



JIMMA UNIVERSITY

JIMMA INSTITUTE OF TECHNOLOGY

SCHOOL OF GRADUATE STUDIES

FACULTY OF CIVIL AND ENVIRONMENTAL ENGINEERING

CONSTRUCTION ENGINEERING AND MANAGEMENT CHAIR

Study to Improve Poor Time Performance of Local Contractors. A Case of Public
Construction Projects in Mizan-Aman City.

This MSc. thesis submitted to School of Graduate Studies, Jimma University, Jimma Institute of
Technology, Faculty of Civil and Environmental Engineering in Partial Fulfillment of the
Requirements for Degree Master of Science in Construction Engineering and Management

By

SEID KASSA HASSEN

January, 2022

Jimma, Ethiopia

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January, 2022
Jimma, Ethiopia

DECLARATION

I declare that this MSc. thesis entitled “Study to Improve Poor Time Performance of Local Contractors. A Case of Public Construction Projects in Mizan-Aman City.” is my original work and has not been submitted as a requirement for award of any degree in Jimma University or elsewhere.

BY

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ABSTRACT

Projects such as buildings, roads, dams, and railways are the top vital construction projects in developing countries like Ethiopia. For our country growth in national income, those projects play a crucial role and also, they are major drivers for the economic development of our country. Many projects in the country, regional, zonal, woreda, city and kebele level involve local contractors at different public construction projects. However, projects executed by the local contractors face critical problems with respect to time and also the local contractors need performance improvement to achieve their project goals with quality, cost and time. This study attempts to assess on the causes of local contractor's poor time performance in public construction projects, to identify the impacts on the projects, stakeholders of the projects & the construction industries and developing strategic techniques to improve local contractor time performance during construction a case in Mizan-Aman city public construction projects. To receive data from different construction experts and to achieve this research objectives, the research conducts desk studies and a questionnaire survey with a total of 48 possible factors, 12 possible impacts and 16 possible strategic time performance improvement techniques are listed in the questionnaire survey and this questionnaire survey was conducted with different stakeholders from client, consultants and contractors. Final results of the desk study show all the projects handled by the local contractors used D.B.B. (design bid build) delivery systems and unit rate contract types and they suffer delays and the time needed to complete the projects required more than 41 % of the original contract time. And the results from the questionnaire show, rise in costs or prices of materials (price inflation), shortage of materials, changes of design by owner or his agent during work and poor project management system by contractors as the top ranked factors causing poor time performance by local contractors. The impacts of poor time performance by local contractors are; cost overruns on the projects, additional cost to contractors depending on time delayed, the end users of project loss its benefit from the projects and expose employer for additional cost & loss of its investment money return from projects & also it may create negative attitudes towards the industry by eroding mutual trust and respect among the parties. and some of the techniques that used to improve local contractor's poor time performance are; use appropriate construction methods by contractors, hire skilled workers by all of the stakeholders to achieve good progress and proper planning & scheduling of construction projects by contractors. The local contractors should have enough cash & materials availability before the project implementation work starts and it should have good project management system and also it should have communicated and coordinate smoothly with other parties in the project.

Key Words: Local Contractors, Performance Improvement Methods or techniques, Public Construction Projects and Poor Time Performance.

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ACRONYMS

BC	Building Contractors
DBB	Design Bid Build
EBDA	Ethiopian Building and Design Authority
ERA	Ethiopian Road Authority
GC	General Contractors
ILO	International Labor Organization
LC	Local Contractors
MOSHE	Ministry of Science and Higher Education
MoWUD	Ministry of Works and Urban Development
OECD	Organization for Economic Co-operation and Development
PCP	Public Construction Projects
PMS	Project Management System
RC	Road Contractors
RRAs	Rural Roads Agencies
RSDP	Road Sector Development Program
SMEs	Small and Medium-Sized Enterprises
SNNPR	South Nation's Nationalist and People's Region
SPSS	Statistical Package for Social Science

CHAPTER ONE

INTRODUCTION

1.1 Background

In the world construction industry, the main intention of successful project management is performing the project activities within estimated time, estimated budget, at the desired achievement/ technology level and other objectives (Harold Kerzner, 2003).

Both in developing and developed countries construction industries are key origin of job or employments. Its estimations for 7.6% of the total global job or employment equal to about 230 million people. Construction generally commits 5% to 9% to GDP in developing countries and contributes backward and forward connection to the rest of the economy (ILO, 2020). The construction industry remarkably adds to economic success and communal growth of nations. The Ghana construction industry (sector) is the second biggest benefactors to Gross Domestic Product (GDP) with 13.7%, just beyond crops (Accra, Ghana, 2018). Other studies have accepted that notable association exist in one method or another between the amount of extension or growth of the construction sectors (industry) & the amount of macroeconomic widening or growth of developing countries (Anaman K.A. & et.al, 2007). Other industrial parts of the economy depend on the products of the construction industry to make other goods and services. For example, the construction of roads, infrastructure, and water supply and electricity lines can increase the manufacture of goods and services while generating work for the mankind's. Developing country such as Ghana where the number of workless people is higher. So, this sector or construction industry is the major source of work for the jobless and/or untrained (Darko, E.& et.al., 2016).

In Ethiopia, the construction sectors are the biggest receiver or consumer of administrative spreadsheet in terms of government development program. Accordingly, public construction projects devour an average annual rate of about 60% of the government's capital budget (Ministry of Works and Urban Development (MoWUD), 2006). Construction slow down are occurring in each phase of a construction projects & it is familiar problems in Ethiopian construction projects. In Ethiopia context only 8.25% projects have been completed by the agreed or originally specified completion time. The outstanding 91.75% poor or bad time performance or delayed or 352% of the specified contractual time (Werku Koshe, K. N. Jha, 2016).

Mini and medium-sized ventures are crucial players in the construction industry. When SMEs in the construction industry (hereafter “small-scale contractors”) enter the market, they often face numerous obstacles comparing or competing with existing big contractors. The objections and struggling that local contractor face have been totally homogeneous across countries (ILO, 2020).

Since, construction project is odd or unique in nature, and every construction project contrast or differs from another project in terms of extent or scope, time, aim or purposes, doubt or uncertainty, complication, time frame and some other evaluation. Hence, construction projects experience various discretion such as material, organizational, professional and project subset or work package constraints (Edum-fotwe et. al, 2008). Because of these discretion or constraints, the industry is consistently or constantly facing difficulty of poor or bad time performance or overrun of time which has matured or become a frequent or common caution in the world wide (Le-Hoai et. al, 2013). Incident of time overrun has afforded injurious effects of the development plans. It causes many adverse effects such as claim or lawsuits between client & contractors, cost increments, fall of capacity and income, and contract close out or termination (Tumi et. al, 2009).

Poor time performance by local contractors in many projects are contemplate amongst the most usual complication causing a lot of negative consequence on the project and its engaging parties. Along with delayed time performance, the regularly faced results are project abortion, depletion of income or profit margin, and collapse trust of people in public construction projects, etc. When delays do occur, they are either quickened or have their time duration increased far away the planed completion time. These are not beyond some expense result. poor time performance also gives increases to disturbance of work and losing productivity, delayed execution of the project rises time associated expenses, claims arise from third party, carelessness or abandonment and stopping of contract (Abdul-Rahman, 2006).

In Ethiopia, many of those contractors are latest beginner to construction industry and face various limitations such as insufficiency of funds, equipment, Machinery and human resources. The cheap cost provide for construction is also one of the reasons for undesirable achievement of the contractors. Moreover, Rural Roads Agencies (RRAs) and DMOs have limited capacity both from the human element and technical perspectives to play a big role in the process of improving the sector. To inspire entry of those contractors into that sector, the government introduced the minimum capital requirement and as result 1,020 contractors have been given licenses since 1993 (ERA, 2014).

1.2 Statement of the Problem

Poor time performance are major problems faced by today's construction industry (Aftab Hameed Memon and et. Al., 2012). In developing countries performance problems are even bigger, compounded by lack of adequate resources and institutions to address them (Gyandu-Asiedu, 2009). In india, it is reported that 40% of construction projects face performance problems of time overruns (Iyer, K. and Jha, K. 2006).

As the construction sector is developed, construction projects are also enlarging in size and complication. In this term, poor time performance has still remained as project managers' task. Identifying the principal causes of poor time performance in public construction is very hard and often begins disagreement about burden for delay (Samad M E Sepasgozar et al., 2015).

In our country's construction practice, it is very rare that construction projects are completed on the time specified or agreed contract time upon. Ismeal in 1996 studies reported that delays are endemic to construction projects in Ethiopian. His study indicates, most of the projects experience delay from 100% to 460% of the original contract time. The study shows how important it is to investigate and study on delay causing factors in construction projects of Ethiopia and find solutions to reduce the effect (Ismael, 1996).

Construction freezing are occurring in each phase of a construction projects & it is familiar problems in Ethiopian construction projects. In Ethiopia context only 8.25% projects have been completed on the targeted completion time. Around 91.75% of projects faced delays which mean 352% of the agreed contractual time. This means our countries construction sectors are at a higher risk (Werku Koshe, K. N. Jha., 2016).

According to Shewaferahu Tilhun, in his study on delay on educational building projects found that no one of the case study projects are completed within the estimated contract time and consultant & contractor caused delay factors are the two most responsible factors for most delays. The total delay ranges from 200% to 329% of the estimated contract times excluding the time needed to accomplished the project (Shewaferahu T., 2016).

Local contractors who were available in the previous fewer years were technically incapable or it is constrained by shortage of skilled man power, shortage of capital & equipment and insufficient

experience in managing construction projects. To full fill our countries needs or to develop our countries construction industry there must be develop strategies to improve local contractor's performance both technically and financially (ERA, 2014).

According to ERA 16 years' assessment plans introduced that a delay in time performance on those projects leads to delay in benefit of our country's economy. There are numerous bases for suffering delay on project which are handled by local contractors. The time overruns or poor time performance of those contractors has a negative impact on development and growth as regards construction sectors. And also disturbs the productive & systematic use of resources by the owners (ERA, 2014).

Therefore, this study is improved poor time performance of local contractors. a case of public construction projects in Mizan-Aman city.

1.3 Research Questions

1. What are the major causes of local contractors' poor time performance on public construction projects?
2. What are the negative impacts of local contractor poor time performance on public construction projects, the stakeholders & the construction industry?
3. Which Strategic techniques or methods are used to improve local contractors' time performance in public construction projects?

1.4 Objectives

1.4.1 General Objective

The general objective of this study is asses on the causes & impacts of local contractor's poor time performance and developing strategic techniques to improve local contractor's time performance. A case in Mizan-Aman city public construction projects.

1.4.2 Specific Objectives

- To assess the causes of local contractor's poor time performance a case in Mizan-Aman city public construction projects.

- To identify the impacts of local contractor's poor time performance on the project, the stakeholders and the construction industries a case in Mizan-Aman city public construction projects.
- To develop strategic techniques to improve local contractor time performance a case in Mizan-Aman city public construction projects.

1.5 Scope of the Study

This study limited to public construction project (particularly in building and road projects) in south western part of Ethiopia in the administration of SNNPR construction office, Banch-Shako Zone Construction Office, EBDA, Mizan-Tepi University and ERA. And also, the scope of this study is limit on improving poor time performance of local contractors. a case of public construction projects in Mizan-Aman city.

1.6 Significance of the Study

This study is able to contribute benefits for project stakeholders and Ethiopia construction industries in various ways like for local contractors in the study area may know the major causes and impacts of local contractor's poor time performance and also knows the local contractor's time performance improvement techniques those all makes the local contractors competitive. The significance of establishing the issues related to local contractor's time performance was to provide a greater insight and understanding on the causes of poor time performance particularly among the main project players: contractors, client and consultants. This is achieved by applying theoretical concepts that discussed in many literatures into the practical one or in real projects. This study guide effort to improve time performance of local contractors & the construction industry major players. Therefore, these studies encourage the practitioner to focus on poor time performance problem that might have existed in their present or future projects & their performance improvement techniques. Other than that, this study is provide a better ways and methods in delivering projects by minimizing the main causes on local contractor's poor time performance and by using performance improvement strategic techniques. Beneficiaries on the study are primarily the client (SNNPR Construction Office, Banch-Shako zone Construction Office, Mizan-Tepi University, ERA, EBDA and end users); enable them to enhance achievement of the project objectives with in specified quality and time. The second beneficiaries are

locally available contractors and consultant working on public construction projects in Mizan-Aman city & it helps them to work on their weakness to improve project time constraints to a required level.

CHAPTER TWO

LITERATURE REVIEW

2.1 Performance

2.1.1 Definition

Performance defines as a standard in which an action (operation) fulfills primary measures (performance objectives) in order to meet the demand of customers (Salaheldin, 2009).

Contractual performance commonly referred as the carry out of works according to conditions described in an agreement. Performance precondition or requirements may encompass progressing works or tasks according to programed, completing work by the completion date, satisfying quality, health, safety & environmental & other standards, reporting required information, following instruction & paying suppliers(<https://www.designngbuidings.co.uk/w/index.php?title=performance%20in%20the%20construction%20industry&action=history>, 2021).

Performance has described as a valued, productive output of system in the form of goods (commodities) & services (works) with units of performance describing the actual fulfillment of goods(commodities) & services(works) relating to perform production, quality and or time. There are three level of performance Organizational, process & individual (Swanson, 1995).

Time performance defined as meeting the duration baseline in the initial planning process of the project. Time overruns occurs when there is an extension of time beyond planned completion dates traceable to the major stakeholders (Kaming et al., 1997).

2.1.2 Measurement and Performance Indicators

Performance measurement defined as a systematic collecting & describing (reporting) of details against the inputs, productivity (efficiency) & capability (effectiveness) of construction projects (Takim, 2003). Effectiveness is the extent in which goals are achieved, making the right decisions and successfully implementing them & doing the right things (Takim, 2003). Efficiency is using minimal or small resources to generate the desired volume of output, using resources wisely & in cost-effective way, operating in such a way that resources are not wasted and do the honorable thing at right time (Takim, 2003).

Performance measurement is the process of determining how successful organization or individual have been in attaining their objectives (Sinclair, D. and Zairi, M. 1995). It is evident that performance measurement is the comparison between the desired and the actual performances and its purpose is to provide timely and accurate feedback on the efficiency and effectiveness of operations and to focus attention on continuous improvement (Amaratunga and Baldry, 2002).

Performance measurement is a continuing activity of ascertaining how well, or how poorly, a government program is being provided. It involves the continuous collection of data on progress made towards achieving the program's Pre-established objectives (OECD, 2014). This definition of performance measurement will be adopted for this study.

Key performance indicators can provide a method for measuring performance. It can be able to: monitor costs and time, track progress, impacts on the environment, assess client satisfaction, identify strength and weakness, compare performance across and between projects and assess specific areas of the project such as sustainability, safety & waste management and labor productivity (<https://www.designnguidings.co.uk/w/index.php?title=performance%20in%20the%20construction%20industry&action=history>, 2021).

Key performance indicator's is very important in order to deliver value to stakeholders. So, organizations must be sure that they have the right processes and capabilities in place. It includes factors such as quality, cost, time, health and safety, business performance it enables them to measure of current project performance and to achieve a significant performance improvement of future project (Saleh, A. 2011).

2.1.3 Time Over-run

“Time overrun is defined as the extension of time beyond planned completion date specified in contract or beyond the date that parties agreed upon for delivery of project” (T. Subramani et al Int., 2014). Also defined as “the extension of time beyond planned completion dates traceable to the contractors” (T. Subramani et al Int., 2014). “Defined the time overruns as the difference between the actual completion time and the estimated completion time” (Choudhry, 2004 and Chan, 2001). “Time overrun is defined as the time lapse between the agreed estimation or completion date and the actual date of completion” (Elinwa and Joshua, 2001).

2.1.4 Time Performance Management

Project management (P.M) explains as implementation of skills, tools, knowledge, and techniques to ensure project is completed on time, within cost & fulfills the quality standard (George T., 2012).

Construction sites are generally complex because of extensive application of sophisticated plant, equipment, modern methods of construction, multidisciplinary and multi tasked aspects of its project workforce (Evelyn Ai Lin Teo, et.al, 2004).

Construction site time management is defined as centralized of schedule or time planning, organizing and controlling the fieldwork or the construction sites to meet the goals of schedule, cost & quality estimation (Ritz, 1994).

2.1.5 Poor Time Performance

Delayed construction projects time performance refers to something happening at a later time performance than the planned time expected or specified on a contract or the later time beyond the specified time(dates) that the parties (or stakeholders) agreed for delivering projects (Pickavance K. 2005). It also defined as slowing down (de-escalating) of work progress or flow without break off construction totally & that leads to time overrun either above the agreed contract time or above the date that the parties (or stakeholders) agreed for delivering projects (Lo, Fung & Tung, 2006).

Poor time performance can be divided into 4 categories as follows non-excusable poor time performance, excusable non compensable poor time performance, excusable compensable poor time performance and concurrent poor time performance. Non-excusable poor time performances are delays, which a contractor either causes or accept the possibility (risk) for. Excusable non-compensable poor time performance is delays caused by factors that are not foreseeable, beyond the contractor's reasonable control and not attributable to the contractor's fault or negligence. Compensable excusable poor time performance these are compensable delays are excusable delays, suspensions, or interruptions to all or part of a work caused by an act or failure (nonsuccess) to act by the owner resulting from owner's breach of an obligation, stated or implied, in the contract. Concurrent poor time performance happens when both Clients (owners) & contractor are liable for the delayed time performance (Syed, Azhar, Castillo & Kappagantula, 2002).

2.2 Delay Types

Most importantly, four major categories of delays are shown bellows;

1. Critical or Non-Critical.
2. Excusable or Non-Excusable,
3. Compensable or Non-Compensable and
4. Concurrent or Non-Concurrent (Trauner & et. al. 2009)

2.2.1 Critical or Non-Critical Delays

Poor time performance that has impacts on task final touch or in a few instances a milestone (climax) date is accepted as essential delays and delays that do not have an effect on the mission final touch or a milestones date are accepted as noncritical delays. If those activities are hold up (delayed), the challenge achievement day or a milestone later may be delayed. The figuring out which activities certainly manage the entire final touch date relies up on the following:

1. The task itself
2. The contractor`s plan and schedule (particularly the critical path)
3. The requirement of the contract series
4. The bodily constraint of ventures, i.e., the way to construct the task from perspective (Dinakar, 2014)

2.2.2 Excusable or Non-Excusable Delays

Non-excusable poor time performance are occasions which obtained inside the contractors manipulate or which may be foreseeable. Those are few examples of non-excusable delays:

- Overdue overall performance on subcontractors.
- Premature overall performance via way of means of suppliers.
- Defective workmanship with the aid of using the contractor and subcontractors.
- Challenge precise exertions strike because of both the contractors' unwillingness to fulfill with hard work consultant or with aid of using unfair hard work practices. (Ahmed, 2017)

Excusable poor time performance are occurrences over which neither the clients (owner) or proprietor nor the contractor have any control, e.g., extreme weather conditions, Force majeure or acts of God and other unforeseen future events. (Srdić & Šelih, 2015)

2.2.3 Compensable or Non-Compensable Delays

A compensable put off is one in which a contractor is entitled to monetary recuperation with inside the shape of direct and oblique time associated expenses springing up from an agency chance event (Kane & Caletka, 2008).

