 3.1 summarizes the target population:

Table 3.1: Target Population

Category	Target Population	Percentage
Project Consultants	150	23.1
Project Direct Beneficiaries	500	76.9
Total	650	100.00

3.3 Sample size and Sampling Procedure

Krejcie and Morgan Table (1970) was used to determine the sample sizes as it uses a formula which has been proven over time. Based on the target population the sample size was 242 with 52 and 245 for project consultants and project direct beneficiaries respectively. Table 3.2 below gives a summary of the sample size.

Table 3.2: Sample Size

Category	Target Population	Sample Size
Project Consultants	150	56
Project Direct Beneficiaries	500	186
Total	650	242

3.4 Research Instruments

Data was collected using two instruments which were the Project Consultants Questionnaire (PCQ) and the Project Direct Beneficiaries Interview Schedule (PDBIS). While the PCQ was a structured questionnaire the PDBIS was an interview schedule designed to guide in the interviewing of the public infrastructure projects direct beneficiaries and especially in the vicinity of the project undertaken.

3.5 Piloting

The research instruments were piloted with one infrastructure project and its direct beneficiaries in Ruiru-sub County within Kiambu County which experienced the same conditions but were not involved in the study. The reliability of the PCQ was checked and that of the PDBIS. This pilot study also offered an opportunity for the researcher to familiarize with the data collection process.

3.5 Reliability and Validity

Creswell (2005) describes validity of research as the degree to which evidence supports any inferences a researcher makes based on the research data collected using a specific instrument. In order to ascertain validity of the instruments expert opinion was sought from the college of human resource and management and the department of statistics of Jomo Kenyatta University of Agriculture and Technology (JKUAT).

Reliability according to Mugenda and Mungenda (2003) is the measure of a research instrument to yield consistent results after repeated trials. A test-retest method was used to assess the reliability of the data. The PCQ and the PDBIS was administered twice and the second administering was done after a one week lapse of time to check whether it gave the same results. In order to determine the extent the questionnaires were able to obtain a consistent result each time it was administered, a correlation coefficient was computed. A reliability coefficient of at least 0.7 was accepted as recommended by Creswell (2005).

3.7 Data Collection Procedures

The PCQ and PDBIS were left with the project consultants and project direct beneficiaries respectively for response and were later collected after one week. In case of questionnaire which the respondent could not be traced at the time of the audit, a new questionnaire was given and a date set for collection that did not exceed three days later. A selection of the project consultants and the beneficiaries were interviewed to ascertain issues and clarification of data obtained. This was thematic on government policies, funding process, participatory planning and their influence on public infrastructure projects implementation.

3.8 Data Analysis Techniques

The questionnaires from the various respondents were screened, cleaned, coded and entered in an SPSS Version 21.0 computer software for analysis and this was then edited for completeness and consistency with the variables of analysis. The collected quantitative data was analyzed using descriptive statistics which included the frequency distributions tables, mean and percentages.

3.8.1 Empirical Model

The research was guided by a linear regression model that relates to factors influencing public infrastructure projects implementation. The model was then indicated as:

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

Where:

Y - is public infrastructure projects implementation

X₁- isGovernment Policies

X₂ - is Funding Process

X₃- isParticipatory Planning Process

3.8.2 Test of Significance

The research used inferential statistics to test the significance of the overall model at 95% level of significance and the coefficient of correlation (r) used to determine the magnitude of the relationship between the dependent and independent variables. Coefficient of determination (r²) will also be used to show the percentage for which each independent variable and all independent variables combined will beexplaining the change in the dependent variables.

IV. DATA ANALYSIS, PRESENTATION AND INTERPRETATION OF FINDINGS

4.0 Introduction

This chapter presents the data analysis, presentation and interpretation of the findings on the critical factors influencing the public infrastructure implementation. The collected data was collated and descriptive table reports generated.

4.1 Questionnaire Return Rate

The researcher administered 242 questionnaires and collected 228 which constituted 94.2% response rate for the data collection. The table 4.1 below shows the various response distributions for the project consultants and project direct beneficiaries.

