



**AN ASSESSMENT OF PERCEPTION OF CONTRACTOR'S PERFORMANCE ON
LOWEST BID AWARD SYSTEMS: THE CASE OF OROMIA REGION**

**A Thesis submitted to the School of Graduate Studies of Adama Science and Technology
University in partial fulfillment of the requirements for the Degree of Master of Science
in Civil Engineering (Construction Management**

By

Jarso Midekso

September 2017

Adama, Ethiopia

DECLARATION

I hereby confirm that, except for references to other people's works, opinions and observations which have been duly acknowledged, the intellectual content of this work is the result of the my own efforts. I hereby declare that this work has not been submitted elsewhere for any other degree or qualification.

Jarso Midekso

Student Name

Signature

Date

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Approved by Board of Examiners

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ABBREVIATIONS

ALT	Abnormally Low Tender
EMAT	Economically Most Advantageous Tender
ETB	Ethiopian Birr
EU	European Union
ITB	Instruction to Bidders
NCB	Nationals Competitive Bidding
PPA	Public Procurement Agency
RFP	Request for Proposal
RFQ	Request for Quotation
SBD	Standard Bidding Document
OWMEB	Oromia Water, Mineral and Energy Bureau
OIDA	Oromia Irrigation Development Authority
ORA	Oromia Roads Authority
LEB	Lowest Evaluated Bid

ABSTRACT

This research was undertaken to assess the performance of public owned construction projects awarded on a lowest bidder bid awarding system and based on the findings to propose improvements in the existing practices in Oromia construction industry.

An extensive literature search was carried out to identify different practices; a questionnaire survey was conducted among the different groups that make up the construction industry in Oromia; a number of alternative bid evaluation and contract award procedures were presented and discussed in this research. Regional government regulations are reviewed to examine the objectives and intent of the law on this issue.

The research showed that inappropriate contractor selection is a key contributory factor toward project non-performance, which is, as the result indicates, primarily a consequence of low-bid price selection criteria. Moreover, Results also showed that the bids evaluation and contractors' selection based on lowest price are a major challenge. Competitive low bid method has been highly criticized for its negative impacts on disputes/claims, coordination, quality control and project duration. On the other hand, other alternative bidding procedures included in the study were highly appreciated by respondents for their positive effects on these attributes. Particularly, the researcher shared the idea of adopting the average bid method of awarding contracts among responsive bidders which are supported by many construction professionals included in the study.

Keywords: bidding system, construction projects, public sector construction, and public sector procurement.

CHAPTER ONE

1. INTRODUCTION

1.1 Back Ground of the Thesis

The construction industry is one of the major sectors which involve substantial financial and human resources. Design and construction play a vital role in the national economy, including the development of residential housing, office, commercial and retail buildings, as well as industrial plants, and the replacement, maintenance, and restoration of the nation's infrastructure and other public facilities. Bid and Procurement issues are widely related to the construction industry and its participants so that striving to improve the procurement of construction by the public sector in particular is in the best interest of both the public and the construction industry.

Bid and Procurement is a substantial and integral element of Construction project management. It has been the issue of attention in the construction world. Due to time and cost overruns associated with construction projects, so many projects fail to accomplish their targets and objectives. Unmanaged or unmitigated bidding and procurement procedures are one of the fundamental causes of these overruns. These issues can be managed and controlled by influencing the current and adopting the latest procedures of bidding and procurement.

Currently, the public sector procurement of construction is largely based on the lowest bid award system. The customary practice of awarding contracts to a lowest bidder was established to ensure the lowest cost for completing a project. In public construction works, this practice is almost universally accepted since it not only ensures a low price but also provides a way to avoid fraud and corruption (Irtishad, 1993). While the low-bid procurement system has a long-standing legal precedence and has promoted open competition and a fair playing field, a long-standing concern expressed by owners and some of their industry partners is that a system based strictly on the lowest price provides contractors with an incentive to concentrate on cutting bid prices to the maximum extent possible (instead of concentrating on quality enhancing measures), even when a higher cost product would be in the owner s best interest, which makes it less likely that contracts will

be awarded to the best performing contractors who will deliver the highest quality projects. As a result, the low-bid system may not result in the best value for money expended or the best performance during and after construction. Moreover, the traditional low-bid approach tends to promote more adversarial relationships rather than cooperation or coordination among the contractor, the designer and the owner, and the owner generally faces increased exposure to contractor claims over design and constructability issues (Rizwan, 2008).

The paper aims at analyzing the current status of Bid and Procurement Strategies in the construction industry of Oromia regional state. In the region, the most common method of awarding the contract is the Least Responsive Bidder or Price Based method, which has inherent flaw of high competition and minimum performance. These incompetent practices pose a serious risk and problems like: Delays in meeting project duration, Increase in total cost of the project, resulting in bankruptcy of companies, Descend in construction quality, serious question on public safety, Overall project failure.

It is therefore, imperative to assess the impact of competitive low bid awarding system on performance of major public work projects (in terms of schedule, cost, quality and safety) in Oromia construction industry. The study will forward recommendations and suggestions for developing a proposal for implementing alternative bid-evaluation and contract award procedures for the construction industry of Oromia.

1.2 Statement of the problem and research questions

There is emerging acceptance to award of projects to Contractors who quote low rates with anticipation of getting jobs. Evidence suggests that this approach accounts for delay in project completion, suspension of projects, poor performance, total cost of the projects increases, etc. Therefore, the following questions are posed;

- What are the Problems and Challenges in the Public Procurement Practices for Construction Works in Oromia Region?
- What has been the performance of Contractors who have won projects using the lowest bidder?
- What are the impacts of problems over the life cycle of projects in Oromia Region?
- How to Improve the Public Procurement Practices and Regulatory Frameworks for Construction Works in Oromia Region?

1.3 Aim of the study

The aim of this research is to assess the impact of competitive low-bid awarding system on performance of major public work projects (in terms of schedule, cost, quality and safety) and to propose improvements in the existing practices in Oromia construction industry.

1.3.1 Objectives the study

The specific objectives of the study are to:

- a) To assess the problems associated with the lowest evaluated bid in construction industry of Oromia, specifically in Public owned projects ;
- b) To analyze the impacts of these problems over the life cycle of projects;
- c) Based on the results of the study, to propose improvement in the current practices (low-bid procurement) to improve the performance of projects in Oromia Region;

As this research focuses on construction works contract for public bodies under the Regional State government of Oromia, attention will be given for the examination and evaluation of bids in the open tendering procedure.

1.4 Research Methodology

Information for the study was obtained from both primary and secondary sources. The primary data were obtained from a field survey using structured questionnaires administered to select respondents (both government and private) in Oromia Regional State. The secondary data were from literature search mostly from textbooks, journals, newspapers and the internet. Data were processed and analyzed using Microsoft Excel (excel 2007). The results were further presented in graphs, charts and tables.

Finally the outcome was compared with the reviewed literature to draw conclusion and make recommendations.

1.5 Expected Benefits of The outcome

The benefit/significance of the study is twofold.

- To build up a data-base on bidders/Contractors' performance on projects

awarded using the lowest evaluated tender that would be used by the construction industry, policy makers and academia

- To identify and make recommendations for use a more suitable and effective evaluation method that would be used in bid evaluation to ensure improvement in projects' performance.

1.6 Research Scope

Mainly, the scope of the study was limited to assess the performance of public owned construction projects which are awarded by the lowest bidder bid awarding system in Oromia Regional State. Legal basis and government regulations pertaining to the issue of public construction contract-award procedures are covered in this study. However, this research mainly covers public construction projects completed in the past five to ten years and under construction in Oromia Regional State. The study sought information only from the most experienced and well-informed Civil Engineers and other professionals from both public clients and private contractors. Private sector and other practices are given very little attention in this research and they may have slightly different results. The research work intends to concentrate on publicly financed construction projects, as these are the ones that constitute a substantial proportion of civil engineering construction projects in Oromia. It is also not easy to get full information concerning privately owned works in the study area.

1.7 Structure of the Research Report

The study has been organized into five chapters.

- Chapter one focused on the general introduction of the study.
- The second chapter looked at the literature review.
- Chapter three dealt with the method used for the study.
- Chapter four discussed the analysis of the results of the study.
- The last chapter dealt with the conclusions and recommendations of the study.

CHAPTER TWO

2 LITERATURE REVIEW

2.1 General

The latest developments and desires in different aspects of human life, has led the professionals in construction industry to use alternative forms of project delivery systems. The insufficiency and inappropriateness of the awarded contractors has led to sub-standard work, delays, disputes, or even bankruptcy. If a client wishes to cope with these new developments and invite acceptable bidders, it is necessary to clarify and develop pre-determined selection criteria and the objective of the prequalification and bid evaluation processes (Hatush et al, 1997).

In Oromia, major clients of construction industry are Sector Bureaus (ORA, OIDA, and OWMEB), Bureau of Oromia Urban and Industry and some city Administrative of Oromia Regional Government. The most common procurement method is the competitive low-bid procedure in which contracts are awarded to a responsive contractor who offers the least price. The prequalification and bid evaluation processes requires the development of necessary and sufficient criteria. The last two decades have witnessed some development in project complexity and clients need and this has led to an increasing use of alternative forms of project delivery systems. In contrast, the prequalification and bid evaluation process, quantifying and assessment of criteria are still in its original form.

Prequalification provides a client with a list of contractors that are invited to tender on a regular basis. This is the approach most currently used by many countries and in which many and different types of criteria are considered to evaluate the overall suitability of contractors.

There are definite benefits and drawbacks to the low-bid award system. Promoting competition amongst contractors is a clear benefit to the process. It compels contractors to lower their costs, usually through innovation, to ensure they win bids and maintain their profit margins. In addition, the process is beneficial specifically to the public sector because of the transparency, an important criterion of public policy (Photios, 1993). However, allowing projects to be awarded based on the least price has inherent flaws. Delays in meeting the contract duration, increment of the final project cost due to high variations,

tendency to compromise quality, and adversarial relationship among contracting parties are the major drawbacks associated with responsive low- bid award procedure (Thomas, 2009). In a survey conducted in the Oromia regional state, non-existence of real competition during contractors selection; excessive time overruns; compromising quality; and escalation of the final project cost from the estimated cost were the major problems associated with the existing approach of delivering projects (Lemma, 2006). Poor initial funding of the project by the contractor and lack of timely resources of materials, machineries and workforces are also the major factors identified as causes of delays during the construction phase in Ethiopian construction industry (Abdo, 2006).

The construction process involves multi-organizational activity. Conflict and disputes can therefore exist at all levels in the contractual chain: between client and consultant, client and contractor, client and sub-contractor, and so on. Among many causes of disagreements in the construction project, the project delivery system selected is one of the significant elements (Abera, 2005).

2.2 Legal Framework (Bidding Procedures and Laws)

The Regional Government of Oromia has statutes requiring submission of competitive bids for construction projects. This statute requires public organizations to award such contracts to the lowest responsive bidder.

The word **responsive** is inserted to require that a successful bid must also be adequately responding to the requirements of the project as specified. While it is not too difficult to determine whether a bid is responsive because responsiveness is evaluated based on the documents submitted by contractors, it takes considerable amount of time and effort to ascertain whether a bid is responsive. Responsible generally refers to the apparent low bidder's quality, fitness, and capacity to perform the proposed work satisfactorily. Responsible means more than simply financially responsible. The bidder must also have the requisite judgment, skill, ability, and integrity to perform the contract according to its terms (Irtishad, 1993).

For two reasons application of this requirement becomes difficult. First, there is generally a narrow window of time available between a bid opening and the award of the bid. Second, although the law allows public organizations to reject any or all the bids, the rejection

cannot be done arbitrarily or in bad faith. When it is the low bid which is rejected, particularly close scrutiny of the reasons given for the rejection is warranted. For these reasons, the decision to reject a low bid on the ground that the bidder was not responsive enough is dependent on the discretion of the organization. In most cases some degree of subjectivity gets involved in the process of determining whether a particular bidder is responsible. As a consequence, these kinds of rejections frequently give rise to resentment and may end up in court. To avoid these problems, many public organizations take only responsiveness of the bid in consideration before making award decisions. Some public organs use a stringent and specific set of prequalification procedures.

2.2.1 Regional Procurement Laws

The Oromia Regional Government procurement and property administration is following the Ethiopian Federal Government Procurement and Property Administration Laws. So regarding Oromia Regional Government procurement and property administration (PPA) the researcher referred to Ethiopian Federal Government PPA Laws in this study.

The Ethiopian Federal Government Procurement and Property Administration proclamation no 649/2009 article 33 (1) states six methods of procurement for public goods and services, viz. open bidding, request for proposal (RFP), two stage tendering, restricted tendering, request for quotation and direct procurement.

The proclamation, however, limits public bodies to use open bidding as the preferred procedure of procurement except as otherwise provided in the proclamation to use other options (article 33(2)). Restricted tendering is allowed only when the required object of procurement is available only with limited suppliers and the cost of the procurement does not exceed the limit in the directive issued by the Bureau; or where a repeated advertisement of the invitation to bid fails to attract bidders in respect of a procurement subject to the directive to be issued by the Bureau (article 49). The total contract value of procurement made by restricted bidding is limited by the regional public procurement directive to 2 million birr for works (article 23.3).

Direct procurement is allowed when there is no competitions for technical reasons and if the required service can be supplied or provided only by one candidate. Or when there is a need of similar service or repetition of works from one supplier and when the total contract

value is not exceeding the limit stipulated in the directives (The Ethiopian Federal Government Procurement and Property Administration proclamation no 649/2009 article 51). The maximum contract amount allowed in the directive for direct bidding for works is similar to the restricted bidding (article 9).

The third type of procurement for public bodies is **request for proposal (RFP)**. RFP is allowed only when the public body seeks to obtain consultancy services or contracts for which the component of consultancy services represents more than 50% of the amount of the contract (article 53).

The other two types of procurements are **request for quotation and two stage bidding**. Request for quotation is allowed when there are readily available goods or for procurement of works or services for which there is an established market, so long as the estimated value of the contract does not exceed an amount stated in the procurement directives issued by the Bureau (article 55). Two stages bidding on the other hand is permitted when it is not feasible for the public body to formulate detailed specifications for the goods or works such as, contract for the purpose of research, experiment, study or development etc. (article 57). The maximum contract amount provided for works in the directive to use request for quotation is 250 thousand birr (article 24.2).

In general, alternative procurement procedures other than the open bidding cannot be applicable for most public bodies construction contracts as most public bodies construction contracts are more than the limits specified in the maximum limit provided in the directive. In addition, the conditions set forth for the use of other alternatives are not usually fulfilled for construction work contracts except in rare cases.

As this research focuses on construction works contract for public bodies under the regional state government of Oromia, attention will be given for the examination and evaluation of bids in the open tendering procedure.

2.2.2 Examination and Evaluation of Bids

The proclamation defines the successful bidder as follows: the bid that is found to be responsive to the technical requirements and with the lowest evaluated price (article 43(8)). The responsiveness is determined by the technical evaluation of bidders. In order to participate in public procurement, candidates must qualify by meeting the following criteria

and such other criteria, as the public body considers appropriate under the circumstances: that they possess the necessary manpower, equipment, financial and technical capabilities; that they have legal capacity to enter into the contract; that they are not insolvent; that they are registered in the suppliers list, that they are not suspended from participating in public procurement in that period; that they have renewed trade license and tax clearance; and that they have a bank account (article 28).

Any requirements required by the public body will be set forth in the bid documents or other documents for solicitation of proposals, and deemed to apply equally to all candidates. In addition, in the process of selecting the successful bidder, the public body should only consider substantially responsive bids for further evaluation and comparison in accordance with the criteria set forth in the bidding documents (article 43(6)).

The tender document for the procurement of works for public bodies in the regional government is The Federal Democratic Republic Of Ethiopia Standard Bidding Document (SBD) For Procurement of Works For National Competitive Biddings (NCB) Public Procurement Agency (PPA) January 2006, Addis Ababa. And hence, the tender document to be referred here in the research is this document.

2.2.3 Procurement of Works for National Competitive Biddings (NCB)

In addition to the basic requirements defined in the proclamation article 28(1) and in accordance to ITB Sub-Clause 4.5, bidders are required to meet the minimum qualifying criteria set forth in the qualification criteria in the bid document (section 3: evaluation and qualification criteria).

Table 2-1 Qualification Criteria Recommended by PPA 2011 User Guide

. Legal, Professional, Technical, and Financial Qualification Criteria

No.	Qualification Criteria	Minimum Requirements
1	Average annual volume of construction work over the past <i>[For major contracts, it is normally 5 years, for smaller contracts 3 years would be sufficient]</i>	At least <i>[Ideally the minimum value of the annual turnover of construction work should be set at not less than 2.5 times the estimated annual cash flow for the Contract. For low risk works, this minimum could be reduced to 2 times or less]</i>
2	Experience as a prime contractor in the construction of at least <i>[number of similar contracts, which should be in the range of one to three, depending on the size of contract, risk of contractor default and market conditions]</i>	Works of a nature and complexity equivalent to the Works over the last <i>[number of years, normally in the range of five to ten. For smaller contracts, low risk works or a newly established local industry, the number of years could be reduced to 3]</i> years (to comply with this requirement, works cited should be at least 70 percent complete).
3	Proposal of the timely acquisition of equipments(own, lease, hire, etc.) of the following essential equipment	<i>[list of equipment, For smaller contracts, the list should be limited to specialised items that are critical to the execution of the contract and that may be difficult for the successful Bidder to obtain quickly]</i>
4	Personnel with specific	<i>[Qualifications and experience required for key</i>

	qualification and experience	<i>personnel e.g. “a Contract Manager with five 11 years’ experience in works of an equivalent nature and volume, including no less than three 5years as Manager”. Personnel requirements should be limited to key site management and technical personnel, who will be responsible for major components e.g. site superintendents, contract manager etc]</i>
5	Liquid assets and/or credit facilities net of other contractual commitments and exclusive of any advance payments which may be made under the Contract	<i>Of no less than [amount]. [The successful Bidder must demonstrate that it has or has access to the financial means sufficient to meet the construction cash flow requirements for the contract. The minimum liquid assets and credit should normally be set as the estimated payment flow over approximately 3 months at the average (“straight lined”) construction rate.]</i>

These are the major qualification criteria stipulated in the contract document. In addition, a consistent history of litigation or arbitration awards against the Applicant or any partner of a Joint Venture may result in disqualification. The detail however is determined by the nature of the construction project.

According to the proclamation article 43(3), the public body regards a bid as responsive only if it conforms to salient requirements set forth in the bidding document. And any public body should not award a contract when the bid is not responsive (article 43 (5-c)). It is also clearly stated in the PPA that The Employer will evaluate and compare only the bids determined to be substantially responsive in accordance with Clause 26 (clause 28.1). A substantially responsive Bid is one, which conforms to all the terms, conditions, and specifications of the bidding documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality, or performance of the Works; (b) which limits in any substantial way, inconsistent with the bidding documents, the Employer's rights or the Bidder's obligations under the Contract; or (c) whose rectification would affect unfairly the competitive position of other bidders presenting substantially responsive bids (clause 26.2).

Prior to the detailed evaluation of bids, the Employer will determine whether each Bid (a) meets the eligibility criteria defined in ITB Clause 3; (b) has been properly signed; (c) is accompanied by the required securities; and (d) is substantially responsive to the requirements of the bidding documents (clause 26.1). If a Bid is not substantially responsive, it will be rejected by the Employer, and may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation or reservation (clause 26.3).

The employer will award the Contract to the Bidder whose Bid has been determined to be substantially responsive to the bidding documents and who has offered the lowest evaluated Bid price (clause 30.1). However, the employer reserves the right to accept or reject any Bid, and to cancel the bidding process and reject all bids, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or bidders or any obligation to inform the affected Bidder or bidders of the grounds for the Employer's action (clause 31.1).

2.2.4 Tender Evaluation and Analysis Amendment Directives

Bureau of Works and Urban Development of Oromia was the authorized public body in the procurement of all works under the Regional Government of Oromia until 2006. However, after the establishment of Public Procurement Agency (PPA) in 2006 the procurement of all Regional Government works and services have been guided by the rules and regulations prepared by this agency.

The tender evaluation and analysis approach were modified by the Bureau of Works and Urban Development in March 2001. The basis for the modification were, according to the letter from the Bureau on the 14th day of March 1993 EC, Ref. no H1-T1 240/21, to improve the procurement of public construction works by avoiding abnormally low bids. The Ministry, accompanied to the letter referred above, has tried to show the modification through the following example.

Example

i. Project Estimate

Project estimate means 50% engineer's estimate and 50% estimate of the Ministry.

The project estimate shall be indicated in the bid document.

Engineer's estimate = ETB 7,500,000.00

Ministry's estimate = ETB 7,300,000.00

Project estimate = 50 % (7,500,000.00 + 7,300,000.00) = ETB 7,400,000.00

ii. Bidders qualified for detail evaluation

Bidders who have submitted the required bid security and whose offer is within plus or minus 20% of the project estimate will be subjected to detail evaluation. This criterion shall be clearly indicated in the bid document.

$$= 7,400,000.00 + 20\% (7,400,000.00) = 8,880,000.00$$

$$= 7,400,000.00 - 20\% (7,400,000.00) = 5,920,000.00$$

Therefore, bidders whose offer is between ETB 5,920,000.00 and 8,880,000.00 will be subjected to further evaluation. Bidders whose offers are outside the limit will be rejected.

iii. Detail Evaluation

The winning bidder will be the least bidder whose offer is within -15% of the adjusted project estimate. The adjusted project estimate is 25% of the project estimate and 75% of

the average of the offer from the bidders who are subjected to detail evaluation.

Table 2-2 Summary of Bidders Offer-Example

Table 2.2 Summary of Bidders Offer		
Bidder	Offer (ETB	Remark
A	6,140,000.00	6,140,000.00
B	5,790,000.00	Rejected
C	7,100,000.00	7,100,000.00
D	7,500,000.00	7,500,000.00
E	8,140,000.00	8,140,000.00
F	7,930,000.00	7,930,000.00
G	9,120,000.00	Rejected
		36,810,000.00

Bidders B and G are non-responsive because their offer is not within plus or minus 20% of the project estimate.

Average offer from contractors = $36,810,000.00/5 = 7,362,000.00$

Adjusted project estimate = $25 \% (7,400,000.00) + 75 \% (7,362,000.00) = 7,371,500.00$

The minimum acceptable bid offer = $7,371,500.00 - 15 \% (7,371,500.00) = 6,265,775.00$

Therefore, the winner of this bid will be the least bidder whose offer is greater than ETB 6,265,775.00. In this particular example, bidder C whose offer is ETB 7,100,000.00 (Seven million one hundred thousand birr) will be awarded.

2.3 Contract-Award Procedures in Construction

Bidding procedures are basically of two types: competitive and negotiated. Most of the other procedures are either variation of, or somewhere between these two extreme types. In pure competitive method, the contract is awarded to the lowest-bidder, if the bidder is found to be responsive. In pure negotiated method the price is negotiated with a selected

contractor. To minimize the shortcomings of these two extreme types, modifications have been proposed and tried in many countries. For the purpose of this research, the following contract-award procedures are considered:

- 1) Competitive Low Bidding (Price-based)
- 2) Competitive Average Bidding (Price-based)
- 3) Multi Parameter Bidding Method (Based on price and other factors)
- 4) Competitive Negotiated Bidding
- 5) Non-Competitive Negotiated Bidding

A. Competitive Low Bidding (Price-based)

Competitive bidding is the most widely used method of obtaining and selecting contractors for construction projects. In general, the purpose of price-based competitive bidding is to obtain the lowest possible price. It is believed that Competitive bidding gives everyone an equal chance to bid, eliminates collusion, and saves taxpayers money. It fosters honest competition in order to obtain the best work and supplies at the lowest possible price. It is also necessary to guard against favoritism, imprudence, extravagance, fraud and corruption (Sweet, 1989). For this procedure to work it is essential to have a set of well-defined criteria to help the officials determine that the bids are responsive and the bidders are responsible. Under the competitive low-bid method, the qualified (responsive) bidder who submits the lowest bid that meets the specifications must be awarded the contract. As stated earlier, pursuant to article 33(2), proclamation no. 649/2009, this method of competitive bidding is the standard method for awarding regional owned construction contracts in Oromia.

B. Competitive Average Bidding (Price-based)

A variation of the competitive low bid method of awarding contracts is based on the principle that the best bid is the bid which is closest to the average of all bids, and not the bid which is highest or lowest. Bids which fall too far below the mean are considered to be unrealistically underbid. Bids which are much higher than the average are considered to be unrealistically overpriced. Methods based on this principle are very common and known, in general, as European Methods (Irtishad, 1993). In general, the winner based on the average-bid method is the contractor whose bid satisfies a certain relationship with the average of all bid prices. Different average-bid method use different procedures for calculating the average, or use

different criteria for determining the winning bid. For example, some use an arithmetic average or a weighted average, while others use the average of the remaining bids after all bids that differ more than a certain percentage from the average of all other bids are eliminated. Similarly, the winner might be the contractor whose price is closest to the average, or the contractor whose bid is closest to, but less than the average. The former, for example, is used in Taiwan while the latter is used in Italy (Photios, 1993). A formula to decide a reasonable offer from several competitive bids was developed in Europe, known as Danish system, wherein the lowest and highest offers are rejected out right away and the rest of the offers are only considered (Irtishad, 1993). This formula stands as:

$$NA = (NL + 4A + NH)/6 \dots [\text{Eq. 2.3}]$$

Where,

NA = new average;

NL = new low;

NH = new high; and

A = average of all offers.

The bid which is first above this new average is then treated as realistic and acceptable. The major shortcoming of this method is that it is not effective unless the number of submitted bids is eight or more.

The basic philosophy behind the average bidding procedure is that the best bid is the one closest to some average, not the lowest, not the highest. These competitive price-based average bidding methods are used mainly to ensure that the contractor is responsible, to avoid contractor-failure, and to reduce disputes and claims.

The underlying principle is that the contractors should get a reasonable and realistic price for their work. It is assumed that with a fair price they would conform to quality requirements of the project, would complete on time, and would not have adversarial relationships with the consultant of the employer.

C. Multi-Parameter Bidding Method (Based on price and other factors)

A model of competitive bidding that is based not only on cost but also on other parameters was proposed by Herbs man and Ellis; they named it the multi-parameter bidding procedure (Herbs man et al, 1992). They suggest that the major parameters should be cost, time and

quality. Given that the amount of time a contractor proposes to take to complete the project may have a major impact on costs. For instance, a contractor who can complete a building 4 months prior to his closest competitor may save the employer additional rent monies, by factoring this cost saving into the bid process, a more accurate reflection of total costs can be calculated. Similarly the impact of quality can also be included in the award-decision. The long-term costs of maintenance and repair are directly related to the quality of the constructed facility being built. In the Multi-Parameter Bid Method, estimates of quality may be measured by the type of materials proposed to be used, the previous experience/past performance of the general contractor and the proposed subcontractors.

Under the Multi-Parameter Bid Method, time and quality concerns are each assigned a maximum attainable number of points. The bids are then reviewed and ranked based upon these factors, as well as upon the contract cost.

Other parameters can also be added in this model as desired by the user. Bidders proposed project-duration and past performance (quality of finished projects, safety records, etc.) can be factored into come up with a total combined cost in this method (Tarricon, 1993). The total combined costs of all the bidders are then compared to select the best bid.

D. Competitive Negotiated Bidding

Sometimes it may become necessary to obtain bids from a select group of contractors known to have the technical, financial and managerial capability to complete a complex project. In such cases competitive price-based bidding may not be appropriate. Pure sole-source negotiation, on the other hand, is very difficult to practice in public sector since this process may easily lead to allegation of favoritism and corruption. To avoid these inherent problems with pure sole-source negotiated bidding many agencies and owners have using variations that have in effect, features of both competitive and negotiated procedures. The most common modification of the pure negotiated procedure is to increase the number of firms to negotiate with, thus increasing the options to select from. In some cases, certain firms which are known to be competent to complete a project, based on previous experience or reference, are contacted by the owner or client (Irtishad, 1993). The public body shall negotiate a contract with the most qualified firm for professional services at compensation which the organization determines are fair, competitive, and reasonable. In making such determination,

the public body shall conduct a detailed analysis of the cost of the professional services required in addition to considering their scope and complexity.

The Ethiopian Federal procurement law allows restricted tendering provided that the required object of procurement is available only with limited suppliers and the cost of the procurement does not exceed the limit in the directive issued by the Ministry; or where a repeated advertisement of the invitation to bid fails to attract bidders in respect of a procurement subject to the directive to be issued by the Ministry (article 49). The total contract value of procurement made by restricted bidding is limited by the Federal public procurement directive to 2 million birr for works (article 23.3).

E. Non-Competitive Negotiated Bidding

The non-competitive negotiated procedure is essentially the process of negotiating a bid with a single source, usually a preselected contractor. For this reason it is also known as sole-source negotiation. The price to be paid, and the goods and services to be received by the owner are usually the items of negotiation. The firm, that is known to have qualification and expertise, can be chosen without any advertisement or notification. This saves time but increases the possibility of corruption and nepotism.

