



JIMMA UNIVERSITY
JIMMA INSTITUTE OF TECHNOLOGY
SCHOOL OF GRADUATE STUDIES
FACULTY OF CIVIL AND ENVIRONMENTAL ENGINEERING
CONSTRUCTION ENGINEERING AND MANAGEMENT CHAIR

Performance Study of Lowest Bidder Bid Awarding System in Public Construction
Projects; in case of Jimma Zone

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

BY:

TIRUNEH TADESSE HIRPO

February 2020
Jimma, Ethiopia

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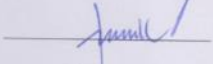



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PERFORMANCE STUDY OF LOWEST BIDDER BID
AWARDING SYSTEM IN PUBLIC CONSTRUCTION
PROJECTS: IN CASE OF JIMMA ZONE

TIRUNEH TADESSE HIRPO

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Performance Study of Lowest Bidder Bid Awarding System in Public Construction
Projects; in case of Jimma Zone

DECLARATION

I declare that this research entitled "Performance Study of Lowest Bidder Bid Awarding System in Public Construction Projects. In case of Jimma Zone" is my own original work, and has not been submitted as a requirement for the award of any degree in Jimma University or elsewhere.

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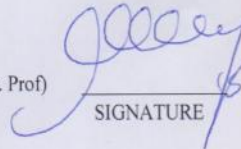
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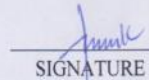
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ABSTRACT

In this 21st century where economic growth is fast, construction industry is highly competitive especially in developing country like Ethiopia. Public construction projects located in Jimma zone awarded using lowest bidder bid awarding system however, the contractor most of the time fails to complete and handover the project to the client due to lack of finance to complete the project. This research was conducted with the aim of analyzing performance of Lowest Bidder Bid Awarding System in Jimma Zone Public Construction Projects, through identify the challenges, impacts of Lowest bidder bid selection system, and by comparing with different bidding system.

For this purpose, questionnaire survey conducted to identify the challenges and impacts while interview has conducted with stakeholders to compare lowest bidder bid awarding system with different bidding alternatives system. In addition, the finding was analyzed using SPSS version 25 software and Microsoft excel.

The main six challenges were identified from the current study in lowest bidder bid award system; No site visit before bidding and no understanding of detail scope of work contractor, contractors' perception on variation, contractors have to bid low to increase annual turnover, Short comings in professional's contractors and Weak contract administration of client. The study also identified six impacts of lowest bidder bid award system where delay on project completion 87.5% happened, cost overrun 45% occurred, increase in number of change request/ orders, unsatisfactory quality of work and increase dispute and claims between contracting parties were the main concern. In addition, the research was comparing lowest bidder bid selection system with different bidding alternatives to achieve organization objectives interims of achieving qualitative, technical and hitting the steted objective of the project with best performance, more secured and less risk are multi parameter and competitive negotiated bidding method were ranked 1st and 2nd respectively.

Therefore; from the study findings, it can be concluded that the lowest bidder bid awarding system needs to be improved and the alternative bid systems are more preferred to select qualified contractors and to achieve the stated project objectives. So, to improve the performance and to minimize the impacts of lowest bidder bid awarding system in public construction projects the following recommendations are forwarded; improve the current procurement system, Organized and summit post project auditing depends on reliable data and report to concerned policy maker to use as input, submit an estimated bid price by considering the current market condition and project cost variations to complete the project with agreed contract requirement. In addition, the consultant should take part effective advice for their client from contractor selection up to effective contract administration to reduce the risk awarding unqualified contractors and contractual problems during the construction stage.

Keywords: Bid, Bidder, Contingency, Effect, Lowest Bidder, Performance, Variation

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ACRONYMS

ALB	Abnormally Low Bid
ALT	Abnormally Low Tender
AELT	Adverse Effects of Extremely Low Tender
BAM	Bid Awarding Method
BM	Bid Method
CIBD	Certificates of Independent Bid Determination
DPD	Different Project Delivery
DTU	Difficult to Understand
EMAT	Economically Most Advantageous Tender
ETB	Ethiopian Birr
EU	European Union
JP	Job Profitably
LBBAS	Lowest Bidder Bid Awarding System
MCS	Multiple Criteria Selection
PCP	Public Construction Project
PERT	Program Evaluation and Review Technique
PLOBM	Prioritize the List of Bid Method
PPA	Public Procurement Agency
PPOA	Public Procurement Authority
PD	Project Delivery
RFP	Request for Proposal
RFQ	Request for Qualification
RR	Response Rate
SPSS	Statistical Package for Social Science
UK	United Kingdom
US	Unite State

CHAPTER ONE

INTRODUCTION

1.1 Background

In today's world construction, the industry is one that has a special role in seek for development. We can say that there is no development in any sector, without the involvement of construction industry. The construction industry plays a key role in building economic infrastructure like roads, railways in expanding social infrastructure like schools, hospitals, etc.; and in expanding factories. To bring about fast growth in any economic sector should have a strong and efficient construction industry. Because of such a high contribution, the construction industry has a major influence on the economic growth of a country (Rizwan U, Farooqui M, Ahmed K, & Azhar M, 2008).

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 community and the construction industry. Currently, the public sector procurement of construction largely based on the lowest bid award System. The customary practice of awarding contracts to a lowest bidder established to ensure the least cost for completing a project. The lowest evaluated bid system may not result in the best value for money expended or the best performance during and after construction but rather owners/clients generally face increased exposure to contractual claims (Rizwan U, Farooqui M, Ahmed K, & Azhar M, 2008).

In a developing country, such as Ethiopia construction industry is increasing vastly. To engage in the construction or have to start especially in public construction should pass the bidding system that mainly used as a bid system called lowest bid awarding system. In Jimma, the public sector procurement of construction largely based on the low bid award system. It is important to review and evaluate the current performance of the procurement process to work toward the public sector obtaining greater value for money in their construction projects. The low bid award system fosters competition amongst contractors attempting to secure the project. This competition can have both positive and negative effects for the client. As the public sector client is accountable to the public, an open competitive bidding process that awarded based

only on price is highly transparent. However, selecting a contractor based solely on price greatly diminishes the significance of important such as criteria, time and quality. Lowest evaluated bid price as the sole award criterion encourages unqualified contractors to submit bids that is very low with the intent of recovering their losses through change orders and claims, also known as predatory bidding (Thomas, 2009).

This research aims to analyze the status of Bid and Procurement Strategies in the construction industry of Jimma Zone. The most commonly adopted method of awarding system here in Jimma Zone public Projects is the Least Responsive Bidder or Price Based method, which has poor performance. By examining past construction project data from several public projects, this research hopes to identify the impact of the competitive low-bid awarding system on the performance of major public work projects in the Jimma zone construction industry. Also, the research plans to give a recommendation and suggestion for the construction industry of Jimma Zone based on the analyzing data.

1.2 Statement of the problem

The Construction industry has continuously been developing for the last decades. Currently, the public sector procurement of construction largely based on the low bid award system. 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 (ALT) (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. Other developing country construction industry participants have long recognized that accepting the lowest price bid does not guarantee maximum value. Achieving a value-based procurement approach is a challenge, particularly for the Ethiopian public sector clients who are limited in their ability to evaluate the competitive bids based solely on the low-bid award system.

In a survey conducted in the Oromiya regional state, non-existence of real competition during contractor's 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 (Lema M, 2006). Public construction projects located in Jimma zone awarded using lowest

bidder bid awarding system and the contractor most of the time fails to complete and handover the project to the client due to lack of finance to complete the project. This financial problem has mainly resulted in the procurement system used to select the bidders, which focuses only on lowest price. 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 on contrary; it discourages qualified contractors to participate. As per PPA stated that “the contracting authority shall award the Contract to the Bidder whose bid has been determined to be the lowest evaluated bid and is substantially responsive to the Bidding Documents, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily”. Therefore, the main aim of this study will be to investigate the performance of lowest bidder bid awarding system in Jimma zone public projects.

1.3 Research Questions

1. What are the challenges of the lowest bidder bid selection system in public construction work projects in Jimma Zone?
2. What are the impacts of the lowest bidder bid selection system over the life cycle of construction projects?
3. Which bidding alternatives system is most preferable when compare to lowest bidder bid selection system?