2.2.4 Concurrent or Non-Concurrent Parallel Delays

Concurrent or parallel poor time performance arise while there are or extra impartial delays at some stage in the identical time period. Concurrent poor time performance is widespread while one is corporation chance occasion & the alternative a contractor danger occasion, the results of that are felt on identical time. While or extra postpone occasions get up at different times, however the consequence of mare felt (in entire or in part) on equal time, that is extra effectively termed ‘concurrent effect’ of sequential put off activities. (Kane *et. Al.*, 2008).

2.3 Causes of Poor Time Performance

The principal reasons of behind schedule time overall performance in Saudi Arabia public construction projects are the shortage of certified and skilled personnel (Al-Kharashi and Skitmore, 2009). According to Aynur Kazaz and et. Al. “design and material changes” was determined as the most significant factor, followed by “delay of payments” and “cash flow problems”. “Contractor’s financial problems” and “poor labor productivity” were subsequent factors in the general ranking (Aynur Kazaz and et. Al., 2012). On his study the top ten causes of time extensions are, design and material changes, delay of payments, cash flow problems, contractor’s financial problems, poor labor productivity, Estimation problems, lack of feasibility studies, construction defects, workers unbalanced numbers & material price fluctuations (Aynur Kazaz and et. Al., 2012).

There are ten maximum critical reasons of behind schedule time performance in Malaysian construction sites or projects those are. identified in his study, inadequate contractor experience, contractor’s poor site management, contractor’s improper planning, shortage in material, inadequate client’s finance and

payments for completed work, equipment availability and failure, problems with subcontractors, labor supply, lack of communication between parties, and Mistakes during the construction stage (Sambasivan and Soon, 2007).

A survey was conducted on different kinds of construction projects time appearance or performance in Saudi Arabia to determine the major causes of bad time performance & their significance according to any of the project members or participants, i.e., the consultant, developer & contractor. The field survey runs or conducted included 19 consultants, 15 developers and 23 contractors. During the research 73 causes of delay are identified. 56% of consultants & 76% of contractors specified that average of time exceed is between 10% & 30% of initial or original duration. The Survey concluded about 70% of projects accomplished time overrun & found that about 45 projects from 76 projects are faced delayed (Assaf and Al-hejji, 2006). In Akure construction sites or projects main reason of behind schedule time performance is. clients' financial difficulties, inadequate contractors' experience and Poor site management & supervision (Alade, K. T., et al., 2016).

In Ghana construction sites or project, by using the relative importance formula that the study lists the cause of delays from all three parties namely owner, contractor and consultants. According to this study the top 10 factors causing bad time performance by contractors in construction projects are: delays in acknowledging or honoring certificates, complication in gaining bank credit, underrate construction costs, underestimation of project complexity, poor or bad supervision, miscarrying time factor accomplishment of projects by contractors, materials shortages, bad professional management, poor site management and growing materials costs. In this study, 32 factors are categorized in nine groups. The major influential factor which is financing group results shows causing delay scheduling & controlling were considered as second most important factor and so on (Frank D. K. Fugar-et.al, 2010).

According to Al-Najjar M. the top ten factors which cause time overruns according to contractors, consultants and owners views are, According to contractors view strikes Israeli the following ten factors are ranked from top to bottom attacks and border closures, lack of materials in markets, shortage of construction materials at project site, material delivery delay on site, cash or liquid assets shortage during construction, poor economic conditions (currency, inflation rate, etc.), bad site management habits, equipment shortage at construction site, tool & equipment's shortage on site and clients delay in releasing the contractor financial payments(Al-Najjar M., 2008).

According to Pourrostan, T. and Ismail, A. on his study an upper ten major causes of time overruns in Iranian construction sites or projects from consultant and contractor point of views are, client delay progress payment to contractors, client change orders during construction, bad site management, client slows decision making process, contractors financial difficulties, design documents delays by clients during reviewing & approving time, problems with subcontractors, contractors ineffective planning & scheduling of projects, variations and mistakes in design documents, & bad weather conditions (Pourrostan, T. and et. Al., 2012).

This study shows major 10 factors which may cause poor time performance form the questionnaire survey and the case studies. Rahel Kassaye 2016 study shows the major 10 factors which may cause bad time performance by local contractors in the road construction industries of Ethiopia is as follows; inadequate planning & scheduling, poor project management system, right of way problem, poor or bad site management & supervision habits, lack of equipment efficiency, insufficient Numbers of equipment & labor, poor resource management, cash flow & financial difficulties faced by contractors, mistakes & errors in design and unrealistic contract duration & requirements/Inaccurate time estimate (Rahel Kassaye, 2016).

Many research were performed in different nations to discover the factors affecting time performance in construction sites or projects identified that as shown: design changes/change order, ineffective scheduling & planning of project, delay payment progress, poor site management & supervision, shortage of labor & contractors financial difficulties, design changes by owner or agent during construction, late delivery of materials, unreliable subcontractors, unqualified / inexperienced workers, delay in performing inspection & testing, poor communication and coordination, poor site management, change orders, site delivery delay, design documents approval delay, unforeseen ground condition, slower decision making, and client-initiated variation & necessary variations of works were found as the main critical factors responsible for this time overrun (Aftab, 2011).

literatures in the above identifies different possible local contractors poor time performance causing factors are summarized below.

- Poor site management by contractors
- Client financial difficulties or delay on progress payments
- Design change or change order
- Contractors improper planning and improper site management
- Rise cost of materials

- Inadequate contractors experience
- Ineffective planning & scheduling of project
- Mistakes during construction
- Insufficient Numbers of equipment and labor

2.4 Impacts of Poor Time Performance

According to Pourrostam, T. and Ismail, A. on his study the uppermost 6 major result of delay in Iranian construction projects from consultant and contractor point of views were, cost overrun of the project, time overrun of the projects, disputes between parties, total abandonment, arbitration, and litigation (Pourrostam, T. and et. Al., 2012).

According to Rahel kassaye study she is found that local contractors' performance have a great impact on the construction industry in such a way :(Rahel Kassaye, 2016).

- ✓ Their poor performance will discourage investment on road construction projects by government,
- ✓ Eroding mutual trust and respect among the parties, and
- ✓ It creates negative attitude towards public authority

According to Kikwasi, G.J. 2012 study the causes & impacts of delayed time performance and disruptions in construction projects in Tanzania shows the main impacts of poor time performance on the construction Projects are as show's cost overrun of the project, time overrun of the project, idling resources negative social impact and disputes (Kikwasi, G.J. 2012).

According to Ramananda Pandit et. Al. 2017 studies there are six main effects of delayed time performance by contractors in construction project are as follows: time overruns of the project, litigation, cost overrun of the projects, dispute, total abandonment and arbitration. As results of analysis shown cost overrun of the project and time overrun of the project are the two most common effects of delayed time performance in construction project (Ramananda Pandit et. Al., 2017).

literatures in the above identifies different possible local contractors poor time performance impacts are summarized below.

- Time overruns of the project
- Idling resources and disputes
- Eroding mutual trust and respect among the parties

-
- It creates negative attitude towards public authority
 - Dispute between parties
 - Arbitration
 - Total abandonment
 - Litigation.
 - Cost overruns of the projects

2.5 Strategic Techniques to Improve Local Contractor Time Performance

Behind schedule overall time performance in construction projects are experienced today with various known and/or unknown factors and will continue to be experienced in future periods. Therefore, it is necessary to forecast & analyze the causes of the delays carefully or correctly becoming to take safeguarded (precaution) & to manage delays. An investigation on the causes & effects of bad time performance for local & small-scale projects is essential as it gives a positive (productive) contribution to national development of the construction industry. The fact that shows time management is not done properly in the provinces like Edire, where the construction activities are progressing rapidly, will affect the investments of the sector negatively. This will help to minimize the time & cost overruns of the projects, especially by taking the necessary precautions at the first stage of the project and by preparing the project schedule plans. Thus, it may be possible to get rid of time and cost overruns (Dincer Aydin and Esma Mihlayanlar, 2018).

According to Diya R. and S. Ramya 2015 delayed time performance by contractors can be decreased by correct & précised initial (primary) cost estimates, appropriate project planning & scheduling, effective (valid) strategic planning, site management & supervision, and frequent (periodic) progress meeting (Divya R. and S.Ramya, 2015).

The provision of technical and management training is essential to improve the capabilities of local contractors. However, the contractors need to stay competitive by regularly upgrading the skill levels of their employees and work actively to remain in the construction market (International Labor Organization, 2019).

According to Aftab H. et. Al. study showed that top 5 effective (successful) techniques for bettering or improving contractors time performance are; proper planning work, dedicated or committed leadership & management, tight control (close monitoring), send understandable & complete

message to worker to assure (provide) successful communication & Hire (employ) skilled employee to attain good progress, prevent poor or bad aspects of work, more amendment & double handling (Aftab H. et. Al., 2014).

According to Rahman et. Al. study showed that the top listed mitigation measures are; Proper planning works, committed (dedicated) leadership & management, send understandable & absolute message to worker to assure successful communication, employ skilled employee to attain good progress, escape bad quality work, more amendment & double handling, close monitoring, training and development of all participant to support delivery process, targeted on the project quality, cost & delivery, Use new construction technologies (IBS-Industrialize Building System), adoption of tools and techniques i.e.: value management, lean thinking, total quality management, provide knowledge/training to unskilled workers based on their scope of work and Fully utilize the construction team (Rahman et. Al., 2012).

To achieve construction projects successfully, one of the conditions is that the projects must be completed within the specified time periods or contract duration. Numerous researchers have suggested various improvement methods to overcome the issues of time performance in the construction projects. To improve the time performance of the contractors to accomplish the project within estimated time they must take appropriate action.

Improvement methods are necessary actions to minimize losses are.

- ✓ Proper planning &
- ✓ Appropriate payment from the client to contractors is the essential performance improvement measures or techniques to avoid project time overrun (Tumi et. al., 2009).

Besides that, (Gunduz 2013) advice that the projects time overrun can be minimized when his reasons are clearly recognized or identified. Also, those contractors should not be rewarded any project which have lacked insufficient expertise. Further, the contractors must highly concentrate to produce successful planning & scheduling. (Abdul Rahman et. al., 2006) recognized the improvement techniques or methods to mitigate & also gets back or recover project time overrun. The authors mentioned that the improvement methods depend on the type of the problems that causes the delayed time performance of the project. It is also recommended that the productivity can be increased by working overtime hours or work by shifts (Abdul Rahman et. al., 2006).

In addition, well organized site meetings b/n whole functional body or groups are supportive in understanding the construction difficulty or problems at premature stage & the management can propose a change in construction techniques (methods) or use different technology to improve the time performance.

According to Aftab Hameed Memon and et. Al. the construction projects time overrun issue is a worldwide phenomenon which occurs almost in every project. Aftab's research paper studies about the techniques or methods to improving contractors' time performance in construction projects. This Study was accomplished through questionnaire survey around 89 construction specialists had participated. The collected questionnaire's survey data was analyzed by using SPSS V17 software's. His Analysis result shows that the top 5 effective methods or techniques for improving contractors' poor or bad time performance are as follows;

- ✓ Proper planning work,
- ✓ Committed(dedicated) leadership & management,
- ✓ Close monitoring,
- ✓ Send understandable & absolute message to worker to assure successful communication &
- ✓ Employ skilled employee to attain good progress, escape bad quality work, more amendment & double handling (Aftab Hameed Memon and et. Al., 2012).

literatures in the above identifies different possible local contractors poor time performance strategic improvement methods or techniques are summarized below.

- ✓ Proper project planning & scheduling
- ✓ Effective strategic planning
- ✓ Frequent progress meeting
- ✓ Accurate(perfect) initial cost estimates
- ✓ Proper planning work
- ✓ Close monitoring
- ✓ Send understandable & absolute message to worker to assure successful communication
- ✓ Employ skilled employee to attain good progress, escape bad quality work, more amendment & double handling
- ✓ Provide knowledge/training to unskilled workers based on their scope of work

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Study Area

This research is conducted on public building and road construction projects in Ethiopia, South Western Regional State, Banch-Shako Zone and Mizan-Aman City.

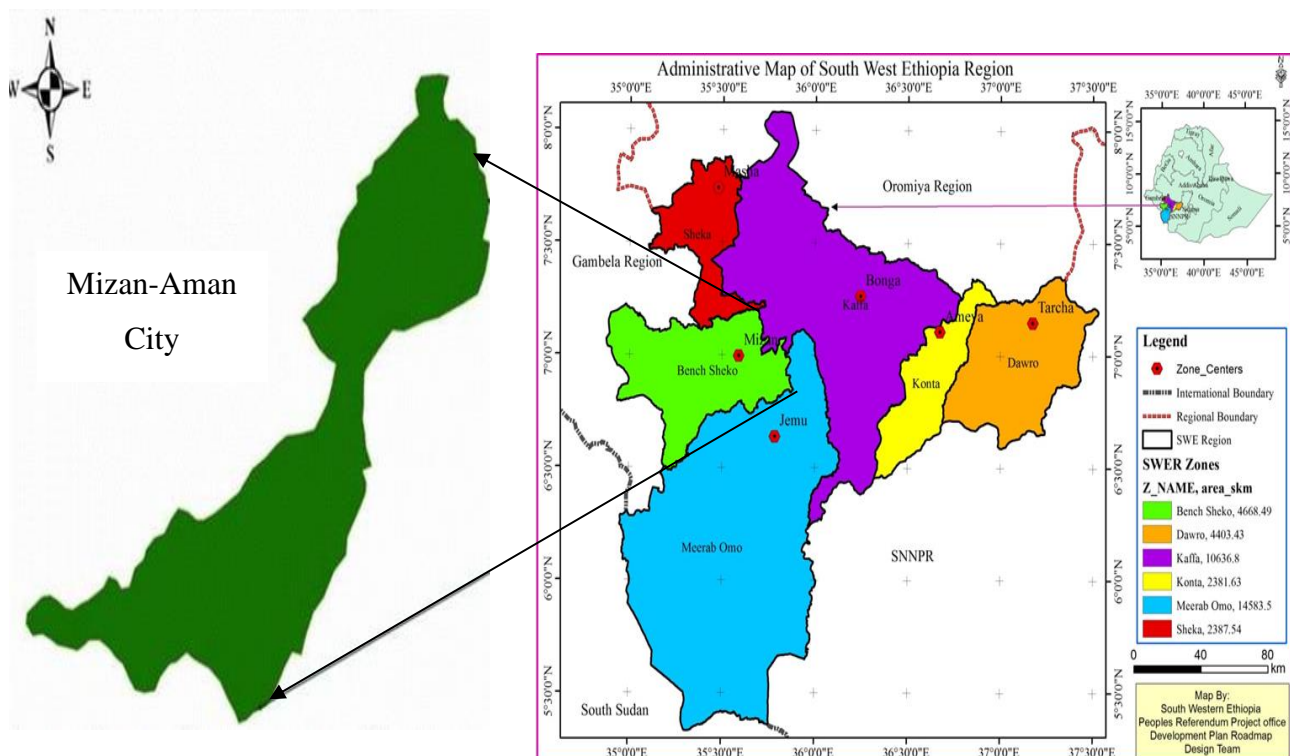


Figure 3.1 Study Area Map (South Western Ethiopia Peoples Referendum Project Office Development Plan Roadmap Design Team)

3.2 Study Variables

Dependent Variable: Local contractors poor time performance in public construction projects in Mizan-Aman City.

Independent Variable:

- For poor time performance by local contractor's different factors faced related to.
 - ✓ Related to design

-
- ✓ Related to local contractors
 - ✓ Related to clients (owners)
 - ✓ Related to consultant
 - ✓ Other environmental/natural factors.
- Local contractors poor time performances impact on the stakeholders, on the projects and the construction industries.
 - Strategic techniques to improve local contractor's time performances in public construction projects.

3.3 Data Sources

Primary and secondary types of data sources are used in this study. The primary source used in this study is data gathered by the analyst collect the information through standardized questionnaire and desk study. The secondary sources used in this study are accessible from optional sources which have been gathered by me and not for particular exploration issues under control. These sources are internet materials, exploration papers, published research, articles, books and journals. Research strategies concerned that the scientist receives an efficient and suitable approach to solve the research issues.

For first phase of assessments, most of quantitative data collected is secondary data. While in second phase, field questionnaires are done to continue the collection of secondary data through gathering information using close ended questions in questionnaire format and conduct a desk study.

3.4 Research Design

A descriptive study design with a quantitative and qualitative method of research was used. a structured type questionnaire to gather information regarding the causes, impacts and strategic techniques to improve local contractors time performance and a desk study survey are used. Respondents from contractor, client and consultant organizations were contacted to participate in survey process.

Scale applied for data gathering is Likert scale it includes no idea, strongly disagreed, disagreed, agreed and strongly agreed for factors causing poor time performance, no idea, no impact, minimum impact, medium impact & high impact for impact of local contractor's poor time performance and extremely effective, very effective, moderately effective, slightly effective and not effective for local contractor's

poor time performance strategic improvement techniques or methods. Analyzing data was carried out with RII & SPSS V 26 Software's and also used statistical software SSPS V26 & Ex-cell software for validity check.

The adoptive research method chosen for this research is mixed method approach regarding the limitation and strength of each type. This research consists of two styles causality and meaning by looking for more details and breadth of information. Mixing between qualitative method in literature review and quantitative method in data analysis allows equal status. By mixing the two methods allows the flexibility of research to produce and gather efficient information.

A desk study from road and building constructions in Mizan-Aman city public construction projects and a questionnaire has been used a close ended questions to gather data & facts regarding the causes, impacts and improving strategic techniques of local contractor's time performance in public construction projects in Ethiopia. a case in Mizan-Aman city public construction projects. This questionnaire is aimed to forward, direct and simple questions. Therefore, the questionnaire should be divided within different forms with no idea, strongly disagreed, disagreed, agreed and strongly agreed for factors causing poor time performance, no idea, no impact, minimum impact, medium impact & high impact for impact of local contractor's poor time performance and extremely effective, very effective, moderately effective, slightly effective and not effective for strategic improvement techniques or methods style to assure the achievement of survey. All questions occur in the questionnaire delivered with space to permit the participants to place on more (additional) or several information free from any restrictions.

The questions arise depend on literatures reviewed and the literature adapting the causes, impacts & improvement strategic techniques of local contractor's time performance. The questionnaire consists of 83 questions were divided within two parts listed as follows:

First Section: Personal and organizational data or information

These sections contain 7 questions that illustrate organizational and personal data or information of participant. It provides information on participant academic background, work experience in public construction projects, name of the organization as optional question, area of specialization, position in firms, characteristics of projects & types of procurement/delivery system.

Second Section: The causes, impacts and strategic improvement techniques of local contractor's time performance leading to time overrun on public construction projects in Ethiopia. A case in Mizan-Aman city public construction projects.