Direct procurement is allowed when there is no competitions for technical reasons and if the required service can be supplied or provided only by one supplier. Or when there is need of similar service or repetition of works from one supplier and when the total contract value is not exceeding the limit stipulated in the directives (article 51). Direct procurement is usually common in the form of variations in the construction industry. The directive from Ministry of Finance and Economic Development limits the volume of the additional requirements of works to procure directly to a maximum of 25% of the initial contract volume (article 25.2). This method is not uncommon to procure new construction projects in the private sector. However, it is almost nonexistent in the public sector construction.

2.4 Issues and Concerns about Different Bidding Procedures and their Consequences

A. Competitive low bidding (Price-Based):

Although it is generally accepted that competitive low bid method saves taxpayers money

and thus protects public interest, this traditional method has recently been criticized lately for promoting inferior quality, causing too many change orders, furthering adversarial relationships, time overrun, and increasing overall cost of the project.

The competitive bidding process for awarding construction contracts in Oromia is typically based on the low-bid method. According to this method, the construction firm who is responsive and submitting the lowest bid receives the right to the construction contract. Its main advantage is that it forces contractors to continuously try to lower costs by adopting cost-saving technological and managerial innovations (Photois, 1993). These savings are then passed to the owner through the competitive process.

If a contractor submits a bid that is significantly lower than the client's estimate and the other bidders, it is difficult to understand how that contractor could complete the job profitably. The European Union defines those bids as Abnormally Low Tenders (Thomas, 2009). An Abnormally low tender is a tender whose price is considered significantly lower than most of or the average of all tenders in the same procurement procedure. The EU introduced legislation to allow public sector clients the option of awarding a construction project using either the traditional low bid or the Economically Most Advantageous Tender (EMAT). The legislation allowed public sector clients to reduce their exposure to some of the adverse effects of abnormally low tenders (ALT), including: Unsatisfactory quality through the need to reduce construction costs (Winch); and Predatory pricing and unfair competition that distorts the market, negatively affecting the other bidders (Alexanderson et al, 2006).

European Commission's Europe report on Prevention, Detection and Elimination of ALT in the European Construction Industry states that a tender is assumed to be abnormally low if in the light of the client's estimate and of all the tenders submitted, it appears to be abnormally low by not providing a margin for normally levels of profit, and the low tender cannot be explained by economy of the selected construction method, the technical solution chosen, exceptionally favorable conditions available to the tender, or the originality of the work proposed (Thomas, 2009).

The underlying assumptions upon which competitive low bidding system is based are discussed in the following.

First, competitive low bidding assumes that goods or services can be objectively evaluated

or compared before award decisions are made. This is not an easy task. To circumvent the inherent problems with this assumption, it is usually stated in the bid invitation that for consideration, bids should be responsive and the bidders should be responsible.

Second, it assumes that there are free bids and true competition. If there is collusion among the bidders to take turns or submit fictitious bids, antitrust laws are violated and competitive bidding cannot accomplish its objective of obtaining the lowest price.

Thus the success of competitive low bidding system depends largely on the integrity and ability of the contractor, which are often difficult to measure since the tendency is to look solely at price.

Another criticism of competitive bidding is the difficulty of involving the contractor in the design process. Rigid specifications may also make competitive bidding process ineffective because it does not give contractors the chance to come up with different options. If product specifications do not provide for alternative products and a viable method for substitutes, competitive pricing may be unduly restricted.

Other problems associated with the competitive low bid method is that when the number of bidders is as large as is the case in a slow economy, an owner runs a significant risk of selecting a contractor that has either accidentally or deliberately submitted an unrealistically low price (Photois, 1993). A contractor cannot adhere to such a low price and at the same time expect to complete the project according to plans and specifications, and also make a reasonable profit.

This often results in excessive claims and disputes during construction that lead to schedule delays, compromises in quality, and increased costs. Although competitive low bid process is supposed to foster innovation by forcing contractors to continuously try to lower costs by adopting cost-saving technological and managerial innovations, it has been criticized for discouraging innovation (Irtishad, 1993). Nicolson asserts, low bids provide little margin for a contractor to implement new techniques or upgrade the quality of his current product. It has been criticized for not providing any incentive for the construction of high quality project at a reasonable price.

The other most concerning reason is the practice of a contractor intentionally submitting an artificially low bid in anticipation of making their profit through change orders and claims (Thomas, 2009). Some bidders carefully review the bid documents searching for mistakes

and ambiguity in areas that could lead to change orders and claims during the project (Dowle et al, 1990). These bidders can then use this knowledge to submit a lower bid with the expectation of recouping the money later. In all cases the abnormally low is not reflective of the final contract cost or the hidden costs incurred by the client when dealing with numerous change orders and claims.

Competitive low bid method has also been criticized to cause abuse of the change order procedure. It is alleged that change orders become too numerous and too expensive under this method. Thus according to its critics, the low bidder method does not guarantee the lowest cost because delays and cost-increases are very likely to occur with the procedure.

Despite all these criticisms there are strong arguments in favor of using the traditional competitive low bidder system.

The public sector seems to be more comfortable with this process because the bid evaluation is not complicated. The checks-and-balance system, and integral part of this competitive process, fosters confidence with the taxpayers. Its objectivity is ensured because price is the only criterion for evaluating bids. Its vulnerability to different sorts of political and social pressure is much less than other procedures that are based on some degree of subjectivity.

B. Competitive average bidding (Price-based):

In competitive average bidding procedures, as described in the previous section, all the features of open competitive system are retained. The only difference is that the selected contractor is the one whose bid is near the average of all the bids submitted.

The major drawbacks of the low-bid method is the possibility of awarding a construction contract to a contractor that submits, either accidentally or deliberately, an unrealistically low bid price.

Often, such an occurrence works to the owner's and contractor's detriment by promoting disputes, increased costs, and schedule delays. To address this problem, other countries have adopted the average-bid method and award the contract to the contractor whose price is closest to the average-bid method and explores its merits relative to the low-bid method (Photois, 1993).

The main advantage is that it safeguards an owner against signing a construction contract for an unrealistically low bid price that almost certainly will lead to adversarial

relationships during construction (Ioannou et al, 1993). It was also pointed out that, under this method, contractors are protected from having to honor a bid containing a gross mistake or oversight.

The basic drawback of the average-bid method is that it does not necessarily promote price competition that leads to lower costs for the owner. A technological or managerial breakthrough that results in major cost savings will not necessarily be passed on to the owner in the form of lower prices, unless this breakthrough is known to be available to all bidders. Although it has been argued that average bidding method results in significantly higher profits for the contractors in projects won (Irtishad, 1993). When such high profits are available throughout the industry, bid prices should be expected to gradually fall and the savings will eventually be passed to the owner. It has been claimed that the average bid method would increase contractor profitability and it has the potential to improve relationships between the owner and the contractor.

Moreover, some of these benefits are of intangible nature. The success of this procedure also depends on the requirement that general contractors select their subcontractors on the average-bidding principle. Given the way bidding is practiced, accepting sub-bids till the last moment, this would be very difficult to enforce. In addition, currently the law does not require general contractors to submit and retain a preselected group of subcontractors.

Some major pitfalls associated with the competitive low bid method can also be prevalent with the average bid procedure. As is the case with the low bid method, collusion among the bidders and the absence of prequalification can negate its intent and produce undesirable results (Ioannou et al, 1993).

Whether contractor profitability is higher and relationships between the owner and the contractor are better in the countries that practice average bid method cannot be ascertained. There is not enough evidence to conclude that incidence of claims are less in European countries (that practice average bid method) (Irtishad, 1993).

C. Other Competitive Bidding Methods (Based on price and other factors):

Under this method factors other than price are considered before award decisions are made. This is done in a more rigorous fashion than the customary practice of prequalification procedure. Technical merit, and time and quality-related factors in a bid proposal are being given more emphasis.

Some people assert that the innovative methods are needed for the sake of time and quality, to get better value for the government money, to reduce life-cycle costs for the public body, to encourage quality and innovations, while maintaining a fair profit for the contractor.

For many years the time element was not the most important element in construction projects in many countries. The element of cost was the most important one, and therefore the procurement systems were mainly for materials and equipment. In the last few years, the construction industry of Ethiopia has involved in both building of new roads and construction of existing facilities.

These reconstruction projects are mainly in urban areas and cause substantial problems to the public. The economic cost of these delays is also enormous. In U.S.A for instance, a few innovative procurement systems for buying time were introduced in order to minimize those delays (Zohar et al). The common denominator of all those procurement system is the ability of the contractor to procure the time for completion of the project.

D. Competitive Negotiated Bidding:

Request for proposals and/or request for qualification for a particular project are examples of typical competitive negotiated method.

Proposals from more than one contractor are scrutinized for factors such as technical capability, project schedule as well as cost. These methods are usually employed when the project is planned to be built under a design/build contract. Proponents of competitive negotiated bidding methods claim that these methods save time, improve quality and reduce number of claims.

The main points against this method are that the cost and time spent by the contractor for preparing a proposal is higher; the system lends itself to a situation where the contractor is reserved to propose any new or innovative ideas because they may not fit the experience of preconceived ideas of the evaluators; contractors are required to disclose confidential commercial and financial information that should not be released outside the company; the owner may try to get cost-saving ideas from the competing contractors during the interviews and yet may choose not to award the project to the contractor whose ideas would later be utilized; and the processes of evaluation turns out to be subjective rather than objective (Kelley, 1991).

2.5 Performances of Contract, Contractor and Project

2.6 Contract Performance

According to Thomas (2002) the main performance criteria of construction projects are financial stability, progress of work, standard of quality, health and safety, resources, relationship with clients, relationship with consultants, management capabilities, claim and contractual disputes, relationship with subcontractors, reputation and amount of subcontracting. Chan and Kumaraswamy (2002) stated that construction time is increasingly important because it often serves as a crucial benchmarking for assessing the performance of a project and the efficiency of the project organization.

Ugwu and Haupt (2007) stated that, an adequate understanding and knowledge of performance are desirable for achieving managerial goals such as improvement of institutional transformations, and efficient decision making in design, specification and construction, at various project level interfaces, using appropriate decision-support tools. It is generally recognized that both the performance of an organization and its long-term effectiveness are impacted by the mode of their selection. Procurement of contractors is a key factor in the success of organizations in many different industries, including the construction industry (Cameron and Quinn, 2002).

2.6.1 Contractor Performance

Performance has been described as “the degree of achievement of certain effort or undertaking”. It relates to the prescribed goals or objectives which form the project parameters (Chitkara, 2005). From project management perspective, it is all about meeting or exceeding stake holders’ needs and expectations from a project. It invariably involves placing consideration on three major project elements i.e. time, cost and quality. (Project Management Institute, 2004). It has been pointed out that, in today’s highly competitive and uncertain business environment, the client who is the major stakeholder, want speedier delivery of their project with early start of construction work, certainty of performance in terms of cost, time and quality, value for money for their investment, minimal exposure to risk and early confirmation of design (Costa et al, 2004). Although many tend to focus on the elements of cost, quality and time, all others are also important parameters of project performance. By the

needs of the clients, it is prudent that at every stage of the project delivery, some kind of checks is done to ascertain discrepancies.

Thus performance measurement as defined by Neely (1995), is the set of metrics used to quantify both the efficiency and effectiveness of action. Further Alwi et al (2002) indicated that performance measurement is a management tool which has the power to focus attention on desired behavior and results. This means that, measuring performance allows an organization to objectively determine what is working and what is not. In order to measure performance or calculate the effects of any given change on the construction process, one must first determine the appropriate Key Performance Indicators (KPIs) to focus on to measure their impact on project delivery.

However, Ofori et al (2001) have indicated that measuring performance is a complex problem. This is because every contractor is unique in terms of the manner in which he follows design specifications, method of delivery, administration, and composition of team members. Performance measurement is a good exercise to undertake in that Steven et al (1996) asserted that performance measurements are needed to track, forecast, and ultimately control the success of a project.

Despite the importance of performance measurement, it has not been widely implemented in construction companies and information on the performance of the construction industry as a whole is also scarce (Dayana et al., 2005). For example, in Nigeria according to Amu, et al (2005) the untimely completion of construction projects has been found to be a major setback in the construction industry. Earlier, Odusami and Olusanya (2000) have indicated that projects executed in Lagos metropolis experienced an average delay of 51% of planned duration for most projects. Therefore an improved contractor performance can lead to increased client satisfaction, improvement in reputation and competitiveness in the market (Ogunsemi and Jagboro, 2006). However contractor performance is critical to the success of any construction project which is the determinant of cost, time and quality standard because the contractor converts the design into practical reality (Xiao and Proverbs, 2003). Having stated this, we need to discuss the link between construction success and performance

2.6.2 Performance of Construction projects

Success of construction projects depends mainly on success of performance. Many previous researches had studied performance of construction projects. Dissanayaka and Kumaraswamy (1999) remarked that one of the principal reasons for the construction industry's poor performance has been attributed to **the inappropriateness** of the chosen procurement system. Reichelt and Lyneis (1999) remarked three important structures underlying the dynamics of a project performance which are: the work accomplishment structure, feedback effects on productivity and work quality and effects from upstream phases to downstream phases. Thomas (2002) identified the main performance criteria of construction projects as financial stability, progress of work, standard of quality, health and safety, resources, relationship with clients, relationship with consultants, management capabilities, claim and contractual disputes, relationship with subcontractors, reputation and amount of subcontracting. Chan and Kumaraswamy (2002) stated that construction time is increasingly important because it often serves as a crucial benchmarking for assessing the performance of a project and the efficiency of the project organization. Cheung et al (2004) studied the project performance related to project managers. He remarked that development of a Web-based construction Project Performance Monitoring

System (PPMS) can assist project managers in exercising construction project performance indicators and can help senior project management, project directors, project managers, etc., in monitoring and assessing project performance. Ugwu and Haupt (2007) stated that an adequate understanding and knowledge of performance are desirable for archiving managerial goals such as improvement of institutional transformations, and efficient decision making in design, specification and construction, at various project level interfaces, using appropriate decision-support tools. Ling et al (2007) investigated project management (PM) practices adopted by Singaporean construction firms. It was determined that the performance level of their projects in China; identifies PM practices that led to better performance; and recommended key PM practices that could be adopted by foreign construction firms in China to improve project performance. Having briefly discussed the link between construction projects and performance it is appropriate to highlight some of the problems associated with performance in the construction industry.

2.6.3 Problems of performance in construction industry

The failure of any construction project is mainly related to the problems and failure in performance. Moreover, there are many reasons and factors which attribute to such problem. Ogunlana et al, (1996) stated that the construction industry performance problems in developing economies can be classified in three layers: problems of shortages or inadequacies in industry infrastructure (mainly supply of resources), problems caused by clients and consultants and problems caused by contractor incompetence/inadequacies. Okuwoga (1998) identified that the performance problem is related to poor budgetary and time control. Long et al (2004) remarked that performance problems arise in large construction projects due to many reasons such as: incompetent designers/contractors, poor estimation and change management, social and technological issues, site related issues and improper techniques and tools. Navon (2005) stated that the main performance problem can be divided into two groups: (a) unrealistic target setting (i.e., planning) or (b) causes originating from the actual construction (in many cases the causes for deviation originate from both sources).

Samson and Lema (2002) found that the traditional performance measurement systems have problems because of large and complex amount of information with absence of approaches to assist decision maker understand, organize and use such information to manage organizational performance. Navon (2005) remarked that traditional project performance control is usually generic (e.g., cost control techniques). It relies on manual data collection, which means that it is done at low frequency (normally once a month) and quite some time after the controlled event occurred (i.e., not in real-time). Moreover, manual data collection normally gives low-quality data. Ling et al (2007) remarked that architectural, engineering and construction (AEC) firms may face difficulties managing construction projects performance in China because they are unfamiliar with this new operating environment. Kim et al (2008) stated that international construction projects performance is affected by more complex and dynamic factors than domestic projects; frequently being exposed to serious external uncertainties such as political, economical, social, and cultural risks, as well as internal risks from within the project. To be able to discuss problems associated with contractor's performance there is the need to identify performance indicators that are used to evaluate contractor's performance.

2.6.4 Performances of contactor and project selected using lowest evaluated Method

The lowest bidder is one whose bid contains the lowest total amount when compared with other bids submitted for the same work. There are definite risks associated with the low bid award system. A number of studies have shown that the lowest bid does not guarantee the lowest cost. Also, the lowest bidder is subject to the winner's curse; the contractor with the lowest bid is the one most likely to have underestimated the cost of the project (Capen et al., 1971). Lowest bidders are required to complete a construction project that no one else was willing to do at that price (Wolfsetter, 1996). It is known that many construction projects exceed the contract cost. Thus, using the bid price (lowest bid) solely for contractor selection cannot guarantee the lowest total construction cost. In addition, construction bid evaluation is one of the primary challenges for the public sector. Its purpose is to choose the best qualified contractor who can accomplish the project on time, within budget, and with the quality specified in the contract documents. In finding a best qualified contractor, two terms, evaluation and selection, are commonly referred to in the literature. Holt (1998) defined contractor evaluation as the process of investigating or measuring contractor attributes, and contractor selection as the process of aggregating the results of evaluation to identify an optimum choice.

If a contractor submits a bid that is lower than the client's estimate and the other bidders, it is difficult to understand how that contractor could complete the job profitably and efficiently. The European Union defines those bids as Abnormally Low Tenders (DGIII, 1999). In that regard the EU introduced legislation to allow public sector clients the option of awarding a construction project using either the traditional low bid or the Economically Most Advantageous Tender (EMAT). The legislation allowed public sector clients to reduce their exposure to some of the adverse effects of abnormally low tenders (ALT), including: unsatisfactory quality through the desire to reduce construction costs (Winch, 2000); and predatory pricing and unfair competition that distorts the market, negatively affecting the other bidders (Alexandersson, 2006).

Some researchers have identified a long list of factors that can influence a contractor's decision to bid and the price they submit (Chua, 2000; Fayek, 1998). In addition to the many factors involved in determining a price, there are a number of reasons that the bid submitted

could be considered abnormally low. Imprecise and ambiguous contract documentation including incomplete drawings may cause a contractor to make a serious omission in calculating costs. Errors may also arise due to insufficient time to prepare the bid. One of the most concerning reasons is the practice of a contractor intentionally submitting an artificially low bid in anticipation of making their profit through change orders and claims (Zack, 1993). Some bidders carefully review the bid documents searching for mistakes and ambiguity in areas that could lead to change orders and claims during the project (Dowle and DeStephanis, 1990). These bidders can then use this knowledge to submit a lower bid with the expectation of recouping the money later. This practice can be equated to a gambit strategy in chess: making a small sacrifice early to setup up the opponent to be in a vulnerable position later (Crowley and Hancher, 1995).

In all cases, the abnormally low bid is not reflective of the final contract cost or the hidden costs incurred by the client when dealing with numerous change orders and claims. One of the remedies that these researchers have suggested is the use of median bid to select contractors.

The median bid is more reflective of the market value than the mean because it is not influenced by outlying high and low bids. For example, it is common for contractors to submit a “courtesy” bid that is high with no expectation of winning the tender to remain in good standing with the owner. Using the postulate that the median bid reflects the fair market value, one could expect that if all of the bidders are tightly clustered around the median, then they have a general consensus of the complexity and the costs of the project. With this scenario, one would expect that the cost escalation of the project would be small. While a large gap between the low bid and the other bids would suggest a greater chance that the abnormally low bidder is not bidding on the same project as the rest of the bidders. Higher cost escalation for those projects is conceivable. Some researchers have identified that highway road construction projects that were awarded to low bidders that were significantly lower than the median bidder experienced 3.5 to 4 times the cost escalation (from the low bid) than projects where the low bidder was close to the median bid price (Crowley and Hancher, 1995).

It is generally recognized that both the performance of an organization and its long-term effectiveness are impacted by the mode of their selection. Procurement of contractors is a key factor in the success of organizations in many different industries, including the construction

industry (Cameron and Quinn, 2002). A common performance metrix for construction clients is the ability to minimize the amount of cost escalation on projects.

The means of obtaining the best value under this system is to award a contract to the responsive and compliant bidder that is willing to fulfill the terms of the contract for the lowest cost value. Having reviewed the performance of contractors selected using the low bid as main selection criteria; their performance can be traced or associated with the factors discussed below.

2.6.5 Factors that affect contract performances

Dissanayaka and Kumaraswamy (1999) remarked that one of the principal reasons for the construction industry's poor performance has been attributed to **the inappropriateness of the chosen procurement system**. The insufficiency and inappropriateness of the awarded contractors has led to sub-standard work, delays, disputes, bankruptcy or insolvency of many company (Hatush et al., 1997).

In Oromia, most common procurement method is the competitive lowest evaluated-bid procedure in which contracts are awarded to responsive contractor who offers the least price after technical evaluation. There are definite benefits and drawbacks to the lowest evaluated-bid award system. Promoting competition amongst contractors is a clear benefit to the process. It compels the contractors to lower their costs, usually through innovation, to ensure they win bids and maintain their profit margins. In addition, the process is beneficial, specifically to the public sector because of the transparency, an important criterion of public policy (Photios, 1993). However, allowing contracts to be awarded based on the least price has inherent flaws. Delays in meeting the contract duration, increment of the final project cost due to high variations, tendency to compromise quality, and adversarial relationship among contracting parties are the major drawbacks associated with lowest evaluated bid award procedure (Bedford, 2009). Moreover, the lowest evaluated-bid award system encourages unqualified bidders in the competition and in contrary it discourages qualified contractors to participate and all these affects contract performance.

According to Hardy (1978) the criteria used for bid evaluation should reflect the client's objectives. These are that bids are fully responsive to the contract and bidders are sufficiently well qualified to undertake the contract. The criteria for selecting the successful bidder are then that bid which maximizes the return on the client's investment. Thus he has proposed that bidders should submit a schedule of the payments they expect to fall due to them during the contract. Also, Owusu (1999) identified two main factors affecting contractor performance in Ghana. The two factors were Financial and Managerial Capacities of the firm. Under the financial factors Owusu (1999) mentioned that contractor's financial stability in terms of access to credit was questionable and that has gone a long way to affect their performance over the years.

2.6.6 Factors that affect contractor performances

Factors that affect contractors' performance have been identified by a number of researchers and are discussed below;

A. Prequalification of Contractors

Prequalification, according to Hughes et al (2006) is the primary mechanism for short listing contractors. This means that prequalification serves as means of identifying bidders who are most capable of doing the work. One of the main functions of prequalification is to reduce the risks of non-performance from contractors which construction clients are likely to experience (Hughes et al 2006). Writing in the same vein other writers such as Mlinga and Lema (1999) among others identified some key principles or factors that are used for prequalifying building contractors. These principles are presented here as: technical capability; financial capacity; quality management; and occupational health safety; Experience and licence /classification

a. Technical Capacity

Technical capacity is broadly defined as having recent previous experience and demonstrated capability relevant to a monetary threshold in one or more of the prescribed field of work types (Brown et al, 2002; Adams et al, 2002). To meet the requirements of technical capability, Adams et al, (2002) asserted that contractor(s) must provide information on areas of work that includes: expertise or specialisation, past experience, staffing levels, and management and administration capabilities including the use of subcontractors and consultants and plant and equipment resources, evidence of appropriate qualifications including current licenses to

practice in a particular field. Again, indication from Brown et al, (2002) seem to suggest that at the tender stage, contractors are required to nominate specified personnel or a team, such that their qualifications and experiences proposed for the particular job tendered for. Implications from Brown et al, (2002) are that with the required technical personnel on projects there is likelihood of good performance of contractors.

b. Financial Capacity

The financial capability of the contractor for funding of a project is very important and crucial to the success of a project. An indication from the Ghanaian Public Procurement Act 663 of 2003 seems to suggest that, the financial good standing of a contractor is an indication of good performance in terms of project delivery. Writing in similar vein, Costa et al, (2004) suggested that the submission of bank statement from reputable financial institution serves as a guide for contractors to work promptly and satisfactorily.

c. Quality

Numerous indications and complaints of low quality of work have been made by consumers /users through media and authorities which lead to decreased quality of life in uncomfortable and unfriendly environments (Egan, 1998). Poor quality control at site, common problems such as project delay and possible economic losses are constant dilemma for the client. Late delivery of work will often result in late occupancy of the building, and this brings about inadequacy of public facilities. As a result, end-users will not be happy if the end product does not meet their requirement in terms of functionality and quality of service. In essence, successful stakeholders' performance has to be measured and managed in order to ensure their continual participation and co-operation in a construction project (Fitzgerald et al, 1991).

d. Occupational health and safety

The occupational health and safety (OHS) is seen to be concerned with physical and mental well-being of the individual at a place of work (Danso, 2008). In the construction industry, the physical and mental well-being of the individual at the construction site appears to be affected through accident. Construction accident is defined to include all minor injuries through fatalities (Danso, 2011). Literature available on this subject indicates that the construction industry all over the world is among the leading cases of accidents. For example, it was

reported that the construction industry, recorded 902 accidents cases comprising 56 fatalities in 2000 and 846 non-fatal accidents (Danso, 2011). In attempting to find the causes of this breach in Occupational Health and Safety issues, a number of factors are discussed and researched, among them are first-aid equipment, safe drinking water, sanitary facilities, provision of personal protection equipment (PPE) and training of construction workers on safety procedures, were the measures needed for addressing the occupational health and safety issues confronting the industry. Understanding gathered from other researchers on Occupational Health and Safety issues suggest that contractors who provide welfare facilities and safety equipment to their workers on sites during construction are likely to perform satisfactory and deliver the project on time.

e. Experience

Previous experience of the tenderer needs to be assessed in relation to the fields of expertise required to achieve the intended outcomes of the project. Recent experience is more valuable than historic experience. The company's previous experience in technical areas comparable to the tendered project, the scale of past projects and the role undertaken within those projects should be considered. Information required should include a list of relevant projects undertaken and for each project provide: description and relevance to the tendered project; role of the tenderer, project cost; and duration of project and performance of the contractor on the projects involved. The tendering organization's performance in completing past projects to the quality standards required, time performance, within budget, claims history, project management, and product value need to be assessed. Extension to the contract completion date and claims for variations also give an indication of performance capability. Similarly, the satisfaction of previous clients regarding the management of the project and project outcome provide useful subjective information on performance of the tenderer.

f. License/Classification

On the international level, regulatory policies relating to control of land use, technical requirement, building permits and inspections, registration of contractors and professionals, wages and remunerations, classification of contractors, foreign equity limitation, transfer offends between projects and lack of recognition of professional qualification have all impacted on the competitiveness and performance of contractors operating abroad (Chan,

2001). Nationally, politicians have voiced their concerns regarding regulation of the industry and the economy in general. In UK parliamentary debate, a case was cited of a small construction firm who had to turn down major contracts because it could not secure insurance cover for accidents, which were extremely costly. This had resulted in loss of employment for the workforce (Chan, 2001). In many developing countries, after obtaining license and registering to operate as a construction business, contractors who wish to engage themselves on government sponsored projects are further required to register with appropriate government departments and then be categorized into financial groups. In Tanzania, contractors are categorised into five groups, and within each group contractors are categorized in seven financial classes (Neely et al, 2001). In Ghana, contractors are classified under four financial classes as indicated earlier. Contractors are required to obtain certificate from Ministry of Water Resources, Works and Housing before they can tender for government projects.

The classification system is justified on the basis that construction product is a social good, so effort should be made to select the most efficient contractor; and that the client (this case the government) needs protection from unscrupulous contractors. Construction clients all over the world, including private clients in developing countries, have employed these well-researched procedures in judging the competence of contractors.

Furthermore, professionals such as architects, engineers and quantity surveyors take responsibility (letter of assurance) and bear the liability for their action in each process.

The question is why a classification system which could damage the very small contractors whom efforts are being made to develop.

B. Warning Letters

Contractors are usually issued warning letters as means of reprimanding them when their performance is seen as below standard or their failure to adhere to instruction. The number of warning letters issued is an indication of contractors' performance. A contractor who is performing poorly is likely to receive many warnings from client or the consultant.

C. Programme of work

The clause 17 of the Ghanaian conditions of contract and the Article of Agreement of 1996 (pink form) indicates, contractor having taken possession of site is expected to regularly and diligently proceed with the works and complete them. It is evident from clause 17 that failure of the contractor to regularly and diligently proceed with the works may lead to the determination of his employment by the employer. Allowing projects to be awarded based solely on one criterion as in lowest bid has inherent flaws. Criteria such as time and quality are negated. Also, the low bid award system encourages unqualified bidders (Carr, 2005). As part of requirements for engaging contractors, they are expected to submit programme of work indicating the various activities that would be performed and when they would be performed which cumulatively give the possible project completion date. An incompetent contractor is most likely to submit a more unreliable and unrealistic programme of work.

D. Project completion Time

Chan et al (2002) has indicated that project completion time is the actual construction time at practical completion. Indications from Aitah, (1988), Adams et al, (2002) suggest that selection of contractors using the lowest bidder as unique criteria can sometimes leads to the selection of incompetent contractors, excessive claims by the contractor against the client, disputes and litigation between two parties, bid shopping and other problems. All these are potential ingredients or elements for project time increase (Adams et al, 2002).