1.4 Objectives

1.4.1 General Objective

The main aim of the study is to analyze the effect of the lowest bidder bid awarding system in the performance of public construction projects that are located in Jimma zone.

1.4.2 Specific Objective

- To identify the challenges of the lowest bidder bid selection system for public construction work projects in Jimma zone.

- To identify the impacts of the lowest bidder bid selection system over the life cycle of construction projects.
- To compare the lowest bidder bid selection system with different bidding alternatives.

1.5 Scope of the Study

The scopes of this study were limit to Jimma Zone construction projects owned by public body, which has awarded by the lowest bidder bid awarding system. Only performance issues related, to the lowest bidder bid award system are being investigated. The result obtained from this paper were based on those projects that will be completed soon, those projects that were completed in the past five years and also those projects terminated or stopped before completion which was only awarded based on the lowest bidder bid awarding system.

1.6 Significance of the study

In Ethiopia, public construction projects bid awarding system frequently based on the lowest bidding system. 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 has assessed. However, the construction industry plays a vital role in the national economy, this bid system and procurement is a substantial and integral element of construction project performance; it should be the issue of attention in the construction world due to time, cost overrun and quality of work associated with the construction project. So many projects awarded based on the lowest price fail to accomplish planned targets and objectives. Generally, it helps to the country to provide information about lowest bidder bid award system, so that they can use the information provided to improve the polices which are related to the procurement of construction projects. This research will be used for all stakeholder who participate in the construction industry which is located in Jimma zone because the researcher would try to study the performance of the lowest bidder bid awarding system that is owned by the public in a given period.

CHAPTER TWO

LITERATURE REVIEW

2.1 Procurement Management in Construction Industry

The public procurement of construction projects is characterized with a process flow starting with procurement planning and proceeding in sequence to project design, advertising, invitation to bid, prequalification, bid evaluation (broken down further into technical and financial evaluation), post-qualification, contract award and contract implementation (Ayoti, B.N., 2012). Construction procurement is the process of identifying, selecting and commissioning the contributions required for the delivery of alteration, refurbishment, maintenance, extension or demolition of an existing building or structure, and/or the creation of a new building or facility, to include all associated and related site works. Successful construction procurement has regarded as a project delivered on time, to cost, and to the desired quality, capable of performing the specific function required by the client. The Public Procurement Authority (PPOA) in its effort to make public procurement should be the one, which is comprehensive transparent legal and institutional framework, clear and standardized procurement procedures and standard tender documents, independent control system, proficient procurement staff and anti-corruption measures. The legal and institutional framework stipulates that the PPA establish the public procurement board as a legal corporate entity (Omondi O J, Abednego S D, & Onyanyo G R, 2017).

Different authors have suggested different procurement selection factors that can assist clients to choose the best procurement method. Studies have demonstrated that procurement selection factors of client characteristics, project requirements and external environment are in use. Several variables of client requirements were measured under cost, time and quality related factors. Project characteristics factors also include project type, size, cost, flexibility, complexity, site risk factors and degree of innovative technology. External environment factors considered are market competitiveness, availability of materials, natural disasters, industrial actions amongst other variables. Client characteristics, project requirements and external factors

considered with general needs for investigating the procurement related factors that affect project performance in this study (Ogunsanmi O E, 2013).

According to (Ng ST, Luu DT, & Chen SE, 2006), the list of client requirements that might affect the selection of a procurement system, are; Speed, Certainty of completion time, Certainty of price, Quality level, Flexibility, Responsibility, Complexity, Price competition, Risk allocation/avoidance are among the selection criteria for effective procurement management.

Inexperienced clients often have to rely on expert advice when selecting a procurement approach and this could result in inappropriate decisions with unforeseeable consequences. Experienced clients may also suffer if they simply based their selection upon biased experience and the conservative decisions of their in-house experts. The need for selecting and using an appropriate procurement system for a particular construction project and together with the proliferation of differing procurement systems calls for more systematic methods of selection. To do this, decision criteria pertinent to the selection of procurement approaches and their properties (i.e. subjectivity) must carefully identified and evaluated (Ng ST, Luu DT, & Chen SE, 2006).

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 (Federal Negarit Gazeta, 2009).

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 has 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 Ministry. On the other hand, where a repeated advertisement of the invitation to bid fails to attract bidders in respect of procurement subject to the directive to issue by the Ministry (Article 49). and 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) (MoF & ED, 2010).

Direct procurement allowed when there are no competitions for technical reasons and if the required service can be supplied or provided only by one candidate. Alternatively, 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 (article 51). The maximum contract amount allowed in the directive for direct bidding for works is similar to the restricted bidding (article 9) (MoF & ED, 2010).

The third type of procurement for public bodies is a 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) (Mechegiaw L, 2012) & (Khan T H & Khan A Q, 2015).

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 Ministry (article 55) (MoF & ED, 2010). Two stages bidding on the other hand, permitted when it is not feasible for the public body to formulate detailed specifications for the goods or works such as the contract for 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 birrs' (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. Also, the conditions set forth for the use of other alternatives have not usually fulfilled for construction work contracts except in rare cases (Mechegiaw L, 2012) & (Khan T H & Khan A Q, 2015). The major problem facing construction clients is how to obtain competitive bids for their projects in a cost-

effective way and at the same time maintain its public accountability (Shrair A N, 2011).

2.2 Lowest Bidder Bid Awarding System

This is the most commonly used procedure to obtain and select contractor's/ construction firms for execution of construction projects. In broad-spectrum, the aim of competitive bidding (price-based) is to obtain the least possible price for a particular project, service or facility. The Competitive bidding method tries to ensure that everyone gets an equal chance to bid, minimizes collusion, and saves the public money (Khan T H & Khan A Q, 2015). It is also the practice of bidding in construction work where the contractors submit lowest price possible for completion of given plans and specifications and such the lowest quoted price is accepted for execution of the project. The award of contract is made to the lowest responsive bidder and an agreement is reached between the client and the contractor (Bista & and Dahal, 2018).

The low-bid procurement system a long-standing legal precedence and has promoted open competition. In addition, a fair playing field a long-standing concern expressed by owners. Moreover, 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. 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 (Farooqui R U & Ahmed S M, 2008).

Formerly, contractors were, in most cases, selected based on price alone, but in the 1980's the idea of selecting contractors based on value, not price, emerged, which led to contractors being selected based on non-price criteria in addition to the evaluation of price. Since then, multiple researchers have pondered the question of which method used for contractor selection results in the most successful project outcome. The

lowest bid method has established in the U.K. public sector in the 19th century in order to provide the lowest price to the public while ensuring fair competition between contractors. Since then, the method has become well establish for selection of contractors and is widely used. However, the method has received a lot of criticism for increasing the likelihood of hiring an incompetent contractor, which can lead to higher overall costs. Researchers have pointed out that choosing a contractor based on value, not price will result in better project outcome, and therefore contractors should be select based on other criteria than price. Nevertheless, the lowest-bid method remains in use, more so though in the public sector (Brynjarsdottir, 2016).

If the bid specifications have written to favor one bidder over another, or if there was an ambiguity in the specifications that, intentionally or inadvertently, favored one bidder over another or misled the bidders, then there was not a “common basis” for the bids, and there is a basis for challenging the award. If bidders “are misled by anything which the [municipality] may have done, or the notice [concerning the bid] may have required, the bidding was not on a common basis; the lowest figures submitted would not, in law, be the lowest bid, because it lacked fair competition.” In short, “no scheme or device promote of favoritism or unfairness or which imposes limitations, not applicable to all bidders alike, will be tolerated (Gisleson, 2002).

There is no uniformity in the definition of low bid and abnormally low bid (ALB). In India, the bid has considered low bid that varies from the estimated rates by more than 25 %, even after updating the scheduled rates to match the prevailing cost index. In Taiwan, the total bid price less than 80% of the estimate has considered as ALB. According to National legislation of the United Kingdom, low tender abnormally is the one that deviates by 10% - 15% from the average price tendered. Similarly, Luxembourg law defines a low bid in terms of a price, which leaves no margin for a normal level of profit. A tender having bid price within 15% lower than engineers' estimate is considered as normal bid with more likelihood of timely completion. Bid lower than engineers' estimate by 15-30% can be considered as low bid and any bid which is lower by more than 30% of engineers' estimate is considered as abnormally low bid (Bista & and Dahal, 2018).