This section contain forty eight (48) questions that illustrate the factors that causes poor time performance by local contractors in public construction projects and these forty eight (48) questions should be divided within five (5) groups, This section also contain twelve (12) questions that illustrate the Impacts of local contractors poor time performance on public construction projects and its stakeholders and finally these section contain 16 questions that illustrate developing Strategic techniques or methods to improve local contractor time performance related to public construction projects as following:

The forty-eight (48) questions that illustrate the factors that causes of poor time performance by local contractors in public construction projects and these forty-eight (48) questions should be divided within five (5) groups are as following:

The first group: the 1st group includes 5 factors that cause local contractors poor time performance in pubic construction projects because of design, the second group: the 2nd group includes 14 factors that cause local contractors poor time performance in public construction projects because of contractor, the third group: the 3rd group includes 9 factors that cause local contractors poor time performance in public construction projects because of employers, the fourth Group: the 4th group includes 12 factors that cause local contractors poor time performance in public construction projects because of consultant and the fifth group: the 5th group includes 8 factors that cause local contractors poor time performance in public construction projects because of external factors or other factors.

This section also contains twelve (12) questions that illustrate the impacts of local contractors' poor time performance on public construction projects and its stakeholders. And finally, these sections contain (16) questions that illustrate developing strategic techniques or methods to improve local contractors time performance related to public construction projects.

3.5 Research Population and Sampling Techniques

The population used in this study is basically three those are contractors, clients (owners) and consultants which are participated in pubic construction projects. The samples used from population are

representatives of three professional's bodies involved currently in public construction projects around this study area.

Contractors included were all grades and were either participate in building or road construction which means it is either small & medium enterprises, building contractors (BC), road contractors (RC) or general contractors (GC). The clients or owners of the projects used for data collections are public employees and list of consultants used for this study are currently involved in both in public buildings and roads construction sectors or projects.

The overall respondents used in my questionnaires' survey are 91 professionals: 36 from contractors, 30 from clients (public body) or owner and 25 from consultants.

3.6 Sample Size Distributions

A sample is selection of small portion from the overall population samples selected for observation & analysis of study.

In order to decide the sample size for contractors, clients and consultant's statistical equations were used.

For Finite Population use correlation formula.

$$\text{New SS} = \frac{SS}{1 + \left[\frac{SS-1}{POP} \right]} \dots\dots\dots \text{(E.q 3.1)}$$

Where:

- ✓ SS = Sample Size Actively Present or N
- ✓ POP = Estimated Population

By considering the previous five years' construction supervisions use POP (Population of constant) which is 120 for contractor and SS (Actively present sample size) are 80.

$$\text{New SS (contractors)} = \frac{80}{1 + \frac{80-1}{120}} = 48.25 \approx 48$$

$$\text{New SS (Contractors)} = 48$$

By considering the previous five years' construction supervisions use POP (Population of constant) which is 93 for client or owner and SS (Actively present sample size) are 73.

$$\text{New SS (Clients or public bodies)} = \frac{73}{1 + \frac{73-1}{93}} = 42$$

$$\text{New SS (Clients or public body)} = 42$$

By considering the previous five years' construction supervisions use POP (Population of constant) which is 90 for consultant and SS (Actively present sample size) are 52.

$$\text{New SS (Consultants)} = \frac{52}{1 + \frac{52-1}{90}} = 35$$

The total questionnaire's is distributed to overall samples 48 for contractors, 42 for clients and the remaining 35 for consultants.

3.7 Analysis Methods

A questionnaire has been used with close ended questions to gather data & information on causes, impacts and local contractor's time performance strategic improvement techniques. A case in Mizan-Aman city public construction projects. This questionnaire is aimed to be forward, direct and simple questions. Therefore, the questionnaire should be divided within different forms with no idea, strongly disagreed, disagreed, agreed and strongly agreed for causes, no idea, no impact, minimum impact, medium impact & high impact for impact and extremely effective, very effective, moderately effective, slightly effective and not effective for strategic improvement methods style to assure the achievement of survey. All questions occur delivered with space to permit the participants to place on more (additional) or several information free from any restrictions.

Analysis of data was carried out with RII (relative importance index formula) & SPSS V 26 software's and also used SSPS V 26 software's & Excel software for validity check and frequency distribution.

The relative important index (RII) for each variables for the causes of poor time performance of local contractors, their impact in stakeholders, project itself & in construction industry and the strategic techniques or methods that are used to improve the local contractors time performance are computed by RII formula listed below and also used SPSS V 26 Software to find out mean values of each questions of part two & rank it and also used to analyze the first part of questionnaire's in accordance with the question types;

For Causes, Impacts and Strategic Improvement Techniques (Methods)

$$\text{Relative Importance index (RII)} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{A*N} \dots\dots\dots \text{(E.q 3.2)}$$

n_5 = the sum total of respondents for strongly agreed/high impact/extremely effective

n_4 = the sum total of respondents for agreed/medium impact/very effective

n_3 = the sum total of respondents for disagreed/minimum impact/moderately effective

n_2 = the sum total of respondents for strongly disagreed /no impact/slightly effective

n_1 = the sum total of respondents for no ideas/no idea/ not effective

A (Highest Weight) = Five (5)

N (Total Numbers of respondents) = 36 for contractors, 30 for clients and 25 for consultants
and 91 for total averages.

Both SPSS and Excels are a statistical method, tools or techniques that are used to analyses the validity, the frequency distributions and also used for analyzing some questions from the distributed questionnaires. In addition to RII formula this study also used SPSS mean values as RII and rank the results by its descending order.

3.8 Coding of Data's

Coding is the overall sequential arrangements of prepared questioners. For example; A represents factors related with design, B represents factors related with contractors, C represents factors related with employers, D represents factors related with consultants, E represents other factors or external factors, F represents impacts and G represents strategic improvement techniques or methods.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 General Discussion

This chapter provides explanations for data collection such as distribution of questionnaire, collection of responses and subsequent analysis of data acquired through the responses from professionals who has working on the sides of clients, consultants and contractors involved in public construction projects and a desk study works.

The principal purpose is to identify the major causes of local contractor's poor time performance, to determine the impacts of their performance on stakeholders, the project itself & the construction industry & developing strategic techniques or methods to improvement local contractors time performance project related with governments or public projects.

A questionnaire survey has distributed for gathering the required information from professionals who has involved in public construction projects in Mizan-Aman city working on the sides of a contractor, client and consultant; towards answering the basic research question.

A total of 125 questionnaires was sent or distributed to selected sample of respondents which comprise of 48 from contractors, 42 from client and 35 from consultants. A sample of questionnaires is attached in appendix A. The questionnaires were also sent to stakeholders in public construction projects in Mizan-Aman city that considered having direct relationship to the objectives of a research and also conduct a desk study.

4.2 Analysis of Questionnaire Response

A total of 125 questionnaires were sent or distributed to three groups of participants in public construction projects. From 125 questionnaires only 91 questionnaires were collected which comprises 36 from contractors, 30 from client (public body) and 25 from consultants. This gives a response rate of 72.8% as shown the table 4.1 below the breakdown of responses from the various sample groups.

4.2.1 Analysis of Contractor’s Questionnaires Responses

A total of 48 questionnaires distributed to local contractor around this study area, only 36 questionnaires were returned, which indicates 75% of questionnaire is returned and all of them are valid.

4.2.2 Analysis of Client’s Questionnaires Responses

A total of 42 questionnaires distributed to client to different departments that are involved in public construction projects, from which only 30 questionnaires was returned. This indicates 71.43% from total questionnaires numbers delivered to public body or client are valid.

4.2.3 Analysis of Consultant’s Questionnaires Responses

A total of 35 questionnaires were distributed to consultants from which only 25 questionnaires was returned and assumed it is valid for analysis. This indicates 71.43% from total questionnaires numbers delivered to consultants are valid.

An overall of 72.8 % response rate was achieved. This result is much enough for validating the study results. The respondents were generally motived and speedy in returning to the questionnaires. Table 4.1 shows summary of total survey response levels.

Table 4.1 Summary of Overall Questionnaires Survey Response Level

Stakeholders	Distributed Questionnaires	Returned Questionnaires	Returned Questionnaire’s in % age
Contractors	48	36	75
Client (public body)	42	30	71.43
Consultants	35	25	71.43
Total	125	91	72.8

4.3 Analysis and Discussion of Results

In this section, analysis of respondents, understanding and views on local contractor’s poor time performance causes, impacts and strategic improvement techniques or methods to local contractor time performance have been considered and discussed. The respond of various participating body to the questionnaires were analyzed and discussed in the next sections.

4.3.1. Respondents Organizational Details and Academic Background

The main purposes of this section were to know the organizational, educational and professional capability of respondents to undertake the work.

The questionnaires were to be filled by respondents who were involved in public construction projects or works in all aspects of construction process. In the academic section the result indicates that 17.58% of respondents have MSc. educational qualification and the rest of 82.42% is BSc. degree educational qualification as shown the table 4.2, 4.3, 4.4 and 4.5 bellows.

The questionnaires survey also indicates that the response was represented by the most qualified professionals in the construction sectors and the respondent groups are expected to have knowledge of subject matter.

The tables generate from SPSS software's below shows the contractor's academic backgrounds in numbers and % ages.

Table 4.2 Contractor's Academic Backgrounds

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bsc.	33	91.7	91.7	91.7
	Msc.	3	8.3	8.3	100.0
	Total	36	100.0	100.0	

The table generates from SPSS software's below shows the clients (public body) academic backgrounds in numbers and % ages.

Table 4.3 Clients Academic Backgrounds

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bsc.	22	73.3	73.3	73.3
	Msc.	8	26.7	26.7	100.0
	Total	30	100.0	100.0	

The table generated from SPSS software's below shows the consultants academic backgrounds in numbers and % ages.

Table 4.4 Consultant's Academic Backgrounds

Consultants Academic background					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bsc.	20	80.0	80.0	80.0
	Msc.	5	20.0	20.0	100.0
	Total	25	100.0	100.0	

The table generated manually below also shows summary of respondent's body academic backgrounds as a total summary.

Table 4.5 Summary of Respondent Academic Background.

Academic Background	Contractors	Client (public body)	Consultants	Total (%)
BSc	33	22	20	82.42
MSc	3	8	5	17.58

4.3.2. Experiences of Respondents and Their Company

From 36 respondents of contractors 55.6% of respondents are less than 5 years of working experience, 27.8% are 5 to 10 years of experience, 11.1 % are 10 to 15 years of experience and 5.6% of them beyond 15 years of experience. This means 20 of them are less than 5 years, 10 of them between 5 and 10 years, 4 of them between 10 and 15 years and the remaining 2 of them are beyond 15 years as shown in the figure bellows.

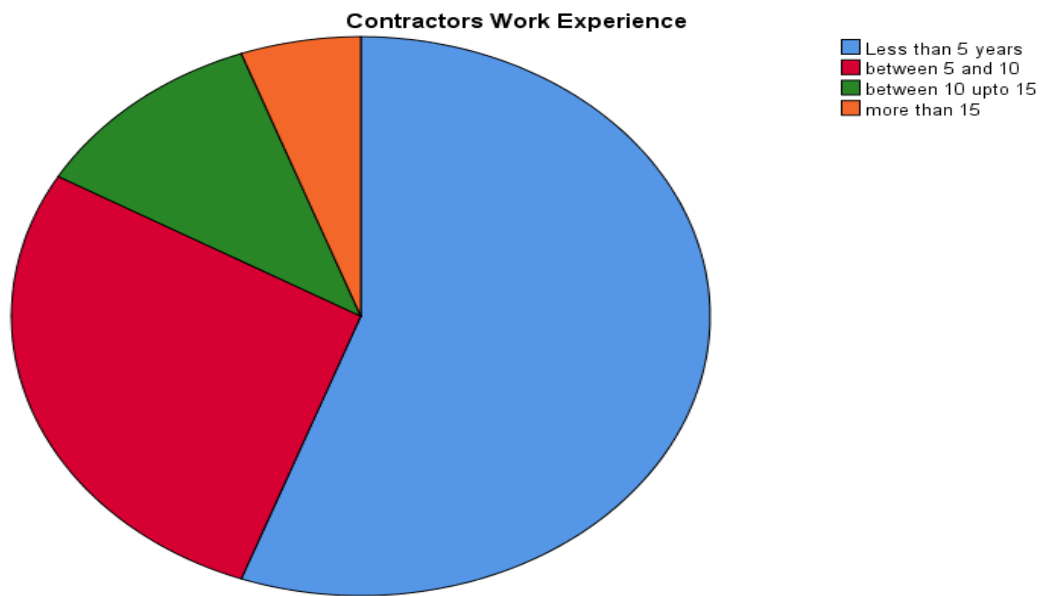


Figure 4.1 Contractor’s work experience

From 30 respondents on the client side 60% of respondents are less than 5 years of working experience, 23.3% are 5 to 10 years of experience, 10% are 10 to 15 years of experience and 6.7% of them are beyond 15 years of experience. This means 18 of them are less than 5 years, 7 of them between 5 and 10 years, 3 of them between 10 and 15 years and the remaining 2 of them are beyond 15 years as shown in the figure bellows.

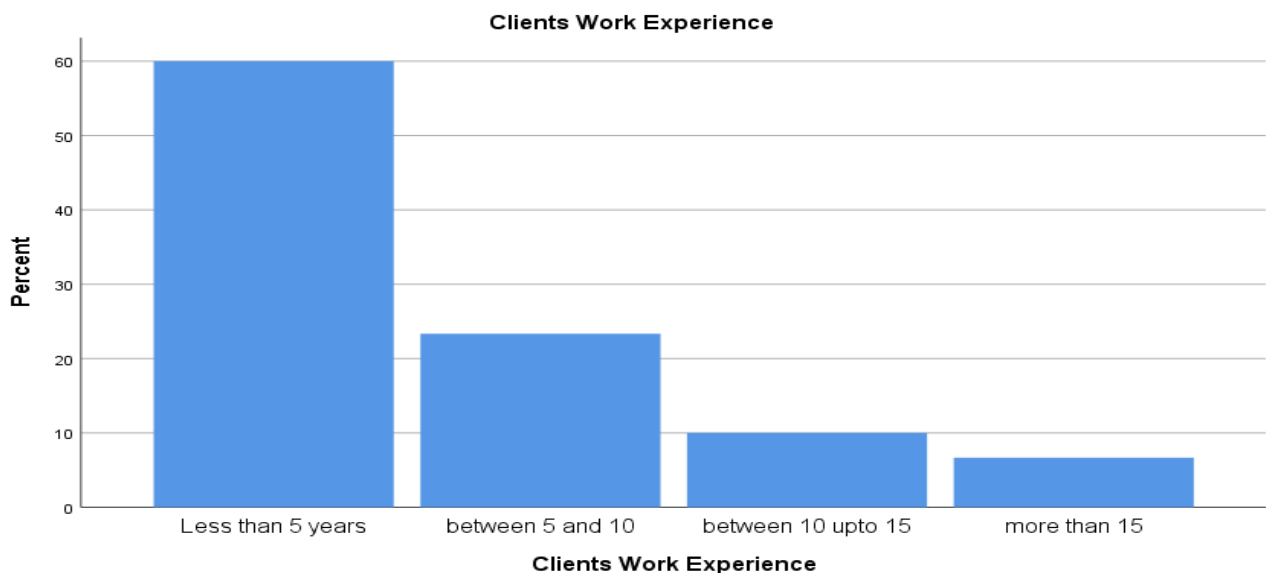


Figure 4.2 Clients Work Experience

Out of 25 respondents by the consultant 40% of the respondents are less than 5 years of working experience, 32% are 5 to 10 years of experience and 8% are 10 to 15 years of experience and 20% of them are beyond 15 years of experience. This means 10 of them are less than 5 years, 8 of them between 5 and 10 years, 2 of them between 10 and 15 years and the remaining 5 of them are beyond 15 years as shown in the figure bellows.

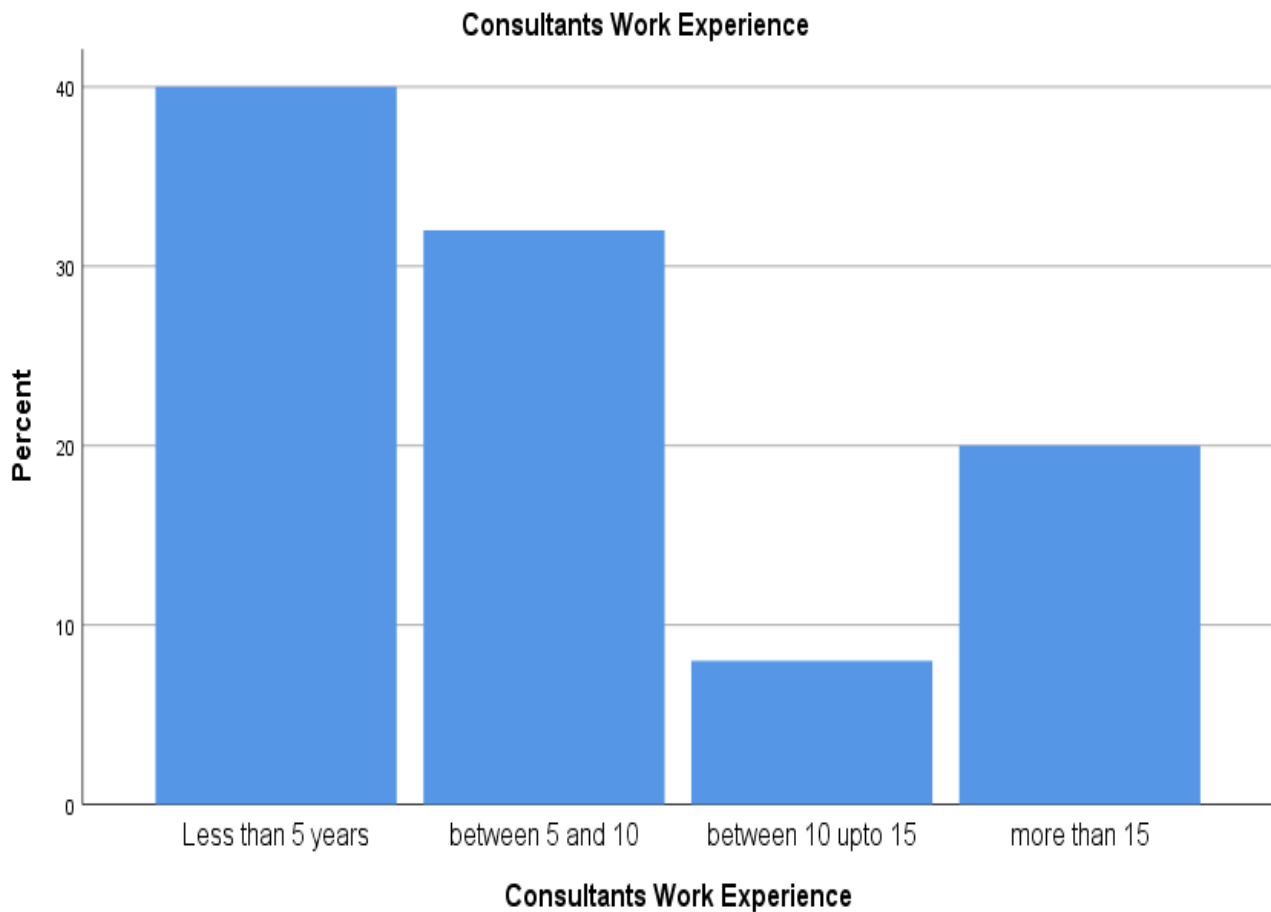


Figure 4.3 Consultant’s Work Experience

Furthermore, 19.8% of questionnaire’s survey respondent bodies have an experience beyond 10 years and the rest 80.2% is between 0 and 10 years. The respondent data shows that the participant’s body has a reasonable experience in public construction projects. As shown below in figure as experiences of respondent’s body and their Company. This means 48 of them are less than 5 years, 25 of them between 5 and 10 years, 9 of them between 10 and 15 years and the remaining 9 of them are beyond 15 years as shown in the figure bellows.