E. Project final Cost

This is the total construction cost at practical completion (Chan, 2001). Researchers such as Carr (2005), Amu et al (2005), have shown that the lowest bid does not guarantee the lowest cost. Lowest bid is normally used to ensure competitive bidding. Its purpose is to choose the best qualified contractor who can accomplish the project on time, within budget, and with the quality specified in the contract documents. However, one of the most concerning reasons is the practice of a contractor intentionally submitting an artificially low bid in anticipation of making their profit through variation orders and claims (Zack, 1993). Some bidders carefully review the bid documents searching for mistakes and ambiguity in areas that could lead to variation orders and claims during the project (Dowle and DeStephanis, 1990).

The project final cost can therefore be used to assess the performance of contractors when other factors that can lead to cost increase such as fluctuation, variations by client or consultant, etc remain the same.

F. Client satisfaction

This is defined as how satisfied the client was with the process and outcome of the project and the service received from contractors and professionals, using a client survey of satisfaction. Client satisfaction, according to Ugwu et al (2007) is one of the major factors used in determining the performances of contractors. A satisfactory performance of a contractor means that complaints by client are virtually minimal (Carr, 2005; Hancher, 1995).

G. Specification

As it is company policy to continually improve products, methods and materials, changes of specification may be made from time to time without prior notice. The ability of the contractor to follow specification as contained in contract document is an indication of contractors' performance.

H. Organization

Iyer and Jha (2005), appear to suggest that the Key Performance Indicators have been particularly useful to organizations with unsophisticated performance measurement systems. Some organizations have used the indicators selectively to measure aspects that are important to their business and to their clients, and to supplement their own performance measurement systems. Again, for Jin Xiao-Hua and Ling Florence Yean Yng, (2006), the Key Performance Indicators are not a substitute for more comprehensive performance measurement systems and benchmarking, which can provide more rigorous assessments. They do, however, enable organisations to gauge their performance in relation to other organisations. The indicators are less suitable as tools to manage projects, suppliers or companies or as criteria for evaluating tenders or in evaluating the success of a construction project in reducing the operational costs of a building.

Affirmation from Ugwu and Haupt (2007), suggest that benchmarking is a management technique to improve business performance. It can be used to compare the performance of the organisation as a client with that of similar organisations, or the performance of different

suppliers in the same industry. For construction projects it can be used to: assess performance objectively expose areas where improvement is needed to identify other organizations with processes resulting in superior performance, with a view to their adoption test whether improvement programmes have been successful.

I. Warranty Period

Two types of warranties are currently used in construction according to Winch (2000) and these warranties are (i) materials and workmanship warranties, and (ii) performance warranties. These warranty types differ by the degree to which the contractor is liable for product failure. In a materials-and-workmanship warranty, the contractor is responsible only for defects that result from poor materials and workmanship (Long, Ogunlana, & Lan, (2004a). On the other hand, a contractor assumes greater responsibility for the product in a performance warranty and is responsible for the product meeting certain agreed upon performance thresholds. In either case, contractor liability should be properly balanced with the contractor's control of the design, construction and long-term maintenance of the structure throughout the warranty period.

The warranted work is measurable or quantifiable and is under control of the contractor. Performance warranty specifications can be written that allow the contractor to provide design input and choose the optimal design. Failure threshold levels or material and workmanship performance measures for the warranted work should be able to be explicitly defined in the specification and measured in the field (Herbsman, and Ellis, 1992; Brown, and Adams, 2000). Contractor is responsible for maintaining the end product for the warranty period, including any necessary routine or emergency maintenance, as well as any required remedial actions.

The contractor is also required to perform any required remedial actions, preventive maintenance, and emergency maintenance necessary for the length of the warranty period. Contractors are bound to the projects within the warranty period. Early failure because of the contractors bad performance will be corrected at the contractor's cost during the warranty period. An increase in contract disputes and litigation can also be expected due to the difficulty in identifying the real reason for a failure during the warranty period.

It has been observed by many researchers such as Alexandersson and Hultén, (2006) that contractors who perform badly do a lot of remedial work during the warranty period. We can therefore infer that the amount of remedial work done by a contractor is an indication of the performance of the contractor during the execution or construction period. The number of calls made to the contractor during the warranty period is also an indication of the quality of work done by the contractor and subsequently performance of the contractor during the construction period. Within the warranty period, the contractor bears any cost of maintenance work due to failures resulting from improper materials, inferior workmanship or defective design for which the contractor is responsible. Any maintenance work incurred within the warranty period would translate to savings to the state agency or the client if no defects are identified during the period.

Within the warranty period, the maintenance work depends on the type of required remedial actions when a failure occurs. Most government agencies require contractors to follow a standard protocol of remedial actions whenever failures happen.

J. Cooperation

Traditionally the construction industry characterized by adversarial relationships, the lack of cooperation among project participants and the fact that construction companies and clients focus mainly on the reduction of project cost and neglect the value, are some reasons for the poor performance of construction projects. Relationships between clients and contractors in construction projects are often adversarial. Traditional contracts, but also more integrated forms of project delivery as design-build, are characterized by lowtrust and poor communication (Cameron and Quinn, 2002; Anvuur et al, 2006 ;). Aiming at increasing efficiency and quality in construction, many clients have taken initiatives to improve cooperation with contractor organizations by promoting partnering arrangements. Moreover, expectations between partners about future cooperation create higher levels of trust among partners. A contractor who performs satisfactorily is likely to receive better cooperation from the client. This means that existence of cooperation between the client and the contractor is an indication of good performance by the contractor.

2.7 Impacts of Lowest Bidding System

The construction industry is an important part of the economical backbone in many countries (Ngai *et al.*, 2002), often accounting for between 7-10 percent of the Gross Domestic Product (Voordijk *et al.*, 2000). In many countries the construction industry has, however, attracted criticism for inefficiencies in outcomes such as time and cost overruns, low productivity, poor quality and inadequate customer satisfaction (Chan *et al.*, 2003). In order to achieve successful governance of construction projects a holistic and systemic approach to procurement procedures is crucial (Eriksson and Pesämaa, 2007,). In construction management literature several studies have indicated that procurement systems have significant effects on construction project performance. Noted in this direction are studies of Rasid, Taib, Ahmed, Nasid, Ali and Zainordin (2006) and Hashim (1999). Studies of Ogunsanmi, Iyagbaand Omirin (2003), and Dada (2012) all confirm the use of various types of procurement methods for project delivery in Nigerian construction industry which significantly affect the performance of most projects. The study of Hashim, M.B. (1999) also confirms the effects of procurement methods on performance of construction projects in Malaysia.

Considering the lowest price or bid as a criterion for selecting a contractor has been criticized by many authors (e.g. Hatush and Skitmore 1998; Stein et al. 2003; Al-Reshaid and Kartam 2005). They collectively argued that the serious problems which arise within the construction phase as a result of accepting the lowest bid can lead to serious **overruns** of time and cost, serious **quality problems** and eventually to increased litigation. Many of the research studies criticized the lowest cost tendering process as the main procurement tool and suggested some other criteria to select contractors in order to achieve better performance (Egan 1998, Sebastian 2011, Eriksson and Nilsson 2008, Tikkanen and Kaleva 2011). Padhi and Mohapatra (2010) claimed that past work performance of contractors is not taken into consideration during the selection procedures and thus, the project will be delivered with poor quality because of the contractor's poor record of past work performance. Ogunsemi and Aje (2006) highlighted that past performance; contractors' experience; workmanship quality; tender sum and plant and equipment were the most important criteria for contractors' prequalification evaluation in Nigeria.

There are definite impacts of the lowest evaluated bid award system. A number of studies have shown that the lowest evaluated bid does not guarantee the lowest cost. The contractor

with the lowest evaluated bid is the one most likely to have underestimated the cost of the project and it is difficult to understand how that contractor could complete the job profitably (Capen et al. 1971). Lowest bidders are required to complete a construction project that no one else was willing to do at that price (Wolfsetter, 1996). According to Chua (2000) and Fayek (1998) the factors that can influence a contractor's decision to bid and the price they submit are imprecise and ambiguous contract documentation, including incomplete drawings which may cause a contractor to make a serious omission in calculating costs.

According to Zack (1993) most contractors intentionally submit low bid in anticipation of making their profit through change orders and claims. Some bidders carefully review the bid documents searching for mistakes and ambiguity in areas that could lead to change orders and claims during the project (Doyle and DeStephanis, 1990). These bidders can then use this knowledge to submit a lower bid with the expectation of recouping the money later. This practice can be equated to a gambit strategy in chess: making a small sacrifice early to setup up the opponent to be in a vulnerable position later (Crowley and Hancher, 1995). In all cases, the abnormally low bid is not reflective of the final contract cost or the hidden costs incurred by the client when dealing with numerous change orders and claims.

According to Machegaiw (2012) the median bid submitted may be considered a reflection of the fair market value for a contract for the bidders. In some cases, half of the contractors would be willing to take the job at the median price, while the other half of the bidders would not. The median bid is more reflective of the market value than the mean because it is not influenced by high or low bids. For example, Highways road construction contracts that were awarded to lowest bidders that were significantly lower than the median bidder experienced 3.5 to 4 times the cost escalation (from the lowest evaluated bid) than contracts where the lowest evaluated bidder was close in price to the median bid price (Crowley and Hancher, 1995).

Although it is generally accepted that competitive lowest evaluated bid method saves taxpayers money and thus protects public interest, this traditional method has recently been criticized lately for promoting inferior quality, causing too many change orders, furthering adversarial relationships, time overrun, and increasing overall cost of the

project(Mechegiaw, 2012).

Kim et al. (2008) stated that international construction projects performance is affected by more complex and dynamic factors than domestic projects; frequently being exposed to serious external uncertainties such as political, economical, social, and cultural risks, as well as internal risks from within the project. According to Odger et al. (2011) the following are the major **impacts of lowest** evaluated bid awarding system; cost overrun, time over run, insolvency, damage to reputation, legal challenge, poor lifecycle performance, no repeat business and legal cost. According to Anvuur et al. (2006) it appears that this lowest bidder system as practiced in Ghana has consequential effect upon contractor's performance on project delivery. The National Competitive Bidding practice where the lowest evaluated bid is accepted, there is apparently some evidence of winning contracts failing to complete their work or experiencing several delays because low bids they submitted.

2.8 Summary of Literature Review

Professionals in the construction industry have agreed the importance of the method of bid evaluation and contract award procedure chosen for the successful accomplishment of construction contracts. Many countries have also revised their construction procurement of construction contracts based on their own experiences and research findings. Least bidder bid awarding procedure has been widely accepted in many countries for decades.

The customary practice of awarding contracts to a lowest bidder was established to ensure the lowest cost for completing a project. In public construction works, this practice is almost universally accepted since it not only ensures a low price but also provides a way to avoid fraud and corruption (Irtishad, 1993). However, allowing projects to be awarded based on the least price has become one of the major sources of construction projects failures. Delays in meeting the contract duration, increment of the final project cost due to high variations, tendency to compromise quality, and adversarial relationship among contracting parties are the major drawbacks associated with responsive low-bid award procedure (Thomas, 2009). Moreover, the low-bid award system encourages unqualified

bidders in the competition and in contrary it discourages qualified contractors to participate. Consequently, many countries based on their previous experiences and research findings have developed modified procedures to address these problems. Competitive Average Bidding, Multi Parameter Bidding, Competitive Negotiated Bidding and None-Competitive Negotiated Bidding methods are the most frequently used procedures in many countries. Competitive Average Bidding method has become the most favorite of many European countries.

Based on previous studies and literature review, the researcher identified and categorized the summary of Literature into two parts: part one about some factors which can be used to assess the performances of construction contracts awarded to lowest evaluated bid. And part two about Impacts of lowest bidding and contract awarding system.

Part I: Factor identified to assess performance of contractor awarded to lowest evaluated bid;

1. Client satisfaction;
2. Rate of issuance of warning letters;
3. Rate of request to attend to warranty calls;
4. Compliance with instructions;
5. Health and safety on site
6. Compliance with specification;
7. Cooperation from the client;
8. Quality level;
9. Rate of compliance with programme of work(organisation);
10. Project completion period; and
11. Project final cost

Part II: Impacts of lowest bidding on the work environment and team relationships:

Serious problems which arise as a result of accepting the lowest bid can lead to the following impacts of problems:

1. Increased number of Claims
2. Increased number of Disputes

3. Work Suspensions/ Termination of contract
4. Increased number of Change Requests/ Orders
5. Higher cost of contract administration
6. Unsatisfactory quality
7. projects time overrun
8. projects cost overrun
9. Increase overall cost of contract
10. Poor project lifecycle performance
11. No repeat business

CHAPTER THREE

3 RESEARCH DESIGN AND METHODOLOGY

3.1 The Research Method

This chapter presents the procedures that have been followed for achieving the objectives set for the study. The procedures include all information relevant to what data are needed, why these data are needed, where and how the data are secured, and the method whereby a sample unit is selected. To demonstrate this in more illustrated ways it can be shown in figure 1.

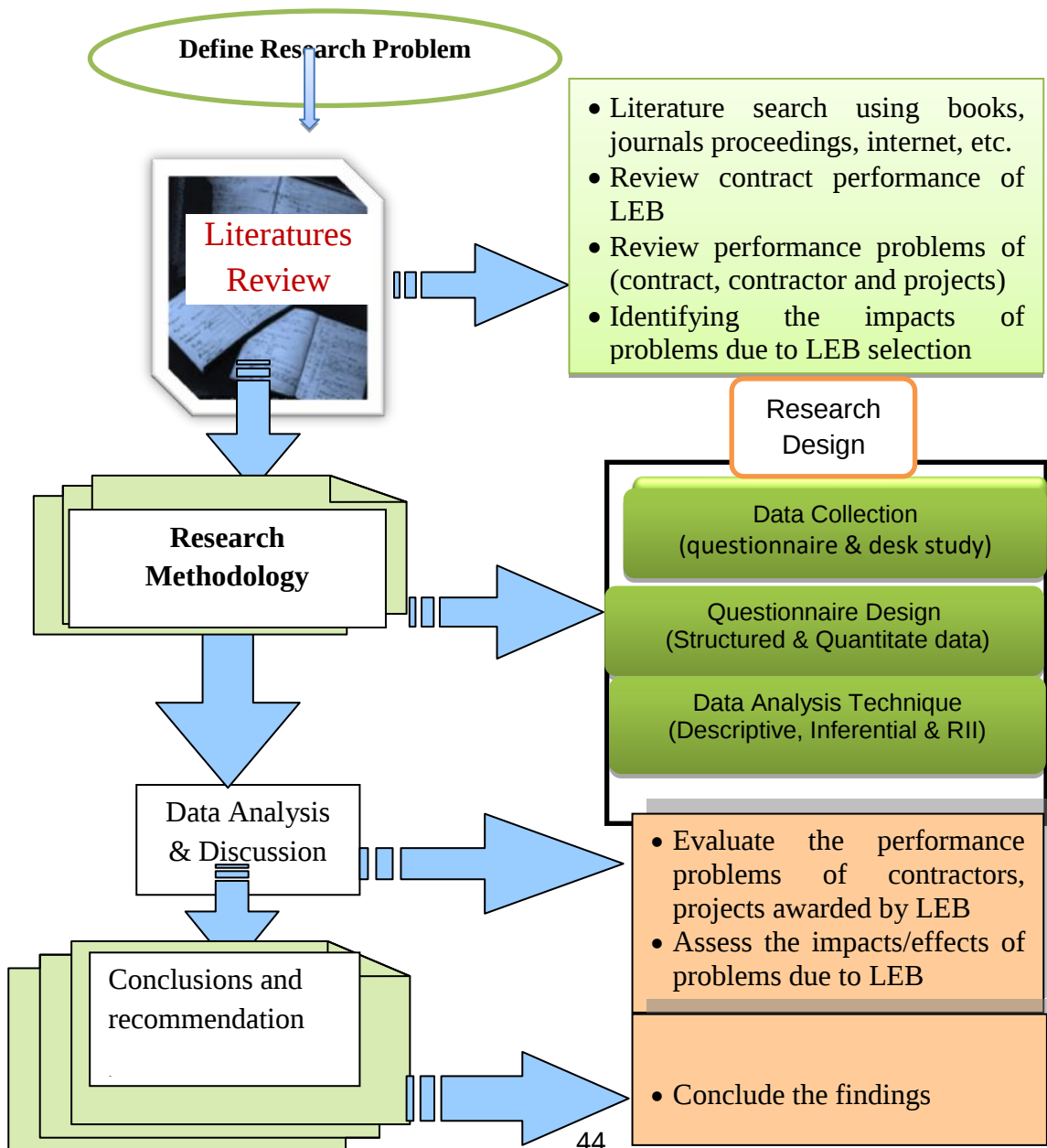


Figure 1: Structure of study

3.2 Research Design

A descriptive and exploratory survey design was used in this study. It was attempted to collect data from the relevant population (public agencies, consulting firms, contractors, and experts) to determine the status of the construction industry.

3.2.1 Questionnaires Survey

The research was started with literature reviews. Based on the information acquired from literature reviews and input from various local experts, questionnaires were developed for survey exercise. Two types of questionnaires were developed for two groups, private contractors and public clients. General contractors, Building contractors, water works contractors and Special contractors/Sub contractors are included in the first group. Architects/Engineers are included in the second group.

After the development of questionnaire and before finalizing the draft, pilot surveys were conducted. Based on the suggestions questionnaires were improved. The questionnaires were then distributed in person. Interviews also were held along the questionnaires survey to cross- check the information and obtain any extra knowledge.

The responses obtained from questionnaire survey were analyzed to identify the trends and practices in bid and procurement in Oromia Regional Government owned construction projects. Questionnaires were analyzed separately and then collectively sections as well as questionnaire wise. Based on the data obtained conclusions are drawn and recommendations are forwarded.

3.2.2 Questions Raised

The questionnaire designed for the construction organizations contained four main types of questions. From question 1 to 4 natures of the organizations were asked and general profiles of the companies were obtained. Part 2 contained questions (5-21). Question number five was asked to respondents to give their rating of the different bid-evaluation and contract award procedures based on some attributes or criteria. Questions (6-21) that sought to measure the performance of contractors on projects awarded using the lowest evaluated bidder as the major criteria. Part 3 contained questions (22-25) that sought to assess and rank the impact of Lowest-Bidding system has on performance of construction projects and

contractors. In the fourth part of the questionnaire, question 26, respondents were asked to indicate their agreement or disagreement at different degree to 12 statements listed in the questionnaire with respect to different bidding practices. In addition to these four groups of questions, respondents were given the chance to reflect any additional comments.

The questionnaire prepared for public organizations were similar in the last three groups of the questions included in the questionnaire developed for construction organizations. However, questions 1 to 3 were designed suitably to public organizations.

3.3 Population of the Study

Respondents assumed to represent the public owners were from the three public agencies selected for this research work in the study area (two from Oromia water works, three from Oromia rural roads, and three from Oromia building infrastructures).

More respondents were not required from the public agencies as routine works are executed in each office so that increasing the number would not change the essence of the response.

The target population for the study was professionals from private contractors and public clients. According to Human Resource of public clients the total number of professionals (civil engineers) was 24. According to Human Resource of private contractors the total number of professionals (civil engineers) was 36. Therefore total population for the study was sixty (60).

3.4 Sampling Technique

The researcher adopted purposive sampling technique to gather the data. The purposive sampling technique, also called judgment sampling, is the deliberate choice of an informant due to the qualities the informant possesses. It is a nonrandom technique that does not need underlying theories or a set number of informants. Simply put, the researcher decides what needs to be known and sets out to find people who can and are willing to provide the information by virtue of knowledge or experience (Bernard 2002, Lewis & Sheppard 2006). Based on the justification, the most experience Civil Engineers within the organization as well as contractors were purposively sampled as respondents for the study.

3.5 Sample Size

The samples were drawn from public agencies in Oromia, Contractors, Consulting Offices, and relevant Professionals. The relevant public agencies (or public owners) in

Oromia for the current study consisted of three sectors: namely Oromia Water Resources Bureau (OWRB), Oromia Rural Roads Authority (ORRA), and Oromia Works and Urban Development Bureau (OWUD). Purposive sampling was used to select these sectors as development of these sectors is directly linked to the development of the welfare of the general society. Moreover, these sectors utilize the lion's share of the annual regional budget. The respondents in the study were both men and women, who are experts or occupying managerial positions in their offices. Both the relevant experts and the chief officers were purposely selected.

The researcher adopted purposive sampling technique to sample twenty (20) Civil Engineers from the rank of Senior Engineers to the rank of Chief Engineers from public sectors and 30 (thirty) Civil Engineers from private contractors. These twenty (20) personnel's were experienced in procurement and supervision of works, highly educated and hold high-level positions within their organizations for the study. Thirty (30) professionals from contractors were purposively sampled. These contractors were well experienced and they are entitled to handle any complexity of works as far as civil works are concerned. Therefore total sample size for the study was fifty (50).

The numbers were decided on the basis of the time available for conducting the research work, available fund for the study (project), and the reliability of the respondents so that the overall research work would indicate the reality.

Respondents assumed to represent the public owners were from the three public agencies selected for this research work in the study area (two from Oromia water works, three from Oromia rural roads, and three from Oromia building infrastructures).

More respondents were not required from the public agencies as routine works are executed in each office so that increasing the number would not change the essence of the response.

3.6 Data Collection

The samples were drawn from public agencies in Oromia, Contractors, Consulting Offices, and relevant Professionals. The relevant public agencies (or public owners) in

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general society. Moreover, these sectors utilize the lion's share of the annual regional budget. The respondents in the study were both men and women, who are experts or occupying managerial positions in their offices. Both the relevant experts and the chief officers were purposely selected.

As indicated in table 3.1 below, total of 54 questionnaires, 33 were administered to professionals of construction organizations (contractors) and thirty (30) were retrieved representing a response rate of 90.91%, and 21 (twenty one) to public organizations were distributed and twenty (20) were retrieved representing a response rate of 95.24%. In all fifty four (54) questionnaires were administered and 50 (fifty) were retrieved representing a response rate of 92.59%.

Table 3-1 Questionnaires response rate

Participants	Distributed in number	Returned in number	Response Rate in %
Contractors	33	30	90.91
Public organizations	21	20	95.24
Total	54	50	92.59

3.7 Data Analysis

The responses of the respondents were analyzed to enable discussions to be made on the subjects. Basically, the questions on general particulars of the respondents and all the necessary questions required to achieve the aim of the study was analyzed using descriptive statistics such as frequencies, and percentages. The results were further presented in graphs, charts and tables.

The other types of questions were analyzed to obtain the relative importance of the factors leading to impacts of lowest evaluated bids selection procedure on performance of projects and contract performance. A Likert rating scale of 1 to 4 with 1 = "Not Important", 2 = "Slightly Important", 3 = "Important", and 4 = "Very Important". This 4 point scale was chosen to prevent respondents from providing neutral answers. Relative Importance Index (RII) was then employed to calculate the relative significance/importance index value of each variable. The formula is given by:

Relative Importance Index (RII) =

Where, W = the weighing given to each variable by the respondents, ranging from 1 to 4;

A = the highest weight (i.e. 4 in the study)

N = the total number of samples

After the analyses the criterion with the highest RII emerged indicating high importance and vice versa.

The third type of questions were designed such that the factors and the criteria considered as variables are evaluated and rated according to their degree of influence and their importance or significance.

A scale of rating each variable was used such that: 0 = not at all, 1 = a little, 2 = sometimes, 3 = often, and 4 = very often. Based on the findings, recommendations were made to the Public Procurement Authority and all stakeholders. The results of the analyses were presented in chapter 4.

CHAPTER FOUR

4 ANALYSIS AND DISCUSSION

4.1 General

Questionnaires were distributed to different organizations involved in the construction business and public agencies and organizations in Adama city such East zone Shoa water, mineral and energy office, East Shoa zone irrigation development office, Adama city Administrative construction office and private contractors. The organizations were selected on a random basis for private sectors. However, public organizations were selected based on their contribution in the construction industry. Public agencies including Public Procurement Agency, and Office of Urban Development and Industry were comprised in the study.

4.2 Questionnaires Response Rate

As indicated in table 3.1 above, out of a total number of 54 questionnaires, 33 were administered to professionals of construction organizations (contractors) and thirty (30) were retrieved representing a response rate of 90.91%, and 21 (twenty one) to public organizations were distributed and twenty (20) were retrieved representing a response rate of 95.24%. In all fifty four (54) questionnaires were administered and 50 (fifty) were retrieved representing a response rate of 92.59%.

4.3 Background Information

4.3.1 Qualification and Experience of Respondents

Construction professionals from different organizations in the construction industry and from public organizations were asked through questionnaires. The result of Table 4.1 (above) reveals that 60% of the respondents were from private organizations while the rest 40% are from public organizations.

As indicated in Table 4.2b, among the 30 respondents from private sector only five were from firms which have less than 10 employees, 12 were from firms which have 10-25

employees, the other 13 respondents were from an organization which has more than 40 employees.

16.67% of the private firms have been established in the last 5 to 10 years. Similarly, the private firms that has been established in the last 2 years was 16.67%, while the other 66.67% of the companies included in the survey has been established in the last 2 to 10 years in the business. From the public sector on the other hand, respondents educational background and working experience are summarized in table 4.2a below: Table 4.2a reveals that 60% of the respondents were first degree holder, 25% respondents were advanced diploma holder and the other 15% of the respondents were master's holder.

The result of Table 4.2a reveals that 37.55% of the respondents have practiced their profession more than ten years, 44.44% of them have practiced between five to ten years and only 17.78% of the respondents have practiced less than five years. Their level of education, affiliation with professional bodies and the working experience is a good ground to justify the credibility of the information.

Table 4-1 Respondents Qualification and Experience

a. From client side

Variables	Frequency	Percentage
Qualification		
MSc	3	15
BSc	12	60
Advanced Diploma and others	5	25
Total	20	100
Years in Construction Industry		
5 years	8	16
6-10 years	20	40
11-15 years	17	34
16 and above	5	10

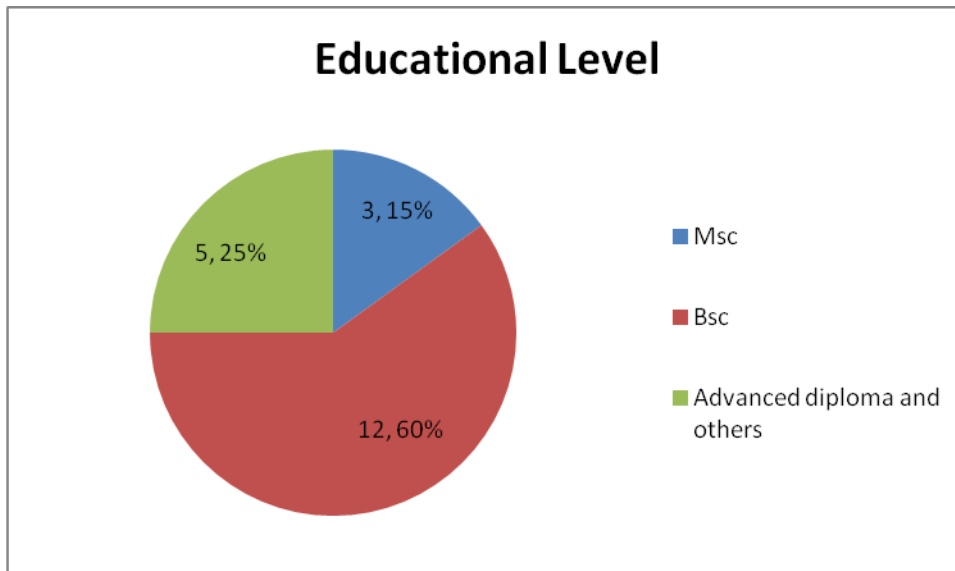


Figure 2: Educational Level

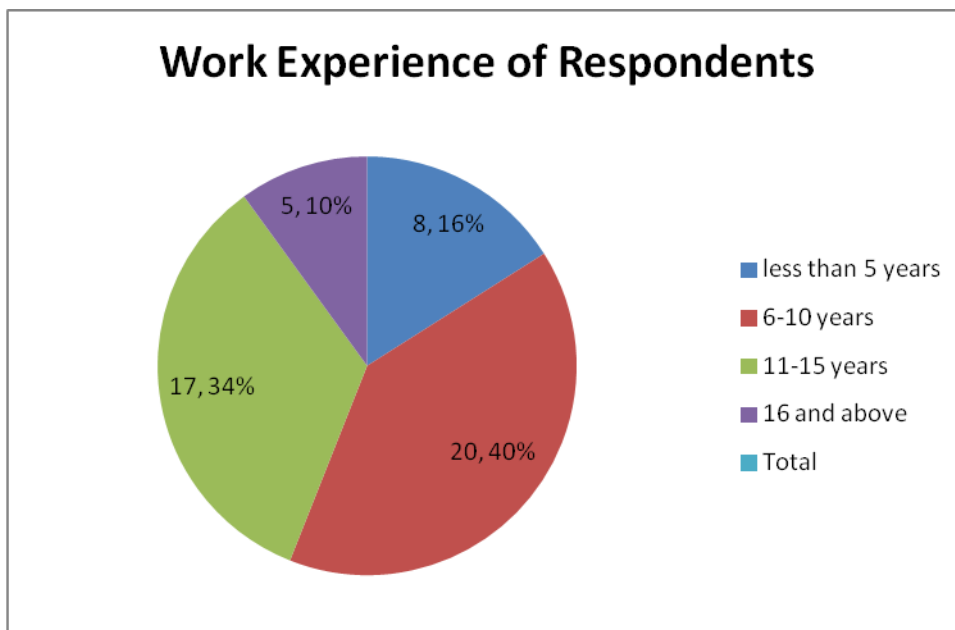


Figure 3: working Experience Respondents

b. From Contractor side

Attributes		
Size of Firm/Organization:	Frequency	Percentage
Less than ten employees	5	16.67
10 to 25 employees	12	40.00
26-40 employees	13	43.33
Over 40 employees	0	0.00
Total	30	100
Years of company Establishment	Frequency	Percentage
Less than 2 years	5	16.67
2 to 5 years	20	66.67
5 to 10 years	5	16.67
More than 10 years	0	0.00
Total	30	100

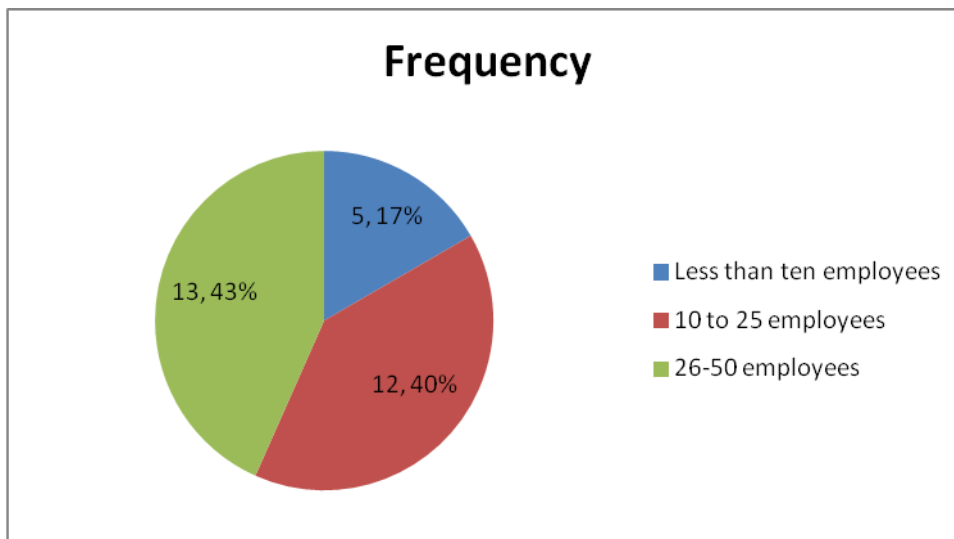


Figure 4: Size of firms

4.3.2 Major Public Works Selected for this study

The professional from public organization was asked to respond the type of construction projects their organizations were involved in.