Table 4.1: Response Rate

Respondent	Frequency	Percentage
Project Consultant	55	22.7
Project Direct Beneficiaries	173	71.5
Total	228	94.2

The 94.2% was rated by the researcher as a high response from a simple random sample of 242 and according to the American Association for Public Opinion Research (AAPOR, 2008) is generally accepted as opposed to a low response rate from the same sample.

4.2 Characteristics of the Respondents

The research also looked at the common characteristics of the respondents and specifically presents the analysis and findings on the respondents gender, age, highest academic level, and marital status.

4.2.1 Gender

The study also made an analysis of the respondents' gender and table 4.2 outlines the gender of the respondents.

Table 4.2: Respondent Gender

Gender	Frequency	Percentage
Male	147	64.5
Female	81	35.5
Total	228	100.0

Table 4.2 shows that the male respondents were the majority at 64.5% while female minority at 35.5%. This result clearly shows that the male are favored in the society and more so in public infrastructure implementation.

4.2.2 Age

Table 4.3 shows the respondents age distribution as the various categories of selection.

Table 4.3: Respondent Age Distribution

Age Category	Frequency	Percentage
18 - 25	47	20.6
26 – 35	58	25.5
36 – 45	104	45.6
56 and Above	19	8.3
Total	228	100.0

From table 4.3 it was evident that majority of those involved in public infrastructure project either as consultants or as direct beneficiaries or both were between the ages of 36 – 45 representing 45.6% while those not actively involved either directly or indirectly were those between the ages of 56% and above representing 8.3%. This is probably because most of the public infrastructure projects require intensive activities and the age group falling between 36 – 45 are in their prime age and more active. The lower youth cadres falling between the age brackets of 18 – 25 were only 47 representing 20.6% while middle youth bracket between 26 – 35 responded at 58 representing 25.5%.

4.2.3 Highest Academic Level

Table 4.4 describes the highest academic levels of the respondents and includes both the project consultants and the direct beneficiaries.

Table 4.4: Respondents Academic Levels

Highest Academic Level	Frequency	Percentage
Basic	23	10.1
Certificate	45	19.7
Diploma	57	25.0
Degree	88	38.6
Post-Graduate	15	6.6
Total	228	100.0

From the data distribution in table 4.4 it was evident that the respondents had at least basic education with those with only basic education which encompasses primary and secondary level qualification being 23 representing 10.1%. Majority at 88 (38.6%) of the respondents had a degree level qualification showing the competitiveness of the public infrastructure projects skills level entry while the minority at 15 (6.6%) were those with post graduate level qualification . Those with certificate and diploma level qualification were 45 (19.7%) and 57 (25.0%) respectively.

4.2.4 Marital Status

The study also sought to find out the marital status of the respondents to ascertain the level of dependency of those involved in the study. Table 4.5 outlines the marital status of the respondents.

Table 4.5: Respondents Marital Status

Marital Status	Frequency	Percentage
Married	76	33.3
Single	141	61.9
Divorced	0	0.0
Widowed	11	4.8
Total	228	100.0

Majority of the respondents at 141 (61.9%) indicated that they were single perhaps reflective of the low number of child births in Kiambu County (Macharia&Ngugi, 2014) while minority at 11 (4.8%) indicated they were widowed. Those who were married were at 76 representing 33.3% while none indicated they were divorced.

4.3 Verification of Hypotheses

This section analyses and verifies the three hypotheses from the respondents’ data and also documents observations made during the study.

4.3.1 Hypothesis One (H₀₁): Government policies do not influence implementation of public infrastructure projects in Thika Sub-County, Kiambu Kenya

One of the major reasons advanced by various quotas implementing public infrastructure projects is the government adherence to policies and procedures in the process. It is on this precept that the researchers sort to find out the influence of government policies on the implementation of public infrastructure projects in Thika sub-county government. Table 4.6 presents the findings on the government policy factors influencing implementation of the public infrastructure projects.