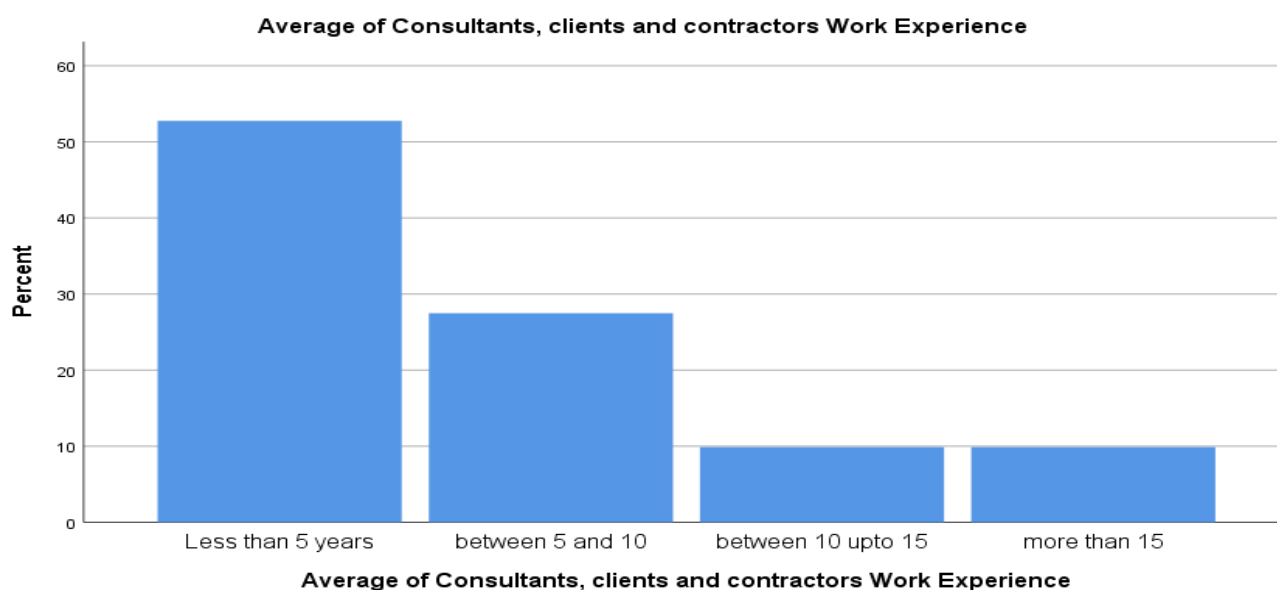


Figure 4.4 Total Summary of Work Experience

4.3.3 Respondents Organization Area of Specialization

The questionnaire survey result by respondents indicates that 65.9% of respondent body have participated in public building construction and the remaining 34.1% of respondent body have participated in public road construction.

Table 4.6 Respondents Organization Area of Specialization

Respondents Organization Area of Specialization		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Building	60	65.9	65.9	65.9
	Roads	31	34.1	34.1	100.0
	Total	91	100.0	100.0	

4.3.4 Respondents Organization Types of Delivery Systems Used

The questionnaire survey result by respondents indicates that 100% of his project follow or used design-bid-build delivery systems on all projects.

Table 4.7 Types of Delivery Systems Used by the Respondent's Specific Projects

Types of Delivery Systems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	DBB	91	100.0	100.0	100.0

4.3.5 Respondents Project Characteristic's

The questionnaire survey result by respondents indicates that 100% of respondents participated in public construction projects.

4.3.6. The Local Contractors Time Performance in Public Construction Projects

The survey result indicates that 93.4 % of respondent have indicated project performed by local contractor's as poor & remaining 6.6 % of respondent graded as good in its performance shown in the table bellows.

Table 4.8 The Local Contractor's Time Performance in Public Construction Projects

Local Contractor's Time Performance on Public Construction Projects

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	85	93.4	93.4	93.4
	Good	6	6.6	6.6	100.0
	Total	91	100.0	100.0	

4.3.7. Factors Results Local Contractors Poor Time Performance in Public Construction Projects

This section is study about the factors that affect local contractors time performance in public construction projects. The factors were divided into 5 groups; these groups are as following:

1. Design related factors.
2. Contractor related factors
3. Client or public body related factors
4. Consultants related factors
5. Other factors or External factors.

Table 4.9, 4.10, 4.11, 4.12, 4.13 & 4.14 shows responses of contractors, clients and consultant’s major factors that affect local contractors poor time performances within specific or implemented public construction projects.

The questionnaire survey analyzed contains the factors for causes of local contractor’s poor time performance from those factors related with design are changes of design by owner or his agent during work, mistakes and delay in producing design document by the contractors as top ranked causes for poor time performance by local contractors.

Additionally, the consultant and contractor has ranked similar for 1st and 2nd top causes and also the client or employer (public body) also shares the 1st top cause with contractors and consultants. The client or public body rank unclear and insufficient details in the drawing as second factors causing poor time performance.

Table 4.9 Factors Related with Design That Causes Poor Time Performance Responses by Contractor, Client and Consultants.

N o.	Factors related with Design	Code	Contractors			Clients (owners)			Consultants			Average mean	Rank
			Rank	Mean	RII	Rank	Mean	RII	Rank	Mean	RII		
1	Mistakes and delay in producing design document.	A1	2	3.88	0.77	3	3.60	0.72	2	3.20	0.64	3.56	2
2	Unclear and Insufficient details in drawing	A2	4	3.50	0.70	2	3.66	0.73	5	2.60	0.52	3.25	4
3	Designs errors because of designers	A3	3	3.83	0.76	5	3.06	0.61	4	2.80	0.56	3.23	5
4	Complicated project design	A4	5	3.33	0.66	4	3.50	0.70	3	3.00	0.6	3.28	3
5	Changes of design by owner or his agent during work	A5	1	4.50	0.9	1	4.16	0.83	1	4.00	0.80	4.22	1

The table shows below indicates the respondent from clients and consultants’ side both mention poor project management system as 1st top rank for consultants & the 2nd one for clients or public body as the most significant contractors related factor that affect the local contractors time performance. The responses from client shows delayed delivery/conveyance of materials and poor or bad project management system are the top ranked factors related with contractors that affect the local contractors time performance. As taken from the responses of consultant body poor project management system and bad/poor site management & supervision as the 1st two top ranked factors related with contractors that affect the local contractors time performance. The response from contractors indicated that inaccurate time estimate and bad/poor site management & supervision as the significant factors that affect the local contractors time performance.

In general, inaccurate time estimate, bad/poor site management and supervision, delayed delivery/conveyance of materials and poor project management system as major contractors related factors that causes the local contractors poor time performance or project delay or time overruns from contractors, clients or public body and consultant point of views respectively.

Table 4.10 Factors Related with Contractors That Causes Poor Time Performance Responses by Contractor, Client and Consultants.

N o.	Factors related with contractors	Code	Contractors			Client (public body)			Consultants			Average mean	Rank
			Rank	Mean	RII	Rank	Mean	RII	Rank	Mean	RII		
1	Bad/Poor site management and supervision	B1	2	4.16	0.83	6	3.83	0.77	2	4.36	0.87	4.12	3
2	Delayed delivery/conveyance of materials	B2	5	3.94	0.78	1	4.33	0.87	5	4.20	0.84	4.16	2
3	Untrained/Un experienced employee used during construction of projects	B3	10	3.52	0.71	5	3.93	0.79	7	3.96	0.79	3.80	9

4	Unsuccessful planning & scheduling of project	B4	8	3.69	0.74	4	4.00	0.80	4	4.20	0.84	3.96	5
5	Problems with subcontractors	B5	13	3.00	0.60	13	2.50	0.50	14	2.60	0.52	2.70	14
6	Fault during project construction	B6	11	3.44	0.69	11	2.90	0.58	13	2.80	0.56	3.05	13
7	Underrate project costs	B7	2	4.16	0.83	9	3.23	0.65	8	3.88	0.78	3.76	10
8	Miscarry for project works complexity	B8	12	3.36	0.68	12	2.73	0.55	12	3.60	0.72	3.23	12
9	Poor project management system	B9	3	4.03	0.81	2	4.16	0.83	1	4.40	0.88	4.20	1
10	Inadequate numbers of equipment & skilled laborer	B10	6	3.83	0.76	8	3.66	0.73	3	4.32	0.86	3.94	7
11	Poor or bad resource management	B11	7	3.77	0.75	8	3.66	0.73	6	4.00	0.80	3.81	8
12	Cash flow & financial difficulties faced by contractors	B12	4	4.00	0.80	3	4.10	0.82	9	3.80	0.76	3.97	4
13	Inaccurate time Estimate	B13	1	4.33	0.87	7	3.76	0.75	10	3.76	0.75	3.95	6
14	Uses faulty workmanship by contractor and subcontractors.	B14	9	3.66	0.73	10	3.00	0.60	11	3.72	0.74	3.46	11

The table shows below indicates contractors and consultant has ranked design changes/additional works by public employers as the significant employer related factors that affects the local contractors time performance.

The contractors ranked design changes/additional works by public employers, improper bidding problems or selection of bidder depending on low price and delayed progress payment by public employer to local contractors as a top three employer related factors that affects time performance of local contractors. From clients or public body side, delayed progress payment by public employer to

local contractors and design changes/additional works by public employers as the first top two employer factors that affects the local contractors time performance. And from the consultants' sides design changes/additional works by public employers, inadequate client's finance & payments for completed work and Improper bidding problems or selection of bidder depending on low price submitted as the top three employer related factors that affects the local contractors time performance.

In general, design changes/additional works by public employers, delayed progress payment by public employer to local contractors, improper bidding problems or selection of bidder depending on low price submitted and inadequate client's finance & payments for completed work as the major employers related factors that affects the local contractors time performance from contractors, clients or public body and consultant point of views respectively.

Table 4.11 Factors Related with Employees That Causes Poor Time Performance Responses by Contractor, Client and Consultants.

No.	Factors related with clients	Code	Contractors			Client (Owner)			Consultants			Average mean	Rank
			Rank	Mean	RII	Rank	Mean	RII	Rank	Mean	RII		
1	Improper bidding problems or selection of bidder depending on low price submitted.	C1	2	4.33	0.87	4	3.17	0.63	3	3.80	0.76	3.77	3
2	Design changes/additional works public employers	C2	1	4.50	0.90	2	3.50	0.70	1	4.00	0.80	4.00	1
3	Delayed progress payment by public employer to local contractors	C3	2	4.33	0.87	1	4.00	0.80	4	3.60	0.72	3.98	2
4	Change orders by public employers	C4	3	4.19	0.83	5	3.13	0.63	5	3.80	0.76	3.71	4
5	Poor Communication & Coordination with other parties	C5	8	3.50	0.70	8	2.93	0.59	4	3.60	0.72	3.34	7

6	Client-initiated variation & necessary variations of work parts	C6	4	4.00	0.80	3	3.33	0.67	6	3.20	0.64	3.51	5
7	Inadequate client's finance & payments for completed work	C7	6	3.66	0.73	6	3.00	0.6	2	3.80	0.76	3.49	6
8	Suspension of work by public employer	C8	7	3.53	0.71	7	2.96	0.59	7	2.40	0.48	2.96	8
9	Un wanted Interference of owner on contractor's work	C9	5	3.83	0.77	9	2.83	0.57	8	2.20	0.44	2.95	9

The table shows below indicates all three respondent bodies contractors, client and consultant has ranked low speeds of decision making by consultant body as firstly ranked consultant related factors that affects the local contractors time performance.

Contractors body ranked lower or slower speed of decision making by consultant, unrealistic contract duration and requirements/inaccurate time estimate and delay in performing inspection, testing and approval of works as top three consultant related factors that affects the local contractors time performance. From client's side, low speed of decision making by consultant and unrealistic contract duration and requirements/inaccurate time estimate as top two consultant related factors that affects the local contractors on time performance. And from consultant's body sides unrealistic contract duration and requirements/inaccurate time estimate, low speed of decision making by consultant and poor supervision by consultants as top ranked three consultant related factors that affects the local contractors time performance.

In general, low or slower speed of decision making, unrealistic contract duration and requirements/inaccurate time estimate, delays during performing inspection, testing & approving of works, poor supervision by consultants, preparation of unclear/incomplete drawing and specification and poor supervision by consultants are consultants related factors that affects the local contractors on time performance from contractors, clients or public body and consultant point of views.

Table 4.12 Factors Related with Consultants That Cause Poor Time Performance Responses by Contractor, Client and Consultants.

No.	Factors related with consultants	Code	Contractors			Client (public body)			Consultants			Average mean	Rank
			Rank	Mean	RII	Rank	Mean	RII	Rank	Mean	RII		
1	Consultant lack of experience	D1	4	3.80	0.76	9	3.13	0.63	10	2.40	0.48	3.11	11
2	Delays during performing inspection, testing & approving of works	D2	2	4.00	0.80	8	3.16	0.63	3	3.40	0.68	3.52	4
3	Delays during approving design documents	D3	7	3.66	0.73	5	3.30	0.66	5	3.16	0.63	3.37	5
4	Low or slower speed of decision making	D4	1	4.16	0.83	1	4.00	0.80	1	3.60	0.72	3.92	1
5	Poor communication & Coordination with surrounding team	D5	10	3.50	0.70	10	3.00	0.60	9	2.60	0.52	3.03	12
6	Poor site supervision by consultants	D6	3	3.83	0.77	4	3.33	0.67	2	3.44	0.69	3.53	3
7	Mistakes and Errors during design by consulting body	D7	5	3.72	0.74	7	3.23	0.65	6	3.00	0.6	3.32	8
8	Unrealistic contract duration & requirements/Inaccurate time estimate.	D8	1	4.16	0.83	2	3.16	0.63	1	3.60	0.72	3.64	2

9	Preparation of unclear/incomplete drawing & specification	D9	6	3.64	0.73	3	3.50	0.70	7	2.92	0.58	3.35	6
10	Delay drawings during preparation and approval time	D10	7	3.66	0.73	8	3.16	0.63	4	3.20	0.64	3.34	7
11	Delay during executing/performing inspection & testing	D11	8	3.61	0.72	6	3.26	0.65	8	2.80	0.56	3.22	9
12	Delay during giving instructions to local contractors	D12	9	3.53	0.71	4	3.33	0.67	8	2.80	0.56	3.21	10

Contractors ranked rise cost of materials (price inflation), shortage of materials and unavailability of utility around the construction sites as top ranked three external factors that affects the local contractors on time performance. From client or public body side, rise cost or prices of materials (price inflation), shortage of materials and unavailability of utility around the construction sites are top three external factors that affects the local contractors on time performance. And from consultants' sides, Shortage of materials, rises costs or prices of materials (price inflation) and unavailability of utility around the construction sites are top three external factors that affect the local contractors time performance.

In general, rises costs or prices of materials (price inflation), shortage of materials and unavailability of utility around the construction sites are consultants related factors that affects the local contractors time performance from contractors, clients or public body and consultant point of views.

Table 4.13 External Factors Cause Poor Time Performance Response by Contractor, Client and Consultants

No.	Other Factors or external factors	Code	Contractors			Client (public body)			Consultants			Average mean	Rank
			Rank	Mean	RII	Rank	Mean	RII	Rank	Mean	RII		

1	Rise cost or prices of materials (Price inflation)	E1	1	4.67	0.93	1	4.67	0.93	2	4.60	0.92	4.65	1
2	Shortage of materials	E2	2	4.50	0.90	2	4.50	0.90	1	4.80	0.96	4.60	2
3	Difficulty in accessing bank credit	E3	4	3.33	0.66	4	2.66	0.53	5	2.80	0.56	2.93	4
4	Unforeseen ground condition	E4	5	3.16	0.63	6	2.46	0.49	4	3.00	0.60	2.87	5
5	Force Majeure/ Gods Acts	E5	6	3.08	0.62	8	2.16	0.43	7	2.00	0.40	2.41	8
6	Our country policy, rules And regulations	E6	7	2.83	0.57	7	2.43	0.49	6	2.20	0.44	2.49	7
7	Unexpected accident On construction site on worker	E7	7	2.83	0.57	5	2.50	0.50	4	3.00	0.60	2.78	6
8	Unavailability of utility around the construction sites	E8	3	4.16	0.83	3	3.00	0.6	3	4.00	0.80	3.72	3

4.3.8 Additional Factors Causing Time Overruns on The Projects

Additional factors causing poor time performance

- ✓ Transportation shortages
- ✓ Our countries security problems
- ✓ The weather conditions
- ✓ The COVID-19 pandemic
- ✓ The local contractors lack of knowledge and experience in planning, organizing and controlling all of the major resources.
- ✓ Lack of skilled manpower's

- ✓ Lack of equipment’s and machineries by local contractors
- ✓ Lack of modernized building systems
- ✓ Lack of organizational structure to properly manage local contractors (no system)

4.3.9 Impact of Local Contractor’s Poor Time Performance on The Projects, Stakeholders of Projects and The Construction Industries

The tables below show the responses by contractors, clients and consultants on impacts of local contractor’s poor time performance in stakeholders, the public construction projects and overall construction industry.

The survey shows cost overrun on projects, time overrun on projects, additional cost to contractors depending on time delayed (liquidated damage), lowering local contractor’s capacity development, eroding mutual trust and respect among the parties, the end users of projects loss its benefit from projects & idling resources and disputes b/n parties are the main impact of local contractors’ poor performance on stakeholders, on project & construction industries of Ethiopia.

Table 4.14 The Impact of Local Contractor’s Poor Time Performance on Stakeholder, In Project & In Construction Industries of Ethiopia.