Results from table 4.2 show that 43.90% of the respondents supervised Small-scale projects such as, water supply, Irrigation, Drainage and road side ditch projects, 36.59% of the respondents supervised Public buildings (market center, youth center etc) and 19.51% of them supervised Heavy Engineering works (gravel roads etc). It was clear indication that the respondents were involved in supervision of projects and therefore their responses were true reflection of what is happening in their organization.

4-2 Major Public works

Participants	Frequency	Percentage
Public buildings (market center, youth center etc)	15	36.59
Heavy Engineering works (gravel roads etc)	8	19.51
Small scale projects(water supply, Irrigation, Drainage and road side ditch projects)	18	43.90
Total	41	100

4.3.3 Public Organizations Bid Evaluation Procedures

Respondents were asked to describe their organization bid evaluation procedure. Alternatives were given in the questionnaire: Based on bid price only, Based on bid price and responsiveness & Based on bid price, responsiveness and other factors.

Only 26% of them replied that their organization bid evaluation procedure is based on bid price, responsiveness and other factors. All the other 74% respondents said their bid evaluation procedure is based on bid price and responsiveness.

Table 4-3 Bid evaluation Procedures

Variables	Frequency	Percentage
Based on bid price only	13	26
Based on bid price and responsiveness	37	74
Based on bid price, responsiveness, and other factors	0	0
Total	50	100

4.4 Ratings on Different Bidding Methods

In the third part of the questionnaire, question 25, subjective rating on different attributes for the selected contract-award procedures of both construction organizations and public body respondents were asked. They were asked to rate each method on the basis of contractor's profit, employer's cost, disputes/claims, coordination, quality control, and project duration. They were advised to indicate, using a predefined scale, each method's possible effect on the attributes listed. The responses are discussed below.

4.4.1 Competitive Low Bid Method

The results obtained for the competitive low bid method are shown in *Figure 5a to g*. Majority of the respondents, about 66%, thought that the current bidding method might sometimes have negative effect on contractor's profit. About 40% of the respondents believed that the method might sometimes have a negative effect on the owner's cost and

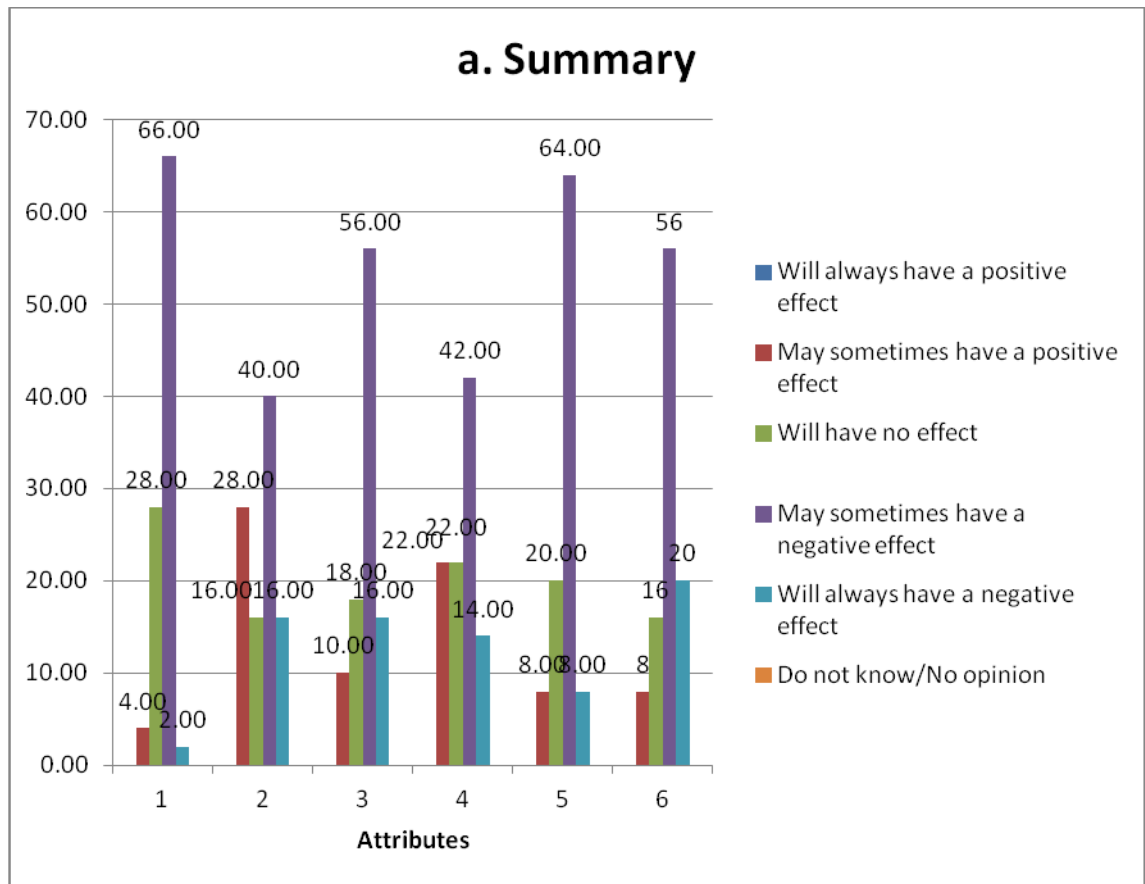
the other 28% believed that it might sometimes have a positive effect in this regard. A majority of respondents indicate that competitive low bid method might sometimes have a negative effect on dispute/claims (56%), quality control (64%), and project duration (56%). On the project coordination issue, 42% of the respondents felt that it might have a negative impact and the other 22% believed that it might sometimes have a positive effect in this regard. On the other hand, 22% believed that it would not have any effect in this regard.

As competitive low bid method is the major type of bid evaluation and contract award procedure for public projects, all construction projects included in this study were those which are awarded in this method. Interestingly, construction professionals from both groups (private and public) acknowledged the negative impact of competitive low bid method on the contractor's profit. And hence the contractor will be forced to compromise quality of works to compensate the price. In addition, variations claims and other disputes are very common on construction projects awarded on least price procedure. Contracts awarded on least price procedure are also known for their unsatisfactory mobilization of resources, which leads to delays on project duration.

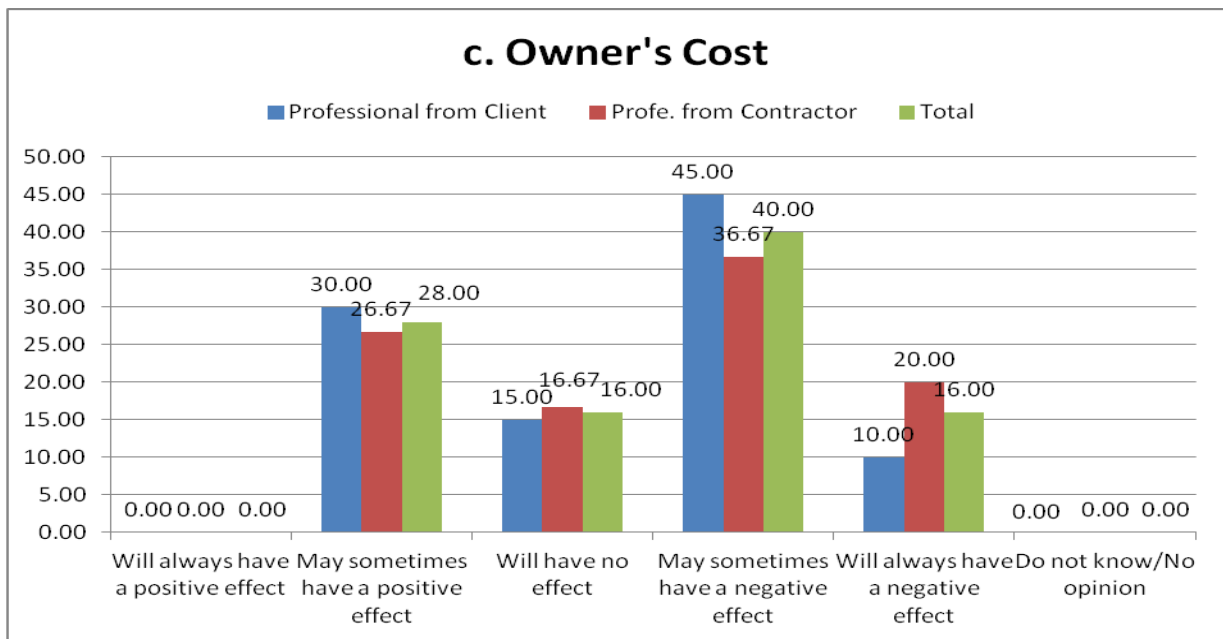
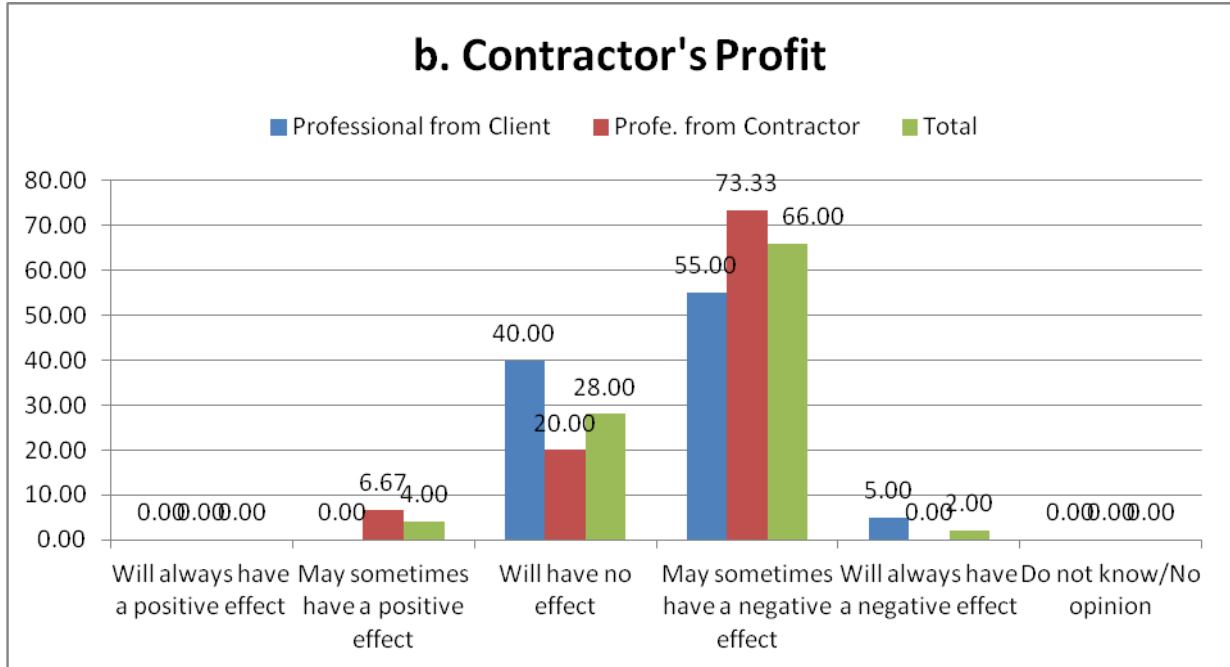
4-4: Rating on Low Bid method

Attributes	Will always have a positive effect	May sometimes have a positive effect	Will have no effect	May sometimes have a negative effect	Will always have a negative effect	Do not know/No opinion
1	0.00	4.00	28.00	66.00	2.00	0.00
2	0.00	28.00	16.00	40.00	16.00	0.00
3	0.00	10.00	18.00	56.00	16.00	0.00
4	0.00	22.00	22.00	42.00	14.00	0.00
5	0.00	8.00	20.00	64.00	8.00	0.00
6	0	8	16	56	20	0

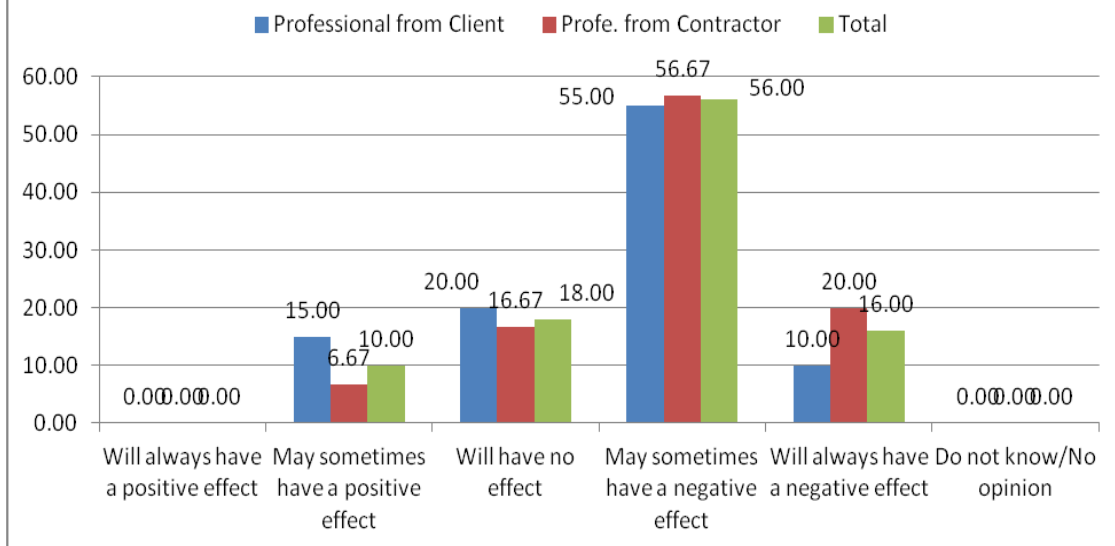
Figure 5a to f : ratings on Competitive low bid method



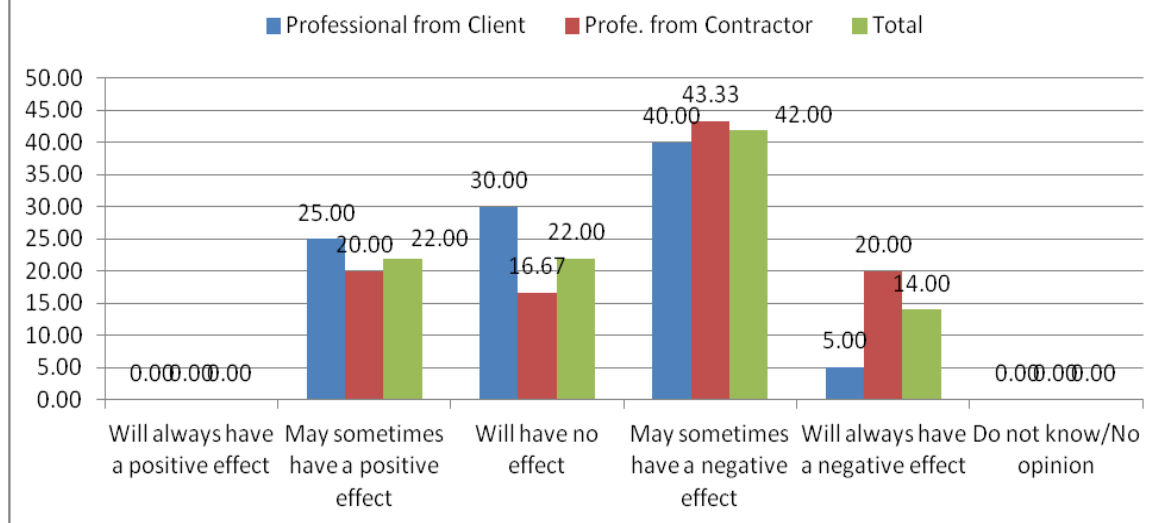
1= Contractor's profit, 2= Owner's cost, 3= Disputes/Claims, 4= Coordination, 5= Quality control, 6= Project duration

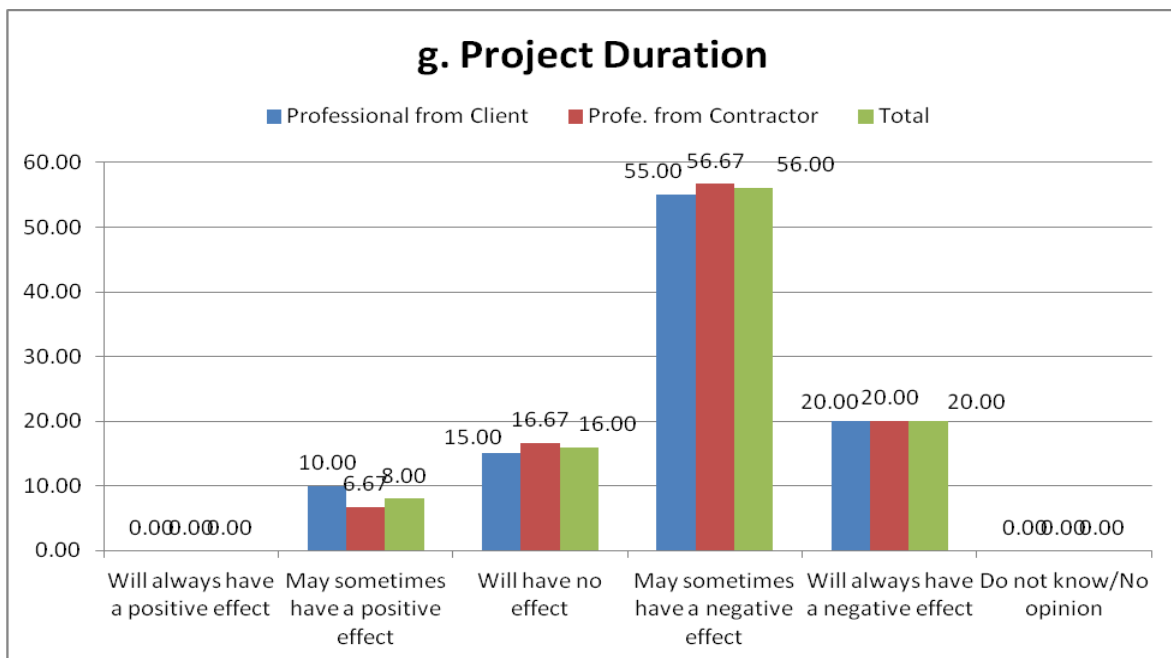
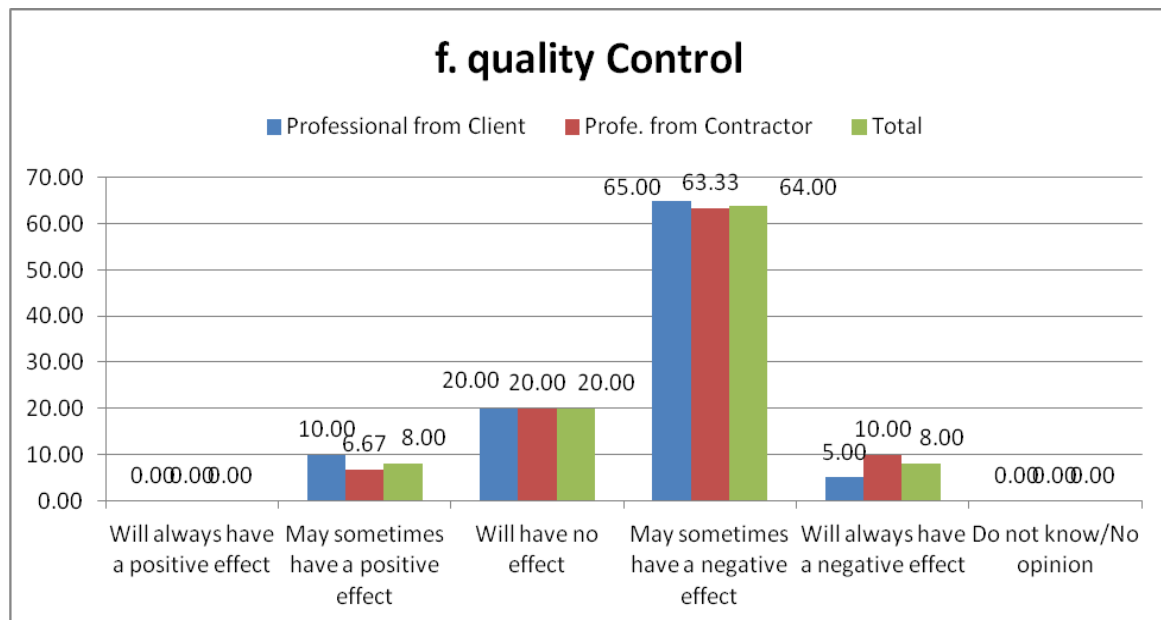


d. Disputes/Claims



e. Coordination





4.4.2 Competitive Average Bid Method

Responses on the competitive average bid method are summarized in *Figures 6a to f*. About 25% of the professionals from the public sector respondents indicated that they were not

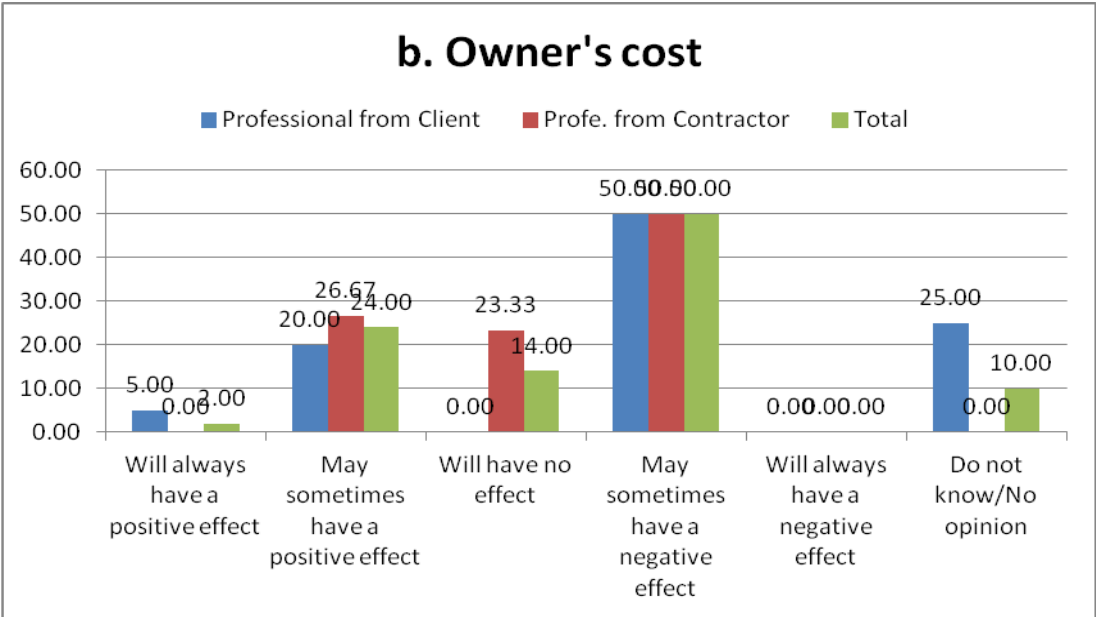
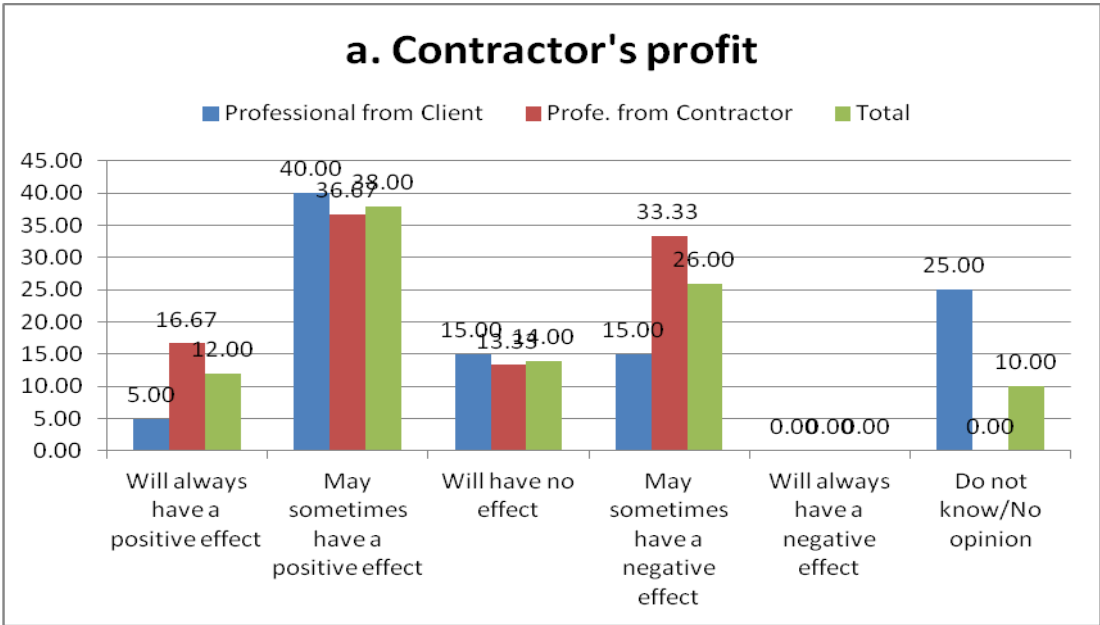
sure about how it would affect the listed attributes. About 36.67 of the private sector and 40% of professionals from the public sector felt that the method might have a positive effect on contractor profit. 33.33% of the construction organizations and 15% of professionals from the public sector respondents indicated that the method might have a negative effect on contractor profit. On the issue **of owner's cost**, the two groups reflected different ideas. About 26.67% of the construction organizations thought there would be a positive effect, and 50% indicated a negative effect. 20% of professionals from the public sector felt that owner's cost would be positively impacted if this method is used while 50% they indicated that the method might have a negative effect. 40% of respondents from public sector indicated that it might improve quality and would have positively affected coordination (50%), disputes/claims (30%) and project duration (50%).