Here in Ethiopia the tender evaluation and analysis approach, was modified by the Ministry of Works and Urban Development in March 2001. The basis for the modification were, according to the letter from the Ministry on the 14day of March 1993 EC, Ref. no H1-T1 240/21, to improve the procurement of public construction works by avoiding abnormally low bids. Bidders who have submitted the required bid security and whose offer is within plus or minus 20% of the project estimate will be subject to detail evaluation. However, after the establishment of Public Procurement Agency (PPA) in 2006 the procurement of all Federal Government works and services have been guided by the rules and regulations prepared by this agency. The agency permits only the lowest evaluated bid to win the construction tender.

2.3 Legal Aspects of the Lowest Bidder Bid Awarding System

In Ethiopia solicited a tender through a form of competitive bidding for construction projects. This requires public organizations to award such contracts to the “lowest responsive bidder”. The word “responsive” inserted to require that a successful bid must have also been adequately responding to the requirements of the project as specified (PPA, 2011). Competitive bidding, where the project awarded to the lowest bidder, is a basic part of the construction industry. This method of project delivery has designed to promote healthy competition in an attempt to ensure the lowest price for the project (Khan T H & Khan A Q, 2015). While private owners may choose to award contracts in several methods. Many public agencies are required by law to award the project to the lowest bidder (Shrair A N, 2011). 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 responsible. “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 (Deep, Singh, & Ahmad, 2017).

For the reason of that short duration of time available between a bid opening and the award of the bid and the law allows public organizations to reject any or all the bids, the rejection cannot be done arbitrarily or in bad faith (Mechegiaw L, 2012). For such

issues, the decision to reject a low bid on the ground that the bidder was not responsible enough depends on the discretion of the client. In most cases, some degree of subjectivity gets involved in the process of determining whether a particular bidder is responsible. Consequently, these kinds of rejections frequently lead to litigations. To avoid such stereotypes, many organizations consider the responsiveness of the bid before making award decisions. Some organizations use an astringent and specific set of prequalification procedures (Deep, Singh, & Ahmad, 2017).

The legal environment that public clients often operate in could be the cause of this since transparency is important and subjectivity in the selection process can lead to litigation, which limits the criteria that public clients can apply. Nevertheless, recent studies have shown that the public sector, in some countries, is moving towards the multiple criteria selection method, though at a slower pace than the private sector, and several governments have even encouraged the use of value-based tendering (Brynjarsdottir, 2016).

Generally, the competitive bidding process not be avoided by splitting a contract into several smaller contracts, each of which is under the competitive bidding threshold. A contract will be void, if it split for avoiding the competitive bidding process. It may be appropriate, however, to enter into two separate contracts for materials or work if they involve separate transactions. An example of this might be the services of different specialty contractors that are necessary to complete a particular project. In such a case, there appears to be no reason why the work or material not be contracted for without advertising for bids if each of the contracts does not exceed the competitive bidding threshold (Paul S, 2017).

2.4 Challenges of LBB Awarding System in Public Construction Projects

It is not the end desire of the clients to obtain reasonable number of bids, but the most important objective that has integrated strongly with the participation process is to achieve the competitive bids that satisfy the clients' requirements and needs. At the same time, not all the bidders participate strongly to compete, some of the bidders participate to add their name for the client list or to mislead the other competitors in the next tenders. These discussions reflect that the competitiveness environment

integrated strongly with the bidders' participation process (Shrair A N, 2011). Increasing complexity in design and the involvement of numerous stakeholders in modern construction projects are a huge challenge for both clients and contractors to meet criterion of skills and capabilities required successfully deliver a project at the bidding stage. The Selection of an inappropriate contractor for the job increases the chance of dispute and dissatisfaction amongst stakeholders (Deep, Singh, & Ahmad, 2017).

Competitive tendering is the conventional method for procuring major construction for its suitability to guarantee transparency, publicity and equal opportunity in public procurement demands clear procedures to be followed by in order to reduce the risk of unfair bias or corruption and, in which the contract is awarded to the lowest bidder. This method provides the best motivation for project cost reduction and predominates in both public and private. Despite its widespread use, however, the traditional lowest bid method has considered by many to be a recipe for trouble, especially in an overflowing market. Factors such as shortage of contracts, difficulties in prescribing and measuring the quality of work, uncertainty of future costs and potential for claims, encourage a situation where the lowest bid is often not the best bid in terms of price, time and quality (Pérez P B, Skitmore M, Pellicer E, & M González Cruz C, 2015). Bidding with lower value even below the engineer's estimate has often seen as normal practice. Nowadays, bidding trends can be seen as getting bid at very low cost which provides winning feeling but not on completing project (Bista & and Dahal, 2018).

The first problem with estimating is that it takes little account of how contractors' costs have incurred; it was based solely on historical information that does not relate the location of the work to its cost. The second and more important problem is the 'myth of tendering'. Although contractors have very detailed information related to costs and can work out very accurate rates for the bills, not usually reported that these are frequently not the rates that actually appear in the bills. Contractors know about costs (what they pay for their resources); they know about prices (what they charge for their product); and they know about value (what the client is willing to pay for a building). Upon invited to tender, a contractor will first make a decision about whether or not the job is wanted. A contractor will rarely decline to tender, for fear of

not being asked to tender again in the future there is a certain amount of stigma attached to a contractor who declines to tender. If the job is not wanted the contractor will submit an inflated tender called a cover bid While a contractor will know what the rates in the tender ought to be, these will all be altered to make the final figure clearly too high to be acceptable (Murdoch J & Hughes W, 2000).

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. These bidders can then use this knowledge to submit a lower bid with the expectation of recouping the money later. This practice can be equating to a gambit strategy in chess: making a small sacrifice early to setup up the opponent to be in a vulnerable position later. 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 (Quantson Y, 2014).

If the contractor wants the job, then a further decision has taken about the state of the market and an assessment of what this type of building is selling for the moment. This assessment then modified by the level of risk associated with the project, particularly in terms of the contractual conditions put forward by the employer. If the contract is risky, a substantial premium should add to the contractor's bid, so that the risks are covered. The calculation is, in theory at least, similar to the actuarial calculations made by insurers when examining and pricing risks. Finally, the contractor's cash flow has a significant impact on the tender. Having a detailed knowledge of costs and finance, the contractor can predict the monthly net cash flow in or out of the project. If the project takes place near the end of a tax year, the contractor may want to reduce the level of profit appearing on the balance sheets the purpose of reducing tax liabilities. This was done by artificially reducing the rates for work at the beginning of the project and adding a corresponding proportion on to the rates for work later on in the project.

Alternatively, the contractor may need to get cash in quickly to meet liabilities, or to show a good return for shareholders' dividends. In this case, the rates at the beginning of the project can increased, with a corresponding decrease in the rates at the end. The former process is known as back-loading the bill, the latter is known as front-loading

the bill. Neither process makes any difference to the contract sum, although both can have a significant impact on the continued survival of the contractor's business. This brief analysis shows that, notwithstanding the contractor's detailed knowledge of costs and prices, the skill of a good contractor is in pitching the contract sum at a level that will maximize the chances of winning jobs that wanted, while ensuring that profits are adequate. The bill rates then manipulated to add up to the desired contract sum and internally adjusted to regulate the cash flow according to the financial position of the contractor. This shows how dangerous it can be to attach too much credence to individual bill rates when analyzing tendering procedures. It also illustrates one of the major pitfalls in using bill rates for valuing variations (Murdoch J & Hughes W, 2000).

Many ethical behaviors have a direct impact on the competitiveness trend in contract tenders as well as other types of projects. Several studies showed some of the ethical and unethical behaviors in the bidding process such as (bid cutting, withdrawal, cover pricing, bid shopping, compensation of tendering costs, collusion) (Shrair A N, 2011) & (Ayoti, B.N., 2012).

Collusion between firms that are bidding in a public procurement allows them to avoid the pressures of competition, with the result that the public purchaser gets less for its money, or pays more for what it gets. Bid rigging is the typical mechanism of collusion in public contracts, which leads to the predetermination of the outcome of the procurement process by its participants rather than the competitive process. Strategies for implementation of a bid-rigging cartel include cover bidding, bid allocation, bid suppression and market allocation.