No.	Impacts	Code	Contractors			Clients (Owners)			Consultants			Average mean	Rank
			Rank	Mean	RII	Rank	Mean	RII	Rank	Mean	RII		
1	Time overrun on the projects	F1	2	4.16	0.83	2	4.50	0.90	2	4.40	0.88	4.35	2
2	Cost overrun on the projects	F2	1	4.50	0.90	1	4.66	0.93	1	4.60	0.92	4.59	1
3	Additional cost to contractors depending on time delayed (Liquidated Damage)	F3	4	4.00	0.80	2	4.50	0.90	5	4.20	0.84	4.23	3

4	Expose employer for additional expenses & loss its investment return money	F4	5	3.94	0.79	6	3.83	0.77	8	3.60	0.72	3.79	9
5	Negative social impact	F5	7	3.83	0.77	5	3.86	0.77	7	3.80	0.76	3.83	7
6	End users of projects loss its benefit from projects.	F6	3	4.16	0.8	7	3.83	0.77	10	3.52	0.70	3.84	6
7	Idling resources and disputes b/n parties	F7	7	3.83	0.77	3	4.00	0.80	9	3.56	0.71	3.80	8
8	It creates negative attitude towards public authority	F8	9	3.61	0.72	7	3.83	0.77	6	3.92	0.78	3.78	10
9	Eroding mutual trust and respect among parties	F9	6	3.86	0.77	4	3.93	0.79	3	4.20	0.84	4.00	4
10	The delay may be led to Arbitration and Litigation	F10	10	3.53	0.71	10	3.33	0.67	11	3.40	0.68	3.42	12
11	Impact on Economic development of our country	F11	8	3.66	0.73	8	3.66	0.73	6	3.92	0.78	3.75	11
12	Lowering Local contractor's capacity development	F12	3	4.08	0.82	9	3.50	0.70	4	4.08	0.82	3.89	5

4.3.10 Strategic Techniques or Methods to Improve Local Contractors Time Performance in Public Construction Projects.

The tables below show responses by contractor, client and consultant strategic techniques or methods to improve local contractors time performance in public construction projects.

This study ranks the strategic improvement techniques in descending orders or from top to bottom accordingly as shown; use of appropriate construction methods, hire skilled workers to achieve good progress, proper planning and scheduling construction sites or projects, committed leadership and management, use up to date technology utilization and avoid bad or poor quality of work are the top ranked strategic techniques or methods to improve local contractors time performance in public construction projects.

Table 4.15 The Local Contractors Time Performance Improvement Techniques (Methods)

N o.	Strategic improvement techniques or methods	Code	Contractors			Clients (owners)			Consultants			Average mean	Rank
			Rank	Mean	RII	Rank	Mean	RII	Rank	Mean	RII		
1	Accurate initial cost estimates	G1	4	3.81	0.76	7	3.66	0.73	14	3.40	0.68	3.62	9
2	Proper planning and scheduling of construction sites or projects	G2	3	3.83	0.76	4	4.16	0.83	5	4.04	0.82	4.01	3
3	Proper payment from the client to contractors	G3	5	3.77	0.76	5	4.00	0.80	7	4.00	0.80	3.92	8
4	Frequent progress meeting	G4	8	3.66	0.73	8	3.53	0.71	6	4.00	0.81	3.73	10
5	Committed leadership & management	G5	11	3.50	0.70	2	4.50	0.90	10	3.80	0.76	3.93	6
6	Close monitoring among all participants on the projects	G6	12	3.44	0.69	12	3.33	0.67	10	3.80	0.76	3.52	13
7	Send clear and complete message to worker to ensure effective communication	G7	10	3.52	0.71	8	3.53	0.71	11	3.72	0.74	3.59	12

8	Hire skilled workers to achieve good progress	G8	2	4.16	0.83	9	3.50	0.70	1	4.60	0.92	4.09	2
9	Fully utilize the construction team	G9	5	3.77	0.76	6	3.83	0.77	4	4.40	0.88	4.00	4
10	Use new construction technologies (IBS-Industrialize Building System)	G10	13	3.42	0.68	11	3.43	0.69	13	3.60	0.72	3.48	14
11	Provide knowledge/training to unskilled workers based on work scope	G11	7	3.72	0.74	10	3.46	0.69	8	3.88	0.78	3.69	11
12	Adoption of tools and techniques i.e., Value Management, Lean Thinking and Total Quality Management	G12	14	3.39	0.68	13	3.30	0.66	14	3.40	0.68	3.36	16
13	Measure performance against other projects	G13	9	3.61	0.72	14	2.66	0.53	9	4.00	0.80	3.42	15
14	Minimized or avoid bad or poor quality of work	G14	8	3.66	0.73	6	3.83	0.77	3	4.36	0.87	3.95	5
15	Use appropriate construction methods	G15	1	4.33	0.87	1	4.90	0.97	2	4.40	0.88	4.54	1
16	Use up to date technology utilization	G16	6	3.75	0.75	3	4.33	0.87	12	3.64	0.73	3.91	7

4.3.11 Additional Strategic Techniques That Used to Improve Local Contractors Time Performance

Additional strategic techniques to improve local contractor's time performance are listed bellows;

- Local contractors can improve their time performance if the government facilitates different incentives such as;
 - ✓ The government should allow for local contractors to import construction equipment without taxation.
 - ✓ By facilitating loans from banks with minimum interest
- By performing parallel works and by working overtimes
- By effectively utilized machinery

4.4 Summary Rank of Local Contractor’s Poor Time Performance Causing Factors

From analysis or results from relative index formula & SPSS software outputs the top ten local contractors poor time performance causing factors which may related with design, contractors, clients or employer, consultant, and external factors or other factors with average or mean rank of all respondents as shown in the table below.

Table 4.16 Top Ten Major Factors Which Causes Poor Time Performance by Local Contractors (By Using SPSS Mean Values and Relative Important Index Formula Results)

Major causing factors for poor time performance by local contractors
1. Rise cost or prices of materials (Price inflation)
2. Shortage of materials
3. Changes of design by owner or his agent during work
4. Poor or bad project management system by local contractors
5. Delayed delivery/conveyance of materials
6. Poor site management & supervision by consulting body
7. Design changes/additional works by public Employers
8. Delayed progress payment by public employer to local contractors
9. Unsuccessful planning & scheduling of project
10. Cash flow & financial difficulties faced by contractors

4.5 Overall Summary of The Questioner Survey

The questionnaire survey response shows 72.8 % of response rate by participant. The questionnaire survey analysis revealed the following key observations;

1. Owners of the projects or the public clients uses time and quality to manage the time performance of local contractors.
2. Most of the respondent's (contractors, clients and consultants) in public building and road construction projects agreed the local contractors has poor time performance.
3. The study result shows all of public road and building projects handled by the local contractors in Mizan-Aman city are used D.B.B. (design bid build) delivery systems & unit price contract type and all of them suffers delays.
4. The analysis of the study shows that the major top causing factors of local contractor's poor time performance in the construction industries of Ethiopia, according to the main concerned body. Material price escalation & material shortages, change of design by owners & his agents and poor project management system by local contractors are the major three causing factors for poor time performance response by the concerned body average mean.
5. The analysis of the study shows that the local contractors poor time performance has negative impacts on the projects, the stakeholders and the construction industries. Hence, the concerned body ranks cost and time overruns on the projects, additional cost to the local contractors & eroding mutual trust and respect among parties are the three major impacts of local contractor's poor time performance.
6. The analysis of the study shows that improving the local contractors time performance by using different strategic techniques are vital to our countries construction industry development. Hence, the three concerned body ranks use appropriate construction methods, hired skill workers and proper planning and scheduling of construction projects are the three major strategic improvement techniques to improve local contractors time performance.
7. The analysis of the study shows the overall ranks and the three concerned body average ranks of the causes, impacts and strategic techniques to improve local contractors time performance in details.

4.6 Analysis and Discussion of The Desk Study in Mizan-Aman City Public Construction Projects

4.6.1 Description of The Desk Studies

The description of the causes of each project listed below mainly focuses on the local contractor's poor time performance or time overruns on progressed and completed building & road projects in Mizan-

Aman city public construction projects. Hence, the construction those projects are executed by local contractors.

1. Project A

The purpose of the project is building 2B + G + 3 class room & lecture hall building. The project is located in Mizan-Tepi University, Mizan-Aman City, Mizan Town, Bench-Shako Zone, South Western Regional State and Ethiopia. The project commenced 13/08/2017 G.C and the original completion date was 13/08/2020 G.C with a contract period of 1,095 calendar days.

However, in this project partially handover has taken around 99 % of the work completed and that is after 442 days of the expected completion date. This project delays by 40.37 % of the original project duration.

Delayed approval of payment or and/or delayed payment by clients or his representative to contractors, contractor's poor planning & management systems on the project, COVID-19 Pandemic, shortage of materials and material price escalation (specially cement price escalation & shortage), lack of experienced personnel by contractors' side, shortage of major construction equipment and our countries security problems; were the major problems that gave rise for the aforementioned delay.

2. Project B

The purpose of the project is constructing a 1,715 m² (a length of 171.5 m * a width of 10 m) coble road. The project is located in Mizan-Aman City, Aman Town, Bench-Shako Zone, South Western Regional State and Ethiopia. The project commenced 20/10/2013 E.C and the original completion date was 05/12/2013 E.C with a contract period of 45 calendar days.

However, this project has been completed on 03/13/2013 E.C that is after 28 days of the expected completion date. This project delays by 62.22% of the original project duration.

Our countries security problems, contractor lack of experienced personnel, adverse weather conditions, shortage of construction materials, material price escalation, delayed approval of payment or and/or delayed payment by clients or his representative to contractors, were the major problems that gave rise for the aforementioned delay by public contractors.

3. Project C

The purpose of the project is building basement + G + 4 dormitory building. The project is located in Mizan-Tepi University, Mizan-Aman City, Aman Town, Bench-Shako Zone, South Western Regional State and Ethiopia. The project commenced 26/02/2010 E.C and the original completion date was 12/12/2013 E.C with a contract period of 1,395 calendar days.

However, in this project partial handover has taken around 99 % of the work completed and that is after 60 days of the expected completion date. This project delays by 4.5 % of the original project duration. Design change by owner, adverse weather conditions, delayed approval of payment or and/or delayed payment by clients or his representative to contractors, COVID-19 pandemic, contractor's poor planning and management systems on the projects, material shortage & price escalation, our countries security problems, machinery and equipment shortage, complexity of the project design, unexpected ground condition, were the major problems that gave rise for the aforementioned poor time performance by local contractors.

4. Project D

The purpose of the project is building G + 3 class room building. The project is located in Mizan-Tepi University, Mizan-Aman City, Aman Town, Bench-Shako Zone, South Western Regional State and Ethiopia. The project commencement date 29/03/2008 E.C and the original completion date was 29/09/2008 E.C with a contract period of 180 calendar days.

However, this project has been completed on 17/06/2009 E.C; that is after 262 days of the expected completion date. This project delays by 145.55% of the original project duration.

Contractor's poor planning and management systems, delayed approval of payment or and/or delayed payment by clients or his representative to contractors, material price escalation specially cement & transportation cost due to fuel price, adverse weather conditions, lack of experienced personnel on the respective of contractor, change order by client and shortage of major construction equipment, were the major problems that gave rise for the aforementioned delay.

Table 4.17 Desk Study Project Summary

Name of Project	Project A	Project B	Project C	Project D
Project size or length	2B+G+3 Class room & Lecture Hall Building	Constructing a 1,715 m ² (171.5 m * 10 m) coble road.	Basement+G+4 Dormitory Building	G+3 Building
Location of projects	Mizan Town	Aman Town	Mizan Town	Aman Town
Project delivery systems	D.B.B.	D.B.B.	D.B.B.	D.B.B.
Project Contract type	Unit Rate (Unit Price)	Unit Rate (Unit Price)	Unit Rate (Unit Price)	Unit Rate (Unit Price)
Financing body	Government	Government	Government	Government
Project commencement date	13/08/2017 G.C	20/10/2013 E.C	26/02/2010 E.C	29/03/2008 E.C
Contract period	1,095	45	1,395	180
Project completion date	13/08/2020 G.C	05/12/2013 E.C	12/12/2013 E.C	29/09/2008 E.C
Actual completion dates	99% completed now (partial handover is not taken)	03/13/2013 E.C	99 % completed now (partial handover taken)	17/06/2009 E.C
Delays time % age	40.37 %	62.22%	4.5 %	145.55%

4.6.2 General Discussion of The Desk studies

In general, the studies listed above could shows a clear image of the severity of poor time performance in building and road projects in Mizan-Aman city public construction projects executed by local contractors. Besides, the following listed points could be noted.

- All of the projects used in the desk study shows all of the projects handled by local contractors suffering delays or poor time performances and it delays are between 4.5 % and 145.55%.
- Most of the project's result shows the time needed to complete the projects required more than 41 % of the original contract time.
- The study result shows all of public road and building projects used in the desk study shows all of the projects handled by the local contractors are used D.B.B. (design bid build) delivery systems and unit rate contract types and all of them suffers delays.
- The major causes or problems shows on the projects are almost similar to each other's, such like contractor's poor planning & management systems on the project, shortage of materials and material price escalation (specially cement price escalation & shortage), our country security problems, COVID-19 pandemic and adverse weather conditions.

Basically, the volume of the problem found from the referred studies requires the significance of giving due interest to the issue & the need for investigating the principal elements inflicting the problem in a much broader perspective; in order to notably decrease their influences on the next or upcoming new projects. Generally, the results obtained from the above desk study is similar with the results obtained from the questionnaire survey.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

In our country local contractors time performance in public construction projects are much significant. Hence, their time performance in public construction projects has many positive and negative impacts on the stakeholders, the project itself and the construction industry also. Therefore, conducting research in this area is vital. Identification of causes, determining impacts & developing strategic techniques to improve local contractors time performance in the public construction projects is the basic things to minimize or to avoid their poor time performance and to improve their capacity in our countries construction industries. The major aims of this study are developing strategic techniques to improve local contractors time performance. A case in Mizan-Aman city public construction projects.

From the results of the analysis of the questionnaire & desk study and respondent's response the following major conclusions have been drawn.

- According to the desk study and questionnaire survey responds by the participants that agree local contractors has poor time performances in Mizan-Aman city public construction projects.
- According to this study results the main factors causing local contractors poor time performances in public construction projects are as follows: Rise costs or prices of materials (price inflation), shortage of materials, changes of design by owner or his agent during work, poor project management system, delayed delivery/conveyance of materials, poor site management & supervision, design changes/additional works by public employers, delayed progress payment by public employer to local contractors and unsuccessful planning & scheduling of project.
- This study found that the local contractors poor time performance have a great impact on stakeholders, project itself and construction industry in such it may causes cost overruns and time overruns on the projects, it may causes the following impacts listed below on different stakeholders; additional cost to contractors depending on time delayed (liquidated damage), lowering local contractor's capacity development, The end users of project loss its benefit from the projects and expose employer for additional cost & loss its investment money return from projects & also it may create negative attitudes towards the industry by eroding mutual trust and respect among the parties, negative social impact, idling resources and disputes b/n parties,

by lowering the economic development of our country, by leading the project stakeholders to arbitration and litigation, by creating negative attitude towards public authority on the society these all are the impacts of local contractor's poor time performances.

- According to this study all of respondents agreed that all local contractors participated in public construction projects in the study area needs performance improvements to makes our construction industry fruit full. Some of effective strategic techniques or methods to improve local contractors time performance are least as follows; use appropriate construction methods, hire skilled workers to achieve good progress, proper planning and scheduling of construction projects, fully utilize the construction team, avoid poor quality of work, committed leadership and management, use up to date technology utilization, proper payment from client to contractors, accurate initial cost estimates, frequent progress meeting, provide knowledge/training to unskilled workers based on their scope of work, send clear and complete message to worker to ensure effective communication, close monitoring, use new construction technologies (IBS-Industrialize building system), measure performance against other projects & adoption of tools and techniques i.e. value management, lean thinking and total quality management.
- This study result shows that all of public road and building projects used in the desk study shows all of the projects handled by the local contractors are used D.B.B. (design bid build) delivery systems and unit rate contract types and all of them suffers delays and its delays are between 4.5 % and 145.55%.
- Most of the project's result used in the desk study result shows the time needed to complete the projects required more than 41 % of the original contract time.
- The major causes or problems shows on the desk study are almost similar to each other's, such like contractor's poor planning & management systems on the project, shortage of materials and material price escalation (specially cement price escalation & shortage), our countries security problems and adverse weather conditions.

And also, the participant adds some additional factors which may causes local contractors poor time performance are listed bellows;

- Transportation shortages
- COVID-19 pandemic
- Our country security problems

- The weather conditions
- Lack of skilled manpower's
- Lack of equipment's and machineries

And also, the participant adds some additional strategic techniques to improve local contractor's time performance are listed bellows;

- Local contractors can improve their time performance if the government facilitates different incentives such as;
 - ✓ The government should allow for local contractors to import construction equipment without taxation.
 - ✓ By facilitating loans from banks with minimum interest
- By performing parallel works and by working overtimes
- By effectively utilized machinery

5.2 Recommendations

The following recommendations are forwarded based on the study of this MSc. thesis to major stakeholders of projects.

- The local contractors are suggested to have good project management system, remove poor site management & supervision of projects and must have successful planning & scheduling projects in order to prevent poor time performance because of it. This means, the local contractors are the main responsible body for the time performance of the executed projects, they are suggested to deploy experienced professional in project management systems and projects planning & scheduling areas. The local contractors must have given different training & capacity building to their staffs to build a good projects management systems, project planning and scheduling in the company.
- The local contractors should have enough cash and materials availability before starting the project to avoid cash flows & financial problem and shortage of materials delivery faced by local contractors. And also, the study recommended monitoring and controlling the material delivery, financial spending and payment to avoid any materials & financial problem which will result in time overrun or poor time performance on projects.
- The local contractors have also advised to deploy and use the resources such as; financial, machineries and equipment's, human (manpower) and time resources in an effective and efficient ways to achieve the project time objectives.
- The local contractors should have communicated and coordinate with other parties in the projects and also the local contractors are recommended to purchases vital construction materials at the beginning of project and prepares stores for materials to prevent the projects from time overruns during material shortage and material prices fluctuation time.
- The consultants are the responsible body for the projects poor time performance interrelated with the design and supervision related problems. So, the consulting body must hire experienced and qualified personal, to handle design related problems, to give suitable and right instruction, to make right supervision and decision making at the right time and must be able to answer questions raised by contractor to minimize time overrun or poor time performance by local contractors on projects.

- The consultants are control his staff to performing inspection, testing and approval of works at the right time to minimize poor time performance by local contractors on the project.
- The consultants are also required to be accurate time estimate to the projects and approving design documents in order to avoid poor time performance by local contractors on the projects.
- The clients change the bidder selection criteria to select the best competitive bidders. Which means the client select the bidders not only depending on low price submitted but also consider the technical capability of bidders in order to avoid poor time performance by local contractors on the projects.
- The client must give details description about the design he needs to consultants to minimize change order or additional works to local contractors during construction time & avoids necessary variations of work parts in order to avoid time overruns or poor (delayed) time performance by local contractors on the project.
- The client must pay progress payment to local contractors at the right time in order to avoid time overruns or poor time performance by local contractors on the project.
- Our country government should develop better strategic plans and proper policy to enhance local contractor's time performance in order to build up the construction industry. This can be achieved by developing policy for better access to financial facility and by providing higher margin of preference for local contractors.

PLAN FOR DISSEMINATION OF FINDINGS

The result of this study is disseminated to Jimma University, Jimma Institute of Technology, Civil Engineering Department and a copy of it keeps in Jimma University Technology library for all concerned individuals.

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APPENDIX A

Questionnaire For Contractors, Clients (Owners) And Consultants

Date: _____

Dear Sir/ Madam

This questionnaire is designed for research purpose in Jimma University, Jimma Institute of Technology, School of Civil and Environmental Engineering, MSc. Program in Construction Engineering and Management. The questions are prepared for improving poor time performance of local contractors. a case of public construction projects in Mizan-Aman city. The main objective of this study is to assess the cause & impacts of local contractor's poor time performance & developing strategic techniques to improve local contractor's time performance a case in Mizan-Aman city public construction projects. Thus, your response to the questionnaires would be kept confidential and used only for academic purpose.