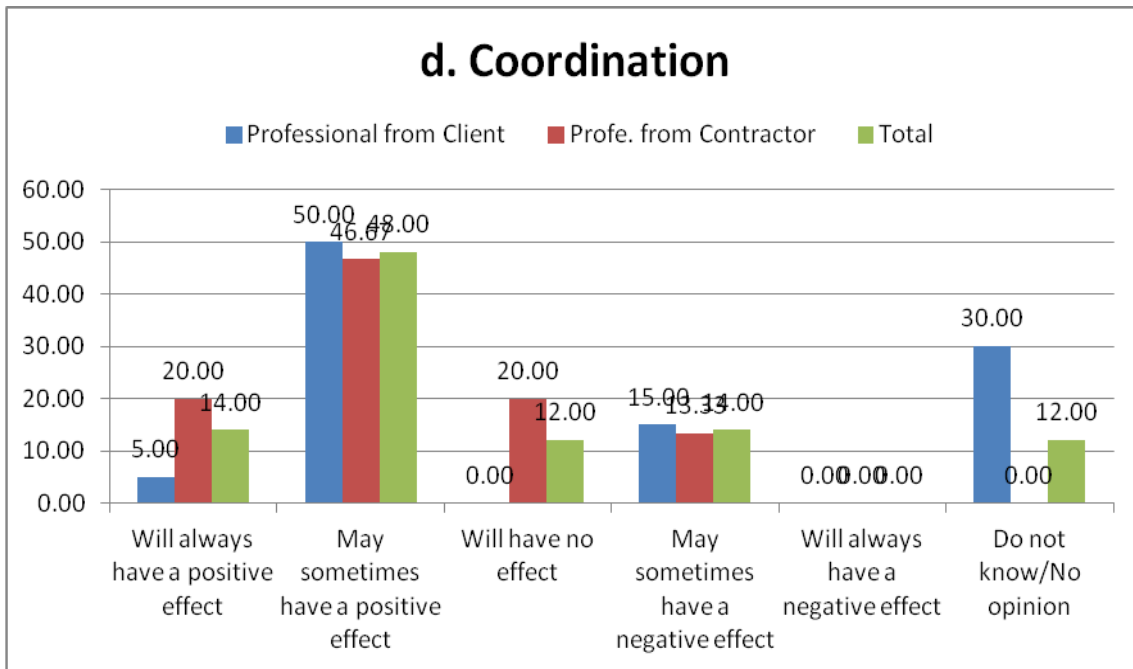
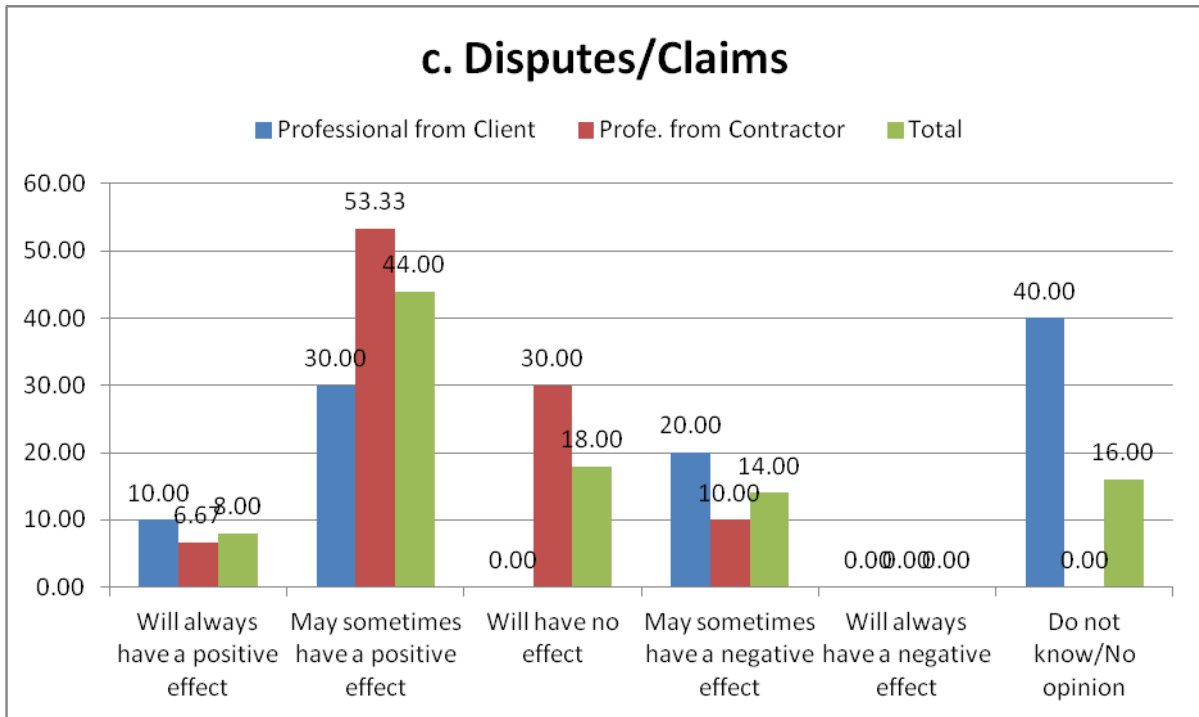
Majority of respondents from the private constructions firms indicated that this method might or would affect disputes/claims (53.33%), coordination (50%), quality control (50%), and project duration (43.33%) positively.

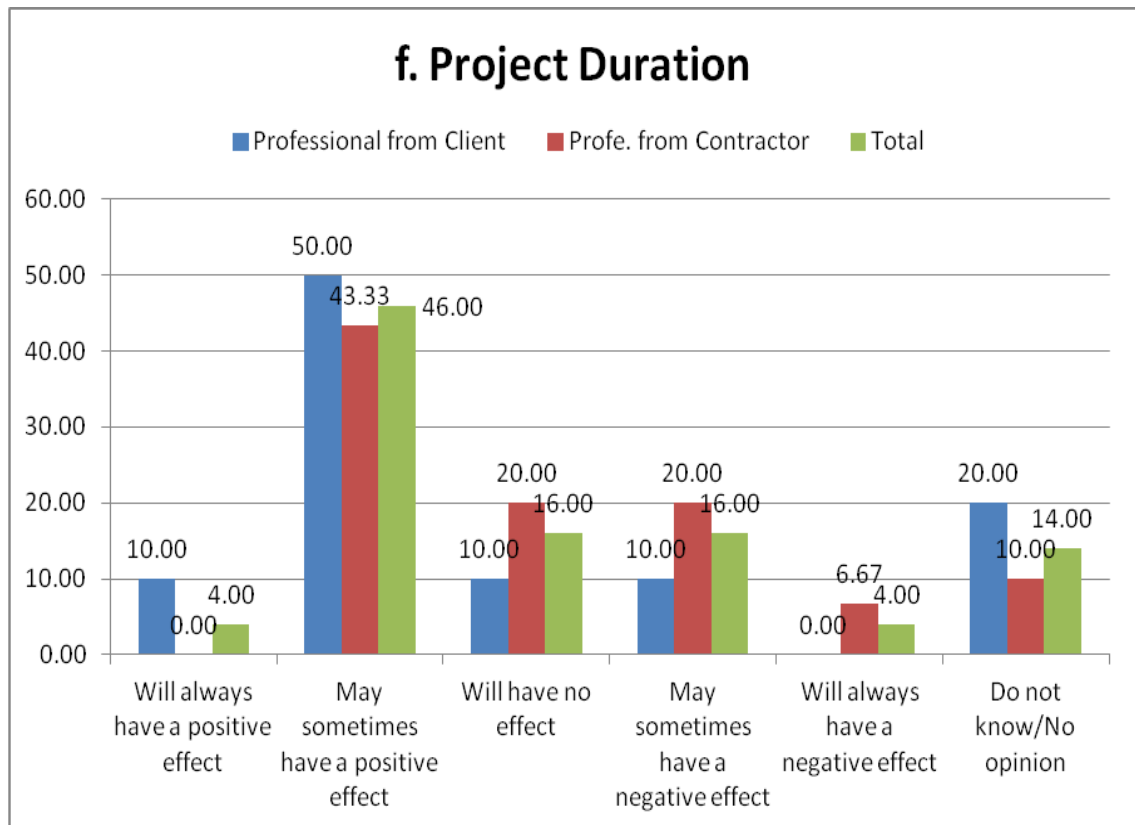
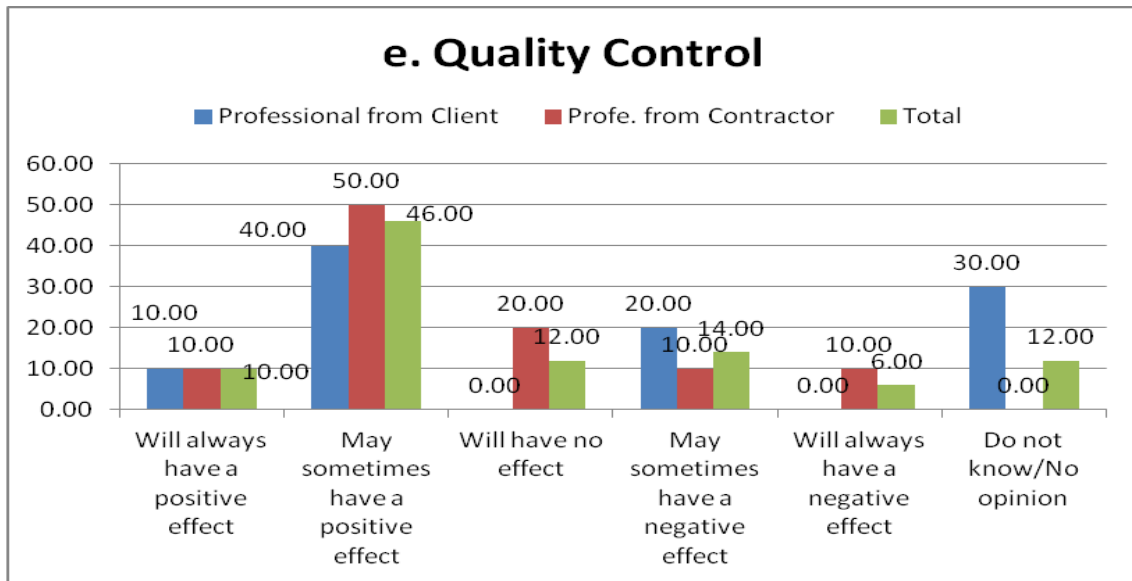
Competitive average bid method is not included in the Regional/Federal Government procurement law. Therefore, no single project can be found to study the actual performance of such contracts.

However, construction professionals have reflected their ideas on this procedure based on their personal knowledge and through discussions with the researcher. Most of the participants granted the merits associated with awarding contracts to the responsive bidder whose bid is closest to some average, not for the minimum. The main advantage is that it safeguards an owner against signing a construction contract for an unrealistically low bid price that almost certainly will lead to adversarial relationships during construction (Ioannou et al, 1993). It was also pointed out that, under this method, contractors are protected from having to honor a bid containing a gross mistake or oversight. They believed that abnormally low bids become the major headache of the construction industry. However, professionals from the public sector reflected their worry on the negative impact it might have on the owner's cost.

Figure 6a to f: ratings on competitive Average method





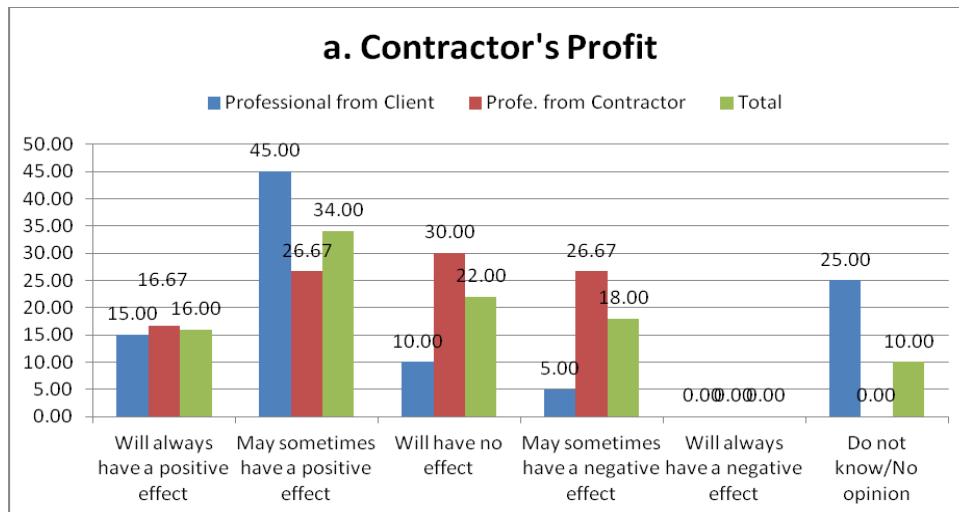


4.4.3 RFP/RFQ (Competitive Negotiated) Method

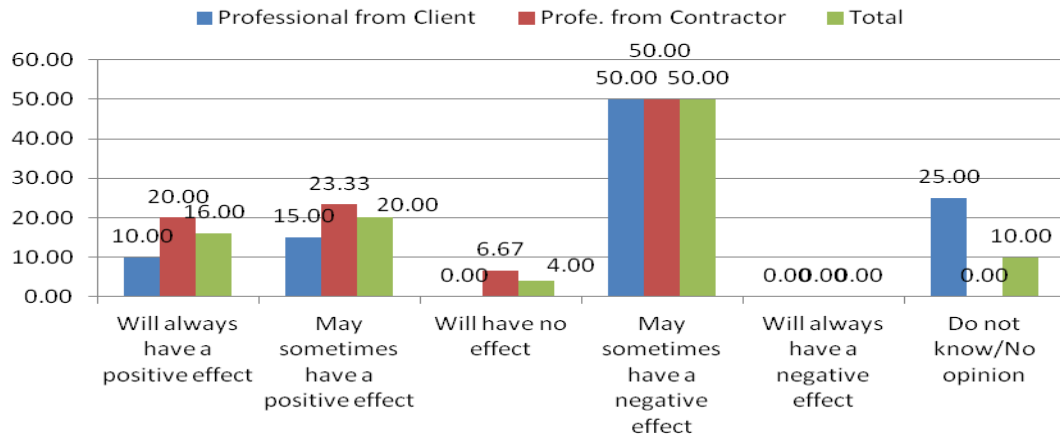
Most of the respondents in the construction organization group (40-70%) indicated that the RFP/RFQ method would positively affect all the listed attributes. The responses are shown in *Figures 7a to f*. A considerable portion in the public organization respondents (20%-30%) indicated that they did not know how it would have any effect on the attributes listed. It is interesting to note that although most of the respondents from public organizations felt that this method would positively impact most of the attributes, 50% of them thought it might affect owner's cost negatively.

Although RFP/RFQ method is introduced in the procurement law, its application is limited to consultancy services. The major drawbacks raised associated with this procedure are its susceptibility for fraud and corruption. Most professionals believed that this method can be used only for small projects and/or special projects which need special attention for public interest. This method is discouraged mainly to avoid corruption during selection of contractors for negotiation and possible ring formation among selected contractors which ultimately increases owner's cost.

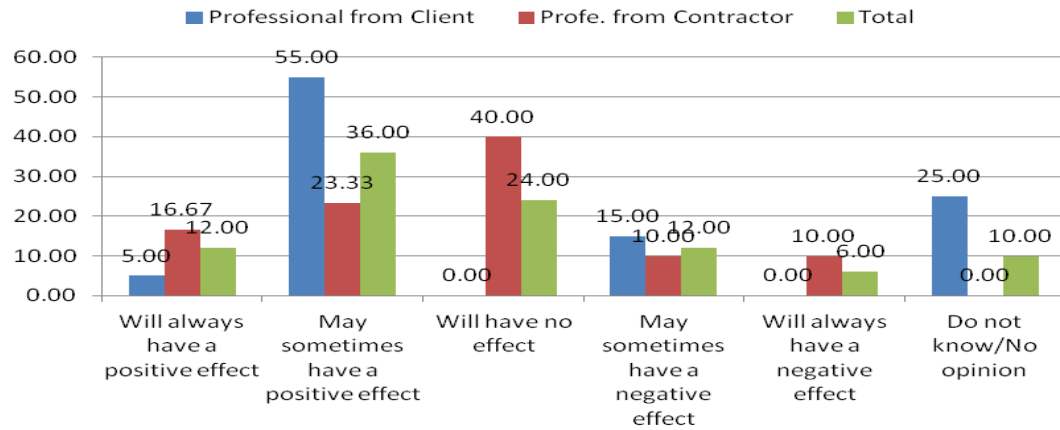
Figure 7a to f: ratings on RFP/RFQ(competitive negotiate) method



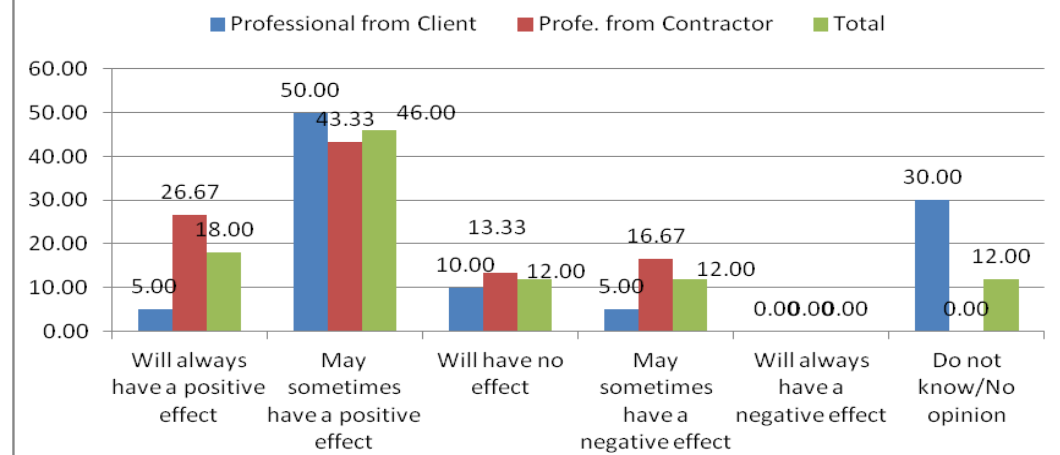
b. Owner's Cost



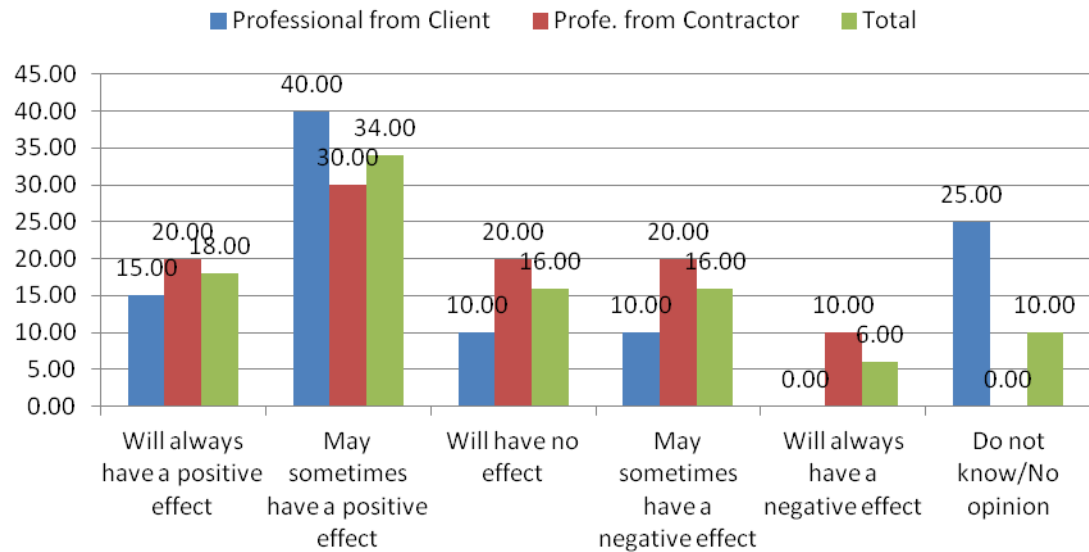
c. Disputes/Claims



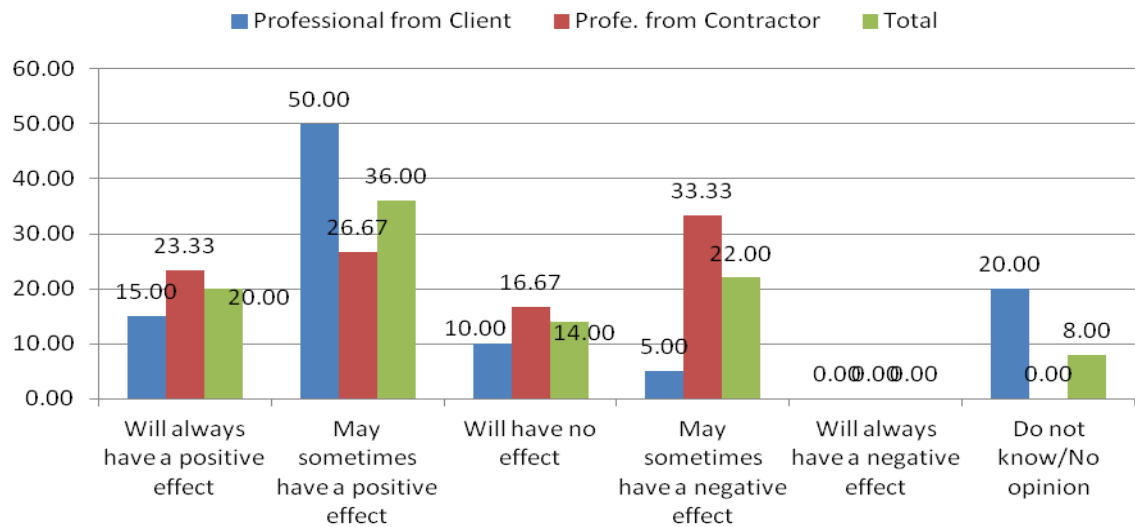
d. Coordination



e. Quality Control



f. Project Duration

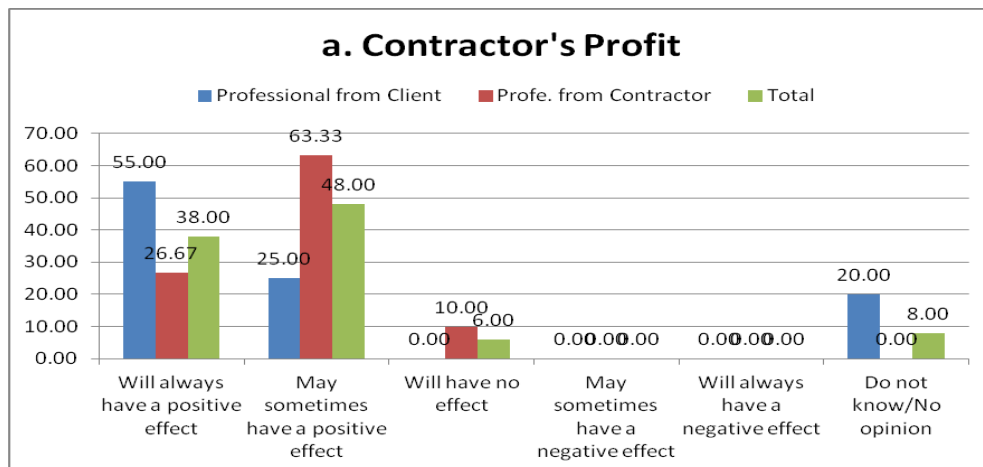


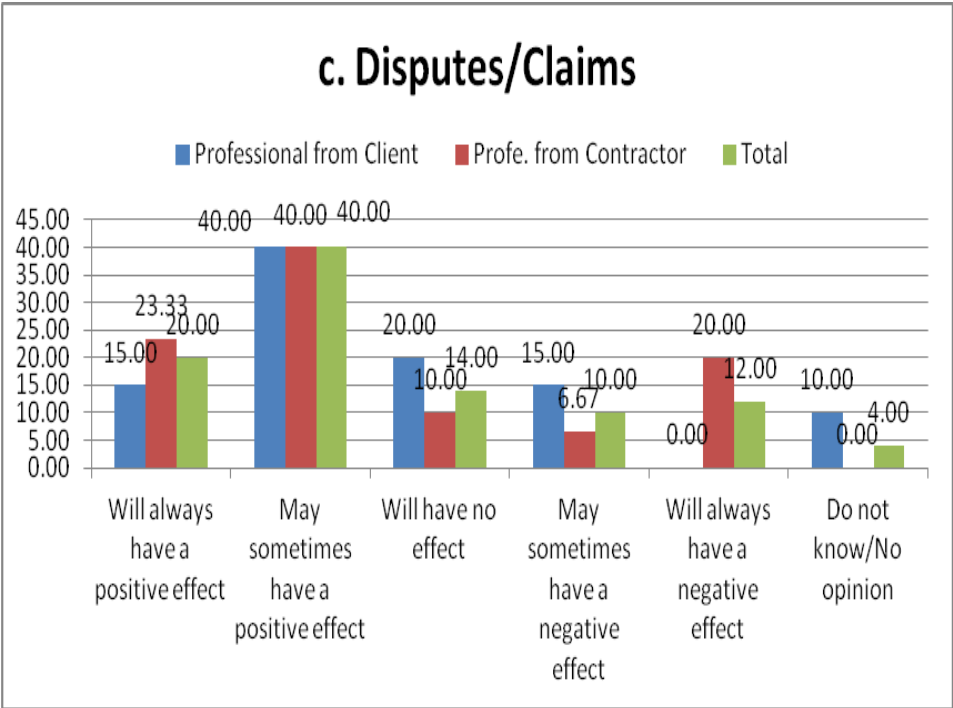
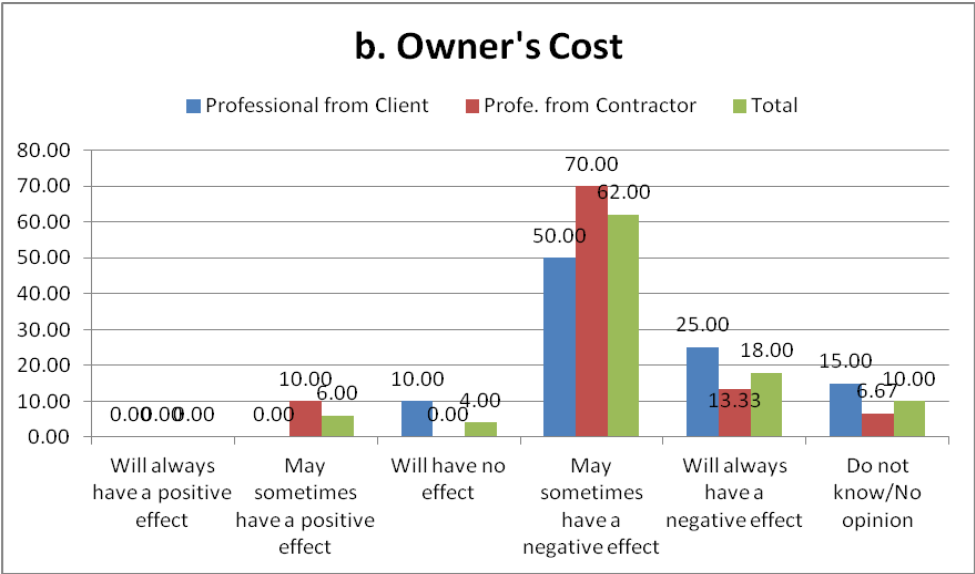
4.4.4 Negotiated Bid Method

Responses of professionals from both private construction organizations and public sectors are summarized in *Figures 8a to f*. 59.3-88.9% of the responding construction organizations indicated that this method either would or might have a positive effect on the listed attributes except the owner's cost (6%). 50% of the public organizations and 70% of private organizations responded that the method either would or might have a negative effect on owner's cost. About 55-80% of the public agencies indicated positive effect on the listed attributes except owner's cost (13.33%).

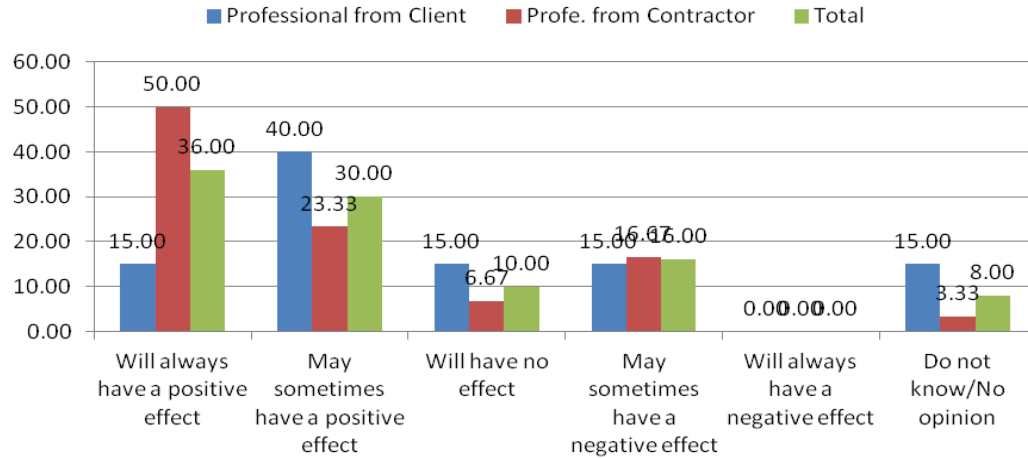
Negotiated bid method is restricted to procurement of variation works in public procurement. The main reason for its unpopularity is its vulnerability for fraud and corruption during contractors' selection and during negotiation of price with the selected contractor. It is also discouraged because the method does not guarantee equal opportunity for contractors which can satisfy the minimum technical requirements. If contracts are awarded by negotiation, all listed attributes will be improved except owner's cost. Therefore, great care should be taken during contractor's selection and during the negotiation of prices between the contractor and the owner.

