

# Influence of Contractors Management Practices on Performance of Housing Construction Projects in Kisii County, Kenya

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## Research

**Keywords:** Project Performance, Housing Construction Projects, Management Practices, Project Management

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**INFLUENCE OF CONTRACTORS MANAGEMENT PRACTICES ON PERFORMANCE OF HOUSING  
CONSTRUCTION PROJECTS IN KISII COUNTY, KENYA**

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**&**

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## **LIST OF ABBREVIATIONS AND ACRONYMS**

ISO:	International Organization for Standardization
MBO:	Management by Objective
MBR:	Management by Results
M&E:	Monitoring and Evaluation
NEMA:	National Environment Management Authority
NCA:	National Construction Authority
NGO's:	Non-Governmental Organizations
PM:	Project Management
RCC:	Reinforced Concrete
SPSS:	Statistical Package for Social Sciences
TQM:	Total Quality Management
USA:	United States of America
UK:	United Kingdom

## **ABSTRACT**

Performance of housing projects is expected to be good if constructions are done in conformance with specific standards, being of good quality, completed in time, and meeting clients' needs. However, the fact that houses are constructed through the use of improper time-frames, poor materials, as well as inadequate planning affects overall quality of the projects. This study was to investigate how contractors' management practices influence housing projects performance in Kisii County. The study employed a descriptive study design. The target population was the 206 registered contractors in Kisii County from where a sample of 136 respondents was taken through simple random sampling approach. A questionnaire was used to collect data and the data obtained was cleaned, sorted and organized using SPSS. Descriptive and inferential statistics were used to analyse data. The results obtained showed that housing construction projects are affected by contractors' management practices which include planning practices, conformance to industry standards, implementation of designs, and financial management practices respectively which were found to have a positive influence on projects performance. The possible beneficiaries of the study include academicians in the field of project management and contractors.

*Key Words: Project Performance, Housing Construction Projects, Management Practices, Project Management*

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## INTRODUCTION

### 1.1 Background to the Study

#### 1.1.1 Project Performance

Performance can be viewed from the time they take to completion, cost of completion with regard to the budgeted cost, and overall quality of the projects (Dominic and Nick, 2016). Housing Project performance involves the act of measuring the attainability of several objectives which occasionally can be at odds due to the changing conditions in construction (Young, 2013; Choudhry, 2016). The main aim is striving towards the success of the project (Singh, 2011). Schedule as one of the project performance indices is the timing and succession of various tasks within a project and it mostly consists of tasks, their durations, constraints, dependencies and information on the time-oriented project (Price, 2011; Ottosson, 2012). Cost as per Singh (2011) is the estimated budget plan of a project and the measure of the expense efficiency exhausted on a project. Normally the performance used to get the cost performance index is by finding the ratio of earned value by the actual costs (Urizah, 2011; Yellamraju, 2011). Quality performance index, as a performance indicator, is a consistency measure in the implementation of project procedures and standards as well as the projects specification compliance (Svane, 2012; Uher and Loosemore, 2014). Safety performance index is a measure on how the site activities can be carried out safely without any loss of life (Low, 2018; Cheng and Wang, 2016; Jha, 2011).

#### 1.1.2 Construction Projects in Kisii County

Housing Construction Projects in Kisii County are faced with a number of challenges just like in many parts of the country due to the rampant collapsing of structures as witnessed in the recent past. In the past one decade, a number of houses have been reported that have collapsed specifically in Kisii town which is the headquarters of Kisii County leading to massive loss of properties and lives respectively. Such buildings are said to be collapsing due to the fact that they were considered to be of poor quality although measures to rectify these mistakes were not undertaken in good time. This then leads to the main question as to why such measures are not put in place by the County Government owing to the fact that devolution provides the county governments the powers to do so (Ama and David, 2016).

#### 1.2 Statement of the Problem

Housing project performance issues that are rampant in Kenya include completing constructions that use more materials than planned for, increased complains from owners to contractors, increased cases of collapsing houses, projects that take more time to completion than expected, and increased number of houses being earmarked for demolition by NCA and NEMA (Peninah and Moses, 2015; Choudhry, 2016). In housing construction projects, contractors are the ones with a mandate of ensuring that houses built conform to required standards, are of good quality, are completed in time, and meet the clients' needs as well as legal requirements (Lester, 2014). However, there have been increasing number of cases in Kenya where various projects and specifically in the construction industry have been reported for being of poor quality (Peninah and Moses, 2015). The main reason associated to this concept is the sub-standard constructions that either use improper time frame as expected, poor materials which are issues of procurement, inadequate planning for human resources during the project developments, as well as the overall project planning and monitoring (Keating, 2013). In overall, this affects the quality of the projects and which is so far the main focus of this research. In this regard, this study's purpose was to evaluate how contractors' management practices such as: planning procedures, implementation of the approved designs, adherence to construction industry standards and financial management practices generally affect the performance of housing construction projects in Kisii County.

### 1.3 Study Objectives

#### 1.3.1 General Objective

The general objective for this study was to investigate the influence of contractors' management practices on performance of housing construction projects in Kisii County, Kenya.

#### 1.3.2 Specific Objectives

The study was guided by the following specific objectives;

- (i) To investigate the influence of planning strategies on performance of housing construction projects in Kisii County, Kenya.
- (ii) To determine the influence of conformance to construction standards on performance of housing construction projects in Kisii County, Kenya.
- (iii) To establish the influence of design implementation on performance of housing construction projects in Kisii County, Kenya.

- (iv) To determine the influence relevance of financial management practices on performance of housing construction projects in Kisii County, Kenya.

### 1.3.3 Research Questions

The study sought to answer the following questions;

- (i) What is the influence of contractors' planning strategies on performance of housing construction projects in Kisii County, Kenya?
- (ii) What is the influence of conformance to construction standards on performance of housing construction projects in Kisii County, Kenya?
- (iii) What is influence of design implementation on performance of housing construction projects in Kisii County, Kenya?
- (iv) What is the influence of contractors' financial management practices on performance of housing construction projects in Kisii County, Kenya?

### 1.4 Significance of the Study

The study will contribute to different groups in society such as academicians, policy formulators on issues of project management especially in the public sector. The academicians will benefit because the research's results are very critical in validating the theoretical framework that exists on project management or even establishing new theories on housing projects management. Such a benefit is very important especially in identifying gaps that need to be focused on while conducting future studies on the topic. Policy formulators in county governments will benefit through this study by identifying important areas that ultimately need greater attention in order to make public projects successful. The study will also benefit the National Construction Authority (NCA) in identifying the factors that cause poor housing projects in county levels hence being able to come up with mitigating measures to avoid accidents associated with sub-standard housing constructions. Finally, the study will add incredible knowledge to the existing knowledge of public administration that can help the publics to understand relevant procedures in project management, which can in turn help constructors and other private project specialists in different fields that are usually contracted in ensuring that quality of houses constructed are fit for purpose and in accordance with quality assurance standards.

### 1.5 Scope of the Study and Methodology

The study focused on Kisii County by identifying 136 contractors who are involved in the construction of housing projects. The study sought to find out the exact project management practices employed by contractors towards ensuring that housing projects are actually successful. The 136 respondents reached were required to fill questionnaires as the study employed descriptive approach by using semi-structured questionnaires in collecting the relevant data. The data obtained by the use of questionnaires was cleaned, organized, sorted and analysed by the help of Statistical Package for Social Sciences (SPSS). Descriptive and inferential statistics were used to analyse quantitative data. Descriptive statistics included frequencies, percentages, mean and standard deviation. The following multiple regression analysis was applied to show the relationship between the variables guiding the study.

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + e$$

Where;

Y = Dependent Variable

$\beta_0$  = a constant coefficient (if any)

$\beta_1$  to  $\beta_4$  = are coefficients for each variable

$X_1$  = Planning Strategies

$X_2$  = Compliance to Industry Standards

$X_3$  = Design Implementation

$X_4$  = Financial Management Practices

And  $e$  = is an error term respectively; the level of significance used was 5%.

Diagnostic tests were performed to ensure the regression analysis was valid. The tests specifically focused on multi-collinearity, homoscedasticity, and normality of the independent variables. Normality was tested using Shapiro-Wilk test, Multi-collinearity was tested using Variance Inflation Factor, and homoscedasticity was tested using Breusch-Pagan test respectively. The results were presented using tables, charts and figures respectively. Ethical approvals were sought from the government and university before data collection was carried out.

### **1.6 Summary of Existing Literature**

Raji and Firas (2011) suggested that quality planning and control should be the most critical parameter that project managers should consider especially in construction projects. In their study on “implementation of quality management concepts in managing engineering project sites”, the authors state that Quality Management should be the guideline towards meeting the owner's requirements or compliance with the set standards and specifications. The authors employed a descriptive research design in surveying 20 construction companies in Jordan. The main recommendations and conclusions made by these authors is that construction companies should employ quality planning as a competitive strategy towards ensuring that they are associated with high quality projects in order to get more referrals in their business engagement. The study's main limitation is based on the fact that it focused on total quality management (TQM) as the only indicator that should be considered, without incorporating other elements of ensuring safety housing. Further, the study's focus was also on the basis of competitiveness as opposed to reducing high rates of collapsing houses in urban centers respectively.