Therefore, please be beneficial and deliver your genuine and accurate answers to the query given below. The responses are used for study purposes only and perhaps for further recommendations to improve similar works in future. I would love to say thank you earlier for giving specific time.

SEID KASSA

Jimma University
Jimma Institute of Technology
School of Civil & Environmental Engineering
MSc. Program in Construction Engineering & Management

Dear respondents, the objective of this questionnaire is to assess the causes & impacts of local contractor's poor time performance & developing strategic techniques to improve local contractors time performance. This questionnaire is prepared for data collection of a research on developing strategic techniques to improve local contractors time performance. A Case in Mizan-Aman city public construction projects.

Part one: Personal and Organization Data

1.1 Your academic background

1.2 Your work experience in public construction projects & related works.

Less than 5 years between 10 & 15 years

Between 5 and 10 years Beyond 15 years

1.3 Organization.....

1.4 Organization area of specialization

Building Road

1.5 Organization you are working from sides of

Client

Contractors

Consultant

1.6 Types of procurement/delivery system

DB (Design Build)

DBB (Design Bid Build)

Lump sum/Turnkey

Construction management (At risk and as agent)

1.7 Characteristics of projects

Public

Private

Part Two: The Causes & Impacts of Local Contractor's Poor Time Performance Leading to Time Overrun in Public Construction Projects.

2.1 What are the key performance standard's you used to measure the performance of the local contractors?

Time

Safety

Quality

Owners/ Government satisfaction

Community satisfaction

2.2 What mechanism/instrument do you use or apply to evaluate/asses the above performance measures/ key standards?

2.3 How do you describe local contractors time performance on most P.C.P?

Excellent

Very Good

Good

Poor

2.4 If your answer is good or poor for question 2.3, which of the following are most contributing factors for local contractor poor performance leading to time overrun in public projects?

Please show the extent to which you agree or dis agree the following statements using the following scale

1-No Idea

2-Strongly Disagreed

3-Disagreed

4- Agreed

5-Strongly Agreed

Table 1.1 Factors Causing of Local Contractor's Poor Time Performance.

No.	Causes	Degree of agreement				
		Poor Time performance or Overruns				
		0	1	2	3	4
A. Factors related with Design						
1	Mistakes and delay in producing design document					
2	Unclear and Insufficient details in drawing					
3	Designs errors because of designers					
4	Complicated project design					
5	Changes of design by owner or his agent during work					
B. Factors related with contractors						
1	Bad/Poor site management & supervision					
2	Delayed delivery/conveyance of materials					
3	Untrained/Unexperienced employee used during construction of projects					
4	Unsuccessful planning & scheduling of construction project					
5	Problems with subcontractors					
6	Fault during project construction					
7	Underrate the project costs					
8	Miscarry for complexity of project works					
9	Poor project Management system					
10	Inadequate numbers of equipment & skilled laborer					
11	Bad resource management					
12	Cash flow & financial difficulties faced by contractors					
13	Inaccurate time estimate					
14	Uses faulty workmanship by the contractor and subcontractors					
C. Factors related with clients						

1	Improper bidding problems or selection of bidder depend on low price submitted.					
2	Design changes/additional works by public Employers					
3	Delayed progress payment by public employer to L.C					
4	Change orders by public Employers					
5	Poor Communication & Coordination with other parties					
6	Client-initiated variation and necessary variations of work parts					
7	Inadequate client's finance & payments for completed Work					
8	Suspension of work by public employer					
9	Un wanted Interference of owner on contractor's work					
D. Factors related with consultants						
1	Consultant lack of experience					
2	Delay in performing inspection, testing and approval of Works					
3	Delay in approving design documents					
4	Slower or Lower speed of decision making					
5	Poor communication and coordination with surrounding Team					
6	Poor supervision by consultants					
7	Mistakes & Errors during design by consulting body					
8	Unrealistic contract duration and requirements/Inaccurate time estimate.					

9	Preparation of Unclear/incomplete Drawing and specification					
10	Delay drawings during preparation and approval time					
11	Delay in executing/performing inspection & testing					
12	Delay in giving instructions to local contractors					
E. Other Factors						
1	Rise cost or prices of materials (Price inflation)					
2	Shortage of materials					
3	Difficulty in accessing bank credit					
4	Unforeseen ground condition					
5	Force Majeure/ Acts of Gods					
6	Policy, Rules and Regulations of our Country					
7	Unexpected accident in construction site on workers					
8	Unavailability of utility around the construction sites					

2.5 If there are any additional factors that affects project duration. please write down it in spaces below.

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2.6 Which of the following are the impacts of local contractor’s poor time performance on the stakeholders, projects and construction industries of Ethiopia related with public construction projects? Rate the degree of impact of the following statements on stakeholders, projects & construction industries and public construction projects by using the following scales

- 1-No Idea
- 2-No Impact
- 3-Minimum Impact
- 4-Medium Impact
- 5-High Impact

Table 1.2 Impacts of Local Contractor’s Poor Time Performance on The Projects, On Public Construction Projects and Its Stakeholders.

No.	Impacts	Degree of Impacts				
		1	2	3	4	5
1	Time overrun on the projects					
2	Cost overrun on the projects					
3	Additional cost to contractors depending on time delayed (Liquidated Damage)					
4	Expose employer for additional cost & loss its investment return money					
5	Negative social impact					
6	End users of projects loss its benefit from projects.					
7	Idling resources and disputes b/n parties					
8	It creates negative attitude towards public authority					
9	Eroding mutual trust and respect among parties					
10	The delay may be led to Arbitration and Litigation					
11	Impact on Economic development of our country					
12	Lowering Local contractor’s capacity development					

2.7 If there are any additional impacts of local contractor’s poor time performance on projects, the construction industries and its stakeholder’s please write down it in spaces below.

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2.8 Does Improving local contract’s time performance by developing different strategic techniques is possible?

Yes

No

2.9 If your answer is Yes for question 2.8. Which strategic techniques or methods can be effective to improve local contractors time performance related to public construction projects?

Rate the degree of effectiveness on the following strategic techniques or methods in public construction projects by selecting the following scales.

1. Not Effective
2. Slightly effective
3. Moderately effective
4. Very effective
5. Extremely effective

No.	Strategic improvement techniques or methods	Degree of Effectiveness				
		1	2	3	4	5
1	Accurate initial cost estimates					
2	Proper planning and scheduling of Construction Projects					
3	Proper payment from clients to contractors					
4	Frequent progress meeting					
5	Committed leadership & management					
6	Close monitoring					

7	Send clear and complete message to worker to ensure effective communication					
8	Hire skilled workers to achieve good progress					
9	Fully utilize the construction team					
10	Use new construction technologies (IBS-Industrialize Building System)					
11	Provide knowledge/training to unskilled workers based on the work scope					
12	Adoption of tools and techniques i.e., Value Management, Lean Thinking and Total Quality Management					
13	Measure performance against other projects					
14	Avoid bad or poor quality of work					
15	Using appropriate construction methods					
16	Use up to date technology utilization					

2.10 If there is any additional strategic techniques or methods that can be used to improve local contractors time performance on project duration. Please write down it in spaces below.

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APPENDIX B

Respo ndent	Questions																													
	Causes Of Local Contractor's Poor Time Performance																													
	A					B														C										
	1	2	3	4	5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1	2	3	4	5	6	7	8	9		
Contractor	1	4	4	4	3	3	4	3	3	4	1	3	5	4	4	3	4	4	4	4	5	5	5	4	4	5	5	4	4	
	2	3	4	4	4	5	5	4	4	3	4	4	5	3	4	5	4	3	5	4	5	5	4	5	2	5	2	4	5	
	3	4	4	4	4	5	4	4	3	3	3	4	5	4	4	4	4	5	3	4	4	4	3	4	4	4	3	4	3	
	4	4	4	4	3	4	5	5	4	4	5	4	5	3	5	5	5	5	4	5	5	4	5	4	4	4	4	4	3	4
	5	4	3	4	3	4	3	4	4	4	3	3	4	3	3	3	3	3	5	3	3	4	3	4	4	4	4	4	4	4
	6	4	2	3	4	5	4	4	4	4	3	4	2	3	4	3	3	4	4	2	4	5	5	4	3	2	4	3	4	
	7	5	5	5	4	4	5	4	2	3	3	3	5	2	3	4	2	3	5	4	3	5	4	5	4	4	5	2	5	
	8	4	3	3	4	5	4	4	3	5	4	2	2	4	4	3	3	5	4	5	4	5	4	4	4	4	2	4	3	
	9	4	4	4	3	5	4	4	3	4	1	3	5	2	4	5	4	4	5	4	5	4	5	4	2	4	4	3	4	
	10	4	2	3	1	4	4	5	5	3	3	4	5	3	5	5	3	3	4	5	4	4	4	4	3	5	2	2	4	
	11	4	4	5	3	5	5	4	4	4	3	4	5	3	4	3	5	5	5	4	3	5	5	4	2	4	4	3	4	
	12	4	4	4	2	4	4	4	3	4	3	3	5	4	4	3	4	4	4	2	4	5	5	4	2	2	4	4	3	
	13	3	4	3	4	5	4	4	4	3	3	3	5	2	4	3	4	3	5	4	5	5	4	4	4	5	5	4	4	
	14	4	3	4	3	5	3	4	4	5	4	4	3	3	4	4	3	5	4	5	4	4	5	4	4	5	4	3	4	
	15	4	4	3	4	4	5	5	3	4	3	3	5	3	5	5	4	4	4	3	5	4	5	5	4	3	5	3	4	
	16	4	4	4	4	5	4	4	4	4	1	2	2	5	4	3	4	3	4	4	5	4	5	4	4	5	4	4	3	
	17	3	2	4	3	5	4	3	4	3	5	4	5	4	3	5	3	4	4	2	4	5	4	4	5	4	4	4	5	
	18	4	3	4	3	5	4	4	3	5	3	3	5	4	5	3	4	5	5	4	5	4	5	4	4	5	1	4	4	
	19	4	4	4	4	3	3	4	2	4	3	4	2	3	4	3	3	4	4	2	3	5	4	4	5	4	3	3	4	
	20	5	4	3	3	4	5	3	4	3	4	3	4	2	4	3	4	4	5	4	5	4	3	5	4	5	5	4	4	
	21	4	2	4	4	5	4	4	4	3	1	4	5	4	4	5	4	5	5	5	4	5	5	4	3	4	3	3	4	
	22	3	4	4	3	4	5	4	4	4	3	4	5	2	4	3	4	5	4	2	5	4	5	4	3	5	4	4	3	
	23	4	5	4	2	4	3	2	2	3	4	3	5	3	5	4	5	4	5	4	2	4	3	4	4	5	3	4	5	
	24	4	4	5	4	5	4	5	4	4	3	4	2	2	4	3	2	4	5	3	5	5	5	4	4	5	4	3	4	
	25	4	3	3	3	5	5	4	3	4	3	2	5	4	3	5	5	5	3	5	5	4	4	5	2	4	4	4	3	
	26	4	4	4	4	5	5	3	4	3	4	4	2	4	4	3	4	3	5	2	4	5	5	4	3	2	5	3	5	

Rank	Mean	R.I.I	A*N	$= 5n5 + 4n4 + 3n3 + 2n2 + 1n1$	1	2	3	4	5
10	3.8889	0.77	180	140	0	1	6	25	4
20	3.5000	0.70	180	126	0	6	8	20	7
11	3.8333	0.76	180	138	0	0	10	22	4
22	3.3333	0.66	180	120	1	2	17	16	0
2	4.5000	0.9	180	162	0	0	3	12	21
5	4.1667	0.83	180	150	0	0	7	16	13
9	3.9444	0.78	180	142	0	2	5	22	7
17	3.5278	0.70	180	127	0	3	12	20	1
14	3.6944	0.73	180	133	0	0	14	19	3
25	3.0000	0.6	180	108	6	1	18	9	2
21	3.4444	0.68	180	124	0	4	12	20	0
5	4.1667	0.83	180	150	0	8	2	2	24
22	3.3611	0.67	180	122	0	6	13	14	3
7	4.0278	0.80	180	145	0	0	6	23	7
11	3.8333	0.76	180	138	0	1	16	7	12
12	3.7778	0.75	180	136	0	2	10	18	6
8	4.0000	0.80	180	144	1	0	9	14	12
3	4.3333	0.86	180	156	0	1	3	15	17
15	3.6667	0.73	180	132	0	7	6	15	8
3	4.3333	0.86	180	156	0	1	4	13	18
4	4.5000	0.9	180	162	0	0	0	18	18
3	4.3333	0.86	180	156	0	0	7	10	19
6	4.1944	0.83	180	150	0	0	0	30	6
19	3.5000	0.70	180	126	0	6	8	20	7
8	4.0000	0.80	180	144	0	6	3	12	15
15	3.6667	0.73	180	132	1	4	8	16	7
18	3.5278	0.70	180	127	0	2	13	21	0
11	3.8333	0.76	180	138	0	1	10	19	6

Respondent		Questions																				
		Causes Of Local Contractor's Poor Time Performance																				
		D												E								
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	
Contractor	1	4	4	4	4	3	3	4	4	4	4	5	3	5	5	2	1	1	1	1	4	
	2	4	5	2	5	2	4	4	5	4	5	2	4	5	5	4	4	3	4	4	4	
	3	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	4	3	3	4	4	
	4	4	4	4	4	4	4	4	4	4	4	4	3	5	5	4	5	3	3	3	5	
	5	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	4	3	4	4	3	4
	6	3	3	4	4	4	4	3	4	3	2	3	4	5	4	2	1	3	2	3	4	
	7	2	3	2	5	2	3	5	5	1	5	4	3	3	5	4	3	4	3	4	4	
	8	4	5	3	4	5	5	3	4	4	3	5	5	5	4	5	4	3	5	4	5	
	9	3	3	4	4	4	3	5	4	1	2	4	3	5	5	2	4	3	3	4	4	
	10	4	4	4	5	3	4	3	5	2	3	3	3	5	5	2	3	4	1	3	4	
	11	4	4	5	4	4	3	2	4	3	2	4	3	5	5	4	4	3	3	4	4	
	12	4	4	4	3	2	4	3	4	4	4	3	4	5	4	2	3	3	2	4	5	
	13	4	3	4	4	4	5	4	3	4	3	2	3	5	5	3	4	3	1	4	4	
	14	3	4	4	4	3	4	4	4	4	2	4	4	5	3	4	2	4	2	1	4	
	15	4	4	2	5	4	4	3	4	4	5	4	5	3	5	2	5	2	4	4	4	
	16	4	4	4	4	4	4	4	4	4	3	5	3	5	5	2	3	2	4	3	4	
	17	4	4	4	4	4	4	5	4	4	4	3	4	4	5	4	4	3	4	3	5	
	18	4	5	4	3	3	4	4	4	4	5	1	3	5	5	4	2	4	3	2	4	
	19	4	4	4	4	3	4	4	5	3	4	4	3	5	4	4	4	2	3	3	4	
	20	4	4	3	5	5	4	4	4	4	2	4	3	5	4	2	5	3	3	2	4	
	21	4	4	4	4	4	4	5	4	4	4	2	4	5	5	2	3	3	1	3	4	
	22	4	4	4	4	2	4	4	4	4	4	5	4	5	4	4	5	3	3	3	5	
	23	4	3	4	4	4	3	4	5	4	3	4	3	5	5	4	1	5	1	1	4	
	24	4	4	4	4	4	3	3	4	4	4	4	5	5	4	2	5	3	5	4	4	
	25	4	5	4	4	3	4	4	4	4	5	3	4	4	5	4	2	1	2	3	4	

Rank	Mean	R.I.I	A*N	$= 5n5 + 4n4 + 3n3 + 2n2 + 1n1$	1	2	3	4	5
13	3.8056	0.761	180	137	0	2	4	29	1
8	4.0000	0.80	180	144	0	0	6	24	6
15	3.6667	0.733	180	132	0	6	2	26	2
5	4.1667	0.833	180	150	0	0	2	26	8
18	3.5000	0.70	180	126	0	6	8	20	2
11	3.8333	0.766	180	138	0	0	9	24	3
9	3.7222	0.744	180	134	0	2	10	20	4
5	4.1667	0.833	180	145	0	0	2	26	8
14	3.6389	0.727	180	131	1	2	6	27	0
15	3.6667	0.733	180	132	0	6	9	12	9
16	3.6111	0.722	180	130	2	4	6	18	6
17	3.5278	0.705	180	127	0	1	19	12	4
1	4.6667	0.933	180	168	0	0	2	8	26
2	4.5000	0.90	180	162	0	0	2	14	20
23	3.3333	0.66	180	120	0	12	2	20	2
24	3.1667	0.633	180	114	7	4	8	10	7
25	3.0833	0.616	180	111	3	3	20	8	2
26	2.8333	0.566	180	102	6	6	14	8	2
26	2.8333	0.566	180	102	7	4	14	10	1
5	4.1667	0.833	180	150	0	1	1	25	9