Figure 8a to f : ratings on Negotiate method

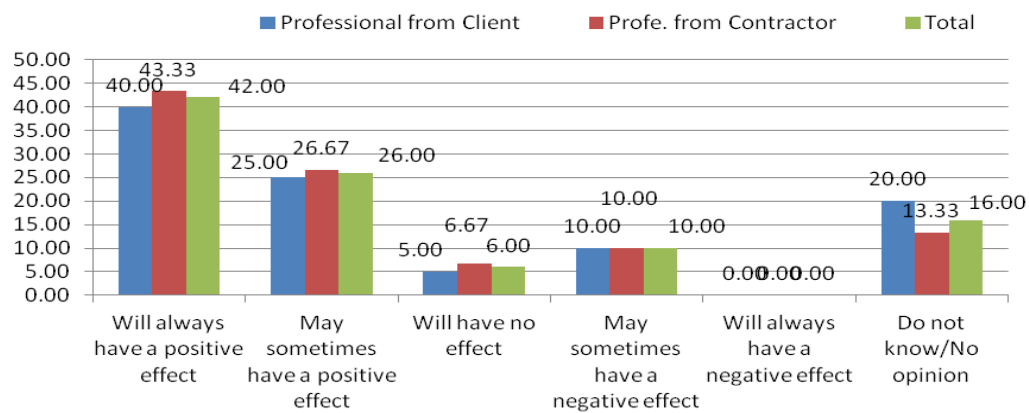




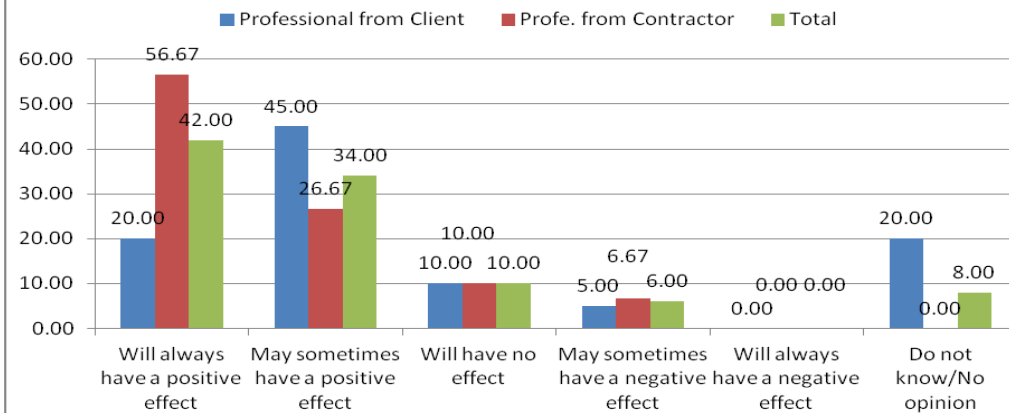
d. Coordination



e. Quality Control



f. Project Duration



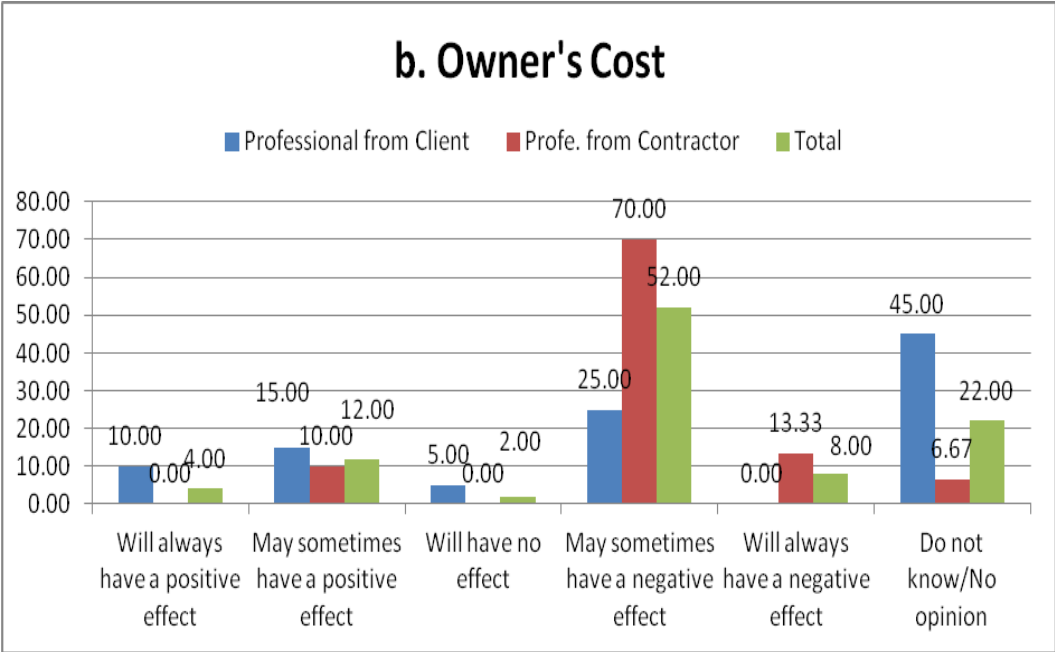
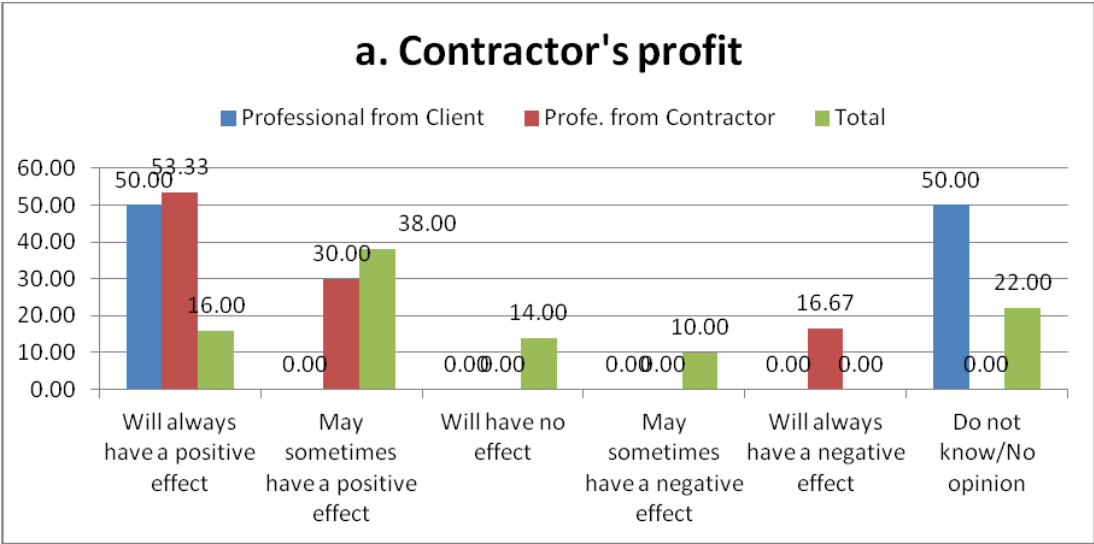
4.4.5 Subjective Rating Method

Figures 9a to f show the response distributions of the respondents from private construction firms and public organizations on the subjective rating method. About 53.33% of the construction firm respondents indicated that it would have a positive effect on contractor profit, 50% of the public sector respondents indicated the same. A considerable portion of public organization respondents (50%) said they didn't know its effect on contractor's profit. 70% of respondents from the private sector felt that it might have negative impact on owner's cost. About 25% in public sector group indicated that it might negatively impact the owner's cost. 40-50% of the public sector respondents indicated that they did not know whether this method would have any effect on the listed attributes. About 30-52.67% of the responding professionals from the private sectors indicated positive impact of this method on disputes/claims, coordination, quality control, and project duration. Among the public sector respondents about 10% thought it might have a positive effect on coordination, quality control, and project duration.

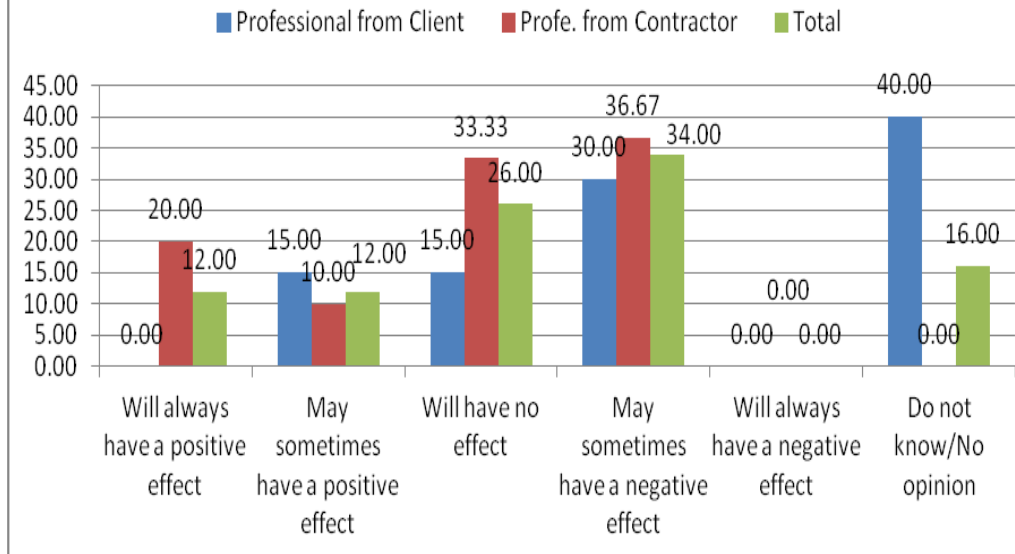
The Regional/Federal Government procurement law does not allow subjective rating method for procurement of works. People in favor of this procedure strongly argue that this method would encourage competent contractors to participate in the tender process. And hence, the possibility of selecting responsive and responsible contractor will be higher. In addition, inexperienced contractor's which might offer abnormally low bids will have little chance of winning the tender because the winner is identified by the cumulative result of the technical and financial offers.

However, most professionals believe that this procedure might positively affect the owner's cost. Moreover, highly qualified professionals for the bid document preparation and evaluation of bids will be important if subjective rating bid method is used.

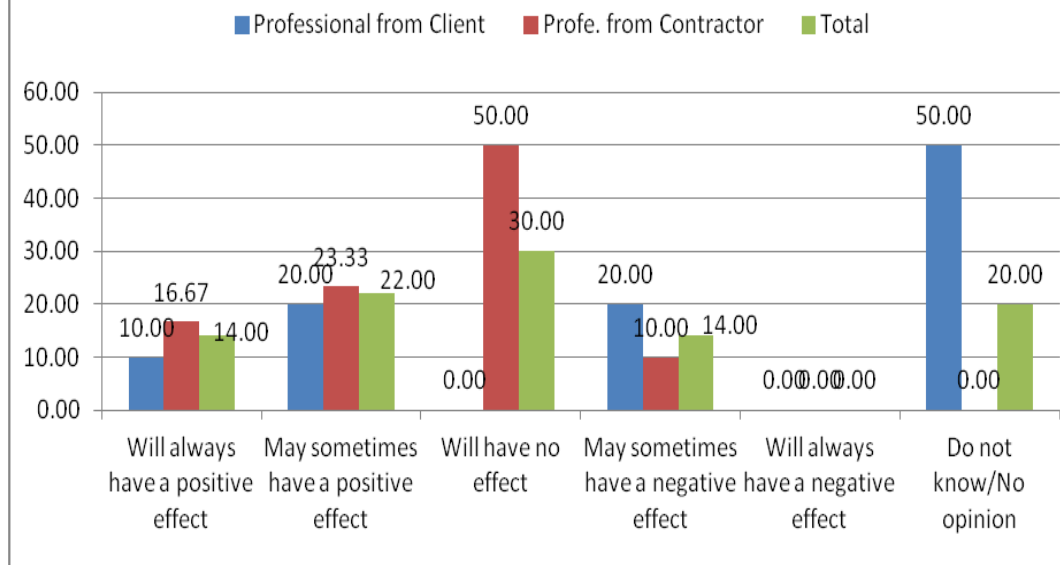
Figure 9a to f: ratings on subjective method

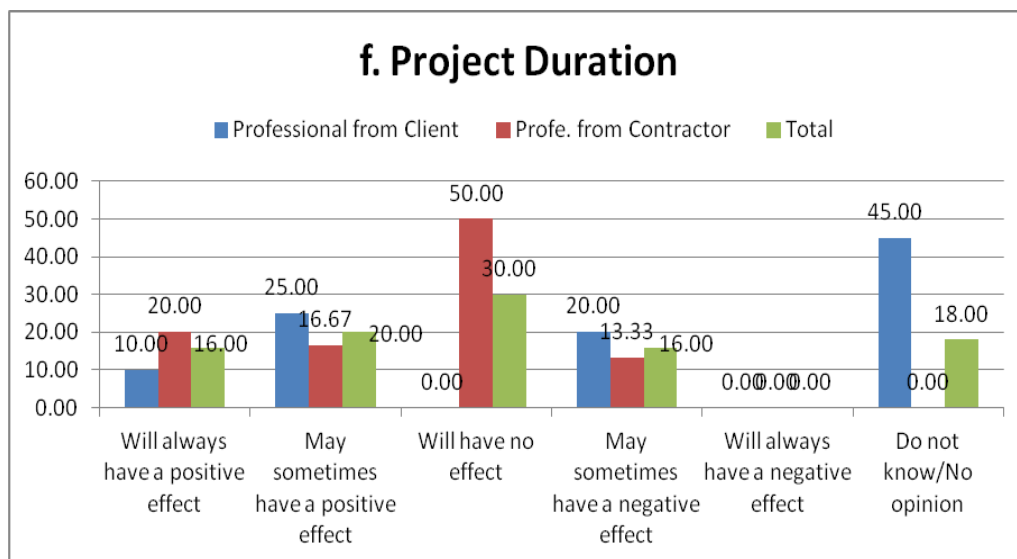
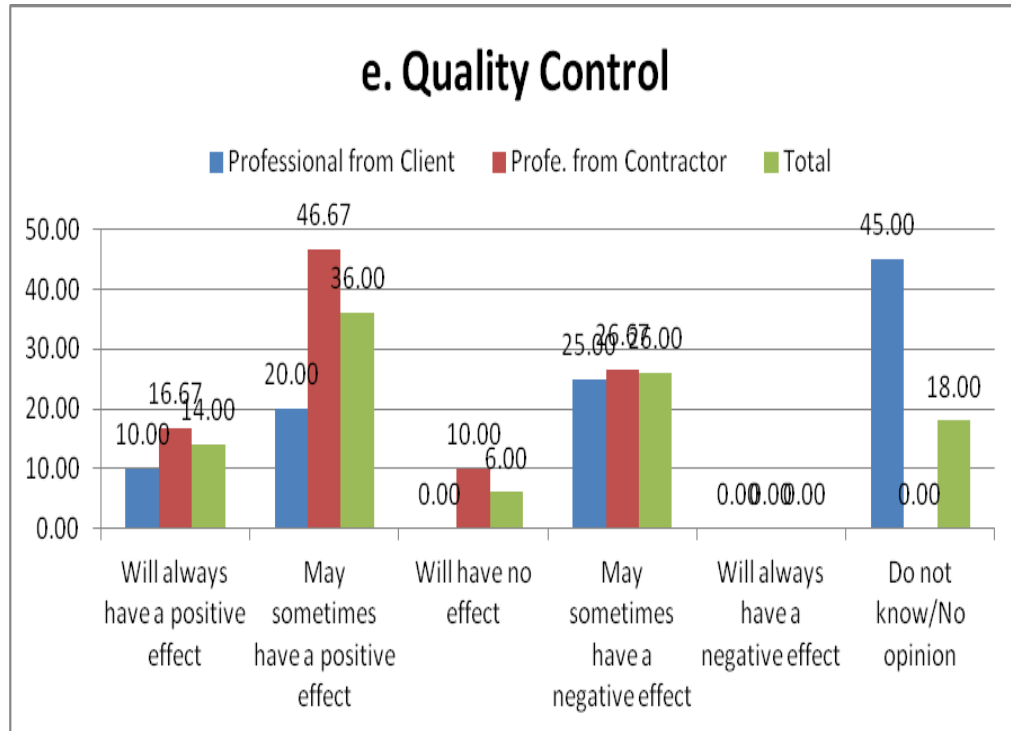


c. Disputes/Claims



d. Coordination





4.1 Evaluation of Contractors Performance

Ten (10) factors that were identified in the Literature review were used to evaluate contractors' performance. Only Professionals of public clients were involved in this section.

4.1.1 Project Final Cost

Out of the 38 projects that were selected and analyzed, there was no project with fixed sum contracts whilst all the 38 projects representing 100% were not fixed sum contracts (Table 4.10).

Table 4-5 project contract sum

Variables	Frequency	Percentage
Fixed sum contract Project		
No	41	100
Yes	0	0
Total	41	100
Contract sum exceeded		
No	3	7.32
Yes	38	92.68
Total	41	100
Contract sum exceeded through**		
Claims	11	26.83
Modification of the original design	17	41.46
Change in specification	13	31.71
Price fluctuation	0	0.00
Total	41	100

The implication of this on the Regional construction industry is that, contractors on these projects can make claims for additional money which according to Dowle and DeStephanis (1990) was one of the strategies that contractors selected using LEB use to make up losses

from the unreasonably low rates used during bidding. From Table 4.10, it can be seen that out of the 38 projects identified as not fixed sum contract projects, representing 92.68% exceeded the contract sum. Among the factors that resulted in this high percentage increase in contract sum are the modifications in the original design (41.46%), claims (26.83%), changes in specifications (31.71%) and price fluctuations (0%).

Claims by contractors therefore accounted for a third of cases where contract sums were exceeded and was second only to modification in the original designs.

From the above, it can be inferred that the cost over runs incurred in the construction industry are partly due to claims made by contractors who attempt to make up for losses resulting from the unreasonably low rates used at the tender stage.

4.1.2 Disputes

The level of disputes experienced on a project can be used to assess the performance of contractors. A contractor who is not performing well is likely to incur the displeasure of the Client and Consultant which can lead to series of disputes and conflict. From Table 4.11, out of 41 projects selected, about two third (80.49%) experienced disputes between the Contractors and the Clients. The effect of this on the construction industry is enormous because any project that experiences series of disputes among the parties is unlikely to be completed on schedule and within the estimated cost since the parties are unlikely to get the needed support from each other.

The main causes of the disputes were identified as claims (41.46%) followed by delay in payments (31.71%) and frequent variations (26.83%). This revelation confirms the observation and assertion made in the literature that projects awarded using LEB experience series of disputes that mainly results from claims submitted by Contractors in attempt to make up for losses resulting from low rates used in bidding.

Table 4-6 Disputes

Disputes between Contractor and Client	Frequency	Percentage
Yes	33	80.48
No	8	19.52
Total	41	100
Cause of dispute**		
Frequent variations	11	26.83
Claims	17	41.46
Delay in payments	13	31.71
Total	41	100

4.1.3 Project Completion Time

From Table 4.12, 33 out of 41 (80.49%) of the projects were not completed within the contract period whilst only 8 representing 19.51% were completed on time. This is a strong indication the projects awarded using LEB were not completed on time. This means the industry is performing badly in the area of completion time and this has serious consequences on the economy of the region because expected increase in infrastructural stock the region would be compromised.

Table 4-7 Project Completion Time

Project completed on time	Frequency	Percentage
No	33	80.49
Yes	8	19.51
Total	41	100
Causes of delay**		
Frequent variations	11	22.45
Delay in payment	17	34.69

Delay in receiving instructions and approvals from client	8	16.33
Delay in receiving instructions and approvals from consultant		
Lack of supervision on site	3	6.12
Lack of financial capability by the contractor	10	20.41
Total	49	100

From the literature reviewed (Section 2.9.4), there were many causes to this delay and notably among them were frequent variations, delay in payment, delay in receiving instructions and approvals from Client, delay in receiving instructions and approvals from Consultant, lack of supervision on site and lack of financial capability by the Contractor.

These factors were used in the questionnaire to identify the causes of project delays. From Table 4.12, the main causes of delay of the projects selected were delays in payments (34.69%), frequent variations (22.45%), lack of financial capacity by the Contractors (20.41%), delay in receiving instructions and approvals from Clients (16.33%) and lack of supervision on site (6.12%). Among the causes selected, two of them that were Contractor related were lack of financial capacity by the Contractor (20.41%) and lack of supervision on site (6.12%). This means that about two-thirds of the causes of the delays are Client related. The implication of this is that the role of each party (Contractors, Clients and Consultants –not included) has influence on the performance of Contractors and that if all the parties perform their contractual obligations effectively and promptly it would positively impact on the performance of Contractors.

4.1.4 Warranty Calls

From Table 4.13, only two contractors out of the 41 (4.88%) were not called to rectify defects during the warranty period.

Table 4-8 Warranty Calls

Attend to warranty calls	Frequency	Percentage
Often	28	68.29
A little	6	14.63
Not at all	2	4.88
Sometimes	5	12.20
Total	41	100

This meant that the works were not effectively and satisfactory executed because projects that are well executed in terms of workmanship, material type and quality experience very little or no warranty calls during defect liability period. As high as 16 out of 41 representing 39.02% were called to rectify defects during defects liability period. It confirms the observation made in the literature (Section 2.11.9) that contractors on projects awarded through LEB normally receive a number of calls to attend to defects during the warranty period.

The inference is that most government projects are shoddily executed resulting in greater number of calls to Contractors to attend to warranty calls during defect liability period.

This implies that more money would be spent on existing structures for maintenance and this is likely to have serious repercussions on the regional economy and impede government's effort to increase the national infrastructural stock.

4.1.5 Compliance to Specifications

In order to achieve the needed performance in terms of quality of work, Contractors are required to comply with specifications spelt out in the tender documents and subsequently in the conditions of contract.

Table 4-9 Compliance to Specifications

Compliance to specifications	Frequency	Percentage
Often	22	53.66
A little	8	19.51
Sometimes	11	26.83
Total	41	100

From Table 4.14 compliance to specifications was not satisfactory, 53.66% of the contractors complied with the given specifications governing the contracts. This means that nearly half of the contractors did not fully comply with the specifications. The reason among others is the attempt by Contractors on these projects to find means of cutting corners to reduce their expenditure in order to make up for losses that may result from unreasonably low rates used in their bids. Consequently sub- standard products (infrastructure) are produced and this in the long run increases government expenditure on maintenance of the infrastructure.

4.1.6 Compliance to Instructions

From Table 4.15, 56.10% of the Contractors complied fully with instructions that were given by the Consultants.

Table 4-10 Compliance to Instructions

Compliance to Instructions	Frequency	Percentage
Often	23	56.10
A little	5	12.20
Sometimes	13	31.71
Total	41	100

This means that more than 40% of the Contractors did not comply with Consultants'' instructions which culminated in the poor performance of Contractors who were awarded

projects through LEB since adherence to instructions by a Contractor is likely to result in good performance. During the execution of the projects, Consultants were expected to issue instructions in accordance with Conditions of Contract to Contractors to ensure that the projects are satisfactorily executed. This means that if Contractors fail to adhere to these instructions then their output cannot be said to be satisfactory and consequently the end products (infrastructure) may not meet the required standards in the construction industry.

4.1.7 Safety at Site

The level at which safety measures are instituted and complied with at site is an indicator of good performance of Contractors (Section 2.11). From Table 4.16, only 9 out of the 41 Contractors complied fully with safety requirements at their sites. This means that 78.05% of the Contractors selected did not comply with safety requirements at site. It can be inferred that there was high (78%) indication of poor performance of Contractors who were involved in the execution of the projects selected in terms of safety measures. The effect of this on the industry is incidents of numerous accidents at site because safety measures have been compromised as a result of drive for economic gains by Contractors to make up for losses incurred from lower rates submitted in their bids. These financial losses to contractors in the long run increase the cost of construction due to payment of insurance, compensations etc.

Table 4-11 Safety levels at Site

Compromised to safety	Frequency	Percentage
Often	25	60.98
A little	5	12.20
Sometimes	2	4.88
Not at all	9	21.95
Total	41	100

4.1.8 Warning Letters

The extents to which warning letters are issued to contractors give indication of performance of contractors. A Contractor with a good performance is unlikely to receive warning letters. From Table 4.17, 32 (87.80%) of the Contractors received warning letters.

Table 4-12 Warning Letters

Warning letters	Frequency	Percentage
Very Often	12	29.27
Often	15	36.59
Sometimes	9	21.95
No Much	5	12.20
Total	41	100

Again only five (12.20%) of the selected Contractors received few warning letters during the execution of projects awarded using LEB. Furthermore each Contractor received at least one warning letter. The rate of issuance of warning letters by Clients/Consultants to Contractors ranged from very often (29.27%) through often (36.59%) to sometimes (21.95%).

It can be inferred from the above that Contractors on the selected projects that were awarded using LEB did not perform satisfactorily and were therefore given series of warning letters to improve upon their performance.

This finding confirms the observation made in the literature (Section 2.11.9) that contractors selected by LEB are usually issued with warning letters with regards to their performance.

4.1.9 Quality of Work

Measurement of quality is subjective and very difficult to measure. However conformity to specification and standards can be equated to quality of work done in terms of workmanship and materials. It can be observed from Table 4.18 that 40 of the Contractors

(97.56%) compromised on the quality of work in one way or the other on site. Only one (2.44%) out of the 41 Contractors met all the quality requirements on site.

This implies that the facilities put up by these Contractors did not meet the required standards. The resultant effect is that the facilities would be prone to defects and this could lead to greater expenditure in terms of maintenance costs.

Table 4-13 Quality of Work

Quality of work	Frequency	Percentage
Very Often	2	4.88
Often	13	31.71
Sometimes	11	26.83
No Much	14	34.15
Never	1	2.44
Total	41	100

4.2 Assessment of Impacts of Lowest-Bidding System

4.2.1 Impacts of Lowest-Evaluated Bid Procedures on performance of project

a. Client view on Impacts of Lowest Bidding system

From the point of view of the public clients, the impacts of lowest bidding had on the work environment and team relationships are indicated in Table 4.5a in descending order of Ranking RII value.

What negative consequences lowest bidding had on the work environment and team relationships?

Table 4-14 Client perception on Impacts of Lowest Bidding system on project performance

Impacts of LEB	Rating								
	1	2	3	4	Total	ΣW	mean	RII	Rank
Work Suspensions/Termination of contract	0	0	7	13	20	73	3.65	0.91	1 st
Time overrun (lengthy delays) for projects	0	0	12	8	20	68	3.40	0.85	2 nd
Increase the overall cost of contract	0	0	13	7	20	67	3.35	0.84	3 rd
Low quality	0	0	15	5	20	65	3.25	0.81	4 th
Increased no. of disputes and claims	0	3	13	4	20	61	3.05	0.76	5 th
Select of inefficient contractors	2	4	11	3	20	58	2.75	0.73	6 th
Increased No. of Change Requests/ Orders	5	5	7	3	20	55	2.40	0.69	7 th
Increase in maintenance and operational costs	0	9	10	1	20	52	2.60	0.65	8 th
Underachievement in project performance	1	10	7	2	20	50	2.50	0.63	9 th
Stress on the public services	2	8	9	1	20	49	2.45	0.61	10 th
Failure to achieve the project objectives	3	11	5	1	20	47	2.20	0.59	11 th
Financial loss for owner	4	7	9	0	20	45	2.25	0.56	12 th
Financial loss for contractor	5	9	5	1	20	43	2.10	0.54	13 th
Shortages in resources	4	10	6	0	20	42	2.10	0.53	14 th

Table 4.5a reveals that professionals from public clients ranked “Work Suspensions/Termination of contract” as topmost direct impact of lowest evaluated bid selection procedure on the implementation of projects. The basis was that, because their rates were very low, there would be the possibility of non- performance and that would lead to the Work Suspension/termination of the contract. Among the causes were lack of financial capacity and lack of supervision of contractors on site selected by lowest-evaluated bid. The second important negative impact they ranked was “Time overrun (lengthy delays) for projects”. The possibility of the contractors not work within schedule is very high as a result of low bid they submitted. The contractor would not likely use right materials; equipment and personnel as it has been specified in the conditions of contracts. These would eventually affect the performance and delay the contract completion date. The third ranked negative impact was “increase the overall cost of contract” This is partly due to claims made by contractors who attempt to make up for losses resulting from the unreasonably low rates used at the tender stage. It was argued that, if care is not taken and any of the risks do trigger, it would increase the overall cost of the contract. The fourth ranked impact was “Low quality “this is due to awarding projects to incapable contractors. The fifth important negative impact they ranked was “Increased no. of disputes and claims”. The reason was that contractors intentionally submit an artificially low bid in anticipation of making their profit through change orders and claims (Thomas, 2009). The majority of respondents, argued the financial loss due to failed projects which finally influences the cycle of the national economy. This has created several disputes and claims between contractors and clients which often have to be solved in litigation. This revelation confirms the observation and assertion made in the literature that projects awarded using LEB experience series of disputes that mainly results from claims submitted by Contractors in attempt to make up for losses resulting from low rates used in bidding. The respondents ranked seventh ‘the cost of operation and maintenance’ which will be affected negatively due to the low quality of project implementation.