A study by Githenya and Ngugi (2014) on assessment of the determinants of implementation of housing projects in Kenya was undertaken utilizing a descriptive design. The study concluded that the specific factors affecting project performance and leading to an alarming rate of house demolition, collapsing, and uninspected houses in various towns in Kenya is due to poor quality planning and control where industry standards are not followed to the latter. Similarly, McClintock (2016) affirms that construction industry specific standards should be used as key parameters that can promote project performance as important tools and techniques which are useful in quality planning, assurance and control respectively. The study did not however focus on contractors who are the main focus in this study.

Ghara (2016) study focused on best practices in quality control and assurance in design echoed that if proper designs are created which are within the expected quality standards and which take into consideration the geographical topography, it will be difficult to have alarming cases of buildings collapsing in the modern world owing to improved technology that is in place. The author noted that in order for projects to be undertaken in construction of buildings, it is required that designs have to be presented to the relevant authorities for appraisal and approval before they are implemented. The purpose of approving plans and designs is to ensure that housing projects follow specific quality standards and in accordance with the specific topography in which they will be constructed the design has proposed measures to enhance standardised buildings.

A study on the impact of contractors' financial management capability on cost and time performance of construction projects was carried by Oje, Odusami and Ogunsemi (2010). The study's methodology employed prequalification assessments of management capability of winning contractors as well as cost data relating to 77 completed building projects executed between 2004 and 2007 were obtained. The data obtained from a questionnaire and archival data were analyzed using one-way analysis of variance and multiple regression. The results revealed that contractors' financial management capability has significant impact on cost and time performance of building projects as evidenced by *p*-values of 0.042 and 0.039, respectively.

## FINDINGS AND DISCUSSIONS

### 2.1 Introduction

The chapter discusses research findings for the data obtained from the respondents using the data collection method proposed on the study's methodology. It is divided into sections covering the response rate, data reliability, background information, dependent variable and the independent variables which include the contractors' planning practices, industry specific standards, design implementation and financial management practices.

### 2.2 Response Rate

Questionnaire response rate was 85.29%, which is higher than the recommended average rate of 30%, as asserted by Saunders and Lewis (2009). Since the response meets the recommended threshold of 30%, it can be interpreted to mean that this study's results are a good representative of the targeted population.

### 2.3 Background Information

The researcher designed the questionnaire to collect the following bio-data of the respondents; age bracket, gender, level of education attained, role in the construction company, duration in the construction industry, NCA category of the company, projects executed in the last 5 years and the number of employees in the Organization. The analysis for both qualitative and quantitative data is presented in the sub sections below.

#### 2.3.1 Respondents' Age and Gender

The findings of the study established that age range of 21 – 30 years is where 47 of the participants belonged with 35 of them being female while 12 were male. This was followed by those below 20 years with 12 female while 11 male. Those aged 31 – 40 years were 22 and notably all of them were male. Finally those above 51 years were 12 and all of them were male respectively as shown in table 2.1 below.

**Table 2.1: Respondents' Age Bracket and Gender**

Respondents' age Bracket		Gender of the respondent		Total
		Male	Female	
Age range of the respondent	Below 20 years	11	12	23
	21 - 30 years	12	35	47
	31 - 40 years	22	0	22
	41 - 50 years	0	12	12
	Above 51 years	12	0	12
Total		57	59	116

Source: (Survey Data, 2018)

The results show that the respondents represented all age groups as there were representatives, hence making the research conclusions applicable to all the entire population. A study that comprises all age groups is considered a fair representation of the society and population of study as echoed in a study by Raji and Firas (2011).

#### 2.3.2 Respondents' Role

The researcher sought to establish the role or position of employment of the respondents. In cases where contractors were not present, one of the members from the organisation was allowed to respond to questions on behalf of the contractors. The results obtained are presented in table 2.2 below.

**Table 2.2: Position of the Respondents**

Respondents' Role	Frequency	Percentage (%)
<b>Contractor</b>	84	72.41
<b>Manager</b>	10	8.62
<b>Head of Department</b>	14	12.07
<b>Foreman</b>	8	6.90
<b>Total</b>	57	100.00

Source: (Survey Data, 2018)

From the results, it was established that majority of the respondents represented by 72.41% were contractors, followed by heads of departments and managers at 12.07% and 8.68% respectively, and finally foremen at 6.90%. Ideally, this representation is a good depiction of the perceptions in construction companies without any bias as maintained by Kemoli (2015).

### 2.3.3 Level of Education

The study also aimed at identifying the level of education attained by the respondents and the results obtained are presented in table 2.3 below.

**Table 2.3: Respondents' Level of Education**

Education Level	Frequency	Percentage (%)
<b>Artisan</b>	12	10.34
<b>Diploma</b>	57	49.14
<b>Bachelors</b>	35	30.18
<b>Masters</b>	12	10.34
<b>Doctorate</b>	0	0.00
<b>Total</b>	116	100.00

Source: (Survey Data, 2018)

From the results obtained, majority of the respondents had attained a diploma level of qualification presented by 49.14%, followed by a bachelor's degree at 30.18%, and then finally artisan and master levels at 10.34% each. There were no respondents who had attained a doctorate level of qualification. This result implies that most of the contractors in the county do not further their education, a fact that can affect their managerial practices. The study is an agreement with the observations made in a study by Kamau and Mohamed (2015).

### 2.3.4 Duration in the Construction Industry and Role

The findings of the research indicated that those who below 2 years duration in the construction industry represented by 47 of the respondents were foremen. Between 3 – 5 years were 45 respondents where 34 were Heads of Departments and 11 were foremen. Also, those between 6- 8 years and above 10 years were 12 each, and were contactors and managers respectively as displayed in table 2.4 below.

**Table 4.4: A Crosstab for Duration in Construction Industry and Role**

Duration in the Industry		Employment role				Total
		Contractor	Manager	Head of Department	Foreman	
Duration in construction industry	Below 2 years	0	0	0	47	47
	Between 3 - 5 years	0	0	34	11	45
	Between 6 - 8 years	12	0	0	0	12
	Above 10 years	0	12	0	0	12
Total		12	12	34	58	116

Source: (Survey Data, 2018)

The results informed the study by indicating that employment position of the respondents was determined by the duration in the construction industry. Managers were retained by the construction industries and served for more than

10 years; an indication of utilizing experience to enhance project performance. As a matter of fact, the literature reviewed supports this assertion as echoed by Otonde and Yusuf (2015) in their study.

### 2.3.5 Number of Projects Executed in Last Five Years

The researcher aimed at finding out the number of projects that have been completed within the last five years as an indication of projects that have performed well or successfully and the results are presented below.

**Table 2.5: Number of Projects Executed**

Number Of Projects Executed	Frequency	Percentage (%)
NCA 3	0	0.00
NCA 4	36	50.70
NCA 5	12	16.90
NCA 6	11	15.50
NCA 7	12	16.90
NCA 8	0	0.00
TOTAL	71	100.00

Source: (Survey Data, 2018)

From the results obtained, it is identified that those in class 4 completed the highest number of projects which were 36 in number representing 50.7% of the total number of projects completed. Class 5 and 7 had 12 projects each while class 6 had managed 11 projects. This finding contradicts the general assumptions made from literature review which places classes in terms of their seniority and therefore the researcher expected that those in higher classes were to be the ones completing the highest number of projects, which was not the case as revealed in a study by Sholarin and Awange (2016).

### 2.4 Project Performance

The respondents were asked numerous questions regarding the project performance, in which case various responses were obtained. The responses obtained are analysed and presented in the sections below.

#### 2.4.1 Overall Project Performance

The dependent variable of the research was measured by the six factors that affected timely completion of the projects and results presented below.

**Table 2.6: Overall Project Performance Statements**

Factors	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Long periods in time taken affects project completion	22.4	24.1	19.8	18.1	15.5
Budgeted cash flow of the projects affects project completion duration	21.6	24.1	14.7	24.1	15.5
Budgeted overhead cost of the project influences completion time taken	15.5	27.6	12.9	19.8	24.1
Project design cost is another factor affecting project quality	24.1	18.1	15.5	15.5	26.7

Material and project costs affects project quality	21.6	16.4	27.6	16.4	18.1
Project labour cost affects project quality	16.4	27.6	14.7	21.6	19.8

Source: (Survey Data, 2018)

From the findings, it was observed that respondents thought all the points presented in a Likert Scale affected performance of projects by virtue that timely completion was affected. Such factors included; long periods, budgeted project's cash flow, budgeted overhead costs, project design cost and implementation, material costs, and project labour requirement respectively. However, the overall results show that overhead cost of the project had a greater impact and stands out as a critical factor affecting performance. These results are supported by Murray (2010) whose opinion stated that quality standards are greatly affected by such factors hence negatively influencing project performance.

## 2.5 Contractors' Planning Practices

Respondents were asked a series of questions that were meant to evaluate their perceptions as far as planning practices is concerned. The findings and responses are presented in the sections that follow.

### 2.5.1 Statements on Contractors' Planning Practices

The researcher sought to determine the extent to which respondents would agree with the given statements on planning practices. The respondents were required to indicate on Likert Scale from 1 – 5 the level of agreement to the statements. The responses were represented in the table 4.8 below in form of frequencies and percentages.