Table 4.6: Government Policy Factors

Government Policy Factors	Mean	Std. Dev.
Policies set up to allow public participation in projects	4.6000	.75592
Policy interest on projects support infrastructure investment and incentives	4.2360	.75095
Public policies change with technological inventions influencing infrastructure projects directly and indirectly	4.4860	.92722
Interest groups advocate for public policies that serve the desire of their members for particular infrastructure projects	4.8600	.57393
Business groupings promote government policies for infrastructure projects in the best interest of the grouping	4.4360	.56395
The government policies focuses on the	4.9232	.63732

impact in public infrastructural spending for benefit of the beneficiaries	4.6223	.48562
Government policies regulate the use of public infrastructure implementation and usage upon completion	4.8296	.76534
The county has developed constituent policies to deal with public infrastructure fiscal policy in some circumstances		

The data for the analysis was collected using a 1 to 5 point likert scale with 1=Very Low, 2=Low, 3= Moderate, 4= High and 5= Very High. The respondents were asked to indicate their levels of agreement with the government policy factors influence on public infrastructure project implementation. The scale was designed to allow the respondents express their level of agreement or disagreement with a particular statement as listed. Each of the responses were then coded into numerical value used to measure their perceptive value under investigation. The score low and very low were combined into one to represent a variable having a mean score of 0 to 2.5 on the continuous likert scale. The scores of ‘moderate’ have been taken to represent a variable with a mean score of 2.5 to 3.4 on the continuous likert scale and the score of ‘high’ and ‘very high’ were combined to represent a variable with a mean score of 3.5 to 5.0 on the same scale. A standard deviation of greater than 1.0 implied a significant difference on the impact of the variables among the respondents of the study.

From the study findings it is evident that majority of the respondents were of the opinion that government policies focusing on the impact in public infrastructural spending for benefit of the beneficiaries will have the greatest impact scoring a mean of 4.9232. A further majority were also of the opinion that the county develops constituent policies to deal with public infrastructure fiscal policy in some circumstances; and that interest groups advocate for public policies that serve the desire of their members for particular infrastructure projects, with mean scores of 4.8296 and 4.8600 respectively. The other factors of considerations in government policies influence in public infrastructure projects gave varied mean scores as follows: Government policies regulate the use of public infrastructure implementation and usage upon completion scoring mean of 4.6223; Policies set up to allow public participation in projects scoring 4.6000; Public policies change with technological inventions influencing infrastructure projects directly and indirectly scoring 4.4860; Business groupings promote government policies for infrastructure projects in the best interest of the grouping scoring 4.4360; and Policy interest on projects support infrastructure investment and incentives scoring 4.2360. The overall positive influence of the government policies on public infrastructure implementation was found to have resulted to a positive debate on infrastructure development and implementation. The responses indicate that the government policies have an influence on the implementation process of public infrastructure projects.

4.3.2 Hypothesis Two (H₀₂): Funding process does not influence implementation of public infrastructure projects in Thika Sub-County, Kiambu Kenya.

The data for the analysis was collected using a 1 to 5 point likert scale with 1=Very Low, 2=Low, 3= Moderate, 4= High and 5= Very High. The respondents were asked to indicate their levels of agreement with the funding process factors influence on public infrastructure project implementation. The scale was designed to allow the respondents express their level of agreement or disagreement with a particular statement as listed. Each of the responses were then coded into numerical value used to measure their perceptive value under investigation. The score low and very low were combined into one to represent a variable having a mean score of 0 to 2.5 on the continuous likert scale. The scores of ‘moderate’ have been taken to represent a variable with a mean score of 2.5 to 3.4 on the continuous likert scale and the score of ‘high’ and ‘very high’ were combined to represent a variable with a mean score of 3.5 to 5.0 on the same scale. A standard deviation of greater than 1.0 implied a significant difference on the impact of the variables among the respondents of the study.