Collusion involves a horizontal relationship between bidders in a public procurement, who conspire to remove the element of competition from the process. In the normal course, independent bidders in a procurement process compete against each other to win the contract, and it is via this mechanism that best value for money for the purchaser achieved. Anticompetitive collusion occurs when businesses that would expect to compete form a cartel; they secretly conspire to raise prices or lower the quality of goods or services for purchasers who wish to acquire products or services through the bidding process, with the result that the purchaser gets less for its money. Bid rigging is the typical mechanism of collusion in public contracts: the bidders

determine between themselves who should “win” the tender, and then arrange their bids in such a way as to ensure that the designated bidder has selected by the purportedly competitive process (OECD, 2011).

Another type of unethical behavior that effects on the bidding process is a cover price, which has been providing at a rate specifically designed to lose a tender but which appear to be competitive. The major reasons for the issuing of cover prices appear to be little contractor’s interest in the contract for sale. lack of contractors' resources to competently complete the work, shortage of time for buyers to compile tender, a desire to remain considered for future sales; and, little chance of winning due to the large number of competing buyers for the same contract (Shrair A N, 2011) & (Ayoti, B.N., 2012).

Corruption occurs where public officials use public powers for personal gain, for example, by accepting a bribe in exchange for granting a tender. While usually occurring during the procurement process, instances of post-award corruption can also arise. Both collusion and corruption prevention are necessary aspects of an overall strategy aimed at protecting the integrity of the public procurement process (OECD, 2011).

Other problems associated with the competitive lowest evaluated bid method is that when the number of bidders is as large as is the case in a slow economy, and owner runs a significant risk of selecting a contractor that has either accidentally or deliberately submitted an unrealistically low price. 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 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.

The low bid award system encourages unqualified bidders to state 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, economic, social, and cultural risks, as well as internal risks from within the project. The following are the major risks associated with 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. 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 (Quantson Y, 2014).

Some of the major factors causing low bidding are as follows: (Bista & and Dahal, 2018). Imprecise and ambiguous contract documentation (including incomplete drawings) may cause a contractor to make a serious omission in calculating costs.

- Preparing tenders by using estimates of historical data and traditional norms causes errors in estimation and usually, prices are under estimate.
- With increasing number of contractors and competition among them, bidders quote low prices to get the contract anyhow to remain in business.
- To have utilization of their ideal resource machine, equipment's and vehicles enforces contractors to bid in low price in construction business of public sector.
- Work in hand and favorable location of site may affect the bid price. If no work in hand, lower is the bid price and if the new site is adjoining in current site of the contractor, this can be a big factor for low bid.
- Nature of work i.e. lower bid in works only with earthworks and simple structures than in works with major structural works.
- Contractor's perception on variation, Contractors initially go for abnormally low bid with the intention of recovering their losses through change orders and claims, also known as predatory bidding.
- Weak contract administration of client leading to assumption that specified work quality has not maintained.
- No site visits before bidding and no understanding of detail scope of work by contractor.
- Contractors have to bid low to increase annual turnover, engage and train staff and utilize equipment and they claim that they manage their company effectively so that there will be optimum use of resources and they will be benefited even if the bid low.

2.5 Impacts of Least Bidder Bid Awarding System

In public construction works, this practice almost universally accepted since it not only ensures a low price but also provides a way to avoid fraud and corruption. Moreover, the traditional approach tends to promote more adversarial relationships rather than cooperation or coordination among the contractor, the designer and the client, and the client generally faces increased exposure to contractor claims over design and constructability issues (Deep, Singh, & Ahmad, 2017). The principal reason for the construction industry's poor performance has been attribute 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 companies. In Ethiopia, the commonly used procurement method is the competitive lowest evaluated-bid procedure in which contracts awarded to responsive contractor who offers the least price after technical evaluation (Quantson Y, 2014).

The most common method of awarding the contract as per government of India recommendation is the Least Responsive Bidder or Price Based method, which has inherent flaws of high competition and minimum performance. These incompetent practices pose constraints like:

- Schedule delays
- Increase in total cost of the project, resulting in bankruptcy of companies
- Poor construction quality
- Serious question on public safety
- Overall project failure

Under this low-bid system, contractors submit bids based on plans and specifications prepared by the public agency or a consulting firm hired by the agency, except in case of low-priced works, the contractor submitting the lowest responsive bid has awarded the contract. Generally, experience levels of the contractor, quality issues, and other criteria not taken into consideration in awarding these contracts (Deep, Singh, & Ahmad, 2017).

There are definite risks associated with the lowest evaluated bid award system. Many 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. Lowest bidders are required to complete a construction project that no one else was willing to do at that price (Quantson Y, 2014).

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. 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 (Thomas, 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 (Quantson Y, 2014). Such low bids have submitted seldom accidentally and more often deliberately to win the contract. It has seen to encourage cost-cutting measures instead of quality enhancing measures. So, it is likely that contractors that deliver best quality construction will not be awarded the contracts. This leads to excessive claims and disputes and results in increased cost and schedule delays. The use of bid prices as the basis for contractor selection is the major critique of current selection practice in many countries (Bista & and Dahal, 2018). 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. According to (Quantson Y, 2014), the two main factors affecting contractor performance were Financial and Managerial Capacities of the firm. Under the financial factors, 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.

Accepting the lowest price is the basic cause of the project completion problems due to often lowering the price means lowering the quality. Although the lowest bidder system protects the public from improper practices, it has certain significant disadvantages including extensive delay, cost overrun, quality problems and increased number of claims and disputes. The impact of time overrun is more severe in public building projects than cost overrun in the low bidding award system. To enhance the condition of construction industry the contractors must make a normal or fair bid through which they could earn reasonable profits so that they can deliver the project within required time, cost and quality. Competitive low bid method is favored for saving a considerable amount of money and minimizing the level of favoritism and corruption and by the application of such method, found negative impact on contractor's profit, disputes and claims, coordination, quality control, project cost and duration. Other alternative bidding procedures such as the weighted multi-criteria selection methods of contractor, competitive bidding method awarding contracts to the lowest bidder, which is within some predefined range of engineers' estimate, and competitive average-price based bidding included in the study are the suggestions to avoid low bidding (Bista & and Dahal, 2018).

European Union (EU) introduced a legislation to allow public sector organizations the option of awarding a construction contract by applying either traditional low bid or the Economically Most Advantageous Tender (EMAT). This aided public sector clients to reduce their exposure to some of adverse effects of extremely low tenders (ALT), including: poor quality of work due to reduced construction cost; and Predatory pricing and unfair competition that disturbs the market, negatively affecting other participants (Deep, Singh, & Ahmad, 2017).

Some of the major impacts of low bidding are; Delay on project completion (more severe than cost), Cost overrun, Low quality work, Claims and Disputes, Financial difficulty in effective contract management. Searching loop holes for omitting some items or quantities of work and Compromising quality and making unnecessary claims makes intended result in terms of project constraints difficult to achieve (Bista & and Dahal, 2018).

According to (Farooqui R U & Ahmed S M, 2008), the negative consequences of low-bid system on work environment and team relationships, ranked as; Increased No. of

Claims, Increased No. of Disputes, Work Suspensions, and Increased No. of Change Requests/ orders and higher cost of contract administration were the factors that could affect the project outcome, and work environment and team Relationships.

2.6 Comparison of LBBA System with Other Bid Awarding System

Multiple criteria selection (MCS) has extensively studied all over the world and research has focused on different aspects of the method. The research topics in the field include, what weight clients use for non-price criteria against price, how frequently the method is used compared to the lowest-bid wins' approach, what criteria are the most frequently used, how these criteria affect project outcome and what method should be applied for evaluating the criteria when a contractor was selected. In recent years, the research focus has slightly shifted towards developing better techniques to assess the criteria for contractor selection due to recent technical developments, and techniques such as neural networks, fuzzy decision-making, and web-based technologies have gained grounds in the field of contractor selection research (Brynjarsdottir, 2016).