**Table 2.7: Responses for Statements on Contractors' Planning Practices**

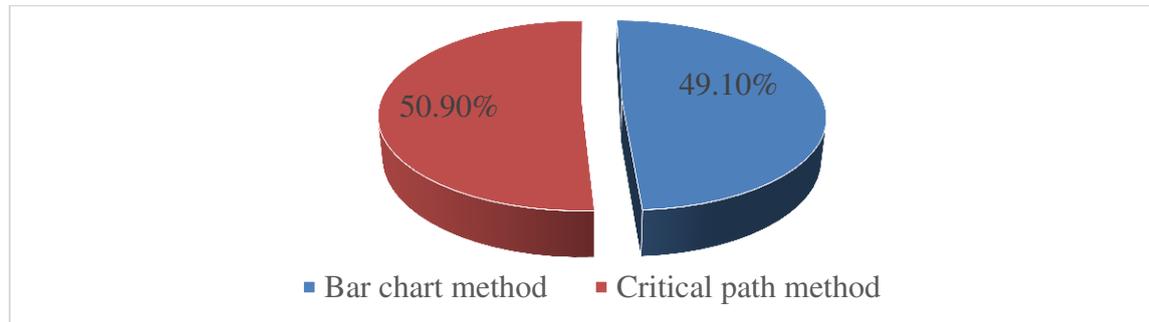
<b>CONTRACTORS' PLANNING PRACTICES</b>	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Planned time for project construction delays projects	38.8	19.8	20.7	20.7	0.0
Site preparation time delays projects	38.8	19.8	0.0	31.0	10.3
Average delay in payment from the owner to the contractor delays projects	0.0	19.8	28.4	31.0	20.7
Availability of the resources as planned through project duration is a major challenge	19.0	0.0	0.0	50.9	30.2

Source: (Survey Data, 2018)

The responses obtained indicated that only 20.7% agreed that planned time for project completion delays projects hence leading to poor project performance. Majority of the respondents represented by 50.9% and 30.2% agreed and strongly agreed to the fact that availability of materials and resources is the main challenge that affects project performance through its impact on planned time. Time taken for site preparation and receiving payment from clients were part of the factors that were found to affect planned time for completion of projects as far as performance is concerned. The results seem to be in agreement with reviewed literature on the need to have adequate planning in order to promote project performance as echoed by Raji and Firas (2011). Similarly, Bent (2012) suggested that planning is a good measure of quality control which enhances appropriate use of available resources to support project performance as observed in this study. However, these findings are contradictory to Karimi (2016) whose findings stated that the main factors affecting performance as far as planning is concerned are categorized into four, namely; project participant related factors, organizational tactics and strategies in planning, environmental factors affecting planning, and project characteristic factors respectively.

### 2.5.2 Project Schedule Planning Techniques

The respondents were asked to identify the kind of method they used to represent the project planning and scheduling. The respondents were required to choose bar chart method, critical path method, S-curve method or any other specified methods. The findings of the study established that only two methods were being used. The bar chart method was used by 50.9% of the respondents while 49.1% of the respondents used the critical path method as displayed in the figure 2.1 below.



**Figure 2.1: Project Scheduling Method**

Source: (Survey Data, 2018)

From the findings, it is clearly evident that respondents are not familiar with other methods of project planning and scheduling apart from the traditional approaches (bar chart and critical path analysis). This study's findings are contrary to what was observed by Liviu et al. (2011) who indicated that technology has changed the manner in which construction projects are undertaken with particular emphasis on using computer-aided applications to plan and schedule resources for projects.

### 2.5.3 Requirement for Submission of Supplier Schedule

In addition, the study sought to establish how often the supplier was required to submit their detail activities for construction workers in advance to adjust their actual schedule. The respondents were required to indicate if daily, weekly, monthly or do not meet. The study findings revealed that 54.8% of the respondents did it weekly, 23.1% of the respondents did not meet while 22.1% submitted their detail activities schedule on daily basis as presented in the table 2.8 below.

**Table 2.8: Frequency for Supplier Activities Schedule**

Supplier Activities	Frequency	Percentage
Daily	23	22.1
Weekly	57	54.8
Do not meet	24	23.1
Total	116	100.0

Source: (Survey Data, 2018)

On the context of requiring supplier's schedules, a proportion of 23.1% do not ask for these activity schedules showing that all stakeholders in project management are not adequately involved in the planning process. This result shows that failure of project performance is more often caused due to poor planning approaches and lack of involving other stakeholders such as suppliers and governments as proposed by Karimi (2016).

### 2.6 Compliance to Industry Standards

The respondents were subjected to a series of questions that were meant to determine their opinions on compliance to industry standards. The responses obtained have been analysed and presented in the sections that follow.

### 2.6.1 Responses for Compliance to Industry Standards

The respondents were asked to indicate the extent to which they agree with the given set of factors related to compliance to industry standards. They were required to indicate if they strongly disagree, disagree, neutral, agree or strongly agree. The responses obtained were analysed and presented in the table 2.9 below as percentages.

**Table 2.9: Responses for Compliance to Industry Standards**

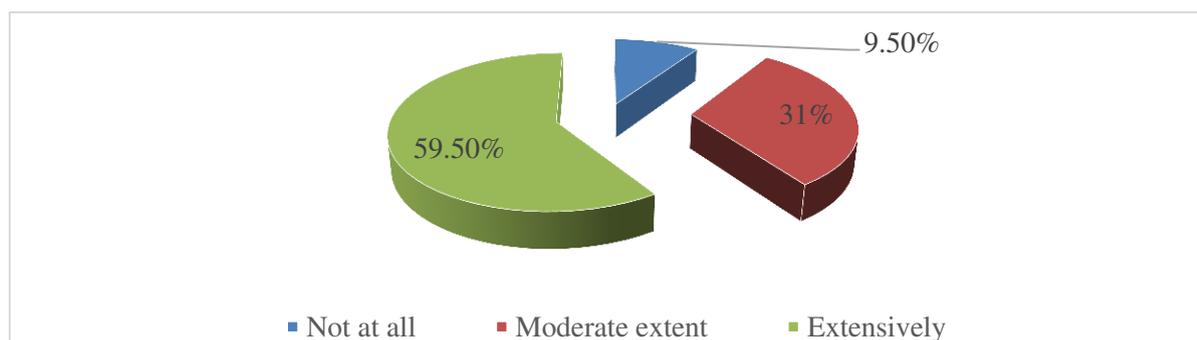
Compliance To Industry Standards	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Project safety is usually implemented to a larger extent	15.5	27.6	12.9	19.8	24.1
Workers receive trainings on construction standards always	24.1	18.1	15.5	15.5	26.7
Concrete mixing needs are affected by materials availability	21.6	16.4	27.6	16.4	18.1
All projects are constantly monitored by government authorities	16.4	27.6	14.7	21.6	19.8

Source: (Survey Data, 2018)

From the findings, implementation of project safety measures was found to be main industry standards implemented as it was supported by majority of the respondents at 24.1% and 19.8% who strongly agreed and agreed respectively. Moreover, all other factors were found to be relevant with the least being concrete mixing as presented in the table below for descriptive statistics. Basically, these findings have a close relationship with the ones reviewed on the literature review such as that by Githenya and Ngugi (2014) and Nyambura (2015) who insisted that compliance to industry standards are important in promoting construction projects performance. Contrary to this observations, it was noted in the literature that majority of contractors do not follow the laid down procedures and standards and prefer shortcuts through corrupt means hence ending up to jeopardize the end result of buildings (Orji et al., 2016).

### 2.6.2 Extent to Which Overall Project Safety Factors Have Been Implemented

The respondents were asked to give their opinions on the extent to which overall project safety factors had been implemented. The findings revealed that 59.5% of the respondents were for the opinion of extensively implemented, 31% said it was moderate extent and 9.5% claimed not at all as shown in figure 2.2 below.



**Figure 2.2: Overall Project Safety Factors Implementation**

Source: (Survey Data, 2018)

From the findings of this study, a total of 91.50% of the contractors are said to be following industry (moderate and extensively), which is a good indicator. Nevertheless, the fact that 9.50% never do so and 59.50% are doing so to a moderate extent raises the question of safety of buildings, which is one fundamental reason for poor performance on constructions as supported by Atamba et al. (2016).

### 2.6.3 Ongoing Formal Safety and Standards Trainings

The respondents were required to state on average how much the on-going formal safety and standards trainings workers received monthly in their construction company. The results revealed that 40.5% received training of 4 – 7 hours, followed by those received 1 – 4 hours represented by 30.2%, 19.8% of the respondents received trainings less than 1 hour while those received training over 7 hours were represented by 9.5% as shown in the table 2.10 below.