Respo ndent	Questions																												
	Causes Of Local Contractor's Poor Time Performance																												
	A					B														C									
	1	2	3	4	5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1	2	3	4	5	6	7	8	9	
Client	1	3	3	3	4	4	4	4	4	3	2	3	3	4	4	4	4	3	4	3	3	4	3	3	3	3	3		
	2	4	4	3	3	3	4	4	4	4	3	3	3	3	4	4	3	5	4	3	3	3	5	3	3	3	4	3	3
	3	4	4	4	5	4	4	4	2	4	1	1	2	2	4	2	4	5	4	2	2	3	5	3	2	3	3	3	1
	4	5	4	4	5	5	4	5	5	5	4	5	5	1	5	5	4	3	5	5	5	5	3	5	5	5	2	2	5
	5	3	4	3	4	5	4	5	4	4	3	2	4	4	5	4	4	5	4	3	5	5	5	4	3	3	5	4	3
	6	2	5	1	5	4	5	4	5	4	5	5	3	2	5	4	3	5	4	5	1	3	5	5	3	5	2	3	2
	7	4	3	5	3	2	5	5	3	4	3	3	2	3	4	4	5	4	5	2	3	5	5	2	1	4	3	5	5
	8	5	4	1	5	5	4	5	4	5	2	5	3	1	5	4	3	3	4	2	1	3	4	2	3	2	5	3	3
	9	4	3	4	5	4	4	4	5	3	2	2	5	2	4	4	4	4	2	5	2	3	5	4	2	2	3	1	2
	10	5	3	3	2	5	5	4	5	4	3	3	2	3	3	2	5	5	4	2	3	2	3	1	3	5	2	2	1
	11	5	3	4	1	4	3	4	5	4	1	2	2	3	5	4	3	3	5	3	1	3	5	2	5	4	2	2	2
	12	3	4	4	1	5	4	4	5	5	1	5	2	2	5	3	3	4	2	3	5	3	3	2	2	3	3	2	3
	13	4	3	3	5	5	5	4	3	4	5	2	3	5	3	4	5	3	4	4	3	2	5	2	3	2	3	3	4
	14	3	3	4	4	4	2	4	5	4	3	3	4	2	5	2	4	4	2	2	5	2	5	4	2	5	2	3	1
	15	2	4	3	5	5	4	3	4	5	2	1	4	3	4	4	3	3	4	5	1	4	2	5	3	3	5	3	5
	16	4	5	4	3	4	4	5	5	3	2	3	3	1	4	5	4	5	4	3	3	3	3	4	5	4	2	2	3
	17	2	4	1	5	5	4	4	4	4	3	2	4	3	5	4	3	5	5	2	4	2	5	2	2	4	3	3	3
	18	5	3	3	2	5	4	5	2	5	3	5	3	2	4	3	3	5	4	3	5	4	5	4	3	3	5	3	2
	19	3	3	4	5	4	5	5	4	4	1	3	4	1	5	4	4	4	3	2	4	3	5	2	3	2	3	5	3
	20	3	4	3	4	5	3	4	5	4	2	3	2	5	4	3	4	5	4	5	3	5	3	5	3	3	2	3	4
	21	4	4	3	5	4	4	5	4	3	3	1	4	4	3	5	3	3	4	2	5	3	5	4	2	3	3	3	3
	22	2	4	4	1	4	4	3	4	4	2	1	3	4	5	2	4	5	4	3	2	4	4	2	2	3	3	2	1
	23	4	3	3	2	4	3	5	2	4	3	4	3	1	4	4	3	3	5	2	5	5	3	5	3	3	2	4	3
	24	3	4	3	4	4	2	5	4	3	2	4	3	2	4	5	4	5	2	4	3	2	5	2	3	4	3	3	1
	25	4	3	3	1	4	4	4	2	4	2	3	4	1	3	4	4	3	4	3	2	5	3	2	2	4	2	3	3
	26	3	4	2	4	3	3	4	5	4	3	1	4	4	5	4	3	5	4	2	1	4	5	5	2	2	3	3	2
	27	4	4	3	4	4	4	4	4	3	1	3	2	4	4	2	4	3	4	3	5	3	2	2	5	5	2	3	4

Rank	Mean	R.I.I	A*N	$= 5n5 + 4n4 + 3n3 + 2n2 + 1n1$	1	2	3	4	5			
										28	29	30
11	3.6000	0.72	150	108	0	4	9	12	5			
10	3.6667	0.733	150	110	0	0	12	16	2			
19	3.0667	0.613	150	92	4	1	15	9	1			
12	3.5000	0.70	150	105	5	4	2	9	10			
4	4.1667	0.833	150	125	0	1	3	16	10			
8	3.8333	0.766	150	115	0	2	6	17	5			
3	4.3333	0.866	150	130	0	0	2	16	12			
7	3.9333	0.786	150	118	0	5	2	13	10			
6	4.0000	0.80	150	120	0	0	6	18	6			
24	2.5000	0.5	150	75	5	10	12	1	2			
22	2.9000	0.58	150	87	5	6	11	3	5			
16	3.2333	0.646	150	97	0	8	10	9	3			
22	2.7333	0.546	150	82	6	8	6	8	2			
4	4.1667	0.833	150	126	0	0	6	13	11			
10	3.6667	0.733	150	110	0	6	3	16	5			
10	3.6667	0.733	150	110	0	0	13	14	3			
5	4.1000	0.82	150	123	0	0	11	5	14			
9	3.7667	0.753	150	113	0	5	2	18	5			
19	3.0000	0.6	150	90	0	12	11	2	5			
17	3.1667	0.633	150	95	5	5	8	4	8			
12	3.5000	0.7	150	105	0	5	12	6	7			
6	4.0000	0.80	150	120	0	3	9	3	15			
18	3.1333	0.6266	150	94	1	14	1	9	6			
21	2.9333	0.5866	150	88	1	9	15	1	4			
13	3.3333	0.666	150	100	0	7	11	7	5			
19	3.0000	0.6	150	90	0	10	14	2	4			
20	2.9667	0.593	150	89	1	6	18	3	2			
22	2.8333	0.566	150	85	5	5	13	4	3			

Respondent	Questions	
	Causes Of Local Contractor Poor Time Performance	
	D	E

		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8
Client	1	4	5	3	5	4	4	3	5	3	4	5	4	5	5	3	3	3	2	2	5
	2	4	4	3	4	4	4	4	4	3	3	2	3	5	5	4	4	4	2	4	3
	3	1	4	4	3	4	4	4	3	4	4	4	4	5	5	4	1	1	3	2	4
	4	5	5	4	5	5	3	5	5	5	5	5	5	5	5	2	3	1	2	2	1
	5	4	3	4	5	3	4	4	2	3	4	5	4	5	4	3	2	2	2	2	4
	6	1	5	3	4	1	4	2	4	4	4	5	1	4	5	5	3	2	3	2	5
	7	2	1	4	5	2	3	4	2	3	3	2	3	5	5	1	4	3	3	2	3
	8	5	2	5	3	4	3	4	5	2	1	5	2	4	4	2	5	2	2	2	5
	9	4	4	2	5	1	3	2	1	3	4	3	5	5	4	3	1	3	1	3	3
	10	4	1	3	2	5	5	1	3	5	1	3	4	4	5	2	3	3	3	2	2
	11	3	4	5	5	2	3	1	4	3	2	4	2	5	4	5	1	2	2	2	5
	12	4	1	3	3	3	2	5	3	2	5	2	3	4	5	3	2	0	3	3	2
	13	2	1	4	5	3	3	4	3	4	4	4	3	5	4	3	3	2	2	2	3
	14	2	3	3	2	2	2	5	5	5	4	5	4	4	5	2	2	5	2	2	4
	15	1	4	3	5	4	4	1	3	3	5	1	4	5	5	3	1	1	3	5	2
	16	2	3	2	2	1	4	2	3	2	4	3	3	5	4	2	3	2	3	2	3
	17	1	5	3	5	2	3	2	1	4	1	1	1	5	5	3	2	2	2	2	1
	18	2	4	3	3	4	5	4	3	3	2	4	5	4	4	2	3	2	3	2	3
	19	4	3	1	5	4	4	4	3	1	5	2	3	4	5	3	2	1	3	2	1
	20	5	1	4	3	3	4	2	3	5	3	5	2	5	4	2	2	1	1	3	4
	21	4	4	2	5	4	3	4	2	4	4	3	5	4	5	2	2	3	3	2	2
	22	3	5	4	4	2	4	1	3	3	4	1	4	5	5	2	3	1	3	2	3
	23	4	4	2	5	3	2	5	2	3	3	1	5	4	4	1	1	5	2	2	4
	24	2	1	3	2	4	3	1	5	3	4	5	3	5	5	2	1	3	2	4	2
	25	4	3	3	5	1	4	4	4	5	2	2	4	4	3	5	3	2	3	2	3
	26	4	1	5	3	2	3	4	3	3	1	4	2	5	4	4	3	1	3	3	4
	27	3	4	3	5	2	2	5	2	5	1	4	1	5	5	1	4	1	3	3	1
	28	5	3	3	2	5	2	4	2	3	5	2	3	5	3	2	2	3	2	4	1
	29	4	3	4	5	2	3	2	3	5	4	1	4	5	4	1	2	1	2	3	4
	30	1	4	4	5	4	3	4	4	4	2	4	4	5	5	4	3	2	3	2	3

Rank	Mean	R.I.I	A*N	$= 5n5 + 4n4 + 3n3 + 2n2 + 1n1$	1	2	3	4	5
18	3.1333	0.626	150	94	5	6	3	12	4
17	3.1667	0.633	150	95	7	1	7	10	5
14	3.3000	0.66	150	99	1	4	13	9	3
6	4.0000	0.8	150	120	0	5	6	3	16
19	3.0000	0.6	150	90	4	8	5	10	3
13	3.3333	0.666	150	100	0	5	12	11	2
16	3.2333	0.646	150	97	5	6	1	13	5
8	3.1667	0.633	150	95	2	6	12	5	5
12	3.5000	0.70	150	105	1	3	13	6	7
17	3.1667	0.633	150	95	5	6	3	11	5
15	3.2667	0.653	150	98	5	5	5	7	8
13	3.3333	0.666	150	100	3	4	8	10	5
1	4.6667	0.933	150	140	0	0	0	10	20
2	4.5000	0.90	150	135	0	0	2	11	17
23	2.6667	0.533	150	80	5	10	8	4	3
25	2.4667	0.4932	150	74	6	9	11	3	1
27	2.1667	0.433	150	65	10	10	7	1	2
26	2.4333	0.486	150	73	2	13	15	0	0
24	2.5000	0.500	150	75	0	20	6	3	1
19	3.0000	0.6	150	90	5	5	9	7	4

Consultant		Respo ndent																					
		Questions																					
		Causes Of Local Contractor's Poor Time Performance																					
		A					B							C									
1	2	3	4	5	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9
1	3	2	3	4	4	5	5	4	4	4	4	5	4	5	5	5	4	4	4	5	5	4	3
2	2	1	2	2	4	4	4	5	5	2	2	4	4	4	5	4	2	2	4	2	3	2	3
3	3	4	3	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	4	4	3	3
4	4	3	3	2	4	5	5	3	4	1	2	3	2	4	4	4	4	4	3	4	3	2	1

	5	5	5	5	2	3	4	2	5	4	3	5	4	4	5	5	2	5	2	4	4	4	3	4	5	5	2	2	3	
	6	4	3	2	4	3	4	4	4	4	1	3	5	4	5	4	4	4	5	3	5	3	4	5	3	5	5	2	3	
	7	3	1	5	5	3	4	4	2	4	3	3	4	5	4	3	3	3	2	5	4	4	3	3	4	2	5	2	1	
	8	2	4	2	3	5	5	5	5	4	2	3	4	3	4	5	4	4	4	4	3	1	5	5	4	4	3	4	5	4
	9	3	3	2	2	5	4	2	5	5	4	2	4	4	5	4	4	5	4	4	4	4	3	5	3	2	4	1	1	
	10	4	2	4	4	4	4	5	4	4	3	2	4	5	4	4	4	2	5	3	4	5	4	3	4	3	4	2	4	
	11	2	4	2	2	3	5	4	5	4	2	5	4	5	5	4	5	4	4	4	5	4	3	4	3	2	5	4	3	
	12	5	1	2	3	5	4	4	4	4	3	3	2	4	5	4	4	5	4	4	4	4	4	3	3	4	2	3	1	
	13	3	3	2	4	4	5	4	5	5	2	3	4	2	4	5	4	3	5	4	4	2	5	5	4	2	5	2	3	
	14	4	3	2	2	4	4	5	2	4	4	2	5	4	4	5	4	4	2	5	2	5	4	3	5	3	4	2	3	
	15	3	2	2	4	4	5	4	5	4	1	2	4	2	5	4	4	5	4	4	5	4	3	4	3	2	2	4	1	
	16	4	3	2	2	5	4	3	4	5	3	2	2	5	4	3	5	4	4	3	4	4	3	3	4	2	5	3	1	
	17	3	2	3	4	4	5	5	5	4	2	3	4	3	4	4	4	3	4	4	4	4	4	4	5	3	4	4	2	3
	18	4	1	4	2	3	4	5	2	4	4	2	5	3	4	5	4	5	4	4	3	4	4	4	4	2	4	2	1	
	19	3	3	2	3	4	5	4	4	4	1	3	4	2	5	4	4	2	5	3	4	5	4	3	3	5	2	1	3	
	20	2	3	3	4	4	3	5	5	4	2	3	3	4	4	4	3	5	4	4	2	4	3	3	5	4	2	3	1	
	21	3	3	3	2	4	5	4	4	5	4	3	4	5	5	5	4	4	4	1	5	4	3	4	3	2	5	2	1	
	22	3	2	2	3	4	4	5	2	4	3	2	5	4	4	4	5	4	2	5	4	4	4	3	4	3	4	1	3	
	23	3	1	3	2	4	5	4	4	4	1	3	2	4	4	5	4	2	5	4	3	3	4	3	3	4	4	1	2	
	24	2	3	2	3	5	4	5	2	4	3	2	4	3	5	4	4	5	4	3	5	4	3	3	3	4	2	3	1	
	25	2	3	3	3	4	4	4	5	4	4	3	4	4	4	5	4	2	3	4	4	4	3	4	3	5	4	3	2	
5																														
4																														
3																														
2																														
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0																														
0																														
5																														
10																														

Rank	Mean	R.I.I	A*N	$= 5n5 + 4n4 + 3n3 + 2n2 + 1n1$
17	3.2000	0.64	125	80
21	2.6000	0.52	125	65
20	2.8000	0.56	125	70
18	3.0000	0.6	125	75
8	4.0000	0.80	125	100
4	4.3600	0.872	125	109
7	4.2000	0.84	125	103
9	3.9600	0.792	125	99
6	4.2000	0.84	125	102
21	2.6000	0.52	125	65
20	2.8000	0.56	125	70
10	3.8800	0.776	125	97
14	3.6000	0.72	125	90
3	4.4000	0.88	125	110
5	4.3200	0.864	125	108
8	4.0000	0.80	125	100
11	3.8000	0.76	125	95
12	3.7600	0.752	125	94
13	3.7200	0.744	125	93
12	3.8000	0.76	125	94
8	4.0000	0.80	125	100
14	3.6000	0.72	125	90
16	3.8000	0.76	125	85
14	3.6000	0.72	125	90
17	3.2000	0.64	125	80
11	3.8000	0.76	125	95
22	2.4000	0.48	125	60
23	2.2000	0.44	125	55

Respondent		Questions																			
		Causes Of Local Consultant's Poor Time Performance																			
		D												E							
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8
Consultant	1	3	3	4	4	4	4	4	4	4	3	3	5	5	4	5	3	3	3	4	
	2	2	4	2	2	1	2	2	4	2	2	2	2	5	5	4	2	2	4	5	
	3	3	4	4	4	4	4	4	3	4	4	4	3	5	5	5	4	3	4	4	
	4	2	3	3	4	2	4	2	4	2	3	2	3	4	5	2	1	1	1	4	
	5	2	3	5	5	5	3	3	5	3	3	3	3	4	4	3	1	3	1	5	4
	6	2	5	3	3	1	4	5	3	2	3	2	2	5	4	5	3	1	2	1	5
	7	2	3	5	3	2	5	2	5	1	5	3	3	5	5	2	3	1	4	3	2
	8	2	5	3	2	3	2	3	3	2	3	2	3	5	5	3	2	3	1	3	4
	9	2	3	3	3	1	4	3	3	4	2	2	3	4	5	3	4	1	1	3	5
	10	2	3	3	5	2	2	4	3	3	3	2	3	4	5	3	5	2	4	3	4

A*N	= 5n5 + 4n4 + 3 n3 + 2 n2 + 1n1																								
		1	2	3	4	5																			
125	60	0	15	10	0	0	11	2	3	4	4	2	5	3	2	4	3	5	5	4	3	2	1	5	4
125	85	0	2	13	8	2	14	2	3	4	3	3	2	4	3	4	3	4	5	4	2	2	3	1	3
125	80	1	4	13	4	3	14	7	14	7	4	4	3	2	4	3	3	4	5	4	5	1	5	3	4
125	90	0	1	12	8	4	14	5	10	10	0	8	2	4	3	4	3	4	5	5	3	1	1	1	5
125	65	5	10	3	4	3	14	5	10	10	1	5	10	0	3	4	3	4	5	4	5	2	2	1	5
125	86	0	5	5	14	1	14	7	6	2	2	5	4	3	3	2	5	4	2	3	4	4	3	1	3
125	75	0	10	7	6	2	14	7	6	2	2	5	4	3	3	2	5	4	2	3	3	3	1	3	3
125	90	0	0	14	7	4	14	7	4	4	4	4	3	3	4	3	3	4	5	5	1	3	1	3	1
125	73	2	8	5	10	0	10	5	10	0	8	2	4	3	4	3	2	4	2	3	3	3	3	3	4
125	80	0	5	11	8	1	14	5	11	8	1	5	10	0	3	3	3	3	4	5	5	4	1	5	4
125	70	0	10	10	5	0	10	5	0	0	10	0	5	0	3	3	2	4	2	3	3	3	3	3	4
125	70	1	3	21	0	0	10	21	0	0	15	0	10	15	5	5	3	4	5	5	4	1	5	3	4
125	115	0	0	0	10	15	10	0	10	15	15	0	10	15	5	5	3	4	5	5	4	1	5	3	4
125	120	0	0	0	5	20	10	0	5	20	20	0	5	20	5	5	4	5	5	4	4	2	3	2	3
125	70	5	5	7	6	2	10	7	6	2	2	5	6	2	5	5	1	5	5	4	5	2	2	1	5
125	75	5	5	5	5	5	10	5	5	5	5	5	5	5	4	1	4	1	3	3	3	3	3	3	4
125	50	10	5	10	0	0	10	5	10	0	0	0	0	0	3	3	2	3	4	5	4	1	1	1	5
125	55	10	5	6	3	1	10	6	3	1	1	5	3	1	3	3	1	3	4	5	4	1	1	1	5
125	75	5	0	14	2	4	10	14	2	4	4	4	2	4	3	3	2	3	4	5	4	2	3	2	3
125	110	0	1	3	16	5	10	3	16	5	5	5	16	5	1	1	3	4	5	4	4	2	3	2	3

Rank	Mean	R.I.I
22	2.4000	0.48
16	3.4000	0.68
17	3.1600	0.632
14	3.6000	0.72
21	2.6000	0.52
15	3.4400	0.688
18	3.0000	0.6
14	3.6000	0.72
19	2.9200	0.584
17	3.2000	0.64
20	2.8000	0.56
20	2.8000	0.56
20	4.6000	0.92
1	4.8000	0.96
19	2.8000	0.56
18	3.0000	0.6
24	2.0000	0.4
23	2.2000	0.44
18	3.0000	0.6
3	4.0000	0.88

Respondent		Questions											
		Impacts Of Local Contractor's Poor Time Performances On The Projects, Stakeholders And The Construction Industry											
		1	2	3	4	5	6	7	8	9	10	11	12
Contractor	1	4	5	4	3	2	3	3	2	3	2	3	4
	2	4	4	3	3	4	5	3	2	4	4	3	3
	3	4	5	4	5	5	4	5	5	5	5	5	5
	4	5	5	5	4	4	4	4	4	4	4	4	5
	5	4	4	4	4	4	5	5	5	4	4	4	4
	6	4	4	4	3	4	4	4	4	4	3	3	4
	7	5	5	4	5	5	4	2	2	5	3	4	3
	8	5	3	5	5	4	4	4	4	4	2	3	3
	9	3	5	5	4	1	4	5	5	2	3	3	2
	10	4	5	4	4	4	4	4	3	4	3	3	4
	11	5	4	4	5	4	3	5	5	4	3	4	5
	12	4	5	4	4	4	4	2	4	4	2	3	4
	13	3	5	2	5	5	2	5	2	3	4	2	4
	14	4	5	4	3	4	4	4	5	5	3	3	4
	15	5	4	5	4	4	5	2	2	5	2	4	3
	16	4	5	4	5	3	4	4	4	4	5	3	5
	17	4	3	4	4	4	4	5	4	3	5	4	4