The construction industry is inherently uncertain and geotechnical conditions, weather, conflicts, and design errors are just a fraction of things that can affect the project outcome. On top of this, the selection of an unfit contractor can increase the likelihood of, among other things, low quality and time overruns, which will eventually affect the bottom line of the organization. The fact that price and cost do not always go hand in hand has to be kept in mind when selecting a contractor, since the low initial cost can result in high cost in the long run due to unforeseen affects. The benefit of multiple criteria selection has established when concluded that a correlation exists between project success and the extent of contractor evaluation carried out by clients. That is, contractor failure becomes less likely when more effort is put into evaluation of contractors before bid acceptance and similarly claimed that pre-qualification should be applied to minimize the risk associated with construction (Brynjarsdottir, 2016) & (Khan T H & Khan A Q, 2015).

Alongside the numerous recommendations of using the MCS method, few researchers have raised the question of the financial feasibility of the method. Even though it is technically possible to gather enough information on all contractors bidding for a contract, so that the best contractor has always selected, it is likely to be financially

infeasible. The impact of contractor selection methods on transaction costs, which they categorized as ex-ante and ex-post costs. Ex-ante costs include costs incurred before awarding a contract, for example, costs of tendering, while ex-post costs incurred after the award of contract to a contractor, for example, due to poor quality or delays. They argued that complex contractor's selection systems could increase ex-ante costs too much to outweigh lower ex-post costs and that future research should focus on cost-benefit analysis of contractor selection methods to evaluate the impact of selection methods on transaction costs. Applying additional criteria to the evaluation method applied is often unlikely significantly affect the choice of a bidder. However, the risk and possible long-term costs associated with the project in question should keep in mind when a contractor selection method has chosen (Brynjarsdottir, 2016).

2.7 Alternative Bid Awarding System

Bidding procedures are mainly negotiated and competitive. Mostly, the other methods are either variant of, or somewhat between these two significant types. In competitive method, the work has awarded to the least bidder, if he/she has proved a responsive one. In negotiated method of procurement, the cost has discussed and negotiated with selected constructor (Bista & and Dahal, 2018) & (Khan T H & Khan A Q, 2015). Some modifications have been proposing for minimizing the concerns and implications of these two extreme types, and tried in many countries. In addition to lowest bid awarding (price only) system, the following contract-award methods are used in different countries (Letarge B, Quezon E T, & Macarubbo Y C, 2016).

2.7.1 Competitive Low Bidding (Price-based)

In the procurement process, a standard practice for many organizations who are interested in using the competitive nature of bidding is to keep procurement costs low. The competitive bidding process for awarding construction contracts typically based on the low bid method. According to this method, the construction firm submitting the lowest bid receives the right to the construction contract i.e. contract is awarded to the responsive and compliant bidder that is willing to fulfill the terms of the contract for the lowest dollar value. Currently, the public sector procurement of construction largely based on the lowest bid award system. The customary practice of awarding contracts to a lowest bidder established to ensure the lowest cost for completing a

project. In public construction works, this practice almost universally accepted since it not only ensures a low price but also provides a way to avoid fraud and corruption (Khan T H & Khan A Q, 2015).

For the procedure to be fair and workable, it is required to have a clearly defined criterion to help the bid-evaluating officials determine whether bids are responsive and the bidders seem to be responsible. In the competitive lowest-bidding method, the prequalified and responsive bidder who submits the least bid, meeting the specifications must be winner of the contract.

2.7.2 Competitive Average Bidding (Price-based)

One of the variations of the competitive lowest bidding method of awarding construction works is based on the principle that the bid closest to average of all the bids is considered to the best bid, and not the one which is minimum or maximum (Letarge B, Quezon E T, & Macarubbo Y C, 2016). The bid, which is greatly higher than the mean has considered unrealistically overbid. Generally, the best contractor based on the average-bidding method is the bidder whose bid satisfies a particular correlation with mean of all the bids. For average-bidding method, different measures have used for calculation of the average, or use different criterion for evaluating the best bid. However, the point to remember is that this method takes into account the price only. Another approach of obtaining the average includes the elimination of all the bids which differ largely (more than a specified percentage) or the outliers and then the mean of the remaining bids is calculated. The formula is similar to the PERT and stands as following: -

Where, $NA = (NH + 4A + NL) / 6$

NA = New average; NH = New high;

A = Average of all offers &NL = New low

The fundamental idea of the average bidding method is that the best bid is the one closest to a defined average, neither the minimum nor the maximum. These competitive cost- based average-bidding methods have mainly used to make sure that the selected contractor is responsible, to minimize project failure, and to avoid disputes and construction claims. The major advantage of this method is that it safeguards a client from signing a contract at an unrealistic low bid price that will certainly lead to adversarial relationships during construction. The basic disadvantage

of the average-bidding method is that it does not promote competition that leads to lesser costs for the client. A breakthrough (technological or managerial) resulting in major money savings not necessarily be passed on to the client in the form of lower costs, unless all participating bidders are known to have this breakthrough (Khan T H & Khan A Q, 2015).

2.7.3 Multi-Parameter Bidding Method (Based on price and “other” factors)

This is a model-based competitive bidding, which not only caters for cost but also considers other parameters. It suggests that the major parameters should be cost, time and quality with minor parameters on the discretion of the client. The amount of time proposed in the bid to complete the project can have an impact on cost. In Multi-Parameter Bidding Method, estimation of quality has calculated by the kind of materials and type of equipment proposed be used, the past performance of the main contractor and the subcontractors, which are proposed in the bid. In Multi-Parameter Bidding Method, time and quality parameters have assigned a maximum number of attainable points. The bids have then evaluated and ranking has made based upon these points, as well as the bid cost. Some other parameters may also be included in the model as desired by the owner. Other factors may include safety records, past working experience with the client, history of disputes and claims, defect rectification history etc. In this method, a “total combined cost“will come up after applying all these factors. The total combined costs of all the bids have then compared to pick the best bidder.

In this method, factors other than cost have considered before contract award decision has made. This was done in a more meticulous fashion than the traditional practice of prequalification procedure. Technical merit, time and quality factors have given more emphasis in bid evaluation. Some people stress that the innovation has needed for the sake of time and high quality, to get better value for the public money, to minimize life-cycle costs of a product for the public department, while maintaining a reasonable profit for the contractor (Khan T H & Khan A Q, 2015).

2.7.4 Competitive Negotiated Bidding

At times, it becomes necessary to obtain bids from a selected group of builders who possess known technical, managerial and financial capacity to complete a multi-

dimensional complex project. Some classified projects may also require only those contractors who can perform work at some specific place. In such circumstances, competitive price-based open bidding may not be suitable. On the other hand, the single-source negotiation method is very hard to put into practice in public sector as this may lead to allegations of corruption and favoritism. To stay away from these problems with single-source negotiated bidding many organizations and clients are using variations that include features of both competitive and negotiated methods. To modify the pure negotiated method, an increase in the number of construction companies/contractors to negotiate with, provides multiple options for selecting amongst the contractors.

In few cases, based on previous experience or reference, some companies, which are well known to be professional and competent to complete a construction project, are contacted by the owner or client. The owner may negotiate a tender with the most qualified company for professional services at compensation, which the organization determines, are fair, competitive, and reasonable. In making such decision, the public body must analyze the price of the professional services needed in addition to their complexity and scope.

Request for proposals and/or request for qualification for a particular project are typical examples of competitive negotiated method. Proposals from more than one contractor have scrutinized for factors such as technical capability, project schedule as well as cost. These methods have usually engaged when the project has planned to built under a design build contract. Promoters of competitive negotiated bidding method claim that this method saves time, improves quality and reduces number of claims. The main pitfalls of this method are; (1) the cost and time spent by the contractor for preparing a proposal is higher. (2) The system lends itself to a situation where the contractor is reserved to propose any new or innovative ideas because preconceived ideas of the evaluators may not fit in the particular situation. Contractors are required to disclose confidential commercial and financial information that should not release outside the company. Moreover, (3) 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

utilize. In addition, the processes of evaluation turn out to be subjective rather than objective (Khan T H & Khan A Q, 2015).