However, they also ranked “Financial loss for contractor” as the least impact with the procedure. It indicates that the probability of it happening is low and if it happens, its impact is not significant as well as “Financial loss for owner”.

b. Contractor’s perception on Impacts of Lowest Bidding system on project performance

From the point of view of the private contractors, the impacts of lowest bidding had on the work environment and team relationships are indicated in Table 4.5 b in descending order of Ranking RII value. *What negative consequences lowest bidding had on the work environment and team relationships?*

Table 4-15 Contractor perception on consequences of lowest bidding system

Impacts of LEB	Rating								
	1	2	3	4	Total	$\sum W$	mean	RII	Rank
Work Suspensions/Termination of contract			11	19	30	109	3.63	0.91	1 st
Time overrun(Lengthy delays) for projects		1	17	12	30	101	3.37	0.84	2 nd
Increased no. of claims and disputes			22	8	30	98	3.27	0.82	3 rd
Low quality		6	14	10	30	94	3.13	0.78	4 th
Increase the overall cost of contract	3	1	21	5	30	88	2.93	0.73	5 th
Select of inefficient contractors	0	11	17	2	30	81	2.70	0.68	6 th
Increase in maintenance and operational costs	2	10	18	0	30	76	2.53	0.63	7 th
Increased No. of Change Requests/ Orders	2	14	13	1	30	73	2.43	0.61	8 th
Financial loss for owner	5	13	11	1	30	68	2.27	0.57	9 th
Underachievement in project performance	6	14	10	0	30	64	2.13	0.53	10 th
Failure to achieve the project objectives	8	14	8	0	30	60	2.00	0.50	11 th
Shortages in resources	11	10	9	0	30	58	1.93	0.48	12 th
Stress on the public services	9	18	3	0	30	54	1.80	0.45	13 th
Financial loss for contractor	13	3	14	0	30	50	2.03	0.42	14 th

From the table 4.5b above, contractors also indicated ‘‘Work Suspensions/Termination of contract’’ as topmost impact of lowest evaluated bid selection procedure on the implementation of projects. The basis was that, because their rates were very low, there would be the possibility of non- performance and that would lead to the Work Suspension/termination of the contract. Among the causes were lack of financial capacity and lack of supervision of contractors on site selected by lowest-evaluated bid. The second important negative impact they ranked was ‘‘Time overrun (lengthy delays) for projects’’. The possibility of the contractors not work within schedule is very high as a result of low bid they submitted. The contractor would not likely use right materials; equipment and personnel as it has been specified in the conditions of contracts. These would eventually affect the performance and delay the contract completion date. The third ranked negative impact was ‘‘Increased no. of disputes and claims’’. The reason was that contractors intentionally submit an artificially low bid in anticipation of making their profit through change orders and claims (Thomas, 2009). The majority of respondents, argued the financial loss due to failed projects which finally influences the cycle of the national economy. This has created several disputes and claims between contractors and clients which often have to be solved in litigation. This revelation confirms the observation and assertion made in the literature that projects awarded using LEB experience series of disputes that mainly results from claims submitted by Contractors in attempt to make up for losses resulting from low rates used in bidding. The fourth ranked impact was ‘‘Low quality’’ ‘‘this is due to awarding projects to incapable contractors. The fifth important negative impact they ranked was ‘‘‘‘increase the overall cost of contract’’ This is partly due to claims made by contractors who attempt to make up for losses resulting from the unreasonably low rates used at the tender stage. It was argued that, if care is not taken and any of the risks do trigger, it would increase the overall cost of the contract. The respondents ranked seventh ‘the cost of operation and maintenance’’ which will be affected negatively due to the low quality of project implementation.

However, they also ranked ‘‘Financial loss for contractor’’ as the least impact with the procedure. It indicates that the probability of it happening is low and if it happens, its impact is not significant as well as ‘‘Financial loss for owner’’.

Summary of impacts of Lowest-Evaluated Bid method

Table 4.5a and b reveal that all professionals from both public clients and private contractors agreed on a number of direct impacts on the implementation of projects. They emphasized the lengthy completion delays or failed projects. Among the causes were lack of financial capacity and lack of supervision of contractors on site selected by lowest-evaluated bid. This resulted in re-tendering a huge number of projects due to insufficient offered bids or withdrawn failed projects. The majority of respondents, argued the financial loss due to failed projects which finally influences the cycle of the national economy. This has created several disputes and claims between contractors and clients which often have to be solved in litigation. The main causes of the disputes were identified as claims, delay in payments and frequent variations. This revelation confirms the observation and assertion made in the literature that projects awarded using LEB experience series of disputes that mainly results from claims submitted by Contractors in attempt to make up for losses resulting from low rates used in bidding.

Additionally, the current bid evaluation and contract awarding system contributed towards realizing the large differences between estimated cost of projects and the final executed cost. This is partly due to claims made by contractors who attempt to make up for losses resulting from the unreasonably low rates used at the tender stage.

Moreover, they agreed that the use of the current tendering process influences the quality of delivered projects due to awarding projects to incapable contractors. Nevertheless, this has occurred because of using the lowest price system. Most of respondents discussed the cost of operation and maintenance which will be affected negatively due to the low quality of project implementation. Public services (water, sanitation, electricity and transportation) have been affected by the tendering process.

4.2.2 Impacts of Lowest-Bidding on performances of lowest bidder contractor

In this section the professionals from both organizations were asked to rate the performance of lowest bidder as a contractor on the basis of seven attributes. “What was your experience regarding the lowest bidder as a contractor on this project?” The responses are summarized in Table 4.7a & b (in descending order of RII response). The results clearly indicate that, as per

the experience of major public clients and private contractors, the low-bidder as the contractor on a project has mostly mal-performed, particularly in terms of generating unprecedented claims and disputes, Lack of technical input in form of human resources ,technical and managerial incompetence, financial incompetence and employment of third-grade human resources on the project.

a. Client's response

Table 4-16 client perception on performance of lowest bidder as the contractor on the project

Low-Bidder Issues	Rating								
	1	2	3	4	Total	$\sum W$	mean	RII	Rank
Unprecedented Claims and disputes parties	0	1	8	11	20	70	3.50	0.88	1
Financial instability	0	2	13	5	20	63	3.15	0.79	2
Lack of technical input in form of human resources(employment of third-grade human resources on the project)	0	5	9	6	20	61	3.05	0.76	3
Technical & managerial incompetence	1	5	9	5	20	58	2.90	0.73	4
Cost at project completion is substantially more than the contract (bid) cost	3	4	8	5	20	55	2.75	0.69	5
Specifications compliance issues	7	4	5	4	20	51	2.30	0.64	6
Low productivity issues	5	7	7	1	20	44	2.20	0.55	7

b. Contractor's response

Table 4-17 Contractor's perception on performance of Lowest-Bidder as a contractor on the project

Low-Bidder Issues	Rating								
	1	2	3	4	Total	ΣW	mean	RII	Rank
Unprecedented Claims and disputes parties	0	0	11	19	30	106	3.63	0.88	1
Technical & managerial incompetence	1	2	17	10	30	97	3.20	0.81	2
Financial instability	0	8	10	12	30	94	3.13	0.78	3
Lack of technical input in form of human resources(employment of third-grade human resources on the project)	3	6	10	11	30	89	2.97	0.74	4
Cost at project completion is substantially more than the contract (bid) cost	4	8	8	10	30	84	2.80	0.70	5
Specifications compliance issues	7	7	8	8	30	76	2.57	0.63	6
Low productivity issues	9	10	5	6	30	67	2.27	0.56	7

4.2.3 Project Non-Performance as related to Inappropriate Contractor Selection

The respondents were asked four questions, as indicated in table 4.9, to establish the relationship between *project non-performance* (in terms of performances on schedule, cost, quality and safety) and *inappropriate contractor selection*. Responses of professionals from

both private construction organizations and public sectors are summarized in Figures 6a to d and Fig.6a to d.

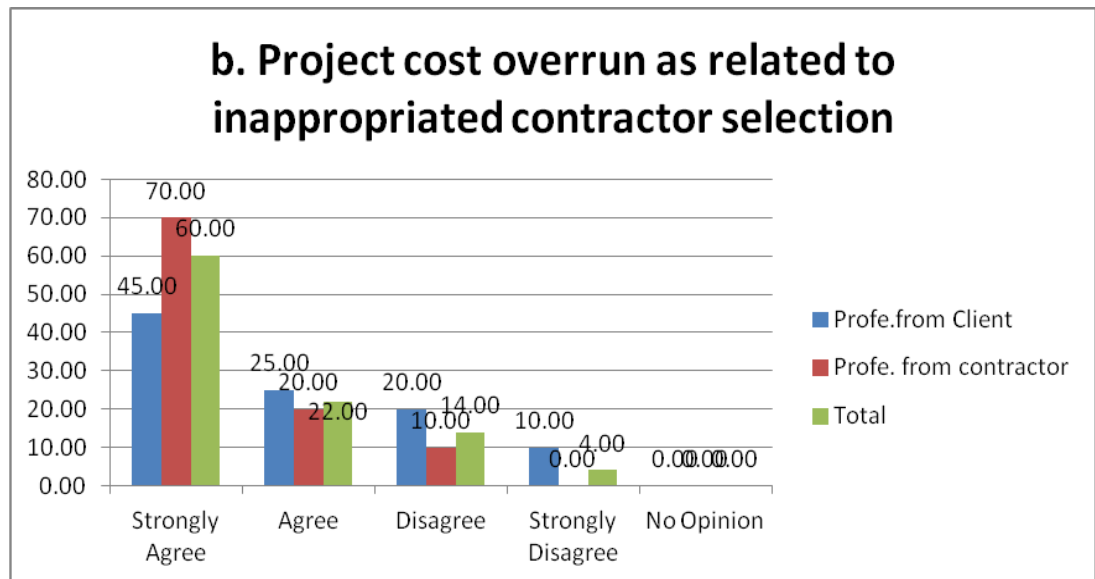
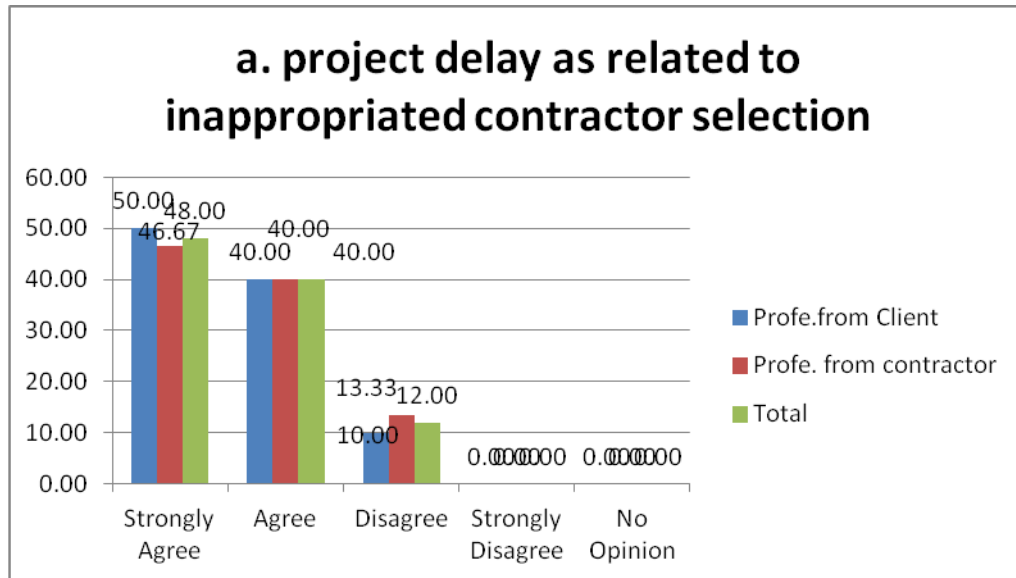
Most of the respondents from public sector (65-90%) indicated that inappropriate contractor selection is a major factor contributing to project non-performance (in terms of performances on schedule, cost, quality and safety); about 10-35% was against this idea. Synonymously, majority of the respondents from the construction organizations (60-86.67%) agreed on this statement while 13.33-40% of them did reject this statement.

Results clearly indicate that the majority of the respondents from both groups (public clients and private Contractors) approve the fact that inappropriate contractor selection is a key contributory factor toward project non-performance. The above responses (Table 4.9) in conjunction with the responses to the options in previous question (section 4.4.2) provide ample evidence as to state that inappropriate contractor selection is a major factor contributing to project non-performance.

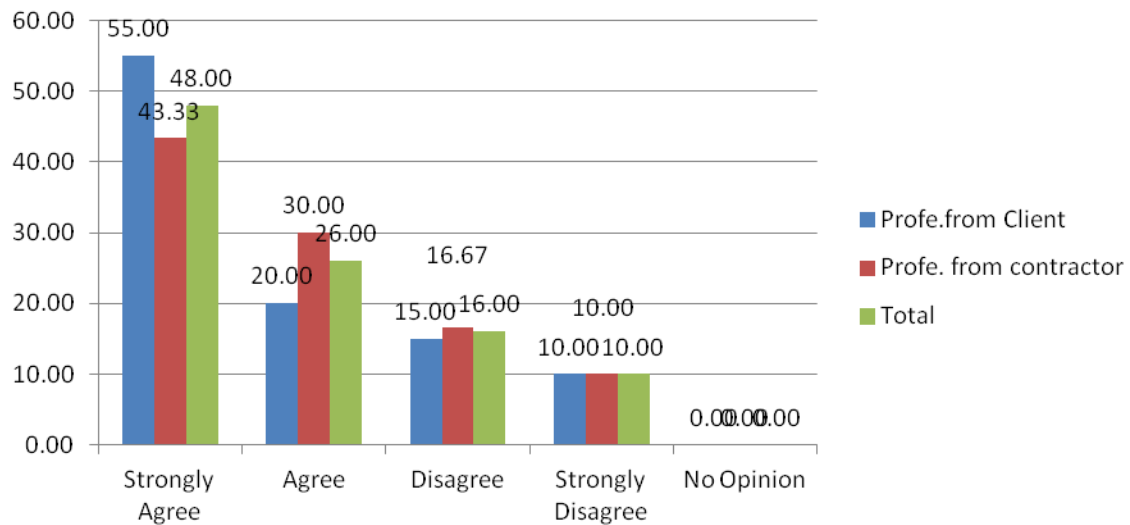
Table 4-18 Project Non-Performance as Related to Inappropriate Contractor Selection

No.	Non-Performance Issue	Percentage Clients Agreed
1	A major proportion of project delay (more than 80% of the delay) is attributed to inappropriate contractor selection.	88.00%
2	A major proportion of project cost overrun (more than 80% of the cost overrun) is attributed to inappropriate contractor selection.	82.00%
3	A major proportion of project quality issues is attributed to inappropriate contractor selection.	74.00%
4	A major proportion of project safety issues is attributed to inappropriate contractor selection.	56.00%

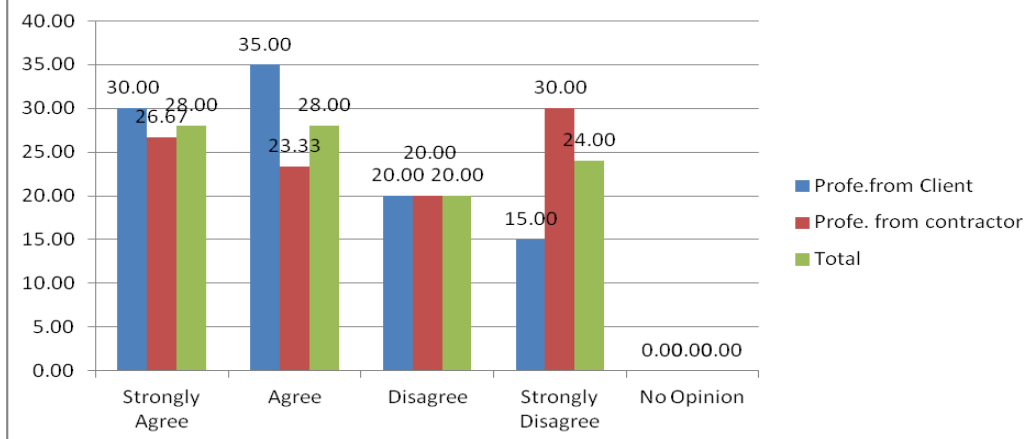
Figure 4.4a to d projects non-performance as related to inappropriate contractor selection



c. project Quality Issues as related to Inappropriated contractor selection



d. Project Safety Issues as related to Inappropriate contractor selection



4.2.4 Inappropriate Selection of Contractors

Respondents from both private and public organizations were asked whether the inappropriate selection of the contractors is the consequence of Low bid practices. The results are indicated in 4.10.

Was Inappropriate Contractor Selection a consequence of Low-Bid Price Selection Criteria? (Yes/ No/ NA)

Majority of the respondents, 80% from public and 73% from the private responded affirmatively to this question, signifying that inappropriate contractor selection is largely a consequence of low-bid price selection criteria. On the other hand, a considerable portion of respondents from the private sector (20%) and 15% from the public organizations responded negatively to this question, opposing that inappropriate contractor selection is largely a consequence of low-bid price selection criteria. The figures for public sector and for contractor respondents who didn't give their opinions either affirmatively or negatively were 5% and 6.67% respectively.

This is a significant finding as to providing ample evidence to the hypothesis that low-bid environment is a major contributory factor towards project non-performance.

Table 4-19 Respondents view on contractors selection

Attributes		
Professionals from Public	frequency	percentage
Yes	16	80
No	3	15
NA	1	5
Total	20	100
Professionals from contractor	frequency	percentage
Yes	22	73.33
No	6	20.00
NA	2	6.67
Total	30	100

In summary, the findings of this section indicate that low-bid environment has generated a wide variety of negative consequences on majority of projects in terms of affecting work environment, team relationships as well as project performance (schedule, cost, quality and safety). The low bidder as the contractor on a project has mostly mal-performed, particularly in terms of generating unprecedented claims and disputes, presenting technical, managerial and financial incompetence, and employing third-grade human resources on the project. A majority of respondents from both public clients and private contractors acknowledge the fact that inappropriate contractor selection is a key contributory factor toward project non-performance, which is, as the survey indicates, primarily a consequence of low-bid price selection criteria.

4.3 Opinions on Stated Effects and Alternative Bidding Practices

In question 6 respondents were asked to provide a score to each of the statements based on their degree of agreement (or disagreement). The responses obtained from both professionals from public institutions and private organizations are shown in *Tables 4.7a to l*.

Table 4-20 Responses given to different bidding practices

- a) **Competitive bidding system has worked well in the past and therefore will work well in the future. No change is necessary**

Respondents		Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion
Professional from Client	No.	0	9	0	11	0
	%	0.00	45	0.00	55	0.00
Professional from contractor	No.	0	15	6	9	0
	%	0.00	50	20.00	30.00	0.00
Total	No.	0	24	6	20	0
	%	0.00	48	12.00	40.00	0.00

Majority of the respondents, 45% from public and 50% from the private respondents, said that they would agree with the current bidding system and they believe that no change is necessary. On the other hand, a considerable portion of respondents from the private sector (55%) strongly disagree or disagree with this statement. The figure for public sector respondents who didn't strongly disagree was 30%.

b) Competitive system with provision to award contracts to bidders closest to the average of all bidders should be adopted

Respondents		Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion
Professional from Client	No.	4	9	5	1	1
	%	20.00	45	25.00	5	5.00
Professional from contractor	No.	0	16	10	4	0
	%	0.00	53.33	33.33	13.33	0.00
Total	No.	4	25	15	5	1
	%	8.00	50	30.00	10.00	2.00

About 65% of public sector respondents believe that competitive system with provision to award contract to bidders closest to the average of all bidders should be adopted; about 30% was against this idea. Synonymously, majority of the respondents from the construction organizations (53.33%) agreed on this statement while 46.66% of them did reject this alternative.

c) Competitive system with provision to award contracts to lowest bidder which is within some predefined range of the engineer's estimate should be adopted

Respondents		Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion
Professional from Client	No.	4	10	3	2	1
	%	20.00	50.00	15.00	10	5.00
Professional from contractor	No.	4	8	12	6	0
	%	13.33	26.67	40.00	20.00	0.00
Total	No.	8	18	15	8	1
	%	16.00	36	30.00	16.00	2.00

Big differences on opinions from the two groups were observed on this issue. While majority of the public sector respondents (70%) would agree or strongly agree with the statement, 60% of the respondents from construction organizations were against the idea.

d) Competitive system with provision to award contracts to bidders closest to the average of all bidders and the engineer's estimate should be adopted

Respondents		Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion
Professional from Client	No.	3	8	7	1	1
	%	15.00	40.00	35.00	5	5.00
Professional from contractor	No.	5	19	6	0	0
	%	16.67	63.33	20.00	0.00	0.00
Total	No.	8	27	13	1	1
	%	16.00	54	26.00	2.00	2.00

Professionals from the private construction organizations were in favor of this contract award method, 80% of them would agree or strongly agree. Similarly, majority of public sector respondents (55%) supported the idea though a considerable portion of them (40%) explained their disagreement and 5% of the respondents in this group said they have no opinion on the issue.

e) A combination of competitive and negotiated procedures should be used

Respondents		Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion
Professional from Client	No.	2	10	1	6	1
	%	10.00	50	5.00	30	5.00
Professional from contractor	No.	0	8	16	3	3
	%	0.00	26.67	53.33	10.00	10.00
Total	No.	2	18	17	9	4
	%	4.00	36	34.00	18.00	8.00

The two groups were also separated on this alternative. Majority of the public sector respondents (60%) gave their support, a considerable portion of this group (35%) was against and 5% was with no idea. On the contrary, 63% of the respondents from the private construction organizations respondents would disagree or strongly disagree with this alternative. Only 26.67% of respondents in this group showed their agreement.

f) Bidding procedure should depend on type and complexity of the project

Respondents		Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion
Professional from Client	No.	17	3	0	0	0
	%	85	15.00	0.00	0	0.00
Professional from contractor	No.	22	8	0	0	0
	%	73.33	26.67	0.00	0.00	0.00
Total	No.	39	11	0	0	0
	%	78.00	22	0.00	0.00	0.00

g) Prequalification of contractors should be used instead of changing the traditional bidding procedure

Respondents		Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion
Professional from Client	No.	9	5	5	0	1
	%	45	25.00	25.00	0	5.00
Professional from contractor	No.	2	11	6	11	0
	%	6.67	36.67	20.00	36.667	0.00
Total	No.	11	16	11	11	1
	%	22.00	32	22.00	22.00	2.00

It was interesting to note that all respondents from both groups supported the idea of using different bidding procedures depending on the type and complexity of projects.

On the prequalification issue, the two groups were reacted differently. Majority of respondents from public organizations (70%) would agree or strongly agree with this alternative, about 30% them in the same group were against. On the other group, about 56.67% of the professionals were not in favor of the issue. About 43.33% of the repliers in this group supported the alternative.

h) Subjective Evaluation factors (such as, schedule, organization, and qualification of personnel) other than cost should be reflected in contract award

Respondents		Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion
Professional from Client	No.	5	9	2	2	2
	%	25.00	45	10.00	10	10.00
Professional from contractor	No.	6	20	0	4	0
	%	20.00	66.67	0.00	13.33	0.00
Total	No.	11	29	2	6	2
	%	22.00	58	4.00	12.00	4.00

i) Traditional bidding procedure (Competitive low-bid) encourages contractors to be innovative

Respondents		Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion
Professional from Client	No.	0	2	5	11	2
	%	0.00	10.00	25.00	55.00	10.00
Professional from contractor	No.	0	2	10	18	0
	%	0.00	6.67	33.33	60.00	0.00
Total	No.	0	4	15	29	2
	%	0.00	8	30.00	58.00	4.00

The reflection of subjective evaluation factors other than cost in contract award was highly favored by private sector respondents (86.67%). Majority of the repliers in the other group

(70%) also gave their support for this issue. A considerable portion of respondents in public organizations (10%) did not know about this contract award method.

j) Traditional bidding procedure guarantees the lowest cost project, but not necessarily the best

Respondents		Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion
Professional from Client	No.	10	7	2	0	1
	%	50	35	10.00	0	5.00
Professional from contractor	No.	12	18	0	0	0
	%	40.00	60.00	0.00	0.00	0.00
Total	No.	22	25	2	0	1
	%	44.00	50	4.00	0.00	2.00

k) Favoritism and corruption cannot be avoided if negotiated bid procedure is used

Professional from Client		Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion
Professional from contractor	No.	7	7	3	0	3
	%	35.00	35.00	15.00	0	15.00
Professional from contractor	No.	13	17	0	0	0
	%	43.33	56.67	0.00	0.00	0.00
Total	No.	20	24	3	0	3
	%	40.00	48	6.00	0.00	6.00

l) Bid evaluation method should depend on the type of contract (e.g. design-build, turn-key, fixed-price, cost-reimbursable) selected

Professional from Client		Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion
Professional from contractor	No.	9	7	2	0	2
	%	45	35	10.00	0	10.00
Professional from contractor	No.	22	8	0	0	0
	%	73.33	26.67	0.00	0.00	0.00
Total	No.	31	15	2	0	2
	%	62.00	30	4.00	0.00	4.00

4.4 Other Comments

Only one comment was given by a participant from the public sector. He stated, “The traditional bidding system which has been used follow the least bidder which will no guarantee the quality of work. Most of our contractors try to submit the lowest rate by thinking the way they will gain that money by compromising the quality of the work. So, in awarding a bid higher percentage should be given to the technical proposal than the financial proposal.”

It is uncommon these days to see contractors submitting unrealistically low bids assuming that they will compensate the price through variations and claims. Although only one person has described his opinion in this regard, I understood through interviews and discussions that the idea has been shared by many others in the construction industry.

CHAPTER FIVE

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The method of procurement of construction works has a significant role in the successful completion of the project. In this research, the performance of public owned construction projects awarded on the least bidder bid evaluation and contract award system were assessed. In addition, the researcher has tried to investigate opinions of construction professionals from private and public organizations about the current method of bid award procedure and other alternatives.

The following conclusions are drawn based on the assessment made through questionnaires from construction professionals.

Construction professionals' opinions regarding the current bid evaluation and contract award procedure and other alternatives were collected through 50 questionnaires (20 from public sector & 30 from private sector workers).

From the findings generated from the study, the main conclusions drawn are as follows:

1. Some government projects are not executed under the Public Procurement Act, 2009. It was also established that some of the projects were awarded and administered by a combination of the Procurement Act and donor's guide line.
2. A majority of public clients and private contractors acknowledge the fact that **inappropriate contractor selection** is a key contributory factor toward **project non-performance**, which is, as the survey indicates, primarily a consequence of **low-bid price selection criteria**. Results also show that the bids evaluation and contractors' selection based on lowest price are a major challenge. Through the researcher's observation and in detailed discussion with construction professionals, major 80% of project delays and cost overrun, major quality defects of works and materials and safety issues have been observed in most of the projects under the study. The major reason for these projects non-performance has been the tendency of contractors to compromise their price because they had won the tender with low bids. More than 80% of the projects assessed were not completed on time. Many reasons were assigned to this delay and notably among them were delay in

payments, frequent variations, lack of financial capacity by the Contractor, delay in receiving instructions and approvals from Client, lack of supervision and delay in receiving instructions and approvals from Consultant. Most of the projects that were assessed exceeded the contract sum and the causes were mainly due to modification in the original design, claims, change in specification and price fluctuation. But among the major reasons of project cost overrun partly was due to claims made by contractors who attempt to make up for losses resulting from the unreasonably low rates used at the tender stage. Almost all the Contractors assessed did not deliver in terms of quality requirements of the projects that they executed. Most of the Contractors assessed did not adhere to safety measures on site. The major reason for these quality defects and safety issues also has been the tendency of contractors to compromise their price because they had won the tender with low bids. Aitah (1988) pointed out that a lower project performance is considered as the expected outcome of the lowest bid price. It has been argued that the serious problems which arise within the construction phase as a result of accepting the lowest bid can lead to serious overruns of time and cost, serious quality problems and eventually to increased litigation (Hatush and Skitmore 1998; Stein et al. 2003; Al-Reshaid and Kartam 2005).

3. The performance of contractors on projects awarded using the lowest evaluated bidder was also assessed in the study. It also discovered from the study that the performance of Contractors on projects awarded using the lowest evaluated bidder was not satisfactory. The low tenders submitted by the Contractors make it difficult for them to perform satisfactorily. Again the major performance indicators that they were unable to achieve were project completion time, contract sum, and safety and quality levels. It was further identified that some shortfalls such as frequent variations, delay in payments, and delay in receiving instructions and approvals from Client and Consultants also contributed to the poor performance of the Contractors.
4. The study further identified that competitive low bid method has been highly criticized for its negative impact on contractor's profit, disputes/claims, coordination, quality control and project duration.