**Table 2.10: On-going Formal Safety and Standards Training**

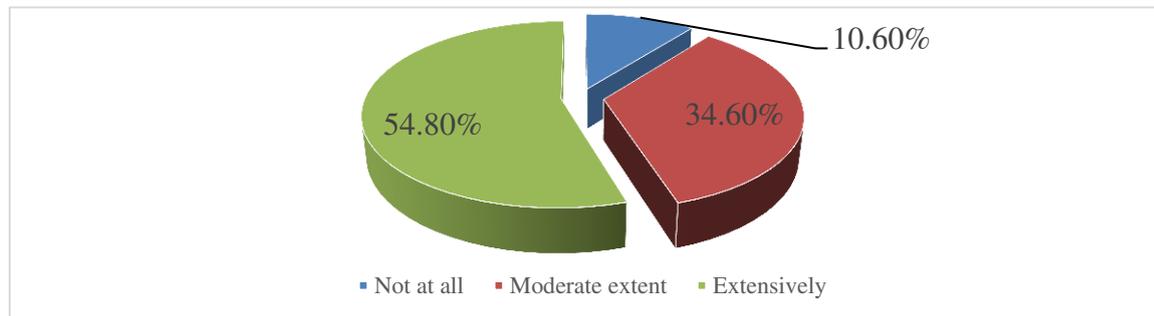
	Frequency	Percentage
Less than 1 hour	23	19.8
1 - 4 hours	35	30.2
4 - 7 hours	47	40.5
Over 7 hours	11	9.5
Total	116	100.0

Source: (Survey Data, 2018)

Results demonstrate that although there are formal trainings in construction companies, they are usually not given much attention as the number of hours covered are less than 7 hours per month with 9.5% only that received trainings above 7 hours in a month. The findings support Atamba et al. (2016) who maintained that lack of training contributes to poor project implementation and performance respectively.

### 2.6.4 Pre-task Planning For Safety Conducted

The study also sought to determine the extent to which pre- task planning for safety conducted by contractors, foremen or other site managers. The findings confirmed that 54.8% of the respondents believed it was extensively, 34.6% said it was moderate extent and 10.6% of the respondents said it was not at all as depicted in figure 4.7 below.



**Figure 2.3: Pre- task planning For Safety**

Source: (Survey Data, 2018)

Another element of industry specific standards in pre-task planning which is an appropriate safety strategy for ensuring that projects are undertaken in accordance with legislations and global best practices according to Orji et al. (2016). However, the findings in this study indicate that 10.60% were for the opinion that this is usually not done with 54.80% indicating it was extensively done. These findings demonstrate that the level of project performance due to industry standards conformance is of great significance.

### 2.7 The Design Implementation

The respondents were asked numerous questions with regard to design implementation and were required to give their opinions concerning how design implementation influenced housing construction projects performance. The results obtained from the respondents were analysed and presented in the sections below.

### 2.7.1 Level of Agreement to Design Implementation Factors

The respondents were also asked to indicate the extent of agreement to a set of factors of design implementation with reference to current project they were undertaking. The workers were supposed to indicate strongly disagree, disagree, neutral, agree or strongly agree. The responses obtained are presented in table 2.11 below.

**Table 2.11: Responses for Factors of Design Implementation**

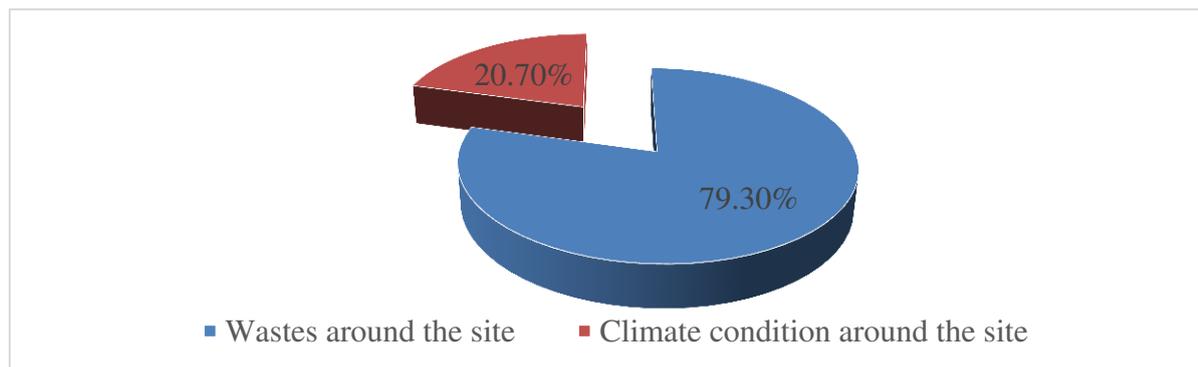
DESIGN IMPLEMENTATION	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Project design implementation has been achieved effectively	9.5	0.0	0.0	31	59.5
Project has quality designs given to use by the owner	9.5	0.0	0.0	10.3	80.2
Construction activities are constantly inspected to ensure quality work and implementation	9.5	0.0	0.0	31	59.5
Critical milestones are constantly well- monitored	9.5	0.0	10.3	20.7	59.5

Source: (Survey Data, 2018)

Aggregation of the responses obtained enhanced the computation of descriptive statistics in which case all the components of design implementation were found to be significant. In reference to the literature reviewed, the project design implementation was found to be important to housing project performance (Ghara, 2016). A proper design was associated with stable houses. The descriptive statistics for the factors show that the respondents are extensively satisfied with them. From the results, all the features of design implementation are relevant towards projects' performance. It was noted in the literature that some of the factors affecting proper house design approval and implementation include corruption, a fact that frustrates the efforts of having quality constructions in society (Mundia, 2013; Kogi, 2013).

### 2.7.2 Factors Considered While Creating and Implementing Designs

The respondents were asked to express their opinions on the factors they considered while creating and implementing designs for construction projects with regard to design implementation. The responses obtained were analysed and revealed that only two factors were considered. 79.30% of the respondents considered waste around the site while 20.7% considered the climate condition around the site as shown in the figure 2.4 below.



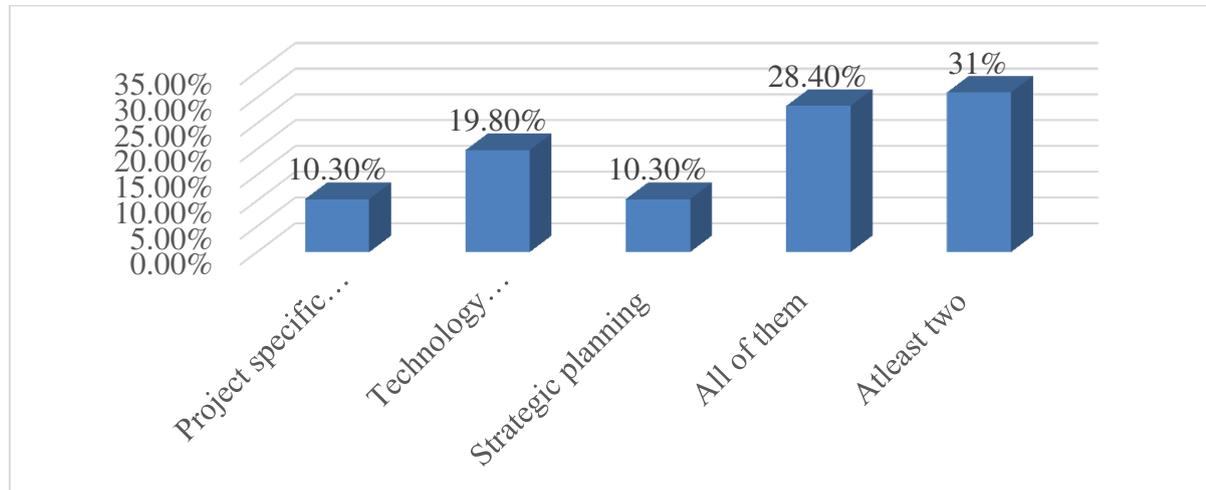
**Figure 2.4: Factors Considered While Creating and Implementing Designs**

Source: (Survey Data, 2018)

From these outcomes, the observations are supported by the claims which were made by Phyllis (2015) that project performance with regard to design does not start at approval stage and end at implementation, but it is rather an on-going process that involves a number of issues such as factors considered in creating and implementing.

### 2.7.3 Strategies in Ensuring Adequate Design Implementation

The respondents were required to state their opinions on the given set of strategies they thought were important in ensuring adequate design implementation. The strategies given were; project specific tasks identification, technology needs assessment, innovation practices and strategic planning. The results revealed 31% chose at least two strategies, 28.4% chose all of the strategies, 19.8% chose technology needs assessment while both project specific tasks identification and strategic planning were represented by 10.3% each as shown in figure 2.5 below.



**Figure 2.5: Strategies in Ensuring Adequate Design Implementation**

Source: (Survey Data, 2018)

These findings confirm reviewed literature assertions that project performance can be influenced to a larger extent by factors such as technology needs and strategic planning (Ama and David, 2016).

## 2.8 Financial Management Practices

The respondents were asked a number of questions with regard to financial management practices in their construction industry to measure the influence to projects performance. The responses obtained were analysed and the findings were presented in the sections that follow.

### 2.8.1 Responses to Financial Management Practices

The respondents were required to express their opinions to the extent they agreed to a set of factors of financial management. They were supposed to indicate strongly disagree, disagree, neutral, agree or strongly agree. The responses obtained were tabulated in inform of frequency and percentages as shown in table 2.12 below.