2.7.5 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 cost to be paid, and the product or goods to be procured by the owner are normally the items of negotiation. The firm that has known to be prequalified and having expertise can choose without any notification or tendering advertisement. This saves additional effort, time and money but chances of favoritism and corruption are increased. Direct procurement is usually common in the form of variations or change orders in the construction industry. This method is very common in new construction projects in the private sector like housing, commercial buildings, private schools, hospitals, industries etc. However, in government construction projects, it is almost nonexistent (Khan T H & Khan A Q, 2015).

2.8 Research Gap Identification

In Ethiopia, public construction projects, numerous problems that can be easily observed in the performance of the projects that are awarded in the lowest bidder bid awarding system, despite the problems observed there was only limited research performed to analyze the performance of the projects, which passes through this system. The application of other competitive bidder selection methods legally prohibited; the rules and regulation of construction procurement has not open ended. Therefore, the options not practiced and the result not observed in Ethiopian construction industry so that to address the above gaps in the industry this research plays a vital role.

2.9 Summary

Construction procurement is the process of identifying, selecting and commissioning the contributions required for the delivery of alteration, refurbishment, maintenance, extension or demolition of an existing building or structure, and/or the creation of a new building or facility, to include all associated and related site works. Successful construction procurement has regarded as a project delivered on time, to cost, and to the desired quality, capable of performing the specific function required by the client (Bolumole, I., 2017). The challenges of lowest bidder bid award in the system are;

preparing tenders by using estimates of historical data and traditional norms causes errors in estimation. and usually, prices are underestimated, With an increasing number of contractors and competition among them. bidders quote low prices to get the contract anyhow to remain in business, to have utilization of their ideal resource machine, equipment's and vehicles enforces contractors to bid in low price in construction business of public sector, Work in hand and favorable location of site may affect the bid price. If no work in hand, lower is the bid price and if the new site is adjoining in current site of the contractor, this can be a big factor for low bid, Nature of work (Bista & and Dahal, 2018).

Some of the effects of lowest bidder bid award system are; Schedule delays, an increase in total cost of the project, resulting in bankruptcy of companies, Poor construction quality, serious question on public safety and Overall project failure. Under this low-bid system, contractors submit bids based on plans and specifications prepared by the public agency or a consulting firm hired by the agency, except in case of low-priced works, the contractor submitting the lowest responsive bid awarded the contract. Generally, experience levels of the contractor, quality issues, and other criteria not taken into consideration in awarding these contracts (Deep, Singh, & Ahmad, 2017).

As suggested in the literature the variety of methods by which integrity of the public procurement process protected or improved. Such mechanisms include opening national markets to international competition, Redesign of the procurement process, Certificates of Independent Bid Determination (CIBD), Education of public officials, Data analysis tools specialized review mechanisms for public contract awards whereby unsuccessful bidders who suspect flaws in the procurement procedure can challenge the award before a specialized tribunal. While such procedures can identify individual instances of corruption or collusion, they are generally unsuitable for detecting patterns of corruption and/or collusion across many contracts, Auditing of public procurement procedures, whether conducted internally by a separate wing of the relevant public agency, or externally by an independent State body with specific powers of audit (OECD, 2011).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Study Area

This research conducted in Jimma zone Oromiya regional state, and southwest Ethiopia at a distance of 346 Km far from Addis Ababa the capital city of Ethiopia. Its astronomical location is $7^{\circ}40''$ N North latitude and $36^{\circ}50''$ East and elevation varies from 1780-2000m above sea level. The ground water level in the area is variable and which ranges from 3-7m. The location of the research area has shown in the figure below. (<https://www.mudco.gov.et>, 2008)

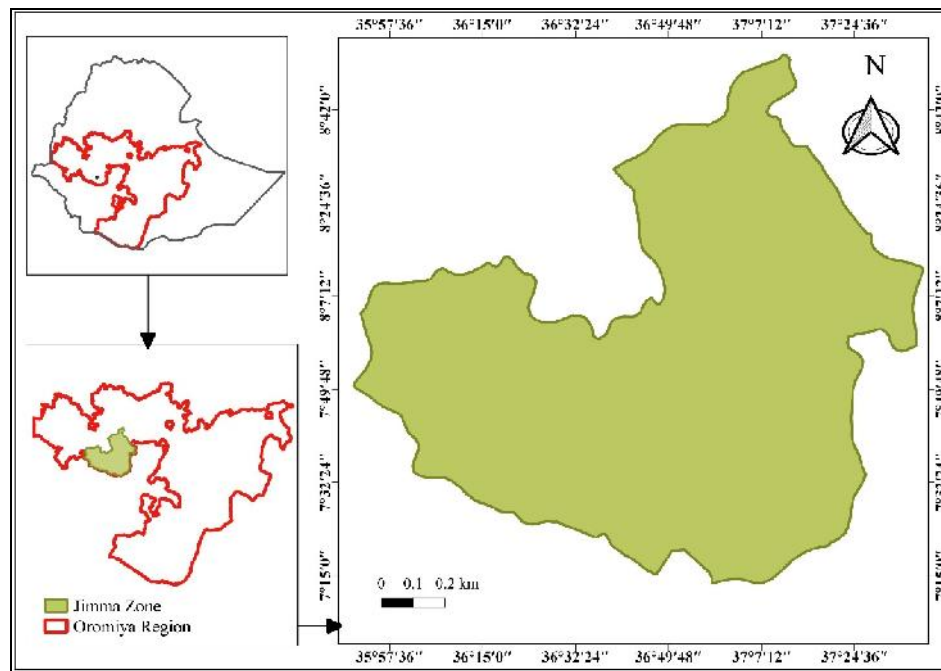


Figure 3.1 Map of Study Area (Q GIS 3.10)

3.2 Research Population and Sampling Method

3.2.1 Research Population

The targeted populations of this study was public sector building construction projects in Jimma zone there are questions responded by clients, contractors and consultants involved in a public building construction projects that has completed in the last five years, terminated and projects which are under construction or on progress. From the targeted populations in the research; the populations were public sector clients in Jima

Zone; the second population comprises contractors that were participated in Jima Zone public building construction projects; that they are registered under the category of general contractors and Building contractors and currently participating in building projects in the study area. These categories are “1st, 2nd 3rd, 4th and 5th”, with valid registration. The small categories (above fifth) are not considered due to the low practical and administrative experience of their companies in construction works and the low experience in lowest bidder bid awarding system. The third population included in this study were, consultants who are serving for Jima zone construction projects and private consultants working in the public sector building construction projects.

3.2.2 Sample Size

The required sample size for the research for each party involved in the survey was determined statistically using the following formula expression.

$$SS = \frac{Z^2 * (P) * (1-P)}{C^2} \text{----- (1)}$$

$$\text{New SS} = \frac{SS}{[1 + (ss-1) / \text{Pop}]} \text{----- (2)}$$

Where:-

SS = Sample Size

Z = Z-value (e.g., 1.645 for a 90 percent confidence level)

P = Percentage of population picking a choice, expressed as decimal (p=0.5)

C = Confidence interval, expressed as decimal (e.g., .04 = +/- 4 percentage points)

To maximize SS, p was set at 0.5. The total populations, N were, 191 for the client, contractors, and consultants. The list of Client, contractors and consultants were obtained from the public construction projects of Jimma zone. Substituting in Equations 1 and 2 above, the minimum required samples is 132 professionals that have been involved in the Jimma zone public construction projects. This means that the minimum sample size of 35, 75, and 22 for the client, contractor and consultant respectively is statically acceptable for analysis of the responses.

The professional included directors, Department heads, section heads and project engineers from client side, Resident Engineer, Assistant Resident Engineer and Supervisor from the consultant's side, project managers and site engineers from the contractor's side.

3.3 Study Variables

I. Dependent Variable

- Performance of lowest bidder bid awarding system

II. Independent Variables

- Procurement policy
- Miss-conducting
- Legal Aspects of Contract

3.4 Data Measurement

Rank-ordering data simply puts the data on an ordinal scale. Ordinal measurements describe order, but not relative size or degree of difference between the items measured. In this scale type, the numbers assigned to objects or events represent the rank order (1st, 2nd, 3rd, etc.) of the entities assessed. A Likert Scale is a type of ordinal scale of measurement. Likert scales provide a range of responses to a statement or series of statements. Usually, there are 5 categories of response ranging from 5 = very high to 1 = very low with a 3 = neutral (no idea) type of response (Croasmun, T, & Ostrom L, 2011). The level of agreement of the participant are measured on five-point Likert scales anchored by very low (1) to very high (5). A scale type and nominal data measurements has used in this research in addition to Likert data measurement system.