	18	4	5	5	3	3	4	2	5	4	3	4	4
	19	5	5	3	2	5	5	4	2	5	4	3	4
	20	5	4	4	4	2	5	5	5	4	4	3	5
	21	4	5	4	3	4	4	5	2	3	4	5	5
	22	4	4	4	5	4	4	3	4	4	5	4	4
	23	3	5	2	5	5	4	5	5	4	3	3	4
	24	4	5	3	4	4	5	4	4	3	2	5	5
	25	3	5	5	3	2	5	2	4	4	4	3	4
	26	4	4	4	5	3	5	4	2	3	3	4	5
	27	5	4	4	4	5	4	5	2	4	4	4	3
	28	3	5	4	3	4	4	3	2	5	3	3	4
	29	4	5	4	4	5	5	5	5	3	4	4	4
	30	5	4	5	5	5	4	3	5	4	3	4	5
	31	4	5	4	2	4	5	5	2	3	4	5	3
	32	4	5	5	4	4	4	4	4	3	5	2	5
	33	5	4	4	4	4	3	3	5	4	2	5	4
	34	5	5	4	3	3	5	2	5	3	4	4	4
	35	3	5	3	4	2	5	5	3	5	4	5	4
	36	5	3	4	5	5	3	4	2	4	5	4	5
5		12	21	8	11	9	12	13	12	7	6	6	11
4		18	12	22	14	18	19	10	10	18	13	14	18
3		6	3	4	9	4	4	7	2	10	11	14	6
2		0	0	2	2	4	1	6	12	1	6	2	1
1		0	0	0	0	1	0	0	0	0	0	0	0
$= 5n5 + 4n4 + 3n3 + 2n2 + 1n1$		150	162	144	142	138	150	138	130	139	127	132	147

A*N	180	180	180	180	180	180	180	180	180	180	180	180
R.I.I	0.833	0.90	0.80	0.788	0.766	0.833	0.766	0.722	0.772	0.705	0.733	0.816
Mean	4.166	4.500	4.000	3.944	3.833	4.166	3.833	3.611	3.861	3.527	3.666	4.083
Rank	2	1	4	5	7	2	7	9	6	10	8	3

Respondent		Questions											
		Impacts Of Local Contractor's Poor Time Performances On The Projects, Stakeholders And The Construction Industry											
		1	2	3	4	5	6	7	8	9	10	11	12
Client	1	4	5	4	3	4	5	2	5	4	3	5	3
	2	5	4	4	4	4	5	4	4	4	4	3	3
	3	5	5	5	4	4	4	5	5	4	4	4	4
	4	5	3	5	5	5	5	5	5	5	2	5	5
	5	4	4	5	5	4	4	5	4	4	4	5	5
	6	5	5	5	3	4	5	3	3	5	3	2	4
	7	5	5	5	5	3	2	5	3	3	5	3	2
	8	5	5	5	2	4	5	2	2	4	3	2	5
	9	3	5	4	4	3	2	3	5	4	1	5	2
	10	5	5	5	2	4	3	5	3	2	4	2	3
	11	5	5	5	5	3	4	5	3	4	3	4	2
	12	4	5	4	4	5	3	4	5	4	4	3	1
	13	5	5	5	4	4	2	4	2	4	2	4	5
	14	5	5	5	3	2	5	5	5	3	4	3	5
	15	4	4	3	4	4	5	2	4	4	3	2	4
	16	3	5	5	2	5	5	5	3	4	4	5	3
	17	5	5	4	5	4	3	5	2	5	1	5	5

	18	4	5	4	5	4	4	3	5	3	4	3	2
	19	5	5	4	4	4	3	5	3	4	3	4	3
	20	5	4	5	5	3	2	4	4	2	4	5	5
	21	4	3	4	4	4	4	5	5	4	2	2	4
	22	4	5	5	5	2	5	3	5	5	2	4	1
	23	5	5	5	4	4	3	5	4	4	4	5	2
	24	4	5	4	3	4	4	5	2	4	5	3	5
	25	5	5	5	2	3	5	2	5	4	4	2	4
	26	4	5	4	4	5	4	5	5	4	4	4	3
	27	4	5	5	3	4	2	4	2	4	5	2	5
	28	5	4	4	5	4	5	2	3	5	4	5	5
	29	5	5	4	2	5	4	5	4	4	4	4	3
	30	4	4	4	5	4	3	3	5	4	1	5	2
5		17	22	16	10	5	11	15	12	5	3	10	10
4		11	6	13	10	18	8	5	6	20	14	7	5
3		2	2	1	5	5	6	5	7	3	6	6	7
2		0	0	0	5	2	5	5	5	2	4	7	6
1		0	0	0	0	0	0	0	0	0	3	0	2
	$= 5n5 + 4n4 + 3n3 + 2n2 + 1n1$	135	140	135	115	116	115	120	115	118	100	110	105
	A*N	150	150	150	150	150	150	150	150	150	150	150	150
	R.I.I	0.90	0.933	0.90	0.766	0.773	0.766	0.80	0.766	0.786	0.666	0.733	0.70
	Mean	4.50	4.66	4.50	3.83	3.86	3.83	4.00	3.83	3.93	3.33	3.66	3.50
	Rank	2	1	2	6	5	6	3	6	4	9	7	8

Respondent		Questions											
		Impacts Of Local Contractor's Poor Time Performances On The Projects, Stakeholders And The Construction Industry											
		1	2	3	4	5	6	7	8	9	10	11	12
Consultant	1	5	5	5	4	4	5	5	5	5	5	5	5
	2	5	5	5	3	5	4	3	4	5	1	5	5
	3	5	5	5	5	5	5	5	5	5	5	5	5
	4	3	4	4	4	3	3	3	3	3	3	3	3
	5	5	5	4	3	3	1	2	5	3	5	4	5
	6	2	5	3	4	2	5	2	3	4	3	5	3
	7	5	5	4	5	2	2	5	5	3	1	4	5
	8	4	3	3	4	4	1	2	5	4	4	2	4
	9	5	5	3	3	4	1	5	4	3	5	4	3
	10	5	5	4	2	4	5	2	3	5	4	5	2
	11	4	5	3	3	5	4	5	3	4	1	4	5
	12	5	4	4	3	3	5	3	4	4	5	4	2
	13	4	5	3	2	2	4	5	2	5	3	4	5
	14	3	5	4	5	4	2	5	5	3	4	2	3
	15	5	5	5	4	2	5	5	5	5	1	3	5
	16	4	5	4	3	5	5	1	4	3	5	4	3
	17	4	5	5	3	5	4	2	5	5	4	5	5
	18	5	5	5	4	2	5	2	4	3	5	3	5
	19	5	3	4	5	5	1	5	2	5	3	4	2
	20	4	5	5	4	5	4	5	3	4	1	4	4
	21	5	4	4	3	5	5	3	5	5	4	3	5
	22	5	5	5	4	2	5	3	3	5	3	4	5
	23	5	3	4	5	5	3	2	4	4	5	3	5
	24	3	5	5	3	4	1	5	3	5	2	5	3
	25	5	4	5	2	5	3	4	4	5	3	4	5

Rank	Mean	R.I.I	A*N	$= 5n5 + 4n4 + 3n3 + 2n2 + 1n1$	1	2	3	4	5
2	4.400	0.88	125	110	0	1	3	6	15
1	4.600	0.92	125	115	0	0	3	4	18
5	4.200	0.84	125	105	0	0	5	10	10
8	3.600	0.72	125	90	0	3	9	8	5
7	3.800	0.76	125	95	0	6	3	6	10
10	3.520	0.704	125	88	5	2	3	5	10
9	3.560	0.712	125	89	1	7	5	1	11
6	3.920	0.784	125	98	0	2	7	7	9
3	4.200	0.84	125	105	0	0	7	6	12
11	3.400	0.68	125	85	5	1	6	5	8
6	3.920	0.784	125	98	0	2	5	11	7
4	4.080	0.816	125	102	0	3	6	2	14

Respondent		Questions															
		Strategic Local Contractor Time Performance Improvement Techniques (Methods)															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Contractor	1	3	4	4	2	2	3	4	4	3	3	5	4	4	2	4	4
	2	4	4	4	3	3	3	3	4	4	3	3	3	3	4	4	3
	3	4	4	4	4	5	3	4	4	4	4	4	4	5	5	5	4
	4	5	4	4	4	4	4	4	4	4	4	4	4	4	2	5	5
	5	3	4	4	5	5	4	2	4	5	4	4	4	4	5	5	4
	6	4	3	3	4	2	4	4	4	5	3	3	3	2	5	3	3

7	3	5	4	2	5	3	3	4	4	3	3	3	3	3	5	4
8	4	3	5	5	4	5	4	3	5	4	5	3	3	5	5	4
9	5	3	3	2	3	4	3	5	4	3	2	5	4	3	4	3
10	4	4	3	4	5	5	3	4	4	4	4	4	3	5	5	4
11	3	5	5	2	5	3	4	4	5	4	4	5	5	5	5	3
12	4	4	3	2	3	4	4	5	4	3	3	4	3	3	5	5
13	3	3	4	4	5	3	4	5	3	4	4	4	4	2	5	4
14	4	4	3	5	4	3	4	4	4	3	5	3	4	3	4	4
15	5	4	4	3	5	4	3	4	3	4	3	3	3	5	5	2
16	4	4	5	4	3	3	4	3	4	2	4	5	4	2	5	5
17	3	5	4	4	4	3	3	4	5	3	2	4	2	5	4	4
18	4	4	3	5	5	4	4	5	4	4	3	4	4	3	5	3
19	5	3	3	4	2	3	3	5	3	5	4	2	5	3	4	4
20	3	4	4	4	3	5	3	4	3	3	5	3	3	2	5	3
21	4	3	4	3	5	4	4	4	4	3	3	4	4	5	4	5
22	3	4	3	5	2	3	3	4	5	4	4	3	2	5	5	4
23	4	4	5	5	4	2	4	4	3	2	3	2	4	4	3	4
24	4	4	3	4	1	3	3	3	4	3	5	3	4	4	4	3
25	3	4	4	3	5	3	3	5	2	4	4	3	4	3	4	4
26	5	3	4	4	1	3	4	4	5	3	3	4	2	5	5	3
27	4	4	4	5	2	4	3	4	3	5	4	2	3	4	3	4
28	2	4	4	4	3	3	4	4	4	4	4	3	4	5	4	3
29	4	4	5	3	5	3	4	3	4	3	3	2	4	3	5	4
30	3	5	3	4	3	3	3	4	3	4	5	4	2	4	4	4
31	5	3	4	3	2	4	3	5	4	3	4	3	4	5	4	3
32	4	3	4	2	3	3	4	4	4	3	4	2	4	3	5	3
33	4	4	3	4	2	3	3	4	5	3	3	4	2	4	3	5
34	3	4	4	3	5	4	4	5	2	4	3	5	4	3	2	4
35	4	4	2	4	4	3	4	4	3	2	4	3	4	2	5	3
36	4	3	4	4	2	2	4	5	3	3	4	4	5	3	4	4

Rank	Mean	R.I.I	A*N	$= 5n5 + 4n4 + 3n3 + 2n2 + 1n1$	1	2	3	4	5
4	3.8056	0.761	180	137	0	1	11	18	6
3	3.8333	0.766	180	138	0	0	10	22	4
5	3.7778	0.755	180	136	0	1	11	19	5
8	3.6667	0.733	180	132	0	6	7	16	7
11	3.5000	0.70	180	126	2	8	8	6	12
12	3.4444	0.688	180	124	0	2	19	12	3
10	3.5278	0.705	180	127	0	1	15	20	0
2	4.1667	0.833	180	150	0	0	4	22	10
5	3.7778	0.755	180	136	0	2	11	16	7
13	3.4167	0.683	180	123	0	3	17	14	2
7	3.7222	0.744	180	134	0	2	12	16	6
14	3.3889	0.677	180	122	0	6	13	14	3
9	3.6111	0.722	180	130	0	6	7	18	5
8	3.6667	0.733	180	132	0	6	12	6	12
1	4.3333	0.866	180	156	0	1	4	13	18
6	3.7500	0.75	180	135	0	1	12	18	5

Respondent		Questions															
		Strategic Local Contractor Time Performance Improvement Techniques (Methods)															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Client	1	2	3	4	3	4	3	3	3	3	1	2	2	1	5	5	5
	2	3	4	3	3	5	5	4	4	5	5	4	4	3	3	4	5
	3	5	4	4	5	5	2	4	4	4	5	4	4	4	5	5	4
	4	5	5	5	5	5	5	5	5	5	5	4	5	2	2	5	5
	5	4	5	4	4	5	4	3	3	4	3	3	4	3	4	5	4

	6	2	4	4	5	5	1	4	2	5	1	4	1	4	3	5	4
	7	5	5	3	2	4	5	5	5	3	2	2	4	3	2	5	3
	8	3	3	4	3	5	4	3	2	2	5	3	1	3	5	5	5
	9	3	4	3	3	5	2	3	4	1	4	5	4	1	4	5	3
	10	5	4	3	4	5	4	1	2	2	5	3	2	3	2	4	5
	11	3	5	4	5	3	1	3	3	3	5	3	1	3	4	5	4
	12	5	4	5	3	5	5	2	4	3	5	4	4	3	3	5	3
	13	2	5	4	4	5	1	4	3	4	5	3	2	3	5	5	4
	14	5	5	3	3	5	4	3	4	2	5	4	4	3	2	5	5
	15	2	3	5	3	5	1	4	2	5	5	5	2	5	4	5	5
	16	3	5	4	3	3	5	3	4	5	3	4	3	3	2	5	5
	17	4	5	4	4	5	3	3	4	3	2	3	5	3	4	5	4
	18	2	5	3	1	3	2	5	3	4	5	1	4	1	5	5	5
	19	4	4	5	5	5	1	3	4	4	5	2	4	3	4	5	5
	20	4	5	4	3	5	5	4	3	5	2	4	1	2	5	5	4
	21	3	5	4	2	3	5	3	2	5	1	4	5	3	3	5	5
	22	4	4	5	3	5	2	4	4	4	5	3	4	2	4	5	4
	23	5	3	3	5	5	2	3	4	5	2	3	4	3	4	5	3
	24	2	5	4	2	3	4	5	3	5	1	5	2	3	5	5	5
	25	3	4	5	4	5	5	3	5	4	5	4	4	1	5	5	4
	26	5	3	4	3	5	3	4	5	3	2	4	1	3	3	5	3
	27	3	4	5	3	4	2	5	2	5	3	3	5	2	4	5	5
	28	4	3	5	5	5	5	2	4	3	1	5	4	1	5	5	4
	29	5	3	4	3	3	5	3	5	5	2	4	4	4	4	5	5
	30	5	4	3	5	5	4	5	3	4	3	2	5	2	5	5	5
5		10	12	8	8	21	10	6	5	11	14	4	5	1	10	25	15
4		6	11	14	5	3	6	8	11	8	1	12	14	3	10	5	10
3		8	7	8	13	6	3	13	8	7	4	9	1	16	5	0	5

Rank	Mean	R.I.I	A*N	$= 5n5 + 4n4 + 3n3 + 2n2 + 1n1$	1	2
7	3.6667	0.733	150	110	0	6
4	4.1667	0.833	150	125	0	0
5	4.0000	0.80	150	120	0	0
8	3.5333	0.706	150	106	1	3
2	4.5000	0.90	150	135	0	0
12	3.3333	0.666	150	100	5	6
8	3.5333	0.706	150	106	1	2
9	3.5000	0.70	150	105	0	6
6	3.8333	0.766	150	115	1	3
11	3.4333	0.686	150	103	5	6
10	3.4667	0.693	150	104	1	4
13	3.3000	0.66	150	99	5	5
14	2.6667	0.533	150	80	5	5
6	3.8333	0.766	150	115	0	5
1	4.9000	0.97	150	145	0	0
3	4.3333	0.866	150	130	0	0

Respondent		Questions															
		Strategic Local Contractor Time Performance Improvement Techniques (Methods)															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Consultants	1	4	4	4	4	5	5	5	5	5	5	4	5	4	5	5	5
	2	2	4	4	3	2	3	4	5	4	1	3	2	4	5	4	2
	3	5	4	4	4	5	4	4	5	5	5	5	5	5	4	4	4
	4	3	4	4	4	3	3	3	4	4	4	4	4	3	4	4	4
	5	5	4	5	5	3	5	4	4	5	3	5	4	3	3	5	4
	6	5	4	3	3	5	3	2	5	4	5	4	5	4	4	4	5
	7	3	5	4	4	4	4	4	4	5	5	4	2	5	5	4	4
	8	3	4	4	3	5	5	4	5	5	2	4	5	4	4	5	2
	9	3	4	4	4	5	3	3	4	4	5	2	5	3	5	4	3
	10	5	4	3	5	4	3	5	5	5	3	5	4	5	4	4	4
	11	3	4	4	4	5	3	4	4	4	5	3	4	5	3	5	2

	12	3	4	4	4	3	5	2	5	4	3	4	5	4	5	4	4
	13	2	4	4	4	5	4	4	4	5	5	4	5	4	4	4	5
	14	5	4	5	3	4	4	3	5	4	2	3	5	3	5	5	2
	15	3	4	4	4	2	3	5	5	4	5	4	4	5	5	5	4
	16	3	4	4	5	3	5	4	4	5	5	5	2	4	4	4	5
	17	4	4	3	4	5	3	3	5	4	1	4	5	3	3	5	4
	18	2	4	3	4	5	3	5	5	5	5	2	5	5	5	4	4
	19	3	4	4	4	5	4	3	4	4	3	4	4	4	4	5	4
	20	5	5	4	3	2	5	4	5	4	5	5	5	4	5	4	1
	21	3	4	4	4	3	3	5	4	5	1	4	5	3	5	4	5
	22	2	4	5	5	2	3	1	5	4	5	3	2	5	4	5	4
	23	3	4	4	4	5	3	3	5	4	1	4	3	3	4	4	4
	24	2	4	4	5	2	4	5	5	4	5	4	2	4	5	5	2
	25	4	3	5	4	3	5	4	4	4	3	4	4	4	5	4	5
5		6	3	4	5	11	7	6	15	10	11	5	10	7	12	10	5
4		3	21	17	16	3	6	10	10	15	3	14	7	11	10	15	13
3		11	1	4	4	6	12	6	0	0	5	4	3	7	3	0	1
2		5	0	0	0	5	0	2	0	0	2	2	5	0	0	0	5
1		0	0	0	0	0	0	1	0	0	4	0	0	0	0	0	1
	$= 5n5 + 4n4 + 3n3 + 2n2 + 1n1$	85	102	100	101	95	95	93	115	110	90	97	97	100	109	110	91
	A*N	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125
	R.I.I	0.68	0.816	0.80	0.808	0.76	0.76	0.744	0.92	0.88	0.72	0.776	0.776	0.80	0.872	0.88	0.728
	Mean	3.4000	4.0800	4.0000	4.0400	3.8000	3.8000	3.7200	4.6000	4.4000	3.6000	3.8800	3.8800	4.0000	4.3600	4.4000	3.6400
	Rank	13	5	7	6	9	9	10	1	4	12	8	8	7	3	2	11