Table 4.7: Funding Process Factors

Funding Process Factors	Mean	Std. Dev.
Commitment and continuity of lead financier of a project determines its implementation speed and quality	4.6000	.86956
Ability of project consultants and beneficiaries to negotiate and maintain a core set of relationship in project implementation influences funding process	4.9365	.46356
Clear description, testing and external validation of public infrastructure funds determines its potential	3.9751	1.45251
Skills to be acquired during the public infrastructure implementation determines the funding process	4.9002	.77524
Aligning project funding process to economic and environmental benefits enables smooth implementation	3.8245	1.7521
Funding process that considers stakeholders in the short-term and long-term leads to effective implementation	4.7854	.42055
Long-term success and sustainability of the project funding lies with the engagement of project consultants and the direct beneficiaries	4.8578	.78545
Funding process must take into consideration a budgeting plan for mitigation of risks and externalities	4.9921	.78542

From the study findings it was evident that majority of the respondents were of the opinion that funding process must take into consideration a budgeting plan for mitigation of risks and externalities scoring 4.9921; ability of project consultants and beneficiaries to negotiate and maintain a core set of relationship in project implementation influences funding process scoring mean of 4.9365; and skills to be acquired during the public infrastructure implementation determines the funding process

scoring 4.9002. The other factors of funding process had varied scores as follows: Long-term success and sustainability of the project funding lies with the engagement of project consultants and the direct beneficiaries scoring 4.8578; Funding process that considers stakeholders in the short-term and long-term leads to effective implementation scoring 4.7854; Commitment and continuity of lead financier of a project determines its implementation speed and quality scoring 4.6000; Clear description, testing and external validation of public infrastructure funds determines its potential scoring 3.9751; and finally aligning project funding process to economic and environmental benefits enables smooth implementation scoring 3.8245

4.3.3 Hypothesis Three (H₀₃): Participatory planning processes do not influence implementation of public infrastructure projects in Thika Sub-County, Kiambu Kenya.

The data for the analysis was collected using a 1 to 5 point likert scale with 1=Very Low, 2=Low, 3= Moderate, 4= High and 5= Very High. The respondents were asked to indicate their levels of agreement with the participatory planning process factors influence on public infrastructure project implementation. The scale was designed to allow the respondents express their level of agreement or disagreement with a particular statement as listed. Each of the responses were then coded into numerical value used to measure their perceptive value under investigation. The score low and very low were combined into one to represent a variable having a mean score of 0 to 2.5 on the continuous likert scale. The scores of ‘moderate’ have been taken to represent a variable with a mean score of 2.5 to 3.4 on the continuous likert scale and the score of ‘high’ and ‘very high’ were combined to represent a variable with a mean score of 3.5 to 5.0 on the same scale. A standard deviation of greater than 1.0 implied a significant difference on the impact of the variables among the respondents of the study.

Table 4.8: Participatory Planning Process Factors

Participatory Planning	Mean	Std. Dev.
Leaders initiating public infrastructure projects are visible active and support the county during implementation process	4.7000	.46287
The culture within the county encourages innovation and change in public infrastructure developments	4.6521	.45950
Communication during public infrastructure project is two-way i.e. from and to project management and the beneficiaries	4.1270	.96425
There is formal planning and strategic change implementation process that targets the public infrastructure projects implemented and their beneficiaries	4.7568	.65821
There is a formal and personal development for the staff consulting for a particular project and direct uptake of skills from project beneficiaries	4.9245	.58752

There is formal data gathering and analysis process for monitoring change by the project consultants to the project direct beneficiaries	4.7215	.78562
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The factor of participatory planning process that demonstrated the highest cognizant with the public infrastructure projects implementation among the respondents was the presence of formal and personal development for the staff consulting for a particular project and direct uptake of skills from project beneficiaries scoring a mean of 4.9245 and, of There is formal planning and strategic change implementation process that targets the public infrastructure projects implemented and their beneficiaries scoring a mean of 4.7568. However most of the respondents were of the opinion that Communication during the public infrastructure project is not two-way i.e. from and to project management and the beneficiaries as it scored 4.1270. The other factors scored as follows: Leaders initiating public infrastructure projects are visible active and support the county during implementation process with a mean of 4.7000; there is formal data gathering and analysis process for monitoring change by the project consultants to the project direct beneficiaries having a mean score of 4.7215; and finally the culture within the county encourages innovation and change in public infrastructure developments scoring a mean of 4.6521.