Table3. 1: Likert scale data measurement

Classification	Very High	High	No Idea	Low	Very Low
Degree	5	4	3	2	1

3.5 Response Rate

The concept of response rate refers to the percentage of individuals who responded to a survey that has administered to them. It is calculated as, the number of survey responses divided by number of individuals to whom the survey was administered. The level of response rate (RR) is an important, sometimes crucial, issue in relation to validity of results. When determining a true response rate, the number of unusable questionnaires must also be determined and taken into consideration. Unusable questionnaires are the result of missing data, usually negligible. The useable number of surveys is the relevant RR. The average and reasonably acceptable response rate are 60% +/-20 meaning that anything below 40% has not reasonably acceptable and would generate validity issues. If the RR is an extreme case, either above or below, justification for usage and accountability must made (Croasmun, T, & Ostrom L, 2011). As shown in the table 3.2, from the total distributed questionnaire 76.67% of the public sector clients returned the questionnaire, 96% of the contractors and 85% of the consultants returned the questionnaire, so the response rate is acceptable for all the three categories of the respondents.

Table 3. 2: Response rate

Respondents	Target Population	Questionnaire Distributed	Questionnaire Received	Response Rate (%)
Client	35	30	23	76.67
Contractor	75	75	72	96
Consultant	22	20	17	85
Total	132	125	112	89.6

3.6 Research Design

Research design is the arrangement considered for the collection and analysis of data to achieve the objectives of the research. A qualitative and quantitative survey design was used in this research. The research was qualitative type because it concerned on describe the gaining information about the lowest bidder bid awarding system and it is a quantitative type because it tried to specify the results of different stakeholders' point of view numerically.

3.7 Source of Data

The data collection approach adopted in this study has both primary and secondary sources. Questionnaire, interview, and case assessment provides the primary data for this research while the secondary data sources include; Books, Journals, previous researches and internet sources. The research combined the use of quantitative and qualitative approaches in which questionnaires and interviews used to obtain relevant information about the subject from professional construction practitioners. Questionnaires organized from literature review and previous researches. Interviews on the other hand are great in gathering opinions face-to-face directly from the participants which questionnaires are unable to reveal. According to (Mosissa A, 2013), questionnaires are a very convenient way of collecting useful comparable data from a large number of individuals. However, questionnaires can only produce valid and meaningful results if the questions are clear and precise and if they asked consistently across all respondents. Therefore, careful consideration should be given to the design of the questionnaire. The questionnaire designed to answer the research objectives by the information gained from the participants in the research. The questionnaire has three sections listed below, which has designed to be responded by public sector clients, contractors and consultants.

- 1) General Information
- 2) Challenges of LBBA system of public construction projects
- 3) Impact of LBBAS (Lowest Bidder Bid Awarding System)

3.8 Data Analysis

The collected data from respondents was analyzed by the use of Statistical Package for Social Science (SPSS Version 25) to interpret data collected by questionnaires and micro soft excel is used to analyze simple data.

3.8.1 Correlation Coefficient and Reliability Analysis

Correlations estimate the strength of the linear relationship between two (and only two) variables. Correlation coefficients range from -1.0 (a perfect negative correlation) to positive 1.0 (a perfect positive correlation) the closer a correlation coefficient gets to zero, the weaker the correlation is between the two variables. If $p < 0.05$, reject the null of no relationship and conclude that the relationship is statistically

significant. If the correlation is "statistically significant" SPSS also flags this number with either a (*) [significant at least at the 0.05 level] or (**) [significant at least at the 0.01 level]. If the correlation statistic does not have a minus in front of it that means that the correlation is positive, which means that high scores for both variables go together, and low scores for both variables go together. If the correlation statistic had a minus in front of it that would mean that as the values of one variable goes up, the values of the other variable goes down (i.e., a negative or inverse correlation). The level of significance for the correlation (a level of 0.05 or smaller is considered "statistically significant") (Gliem J A & Gliem R R, 2003). Cronbach's alpha reliability coefficient normally ranges between 0 and 1. The closer Cronbach's alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale. George and Mallery (2003) provide the following rules of thumb: 0.9 – Excellent, 0.8– Good, 0.7– Acceptable, 0.6– Questionable, 0.5– Poor, and 0.5 – Unacceptable". Cronbach's alpha most commonly used to assess the internal consistency of a questionnaire (or survey) that is made up of multiple Likert-type scales and items (Gliem J A & Gliem R R, 2003).

3.8.2 Interpretation of Item-Total Correlation Coefficient and Cronbach's Alpha

The Corrected Item - Total Correlation column tells how much each item correlates with the overall questionnaire score. Correlations less than $r = 0.30$ indicate that the item may not belong on the scale. The Cronbach's Alpha if Item Deleted tells, if the score goes down if we deleted an item, we want to keep it. However, if this score goes up after the item has deleted; we might want to delete it, as it would make our questionnaire more reliable.

3.9 Data Collective Procedure

The research will follow the following main data collection procedure:

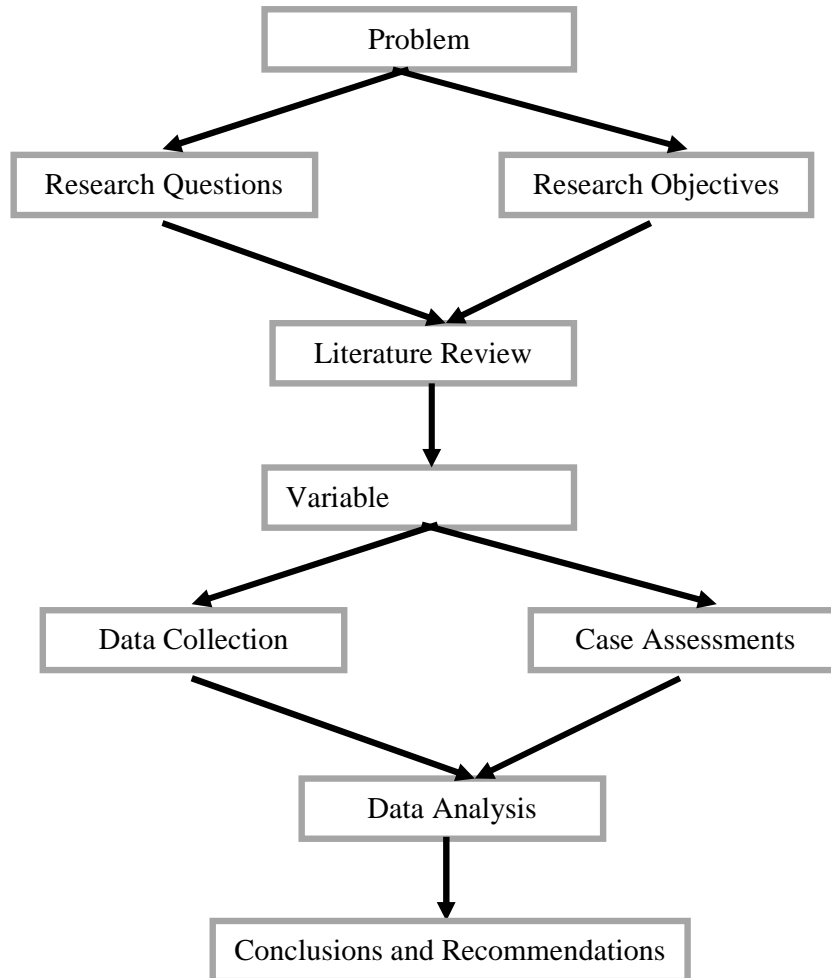


Figure 3.2 Research framework

CHAPTER FOUR

RESULT AND DISCUSSION

4.1 General Information of Respondents

4.1.1 Owners General Information

The following are the general information obtained from the survey result for the public sector clients participated in this research study.