**Table 2.12: Responses for Factors of Financial Management Practices**

FINANCIAL MANAGEMENT PRACTICES	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Financial risk management is done in all projects we have executed	9.5	0.0	0.0	50.9	39.7
Liquidity management is usually done for projects adequately.	9.5	0.0	10.3	40.5	39.7
Budgets are prepared for all projects before execution	0.0	9.5	10.3	50.9	29.3
Owners of projects are usually late in making payments	29.3	29.3	20.7	20.7	0.0

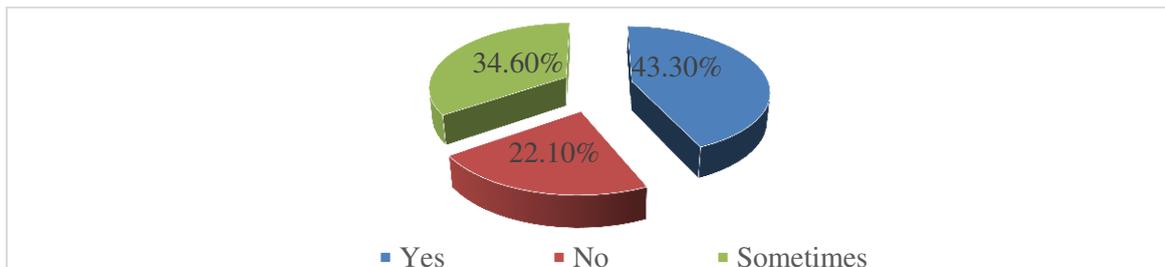
Source: (Survey Data, 2018)

From the responses obtained, a bigger percentage of respondents represented by 50.9% and 39.7% respectively agreed and strongly agreed that they undertake financial risk management, which is a positive implication in promoting project

performance. On the basis of liquidity management, 40.5% and 39.7% agreed and strongly agreed respectively. Only 20.7% indicated that project owners are usually late in making payments. From the findings, it can be observed that there are platforms of ensuring proper financial management techniques which are the foundations for project performance as maintained by Gitau (2015). Ideally, these studies are in agreement with other studies such as Oje et al. (2010), Mayie (2016), and Asinza et al. (2016) whose arguments are founded on the basis that project performance is closely affected by financial management practices.

### 2.8.3 Application of Actual Value and Earned Value Concept

The respondents were asked whether they were applying the actual value and earned value concept in controlling cost for the project in their construction company. Responses confirmed that 43.3% agreed, 34.6% of the respondents applied sometimes while 22.1% disagreed as depicted in the figure 2.6 below.



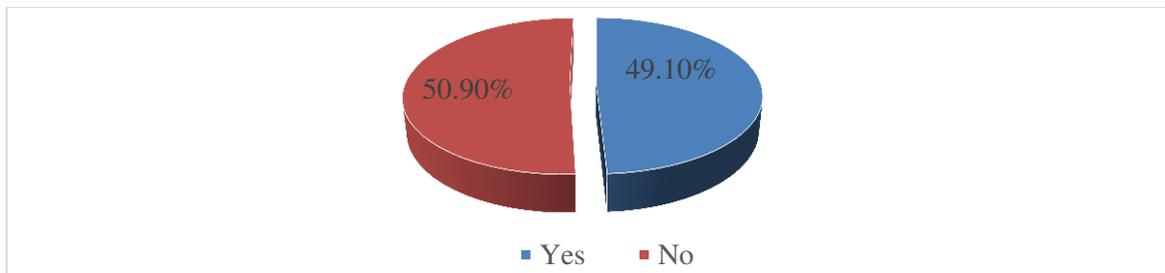
**Figure 2.6: Actual Value and Earned Value Concept**

Source: (Survey Data, 2018)

Results show that majority of contractors in the county applied actual value to earned value as a means of financial management practices. This can be said to be among the reasons behind the higher rate of project completion within the budgeted time and costs which are significant parameters of measuring project performance (Mayie, 2016).

### 2.8.4 Cost Engineer Only Responsible For Dealing With Cost Control

When asked about having a cost engineer who is only responsible for dealing with cost control in the construction company, 50.9% of the respondents said no while 49.1% said yes as shown in the figure 2.7 below.



**Figure 2.7: Cost Engineer**

Source: (Survey Data, 2018)

Although most of the contractors do not have cost engineers as revealed from above, almost a half of the contractors are trying to use the concept of cost engineers in managing their financial in undertaking projects. These results are supported by past researchers such as Oje et al. (2010) who insisted on the need to have cost engineers to help contractors manage finances well and promote project performance in constructions.

## 2.9 The Inferential statistics

The level of significance to be used for inferential statistics is 95% thus the alpha value is 0.05. Therefore, the study will conduct Shapiro Wilk Test of normality to assess if the dependent variable is normally distributed to all for inferential statistics. The results of the normality test are displayed in the table 2.13 below.

**Table 2.13: Shapiro-Wilk Test of Normality for Dependent Variable**

Dependent Variable	Test Statistic	Degree of freedom	P- Value
Project performance	0.981	116	0.101

Source: (Survey Data, 2018)

The P- value obtained was 0.101 which is more than the alpha value of 0.05 therefore confirming the normality of the variable. Thus, inferential statistics that assume normality can be conducted to yield accurate and unbiased results.

### 2.9.1 Diagnostic Test Results and Discussion

For purposes of testing whether the regression analysis conducted in this study was valid and accurate, diagnostic tests were carried out and results are presented below.

#### 2.9.1.1 Test for Multi-collinearity

The Tolerance value and the Variance Inflation Factor (VIF) tests were carried out to test for multicollinearity problem. The VIF is the inverse of the tolerance value and measures the degree of variance to which multicollinearity problem inflates the coefficients of the regression model. The independent variables show no correlation if the VIF is zero. In addition, a unit VIF measure indicates a level of relation between the predictor variables; nevertheless, this level is not sufficient enough to cause multicollinearity problems. Tolerance refers to the amount of variance exhibited by an independent variable that has not been described by other independent variables. Thus, Small tolerance values show multicollinearity problems. A 0.20 tolerance value that corresponds to a VIF of 10 is the maximum tolerable value (Takematsu et al, 2018). The table 2.14 below presents the collinearity statistics.

**Table 2.14: Results for Collinearity Statistics**

Independent Variables	Collinearity Statistics	
	Tolerance	VIF
Contractors' planning practices	.952	1.050
Compliance to industry standards	.967	1.034
Design implementation	.250	4.004
Financial management practices	.242	4.136

Source: (Survey Data, 2018)

The study findings indicate that the independent variables are not highly correlated because none of the explanatory variables has a VIF that exceeds 10 and tolerance value lower than 0.2. This implies that no adequate multi-collinearity that can make the regression unreliable and biased.

### 2.9.1.2 Test of Heteroscedasticity

The Breusch- Pagan Test method was used to test for the heteroscedasticity in the error terms. The method involves regressing the squared unstandardized residuals on the independent variables and obtaining the significant value for the regression model from the ANOVA table. The Significant value is used to test the null hypothesis; Homoscedasticity in the error term against the alternative hypothesis; Heteroscedasticity in the error term. The rule of thumb states that if significant value is greater than alpha value we accept the null hypothesis otherwise reject it.

**Table 2.15: ANOVA Table for Breusch-Pagan Test**

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	.067	4	.017	1.045	.388 <sup>b</sup>
	Residual	1.780	111	.016		
	Total	1.847	115			
a. Dependent Variable: Residuals squared						
b. Predictors: (Constant), Financial management practices, Industry Standards, Contractors' planning practises, Design implementation						

Source: (Survey Data, 2018)

Table 2.15 above indicates that the significant value of 0.388 is greater than the alpha value of 0.05 hence conclude that homoscedasticity is present in the error term. This implies that the regression results are valid, accurate and unbiased since the assumption of homoscedasticity in the error term is met.

### 2.9.2 Results of Regression Analysis

The dependent variable project performance was regressed against the independent variables; financial management practices, contractors' planning practices, design implementation and industry specific standards. The regression results obtained have been explained below.

**Table 2.16: Table for Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.824 <sup>a</sup>	.679	.667	.33368
a. Predictors: (Constant), Financial management practices, Industry Specific Standards, Contractors' planning practises, Design implementation				
b. Dependent Variable: Project performance				

Source: (Survey Data, 2018)

The table 2.16 above gives the summary statistics of the model. The correlation coefficient, R is 0.824 while the R square, adjusted R square and the error term are 0.679, 0.667 and 0.33368 respectively. The R square implies that the independent variables account for 67.9% of the changes in dependent variables *ceteris paribus*. Thus, other factors account for the 32.1% for changes in project performance.

**Table 2.17: The ANOVA Table**

Model		Sum Squares	df	Mean Square	F	Sig.
	Regression	26.148	4	6.537	58.709	.000 <sup>b</sup>
	Residual	12.359	111	.111		
	Total	38.507	115			
a. Dependent Variable: Project performance						
b. Predictors: (Constant), Financial management practices, Industry Specific Standards, Contractors' planning practises, Design implementation						

Source: (Survey Data, 2018)

The table 2.17 above helps in testing the significance of the regression model. Since the Significance value is 0.000 which is less than the alpha value of 0.05, hence concluding that the regression model is significant.