5. Moreover, the **major negative Impacts** of low bid method observed from the study were: Work Suspensions/Termination of contract, Time overrun (lengthy delays) for projects, Increase the overall cost of contract, Low quality, Increased no. of disputes and claims, Select of inefficient contractors, Increased No. of Change Requests/Orders, Increase in maintenance and operational costs.
6. Other alternative bidding procedures included in the study were highly appreciated by respondents for their positive effects on these attributes.
 - Majority of the respondents supported the idea of adopting competitive system with provision to award contracts to bidders closest to the average of all bidders.
 - Respondents were divided in to two opposite groups on the issue of adopting competitive system with provision to award contracts to lowest bidder which is within some predefined range of the engineer's estimate.
 - Majority of the respondents have agreed to adopt competitive system with provision to award contracts to bidders closest to the average of all bidders and the engineer's estimate.
 - Negotiated bid method is highly discouraged in the procurement of public construction works because it may foster fraud and corruption.
 - Majority of the participants in the study have not accepted the use of combined competitive and negotiated bid method.
 - Most people included in the study were interesting about the use of prequalification of contractors instead of changing the traditional bidding procedure.
 - All respondents believed that bidding procedure should depend on type and complexity of the project.
 - Majority of the participants have the idea that subjective evaluation factors (such as, schedule, organization, and personnel) other than cost to be reflected in contract award.
 - The idea of adopting different bid evaluation and contract award methods depend on the type of contract selected were also supported by majority of the participants.

5.2 Recommendations

The findings of the research show the low level performance of public construction works contracts.

The researcher shared the idea of adopting the average bid method of awarding contracts among responsive bidders which are supported by many construction professionals included in the study. This method is highly preferable because it does not solely dependent on either the engineer's estimate or the contractors offer. On one hand, the engineer's estimate may minimize the risk of ring formation among contractors. On the other hand, the average of the contractors bid may reflect the actual construction cost because they believed to have a detailed market assessment and hence an up to dated prices.

In addition to the average bid method, as favored by all participants in the study, the Government should allow different bid evaluation and contract award procedures depending on the type and complexity of the project. Use of prequalification of contractors and use of subjective evaluation factors other than cost are the methods favored by construction professionals.

5.3 Further Research

As follow up to recommendations given above the following research are proposed for consideration in future.

- The researcher recommends fellow researchers to study the magnitude of the effect of the current bid evaluation and contract award system in the performance of public construction works of Oromia.
- Further research may also be conducted into factors leading to non- performance of bidders lowest evaluated.
- Comparison of performance of Contractors on projects awarded using the lowest bidder and that of Contractors selected using other methods
- Detailed analysis of effect/impact of individual identified factors on Contractors' performance
- Identify reasons why some government institutions/establishments are not using the guidelines.

REFERENCES

1. **Abdo Abatemam**, *Delays in Public Building Construction Projects & Their Consequences*, July 2006
2. **Aitah, R. A.** (1988), "Performance study of the lowest bidder bid awarding system in Government Project in Saudi Arabia", Thesis submitted to King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia in partial fulfilment for the degree of Master of Science.
3. Laychluh Mechegiaaw, *Performance Study of Lowest Bidder Bid Awarding System in Public Construction Projects*, March 2012
4. **S. Al-Hammadi**, *Shaqra University, Saudi Arabia. An Investigation into Current Tendering process in Saudi Construction projects, 5th International/11th Construction Specialty Conference, June 8 to June 10, 2015*
5. Hashim, M.B. (1999), "The Effects of Procurement Methods on Performance of Construction Projects in Malaysia". An Unpublished P.hD Thesis of University Teknologi Malaysia, Faculty of Built Environment, Malaysia
6. Rizwan U. Farooqui, Muhammad Saqib, Farrukh Arif and Sarosh H. Lodi, An Assessment of General Trends Adopted for Bidding and Procurement in the construction industry of Pakistan, First International Conference on Construction In Developing Countries (ICCIDC-I) "Advancing and Integrating Construction Education, Research & Practice" August 4-5, 2008, Karachi,, Pakistan.
7. **Frederick Oppong**, *A study on Performance of Contractors selected using the Lowest Bid Evaluation method as major criteria for government projects in Ghana, a Kumasi study, April 2013.*
8. **Anvuur, A., Kumaraswamy M. and Male S.** (2006), *CIB W107 Construction in Developing Countries International Symposium "Construction in Developing Economies: New Issues and Challenges" Santiago, Chile.*
9. **Cameron, K.S. and Quinn, R.E.** (2002), *Diagnosing and changing organizational culture: based on the competing values framework. Addison-Wesley Publishing.*
10. **Crowley, L.G., and Hancher, D.E.** (1995), "Risk Assessment of Competitive Procurement", *Journal of Construction Engineering and Management.* 121(2): 230-237.

11. **DGIII Working Group on Abnormally Low Tenders** (1999), “Prevention, Detection and Elimination of Abnormally Low Tenders in the European Construction Industry”, <http://europa.eu.int/comm/enterprise/construction/alo/altfin.htm>.
12. **Huang, Y. Z.** (2006), Comments on four kinds of bid evaluation methods in civil projects. *Construction Management Modernization*, (2), 25-28.
13. **Ioannou, P. G., and Leu, S. S.** (1993), “Average-Bid Method-Competitive Bidding Strategy,” *Journal of Construction Engineering and Management*, ASCE, Vol. 119, No. 1, pp. 131-147
14. **Lema, N. M. and Samson, M.** (2002), Development of construction contractors performance measurement framework, 1st International conference of creating a sustainable construction.
15. **Dissanayaka, S. M. and Kumaraswamy M. M.** (1999), comparing contributors to time and cost performance in building projects, *Building and Environmental*, Vol.34, pp 31-42.
16. **Garner A. B.** (2009). *Alternative to Low-Bid Selection in Air Force Reserve Military Construction: Approach to Best Value Procurement*. Headquarters Air Force Reserve U.S.A
17. **Hardy, S.C.** (1978). *Bid evaluation study for the World Bank*, Vol 1, The University of Manchester, Institute for Science and Technology, Manchester.
18. **World Bank**, (2006). *Guidelines for Procurement under IBRD Loans and IDA Credits*.
19. **Xiao, H. and Proverbs**, (2003), Factors influencing contractor performance: an international investigation, *Construction and Architectural Management*, 10(5), pp 322-332.
20. **Thomas Bedford**, *Analysis of the Low-Bid Awards System in Public Sector Construction Procurement*, Graduate Department of Civil Engineering University of Toronto, 2009
21. **Abera Bekele**, *Alternative Dispute Resolution Methods in Construction Industry: An Assessment of Ethiopian Situation*, July 2005
22. **Alexanderson, G. and Hulten, S.**, *Predatory Bidding in Competitive Tenders: A Swedish Case Study*, *European Journal of Law and Economics*, 2006.

23. **Dowle, W.J., and DeStephanis, A.**, *Preparing bids to avoid Claims*, Construction Bidding Law, John Wiley & Sons, Inc., New York, 1990
24. **Federal Negarit Gazeta**, *The Ethiopian Federal Government Procurement and Property Administration Proclamation*, Proclamation No. 649/2009, 15th year No. 60, Addis Ababa 9th September 2009
25. **Hardy, S.C.**, *Bid evaluation study for the World Bank, Vol 1*, The University of Manchester, Institute for Science and Technology, 1978
26. **Hatush, Zedan and Skitmore, Martin R. (1997)**, *Criteria for contractor Selection*. Construction Management and Economics, Copyright 1997 Taylor & Francis.
27. **Herbsman, Z. and Ellis, R.**, *Multiparameter Bidding System-Innovation in Contract Administration*, Journal of Construction Engineering and Management, ASCE, Vol. 118, No. 1, March, 1992
28. **Irtishad Ahmed P.E (Dr.)**, *Alternative Bid-Evaluation and Contract-Award Systems*: Department of Construction Management College of Engineering and Design, Florida International University, Miami, Florida, 1993
29. **Kelley, M.N.**, *Ft.Drum Estimating and Bidding from Contractor's Point of View*, Journal of Construction Engineering and Management, ASCE, Vol. 117, No. 3, Sept., 1991
30. **Lema Mosissa**, *Alternative Project Delivery Methods for Public Constructions: Cases in Oromiya Region*, September 2006
31. **MoF&ED**, *Federal Public Procurement Directive*, June 2010
32. **MoF&ED**, *Standard Bidding Document for the Procurement of Works issued by the PPA (Version 1*, January 2006)
33. **Photois G.Ioannou**, *Average-Bid Method-Competitive Bidding Strategy: Journal of Construction Engineering and Management*, Vol. 119, No. 1, March, 1993.
34. **Rizwan U. Farooqui et al** , *An Assessment Of General Trends Adopted For Bidding And Procurement In The Construction Industry Of Pakistan*, First International Conference On Construction In Developing Countries (ICCIDC-I) “Advancing And Integrating Construction Education, Research & Practice” August 4-5, 2008, Karachi,, Pakistan

35. **Sweet, J.**, *Legal Aspects of Architecture, Engineering, and the Construction Process*, 4th ed., West Publishing Company, St. Paul, MN. 1989
36. **Tarricon, P.** *Deliverence, Civil Engineering*, February 1993
37. **Winch, G.M.**, *Institutional Reform in British Construction: Partnering and Private Finance*, Building Research information, 2000
38. **Wubishet Jekale Mengesha**, *Performances for Public Construction Projects in Developing Countries*, Doctoral Theses at NTNU 2004:45, Norwegian University of Science and Technology
39. **Zohar J. Herbsman, Ana-Maria Ellias, and Cristina Cosma**, *“Buying Time”- An Innovative Procurement Concept for Transportation Projects*, Department of Civil Engineering, University of Florida

APPENDIX-A

QUESTIONNAIRES-PUBLIC CLIENT RESPONDENTS

A dissertation to be submitted to the School of Civil Engineering and Architecture of Adama Science and Technology University (ASTU)

My name is Jarso Midekso Msc. Construction Management Student from Department of Civil Engineering at Adama University of Science and Technology, researching on the topic” ***Study on Performance of Lowest Bidder Bid Awarding System in Public Construction projects in Oromia***”. This research questionnaire has been designed to solicit views from **Professionals/Contractors**, based on their experience on works undertaken within Zonal/Municipal level. The aim of this research is to assess the impact of competitive low-bid awarding system on performance of small scale public work projects (in terms of schedule, cost, quality and safety) completed in the last five years and currently on going in the Region and to proffer recommendations, based on the findings, to minimize negative impacts.

The core objective to present the study is:

- ☐ To assess the problems associated with the lowest evaluated bid in construction industry of Oromia, specifically in Govt. owned projects ;
- ☐ to analyze the impacts of these problems over the life cycle of projects;
- ☐ Based on the information gathered through surveys and interviews, to propose improvement in the current practices (low-bid procurement) to improve the performance of projects in Oromia Region.

I would like to convey my appreciation for your cooperation in completing these questions. If you have any questions and contributions about this research, please mail at my address email:jarso_midekso@yahoo.com, Mobile: (+251) 0911-30 0232.

The questionnaires are in three sections namely: background, to assess Impacts of Lowest Bidding System on performance of projects and contractors; and on Adopting Alternative Methods to Lowest Bidder Bid Awarding System in public construction projects in Oromia.

Thank you in advance for your participation and assistance with this study.

SECTION I: BACKGROUND INFORMATION

1. Please tick [✓] to indicate your educational level
 - a. PhD
 - b. MSc
 - c. Bsc
 - d. Advanced diploma
2. What major works do you evaluate?
 - a. Public buildings (market center, youth center etc)

- b. Heavy Engineering works (gravel roads etc)
 - c. Small scale projects(water supply, Irrigation, Drainage and road side ditch projects)
 - d. others(Please Specify): _____
3. For how long have you been in professional practice?
- a. Less than 5 years
 - b. 6-10
 - c. 11-15
 - d. 16 and above
4. How would you describe your organization's bid evaluation procedure?
- a. Based on bid price only
 - b. Based on bid price and responsiveness
 - c. Based on bid price, responsiveness, and other factors,
(Please Specify): _____

SECTION II: Evaluation of project Performance

5. Use the following grading scale to indicate your ratings of each method on the basis of the attributes listed:
- 1. Will always have a positive effect
 - 2. May sometimes have a positive effect
 - 3. Will have no effect
 - 4. May sometimes have a negative effect
 - 5. Will always have a negative effect
 - 6. Do not know/No opinion

Example: if you select no.5 for the attribute coordination against competitive low bid method, you are indicating that under this method coordination of project operation would always be adversely affected.

Bid Evaluation and Contract Award Methods	Attributes						
	Contractor profit	Owner's cost	Disputes /Claims	Coordination	Quality Control	Project Duration	Other, please Specify
1.Competitive Low Bid ¹							
2.Competitive Average Bid ²							
3.RFP/RFQ ³							
4.Negotiated ⁴							
5.Subjective Rating ⁵							
6.Other ⁶							

1 Conventional Regional practice of awarding contracts to responsive low bidder.

2 Competitive, but the bid selected is nearest to the average of all bid offers.

3 Contractors are invited to submit proposals for prequalification. Factors, other than cost, are considered to screen contractors. Contract is awarded or negotiated on the basis of sealed bids obtained from the selected contractors.

4 Negotiation with preselected or prequalified contractors.

5 Factors such as references from previous jobs, financial performance, bonding capacity, technical competence, etc. are subjectively rated and combined with the bid price to develop a scoring system. Bid is awarded to the highest scorer.

6. please specify:_____

6. What was the degree of satisfaction with the overall quality of the work completed?

- a. Excellent ☐
- b. Very good ☐
- c. Good ☐
- d. Fair ☐
- e. Poor ☐

7. How often did you issue warning letters to the contractor who won contracts by the lowest bidder system?

- a. Very often ☐
- b. Often ☐
- c. Sometimes ☐
- d. Not much ☐
- e. Never ☐

8. To what extent do you think awarding the contract to the lowest bidder affected the project execution?

- a. Very often ☐
- b. Often ☐
- c. Sometimes ☐
- d. Not much ☐
- e. Never ☐

9. Please was the project a fixed sum contract?

- a. Yes ☐
- b. No ☐

10. If no, was the contract sum exceeded?

- a. Yes ☐

- b. No ☐
11. If yes, was the contract sum exceeded through;
- a. Claims ☐
- b. Modification of the original design ☐
- c. Change in specification ☐
- Others please specify
12. Please, was there any dispute between the contractor and any of the parties?
- a. Yes ☐
- b. No ☐
13. If yes, what was the cause of the dispute?
- a. Frequent variations ☐
- b. Claims ☐
- c. Delay in payments ☐
- Others please specify
14. Was the project completed on time?
- a. Yes ☐
- b. No ☐
15. If yes, what was the cause of the delay?
- a. Frequent variations ☐
- b. Delay in payment ☐
- c. Delay in receiving instructions and approvals from client ☐
- d. Delay in receiving instructions and approvals from consultant ☐
- e. Lack of supervision on site ☐
- f. Lack of financial capability by the contractor ☐
- Others please specify.....
16. Please tick, to what extent did the contractor cooperate with other parties?
- a. Very often ☐
- b. Often ☐
- c. Sometimes ☐
- d. Not much ☐
- e. Never ☐
17. To what extent do you think the contractor was asked to attend to warranty calls during the warranty period?
- a. Very often ☐

- b. Often ☐
- c. Sometimes ☐
- d. Not much ☐
- e. Never ☐

18. How often did you face major problem after the warranty period?

- a. Very often ☐
- b. Often ☐
- c. Sometimes ☐
- d. Not much ☐
- e. Never ☐

19. To what extent do you think the contractor complied with the specification?

- a. Very often ☐
- b. Often ☐
- c. Sometimes ☐
- d. Not much ☐
- e. Never ☐

20. To what extent do you think the contractor complied with instructions?

- a. Very often ☐
- b. Often ☐
- c. Sometimes ☐
- d. Not much ☐
- e. Never ☐

21. To what extent was the safety at the site compromised?

- a. Very often ☐
- b. Often ☐
- c. Sometimes ☐
- d. Not much ☐
- e. Never ☐

SECTION III: Impacts of Low-Bid System on project

22. What was your experience regarding the impacts of lowest bidding system had on the work environment and team relationships? Please rank in order of importance, the impacts of Lowest-Bidding system has on performance of construction projects in your organization.

1 = Not important, 2 = slightly important, 3 = Important, 4=Very important

No	Impacts of lowest bidding system	Level of Importance of Impact on project			
		1	2	3	4
1	Lengthy delays for projects				
2	Select of inefficient contractors				
3	Low quality				
4	Failed Projects/ Work Suspensions				
5	Shortages in resources (labours, equipment, materials...etc)				
6	Increased number of disputes and claims between contracting parties				
7	Underachievement in project performance				
8	Increased No. of Change Requests/ Orders				
9	Financial loss for owner				
10	Financial loss for contractor				
11	Change in project scope				
12	Failure to achieve the project objectives				
13	Increase in maintenance and operational costs				
14	Stress on the public services such as water, sanitation, electricity and transportation				
15	If Others Please Specify				

23. Impacts of Low-Bid System on contractor

What was your experience regarding the lowest bidder as a contractor on this project?
Please rank in order of importance, the impact of problems associated with Lowest-Bidder as a contractor on performance of construction projects in your organization.

No.	Low-Bidder Issues	Level of Importance of Impact on project			
		1	2	3	4
1	Unprecedented Claims and disputes				
2	Technical & managerial incompetence				
3	Financial instability				
4	Lack of technical input in form of human resources (employment of incompetent human resources on the project)				
5	Cost at project completion is substantially more than the contract (bid) cost				
6	Specifications compliance issues				
7	Low productivity issues				
8	If Others Please Specify				

24. Was Inappropriate Contractor Selection a consequence of Low-Bid Price Selection Criteria?

- a. Yes
- b. No
- c. I am not sure

25. Project Non-Performance as related to Inappropriate Contractor Selection.

Please indicate the degree to which you agree or disagree with the following statements using the following scale. **4- Strongly Agree; 3-Agree; 2-Disagree; 1-Strongly Disagree; 0-No Opinion**

No.	Non-Performance Issue	Degree of agreement				
		4	3	2	1	0
1	A major proportion of project delay (more than 80% of the delay) is attributed to inappropriate contractor selection.					
2	A major proportion of project cost overrun (more than 80% of the cost overrun) is attributed to inappropriate contractor selection.					
3	A major proportion of project quality issues is attributed to inappropriate contractor selection.					
4	A major proportion of project safety issues is attributed to inappropriate contractor selection.					

SECTION IV: Opinions on Existing/Stated bidding Effects and Alternative Bidding Practices

26. With respect to the current bidding practices please indicate the degree to which you agree or disagree with the following statements using the following scale.

4- Strongly Agree; 3-Agree; 2-Disagree; 1-Strongly Disagree; 0-No Opinion

	Description	4	3	2	1	0
A	Competitive bidding system has worked well in the past and therefore will work well in the future. No change is necessary.					
B	Competitive system with provision to award contracts to bidders closest to the average of all bidders should be adopted					
C	Competitive system with provision to award contracts to lowest bidder which is within some predefined range of the engineer's estimate should be adopted.					
D	Competitive system with provision to award contracts to bidders closest to the average of all bidders and the engineer's estimate should be adopted					
E	A combination of competitive and negotiated procedures should be used					
F	Bidding procedure should depend on type and complexity of the project					
G	Prequalification of contractors should be used instead of changing the traditional bidding procedure.					
H	Subjective Evaluation factors (such as, schedule, organization, and qualification of personnel) other than cost should be reflected in the contract-award decisions					
I	Traditional bidding procedure (Competitive low-bid) encourages contractors to be innovative					
J	Traditional bidding procedure guarantees the lowest cost project, but not necessarily the best					
L	Favoritism and corruption cannot be avoided if negotiated bid procedure is used					
K	Bid evaluation method should depend on the type of contract (e.g. design-build, turn-key, fixed-price, cost-reimbursable) selected					

27. Any other comments: Attach additional pages, if necessary

THANK YOU FOR YOUR COOPERATION!!

APPENDIX –B

QUESTIONNAIRE-PRIVATE CONTRACTOR RESPONDENTS

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- ☐ to analyze the impacts of these problems over the life cycle of projects;
- ☐ Based on the information gathered through surveys and interviews, to propose improvement in the current practices (low-bid procurement) to improve the performance of projects in Oromia Region.

I would like to convey my appreciation for your cooperation in completing these questions. If you have any questions and contributions about this research, please mail at my address email:jarso_midekso@yahoo.com, Mobile: (+251) 0911-30 0232.

The questionnaires are in three sections namely: background, to assess Impacts of Lowest Bidding System on performance of projects and contractors; and on Adopting Alternative Methods to Lowest Bidder Bid Awarding System in public construction projects in Oromia.

Thank you in advance for your participation and assistance with this study.

SECTION I: BACKGROUND INFORMATION

1. Primary area of business:
 - a. General Contractor
 - b. Building Contractor
 - c. Water works contractor
 - d. Other (Please Specify): _____
2. Size of Firm/Organization:

- a. Less than ten employees
 - b. 10 to 25 employees
 - c. 26-50 employees
 - d. Over 50 employees
3. How long is it since your company established?
 - a. Less than 2 years
 - b. 2 to 5 years
 - c. 5 to 10 years
 - d. More than 10 years

SECTION II: Evaluation of Performance of project

4. Use the following grading scale to indicate your ratings of each method on the basis of the attributes listed:
 1. Will always have a positive effect
 2. May sometimes have a positive effect
 3. Will have no effect
 4. May sometimes have a negative effect
 5. Will always have a negative effect
 6. Do not know/No opinion

Example: if you select no.5 for the attribute coordination against competitive low bid method, you are indicating that under this method coordination of project operation would always be adversely affected.

Bid Evaluation and Contract Award Methods	Attributes						
	Contractor profit	Owner's cost	Disputes /Claims	Coordination	Quality Control	Project Duration	Other, please Specify
1.Competitive Low Bid ¹							
2.Competitive Average Bid ²							
3.RFP/RFQ ³							
4.Negotiated ⁴							
5.Subjective Rating ⁵							
6.Other ⁶							

1 Conventional Regional practice of awarding contracts to responsive low bidder.

2 Competitive, but the bid selected is nearest to the average of all bid offers.

3 Contractors are invited to submit proposals for prequalification. Factors, other than cost, are considered to screen contractors. Contract is awarded or negotiated on the basis of sealed bids obtained from the selected contractors.

4 Negotiation with preselected or prequalified contractors.

5 Factors such as references from previous jobs, financial performance, bonding capacity, technical competence, etc. are subjectively rated and combined with the bid price to develop a scoring system. Bid is awarded to the highest scorer.

6. Please specify: _____

5. What was the degree of satisfaction with the overall quality of the work completed?

- a. Excellent ☐
- b. Very good ☐
- c. Good ☐
- d. Fair ☐
- e. Poor ☐

6. How often did you issue warning letters to the contractor who won contracts by the lowest bidder system?

- a. Very often ☐
- b. Often ☐
- c. Sometimes ☐
- d. Not much ☐
- e. Never ☐

7. To what extent do you think awarding the contract to the lowest bidder affected the project execution?

- a. Very often ☐
- b. Often ☐
- c. Sometimes ☐
- d. Not much ☐
- e. Never ☐

8. Please was the project a fixed sum contract?

- a. Yes ☐
- b. No ☐

9. If no, was the contract sum exceeded?

- a. Yes ☐
- b. No ☐

10. The contract sum exceeded through;

- a. Claims ☐
- b. Modification of the original design ☐
- c. Change in specification ☐
- d. Others please specify

11. Please, was there any dispute between the contractor and any of the parties?

- a. Yes ☐
- b. No ☐

12. If yes, what was the cause of the dispute?

- a. Frequent variations ☐
- b. Claims ☐
- c. Delay in payments ☐
- Others please specify

13. Was the project completed on time?

- a. Yes ☐
- b. No ☐

14. If yes, what was the cause of the delay?

- a. Frequent variations ☐
- b. Delay in payment ☐
- c. Delay in receiving instructions and approvals from client ☐
- d. Delay in receiving instructions and approvals from consultant ☐
- e. Lack of supervision on site ☐
- f. Lack of financial capability by the contractor ☐
- Others please specify.....

15. Please tick, to what extent did the contractor cooperate with other parties?

- a. Very often ☐
- b. Often ☐
- c. Sometimes ☐
- d. Not much ☐
- e. Never ☐

16. To what extent do you think the contractor was asked to attend to warranty calls during the warranty period?

- a. Very often ☐

- b. Often ☐
 - c. Sometimes ☐
 - d. Not much ☐
 - e. Never ☐
17. How often did you face major problem after the warranty period?
- a. Very often ☐
 - b. Often ☐
 - c. Sometimes ☐
 - d. Not much ☐
 - e. Never ☐
18. To what extent do you think the contractor complied with the specification?
- a. Very often ☐
 - b. Often ☐
 - c. Sometimes ☐
 - d. Not much ☐
 - e. Never ☐
19. To what extent do you think the contractor complied with instructions?
- a. Very often ☐
 - b. Often ☐
 - c. Sometimes ☐
 - d. Not much ☐
 - e. Never ☐
20. To what extent was the safety at the site compromised?
- a. Very often ☐
 - b. Often ☐
 - c. Sometimes ☐
 - d. Not much ☐
 - e. Never ☐

SECTION III: Impacts of Low-Bid System on project

21. What was your experience regarding the impacts of lowest bidding had on the work environment and team relationships? Please rank in order of importance, the impacts of Lowest-Bidding system has on performance of construction projects in your organization.

1 = Not important, 2 = slightly important, 3 = Important, 4=Very important

No	Impacts of lowest bidding	Level of Importance of Impact on project				
		5	4	3	2	1
1	Lengthy delays for projects					
2	Select of inefficient contractors					
3	Low quality					
4	Failed Projects/ Work Suspensions					
5	Shortages in resources (labours, equipment, materials...etc)					
6	Increased number of disputes and claims between contracting parties					
7	Underachievement in project performance					
8	Increased No. of Change Requests/ Orders					
9	Financial loss for owner					
10	Financial loss for contractor					
11	Change in project scope					
12	Failure to achieve the project objectives					
13	Increase in maintenance and operational costs					
14	Stress on the public services such as water, sanitation, electricity and transportation					
15	If Others Please Specify					

22. Impacts of lowest bid on contractor

*What was your experience regarding the lowest bidder as a contractor on this project
Please rank in order of importance, the impact of problems associated with Lowest-Bidder as a contractor on performance of construction projects in your organization.*

1 = Not important, 2 = slightly important, 3 = Important, 4=Very important

No.	Low-Bidder Issues	Level of Importance of Impact on project				
		5	4	3	2	1
1	Unprecedented Claims and disputes					
2	Technical & managerial incompetence					
3	Financial instability					
4	Lack of technical input in form of human resources (employment of incompetent human resources on the project)					
5	Cost at project completion is substantially more than the contract (bid) cost					
6	Specifications compliance issues					
7	Low productivity issues					
8	If Others Please Specify					

23. Was Inappropriate Contractor Selection a consequence of Low-Bid Price Selection Criteria?

- a. Yes
- b. No
- c. I am not sure

24. Project Non-Performance as related to Inappropriate Contractor Selection.

Please indicate the degree to which you agree or disagree with the following statements using the following scale. **4- Strongly Agree; 3-Agree; 2-Disagree; 1-Strongly Disagree; 0-No Opinion**

No.	Non-Performance Issue	Degree of agreement				
		4	3	2	1	0
1	A major proportion of project delay (more than 80% of the delay) is attributed to inappropriate contractor selection.					
2	A major proportion of project cost overrun (more than 80% of the cost overrun) is attributed to inappropriate contractor selection.					
3	A major proportion of project quality issues is attributed to inappropriate contractor selection.					
4	A major proportion of project safety issues is attributed to inappropriate contractor selection.					

SECTION IV: Opinions on Existing/Stated bidding Effects and Alternative Bidding Practices

25. With respect to the current bidding practices please indicate the degree to which you agree or disagree with the following statements using the following scale. **4- Strongly Agree; 3-Agree; 2-Disagree; 1-Strongly Disagree; 0-No Opinion**

	Description	4	3	2	1	0
A	Competitive bidding system has worked well in the past and therefore will work well in the future. No change is necessary.					
B	Competitive system with provision to award contracts to bidders closest to the average of all bidders should be adopted					
C	Competitive system with provision to award contracts to lowest bidder which is within some predefined range of the engineer's estimate should be adopted.					
D	Competitive system with provision to award contracts to bidders closest to the average of all bidders and the engineer's estimate should be adopted					
E	A combination of competitive and negotiated procedures should be used					
F	Bidding procedure should depend on type and complexity of the project					
G	Prequalification of contractors should be used instead of changing the traditional bidding procedure.					
H	Subjective Evaluation factors (such as, schedule, organization, and qualification of personnel) other than cost should be reflected in the contract-award decisions					
I	Traditional bidding procedure (Competitive low-bid) encourages contractors to be innovative					
J	Traditional bidding procedure guarantees the lowest cost project, but not necessarily the best					
L	Favoritism and corruption cannot be avoided if negotiated bid procedure is used					
K	Bid evaluation method should depend on the type of contract (e.g. design-build, turn-key, fixed-price, cost-reimbursable) selected					

26. Any other comments: Attach additional pages, if necessary

THANK YOU FOR YOUR COOPERATION!!