4.4 Regression Analysis

In order to determine the critical factors influencing public infrastructure projects implementation at the thika-sub county, the study conducted a regression analysis. The three variables of critical factors considered were government policies, funding process and participatory process to implementation of public infrastructure projects in thika sub-county.

$$Y = \beta_0 + \beta_1 \text{ Government Policies} + \beta_2 \text{ Funding Process} + \beta_3 \text{ Participatory Planning} + \epsilon$$

Where:

β_0 is the regression constant, $\beta_1 - \beta_3$ are regression coefficient and ϵ is the model error term which indicates its significance. Table 4.9 therefore gives the model of goodness fit.

Table 4.9: Model of Goodness Fit

R	R Square	Adjusted R Square	Std. Error of Estimate	Durbin – Watson
.761 ^a	.678	.646	.22452	2.149

a. Predictors: (constants), Government Policies, Funding Process, Participatory Planning Process

b. Dependent Variable: Public Infrastructure Projects Implementation.

From the table of model of goodness fit generated above the study established the linear dependence of the critical factors influencing the public infrastructure projects in thika sub-county. The study established a correlation coefficient of 0.761 which is a strong positive correlation depicting a near perfect linear dependence between the dependent and independent variables.

An R-square of 0.678 was established and adjusted to 0.646 with the coefficient of determination depicting that government policies, funding process and participatory planning process brings about 67.8% variation in public infrastructure projects implementation at the thika-sub county while 32.2% of the variations are brought about by factors not captured by the objectives of this particular study. The Durbin Watson value of

2.149 established illustrated that there is lack of autocorrelation in the model residuals.

The study further established the regression coefficients of the various variables and presented in table 4.10 below.

Table 4.10: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.348	.563		2.845	.514
Government Policies	.192	.048	.316	2.562	.002
Funding Process	.642	.132	.319	3.821	.026
Participatory Planning Process	.245	.124	.378	3.635	.005

a. Dependent Variable: Public Infrastructure Project Implementation

The regression equation becomes:

$$Y = 0.192X1 + 0.642X2 + 0.245X3 \quad P < 0.001$$

From the findings it is evident that the regression model depicts that when government policies, funding process and participatory planning process have a null value, the public infrastructure implementation would be 1.348. This therefore means that when all other factors are constant, a unit increase in the perceptive value of government policies would yield a 0.192 decrease in the public infrastructure project implementation while a unit increase in perceptive value of funding process and participatory planning process would yield 0.642 and 0.245 respectively.

4.5 Discussion of Findings

The findings of this study have reinforced the current reality at the county governments and by extension the sub-county governments that public infrastructure projects implementation is influenced by certain factors in its environment and that this is characterized by turbulence that is consistent.

4.5.1 Comparison to Theories

The study constructed three objectives which were to determine the influence of: government policies; funding process; and participatory planning process on the implementation of public infrastructure projects. From the findings it is evident that government policies, funding process, and participatory planning process have an influence on public infrastructure implementation. These findings are confirmed by Robey and Holmstrom (2001) who while studying transformation of municipal governance in a global context contends that infrastructure development projects implementations are dynamic, evolving and change in response to environmental changes which might include government policies and procedures, the sources of finance and the participation of the locals in its initial plans. Further they asserts that an environment that is non-specific to conditional changes and experiences various turbulences leads to the project implementers identifying the most gratifying critical factors of considerations. These factors Mohan (2008) confirms must relate to government procedures, rules and regulations and also include

the source of finance for the project and the participation of the local population into the activities of the project from its inception to completion. Further findings are confirmed by the system theorists like Bertalanffy (1972) who asserts that public infrastructure projects implementation success depends majorly on the various planning processes that includes the funding process and participatory process of the stakeholders involved.

4.5.2 Comparison to other Studies

The findings of other study also warns that for the public infrastructure implementation to succeed the actors and the various stakeholders must be cognizant of the various critical factors to take into consideration with a view to ensuring a complete success. The study found that the integral critical factor in public infrastructure must include the compliance to government policies which directly and indirectly to the projects. These findings are also confirmed by Njoki (2013) while studying construction projects in Nairobi, Kenya, and Ker and Newell (2001) who studied projects with policy induced technology adoption and noted that government projects and more so public infrastructural development projects mostly depend on policies to ensure that they meet certain pre and post conditions geared towards their success in implementation. This is further confirmed by Otieno et al. (2010) who also noted that government policies plays a vital role in the implementation of projects and the policies should be geared towards mass implementation of public infrastructure projects.