**Table 2.18: Regression Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	.793	.208		3.815	.000
	Contractors' planning practises	.012	.031	.021	.372	.002
	Industry Specific Standards	.710	.047	.830	15.178	.000
	Design implementation	.101	.054	.200	1.860	.015
	Financial management practices	0.124	.085	.160	1.466	.004

Source: (Survey Data, 2018)

From the regression coefficients at a significance level of 0.05, the study's model becomes as shown below;

$$Y = 0.793 + 0.012X_1 + 0.710X_2 + 0.101X_3 + 0.124X_4 + 0.33368$$

From table 2.18 above, the regression coefficient for contractors' planning practices is significant (Beta - 0.012, P value- .002). Therefore, contractors' planning practices positively influence project performance. In this case, if you increase contractors' planning practices by one, project performance increases by 0.012. The results are in agreement with most of the reviewed studies such as those by Raji and Firas (2011), Liviu et al. (2011), Bent (2012), Agbenyega (2014), and Karimi (2016) who established that there is a positive relationship between project performance and contractors' planning strategies.

The regression coefficient for compliance to industry standards is significant (Beta- 0.710, P value- 0.000). Therefore, compliance to industry standards positively influences project performance. If you increase compliance of industry standards by one, project performance increases by 0.710. On industry specific standards, the positive association is supporting findings in literature reviewed studies conducted by Nyambura (2015), Githenya and Ngugi (2014), Orji et al. (2016), and Atamba et al. (2016) who also supported the association.

The regression coefficient for design implementation is significant (Beta- 0.101, P value- 0.015). Therefore, design implementation positively influences project performance. If you increase design implementation by one, project performance increases by 0.101. The study has also affirmed findings in literature reviewed on design implementation as held by Ghara (2016), Kogi (2013), Mundia (2013), Phyllis (2016), and Ama and David (2016) respectively.

The regression coefficient for financial management practices is significant (Beta- 0.124, P value- 0.004). Therefore, financial management practices positively influences project performance. If you increase financial management practices by one, project performance increases by 0.124. This is in agreement with studies on project performance and financial management practices as reviewed in the literature by scholars such as Oje et al. (2010), Gitau (2015), Mayie (2016), and Asinza et al. (2016) in their studies who indicated that there is a positive association.

## CONCLUSIONS AND RECOMMENDATIONS

### 3.1 Introduction

This part presents the summary of findings, conclusions and recommendations of the study based on the specific intentions that spearheaded the overall research of evaluating how contractors' management practices on housing construction projects have contributed towards the increased cases of houses collapsing in Kisii County as a result of poor performance of the projects. Conclusions are grounded on the study revelations and analysis carried out in the preceding chapter. The recommendations have been reached with reference to the conclusions made after analysis of the data.

### 3.2 Conclusions

#### 3.2.1 Planning Strategies and Projects Performance

The results clearly indicate that planning strategies are closely linked to the housing construction projects performance. The study concludes that planning strategies played a key role in influencing the overall projects performance. In line with first objective of the research, the study concludes that it has been adequately met. The application of sound planning strategies to the housing projects will greatly decrease the cases of houses collapsing across the country. Also, the contractors are obliged to adhere to the planning strategies and ensure the following; availability of resources as planned throughout the project duration creates awareness on the methods of project planning and scheduling in housing projects and project meetings for discussions of monitoring, updating and controlling of the progress are held regularly.

#### 3.2.2 Compliance to Industry Standards and Project Performance

The study concludes that compliance to industry standards is closely associated with project performance. Moreover, with regard to the second objective of the study, various aspects of industry standards revealed negative feedback with regard to project performance. The government authorities were faulted for increased collapse of housing projects. The study results are in line with the statement of the problem clearly indicated that adherence to construction industry standards especially in Kisii county would curb the menace. The workers trainings, concrete mixing needs and extensive pre- tasking planning for safety conducted by contractor foremen were identified as key aspects of industry specific standards to be addressed adequately.

#### 3.2.3 Design Implementation and Projects Performance

Also, with regard to design implementation, it was established that it plays a vital role in housing construction performance. The study discovered a positive relationship of design implementation and project performance. The study results indicated that project design implementation and provision of quality designs by owners contributed immensely to curbing the collapse of housing projects as part of conformance to industry specific standards. The wastes around the site and climate condition around the site were critical in housing designs. In line with statement of the problem, the main strategies to ensure adequate design implementation were; projects' specific tasks identification, technology needs assessment, innovation practices and strategic planning for the housing projects. In this regard, proper design implementation would greatly curb the collapse of housing projects in Kisii County as research sought to find.

#### 3.2.4 Financial Management and Projects Performance

Financial management equally was found to be having a positive effect on the dependent variable (housing projects performance). The contractors who prepared budgets for all projects before they are executed and where cost schedules are associated with the estimated time schedules hence this was not found to reduce the rate at which the housing projects collapses. The study findings established that the actual value and earned value concept is applied in controlling the cost of a project. The research objective is achieved since financial management in line with research problem is adequately met.

### 3.3 Recommendations

#### 3.3.1 Recommendations for Improvement

The study recommends the contractors to ensure that planning strategies are adhered to in housing projects. Efficient planning practices will result to improved projects performance. The contractors should ensure time management in site preparation and planned time for construction of the project to avoid delaying the projects. Also, frequent project team meetings to discuss the monitoring, updating and controlling of the progress and creating awareness on methods of project planning and scheduling are recommended.

The study recommends that all the housing construction projects should be frequently monitored and inspected by government authorities to enhance the quality of the projects. In addition to that, it is recommended that materials for

the housing construction projects should be availed to enhance continuity of projects. The construction materials are essential for the sustainability of the housing projects. Further, overall projects safety factors and pre- task planning for safety conducted by the contractor foremen are recommended to be extensively implemented in the housing projects. The project safety factors will ensure owners are committed to constructing proper houses with high standards. The workers are recommended to be acquainted with the relevant skills to enhance productivity and proper construction of the houses.

The study recommends that proper design implementation should be put in place on the housing construction projects. Provision of quality projects designs by the owners is encouraged to curb the collapse of housing projects. Also, while creating and implementing designs for construction projects, the study highly recommends the consideration of the wastes and the climate condition around the construction sites. This will enhance a strong foundation for the construction of the houses hence improved housing construction projects performance.

The study also recommends financial management practices to be enhanced by contractors in housing construction projects. Ideally, tis should be done in all projects before they are executed. As such, it will ensure the projects do not incur financial challenges during the construction process. Fundamentally, financial management practices ensure that all resources for the projects are well utilized for the benefit of the projects.

### **3.3.2 Recommendations for Further Studies**

Based on the study's limitation, future studies are recommended to focus on large sample sizes and a wider research scope while seeking to improve the respondent's response rate as well as seek to obtain honest responses. This is because the researcher envisaged that fear of being investigated might have made respondents to give dishonest answers to some questions.

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## Figures

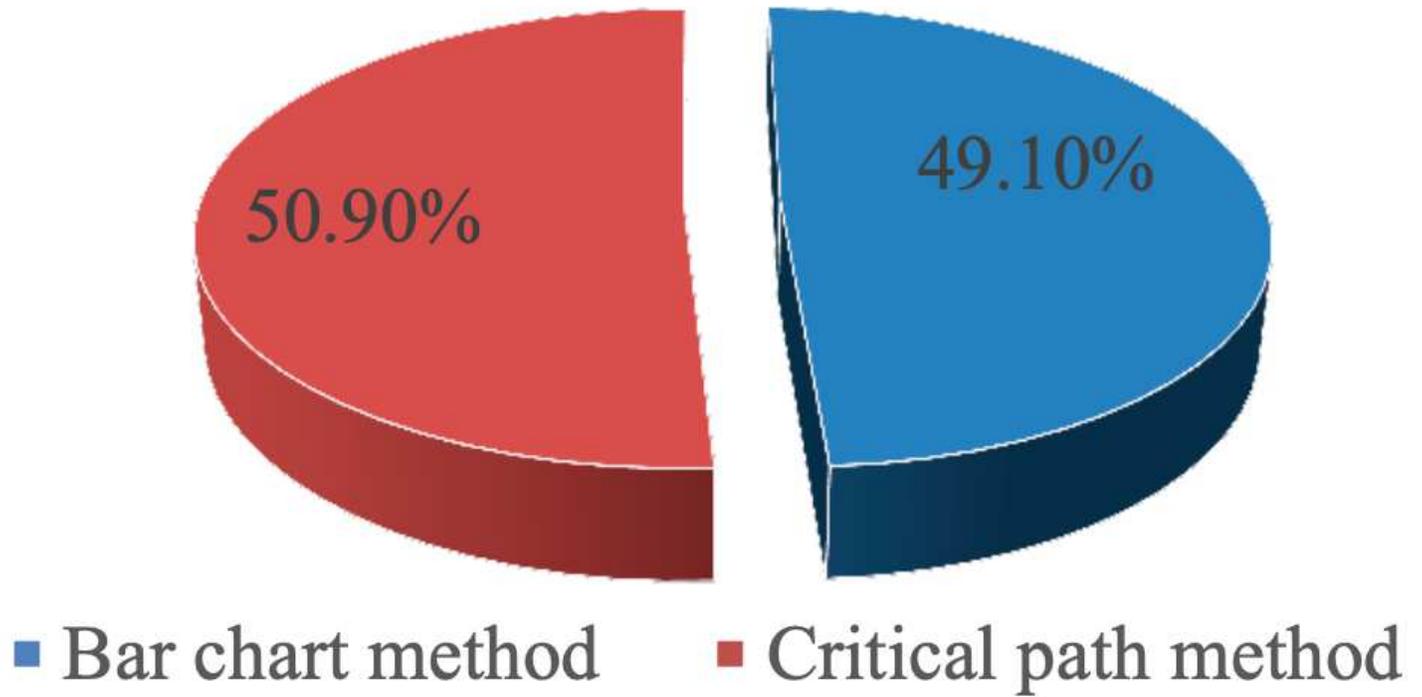


Figure 1

Project Scheduling Method Source: (Survey Data, 2018)

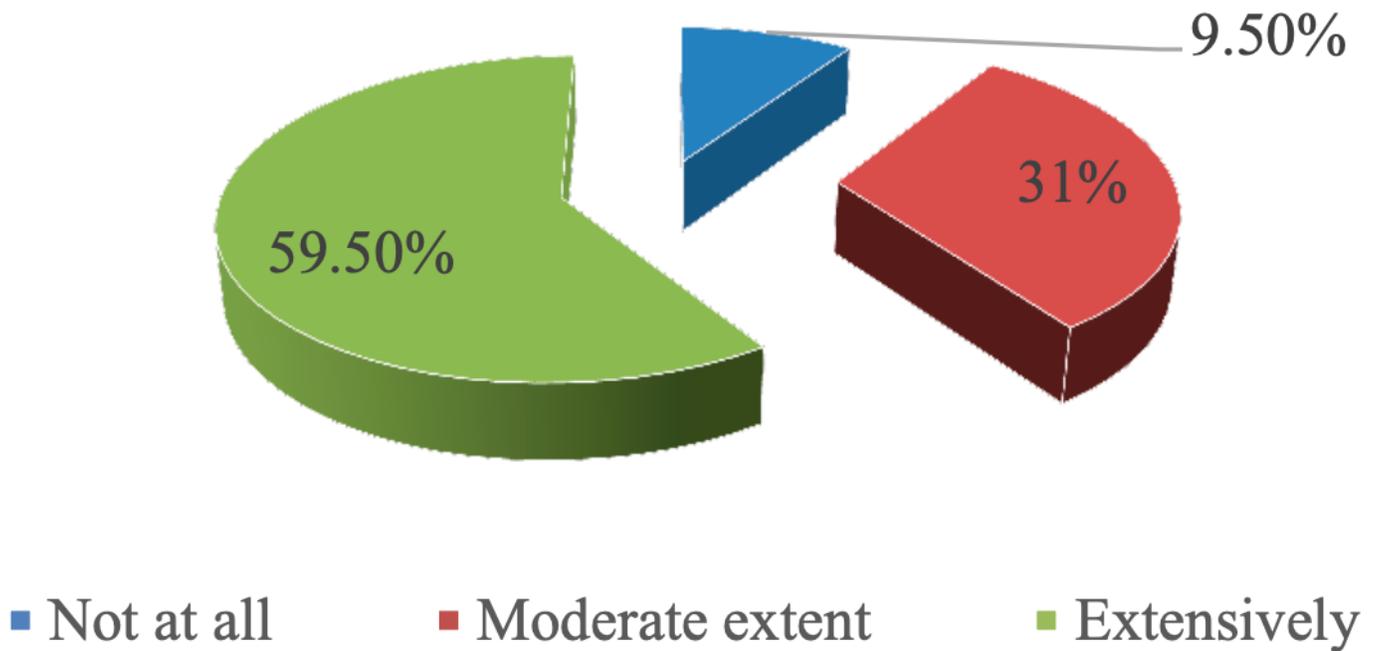
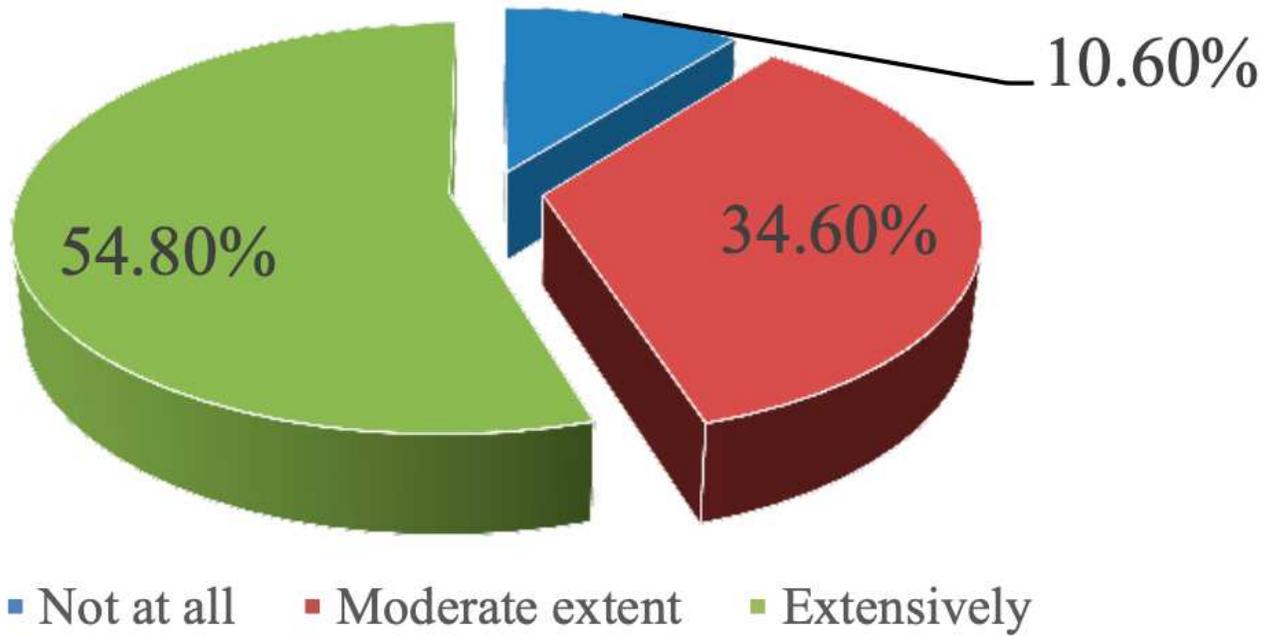


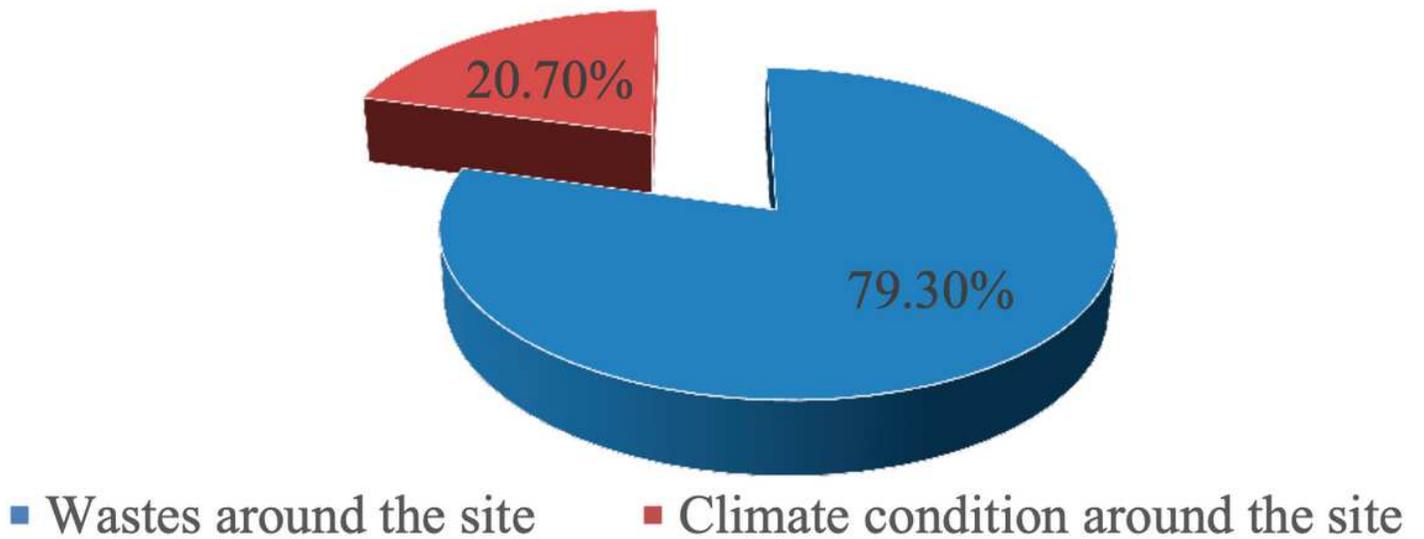
Figure 2

Overall Project Safety Factors Implementation Source: (Survey Data, 2018)