Infrastructure funding process as per the study findings also contributes immensely to the outcome and quality of any given infrastructure projects. The study also assures that funding process within a structured project implementation leads to systematic review of the stages of the projects that are geared towards achieving the implementation target. These findings are in concurrent with Kaiser and Ahlemann (2010) who opined that funding process in any project must be clearly articulated in order for the contractors of the project to apply quality materials and Wanjiku (2012) on her study of factors influencing performance of contractors of government funded building projects further notes that if the funding is not structured it can

lead to poor human resource and low quality implemented projects.

The study also found out that participative planning process is vital in the lifeline of a project and especially in the implementation process to ensure coherence and sequence of understanding in the procedures, policies, process, regulations and laws as it applies to the project until it is fully implemented. Reeves (2004) confirms these findings in his definition of participative planning process as one that encompasses the whole project actors and their sequence of activities that leads to fully implemented project. Njoki (2013) further notes that participative planning process must be embraced at the national and county government levels to ensure that initiated projects are fully implemented and the players involved are aware of their roles at the various stages of the project until full implementation is achieved. The demand for participation therefore must be based on several factors as identified by the study and concurred by Dailami and Klein (1997).

V. CONCLUSIONS AND RECOMMENDATIONS

Based on the responses from the respondents this research came up with findings and were used to make conclusions and give recommendations. Based on the findings of and discussions above, the study makes the following conclusions and recommendations:

Conclusions

From the findings the following issues were observed from the as directly emanating from data analyzed:

- There is a strong gender disparity at the public infrastructure projects being implemented as there are more men than women. This is largely because construction profession which is the larger implemented projects is still considerably viewed as a Man's job in Kenya and the larger African communities.
- Majority of those working at public projects being implemented are graduates with those with no qualifications at all missing at some sites. This is an indicator that the population has an influx of graduates as most of the project activities undertaken did not require specialized training or qualification.
- Most of the project managers do not have a pre-requisite qualification on project management apart from the specialized qualification which is only related to a project cycle stage. In most instances therefore, the project engineers were bestowed with the responsibility of doubling up as the project managers.

According the above discussions and summary thereafter, the following conclusions can be drawn from the study:

With regards to government policies and public infrastructure implementation, there was a statistically significant relationship between the two variables. Government policies influences public infrastructure implementation and a project supported by most policies is likely to be implemented to completion than one that is not.

On the other hand funding process and public infrastructure projects implementation also had a statistically significant relationship. Funding process influencing the projects implementation progress and its eventual completion and further determines in advance the sources of finance for the project outlining the various levels of finance and the specific activities it will be funding.

In regards to participatory planning process and public infrastructure projects implementations, there was a statistically significant relationship between the two variables. Perceived participatory planning process has a direct and indirect influence on the public infrastructure implementation. Perceived participatory planning process in terms of stakeholders participation on the project increases the likelihood of the project success and with low perception of success, there is a likelihood of project implementation failure.

Recommendations

Based on the findings of the study and the conclusions made above, this study recommends the following on critical factors influencing public infrastructure implementation:

- (i) Public infrastructure project implementers must take into considerations all the government policies in place and comply with all policies to ensure that the project is sealed from the direct or indirect influence of these policies. Of particular interest should be the mandatory policies that every project must comply with before its implementation. Government policies that are relevant to the project should serve as the key implementation criteria for the project.
- (ii) To ensure that public infrastructure projects are geared towards full implementation, the funding process should be taken into consideration with specific outlines on the main funding source, the minor and the emergency funds for the project. The usage of these funds should be well outlined in the funding process to gag on misuse and under or over spending by overzealous project management implementers.
- (iii) To overcome the risk associated with non-involvement of stakeholders during the implementation process, the public infrastructure project should have a mechanism in place that ensures that a participatory planning process is in place and involves all those that the project affects directly and indirectly. Perceived non-involvement of stakeholders creates anxiety among the stakeholders and especially those directly affected by the project and may lead to total rejection of the project. It will be of high importance to involve the stakeholders early in the project stages to ensure that they own and defend the project.

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