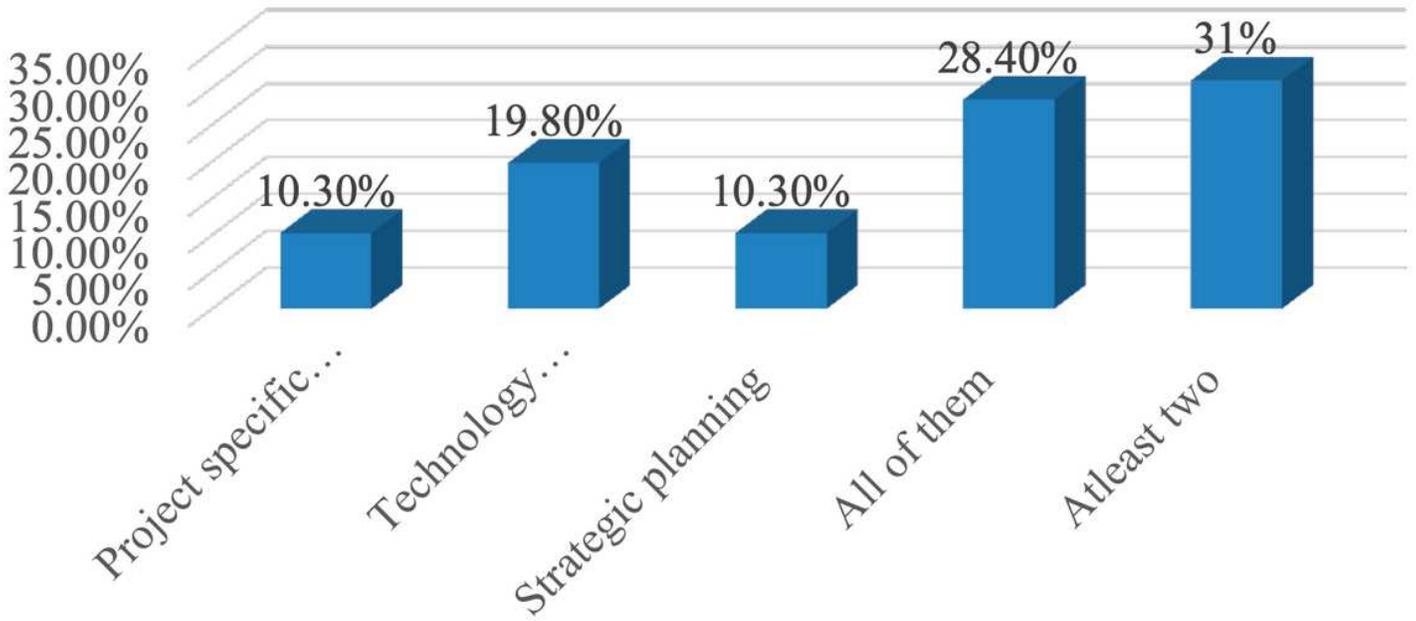
**Figure 3**

Pre- task planning For Safety Source: (Survey Data, 2018)



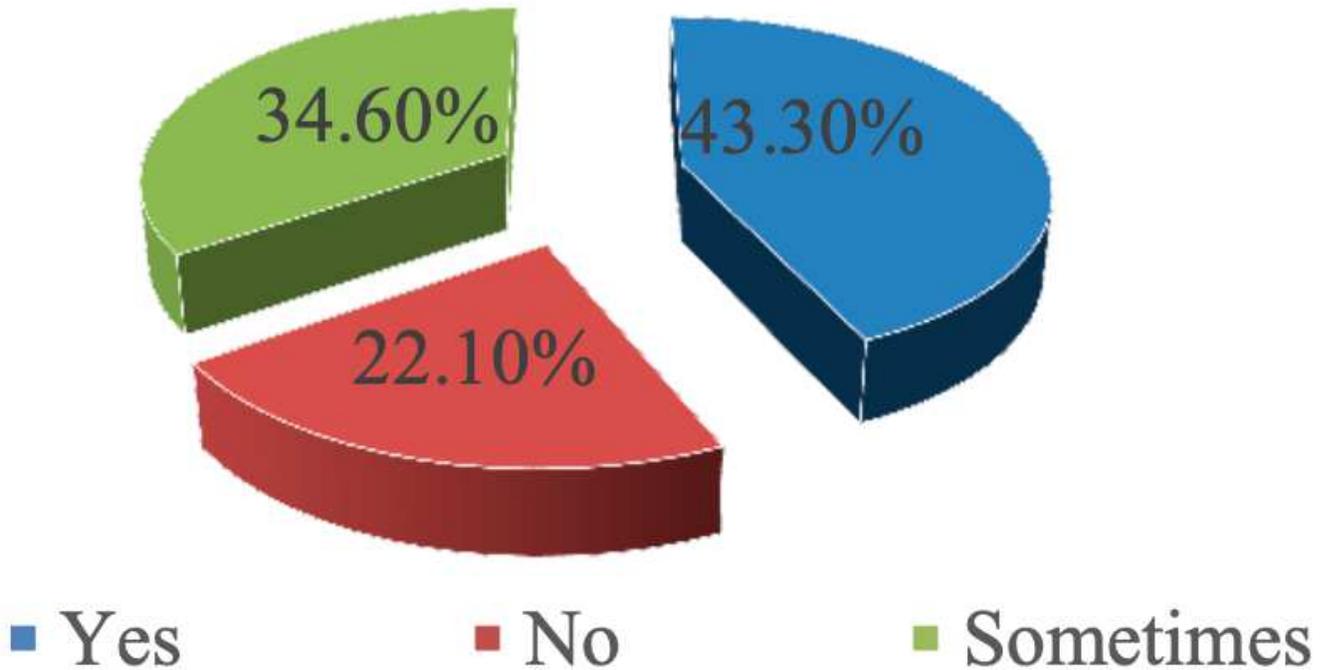
**Figure 4**

Factors Considered While Creating and Implementing Designs Source: (Survey Data, 2018)



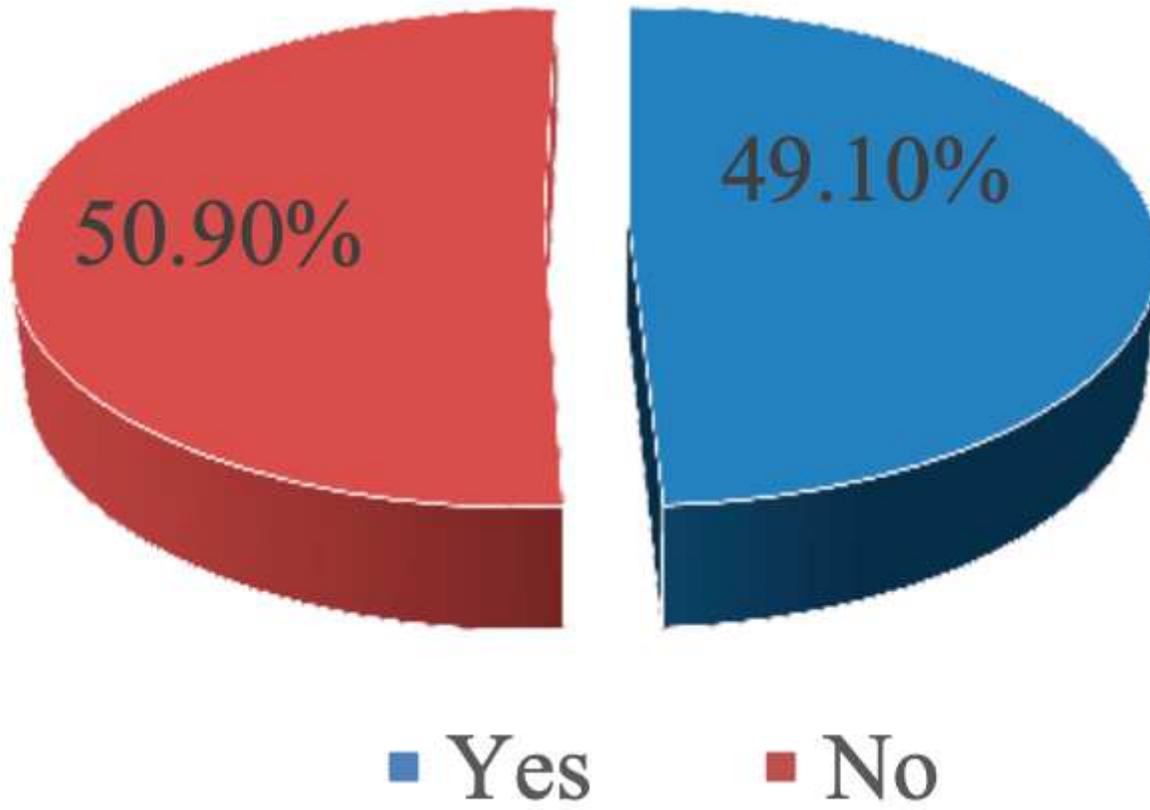
**Figure 5**

Strategies in Ensuring Adequate Design Implementation Source: (Survey Data, 2018)



**Figure 6**

Actual Value and Earned Value Concept Source: (Survey Data, 2018)



**Figure 7**

Cost Engineer Source: (Survey Data, 2018)