A. Way of contract award to the lowest bidder

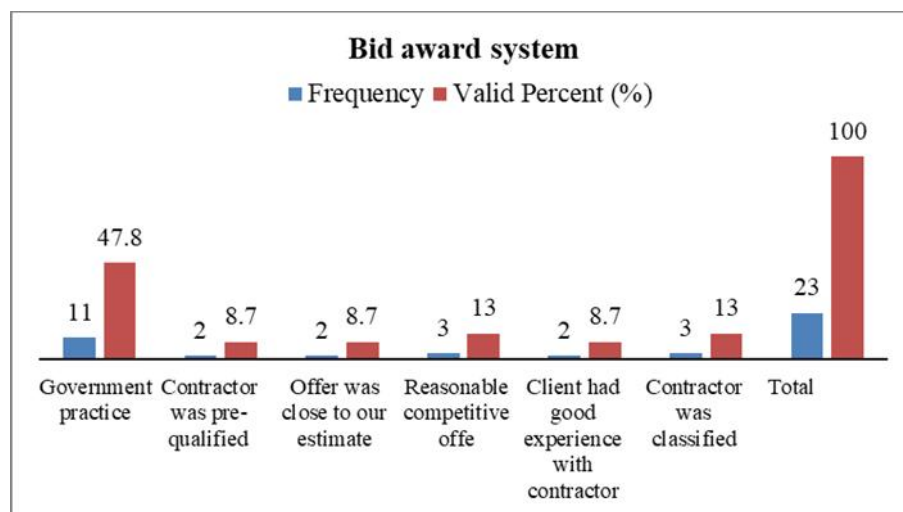


Figure 4.1 Bid award system

Figure 4.1 is about the criteria's used by the public sector clients to award a contract to a lowest bidder in a government project. From the total respondents 47.8% said that the reason for the use of lowest bid award system because of it is a government practice, 13% of the respondents agree that because of it has a reasonable competitive offer (No large difference from others) and the contractor was classified. Finally, 8.7% of agree that it is due to the contractor was pre-qualified and the offer was close to our estimate and the client (yourself) had good experience with the contractor. The above result shows that the lowest bidder bid award system is used in public construction projects is because of it is the governments practice.

B. Major Difficulties Encountered During the Construction Process

Table 4.1 Major difficulty encountered during the construction process

Major difficulties	Yes		No		Unknown	
	Freq.	%	Freq.	%	Freq.	%
Material Shortage	20	87.0	2	8.7	1	4.3
Equipment Shortage	19	82.6	2	8.7	2	8.7
Cash Shortage	22	95.7	22	95.7	-	-
Man Power Shortage	14	60.9	6	26.1	3	13.0
Employer Interference	8	34.8	8	34.8	7	30.4
Design/Drawing related	11	47.8	9	39.1	3	13.0
Supervision Related	14	60.9	5	21.7	4	17.4
Total no. respondent	23					

Table 4.1 shows the level of agreement from the participants of public sector clients about the major difficulties encountered during the construction process. From the participants 87% of the public sector clients agree that Material Shortage is the major difficulty, which has encountered in a construction project. From the respondents 82.6 % agree that Equipment Shortage is the other factor which affect the performance of a project and 95.7% of the participants put Cash Shortage is the one, which affect contractor’s performance. 60.9% of the participant agreed on Man Power Shortage as major difficulty and 26.1% participant replied ‘no’. Design or Drawing related and Supervision Related issues have responded as a least affecting factor during project performance period.

C. Contractor’s Performance Evaluation

Table 4.2 Evaluation of contractor’s performance

Item	Excellent		V. Good		Good		Fair		Poor	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Quality of work	1	4.3	2	8.7	8	34.8	5	21.7	7	30.4
Adherence to construction and specification	2	8.7	4	17.4	8	34.8	9	39.1	-	-
Organization	-	-	12	52.2	5	21.7	5	21.7	1	4.3

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Activity work follow-up and submission	2	8.7	9	39.1	8	34.8	4	17.4	-	-
Cooperation with owner	2	8.7	12	52.2	7	30.4	2	8.7	-	-
Progress of work	4	17.4	9	39.1	6	26.1	4	17.4	-	-
Total No. respondent	23									

Source: SPSS V25

Table 4.2 shows the result obtained from participants of public sector clients about the evaluation of performance of contractors in public building projects in Jima zone under the procurement system of lowest bidder bid awarding system. From the total participants 34.8%, 21.7%, 30.7%, 4.3% and 8.7% ranked “Good”, “Fair”, “Poor” “Excellent” and “V. Good” respectively about the quality of work performed under lowest bidder bid awarding system. The result shows that the quality of work performed were not satisfactory according to the response participants of public sector clients. For the item “adherence to construction and specification”, 34.8% ranked “Good” and 39.1% of the respondent ranked “Fair”. Higher number of the respondent ranked “V. Good” and “Good” for the item “organization, Activity work follow-up and submission, Cooperation with owner and Progress of work” for the projects completed for the last five year and projects under construction.

D. Information from contractors in order to prepare the evaluation list in the system of LBBA

Table 4.3 Evaluation criteria for LBBA

Basic Criteria's	Score									
	Very low		Low		No idea		High		Very high	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Financial stability	-	-	-	-	-	-	9	39.1	14	60.9
Technical & management ability	-	-	-	-	-	-	6	26.1	17	73.9
Experience	-	-	-	-	-	-	9	39.1	14	60.9
Health and safety	2	8.7	1	4.3	4	17.4	15	65.2	1	4.3
Reputation	1	4.3	1	4.3	-	-	18	78.3	3	13.0
Culture experience	7	30.4	9	39.1	3	13.0	4	17.4	-	-
Total no. respondent	23									

Table 4.3 shows the result obtained from participants of public sector clients about the sort of information that their organization is seeking to obtain information from bidders in order to prepare the evaluation list in the system of LBBA. From the list of criteria's, the participants ranked "financial stability, Technical & management ability, Experience and Reputation" with a scale of "High" to "Very high" in order to obtain information about the bidder qualification to the specific contract. Next to the above qualification requirement, "Health and safety" issue considered as an important factor with a rank of "High". And finally, "Culture experience" was considered as a least important factor used by the public sector clients to select bidders to a contract in a lowest bidder bid awarding system in case of Jima Zone public building construction projects.

E. Fair and transparent of Bidding procedure

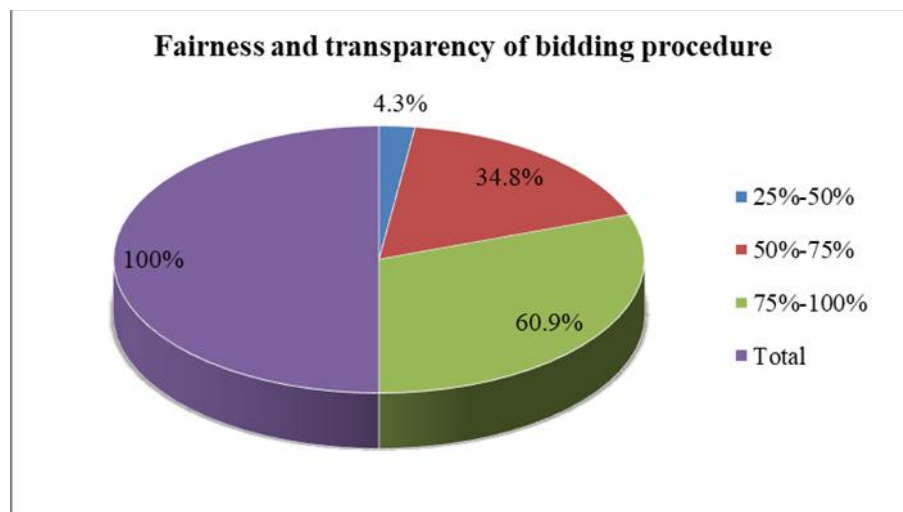


Figure 4.2 Fairness and transparency of bidding procedure

Figure 4.2 Shows, the fairness and transparency of bidding procedure that made in the construction industry of Ethiopia. From the participants of public sector clients, 60.9 % and 34.8 % of the respondents agree that the bidding procedure is transparent from 75%-100% and 50%-75% of the participants agreed that the bidding system is transparent respectively. Finally, only one respondent argues that the he procurement system is not fair and transparent with a ranking scale of 25%-50%.

F. Level to assess contractor selection process take place in LBBAS

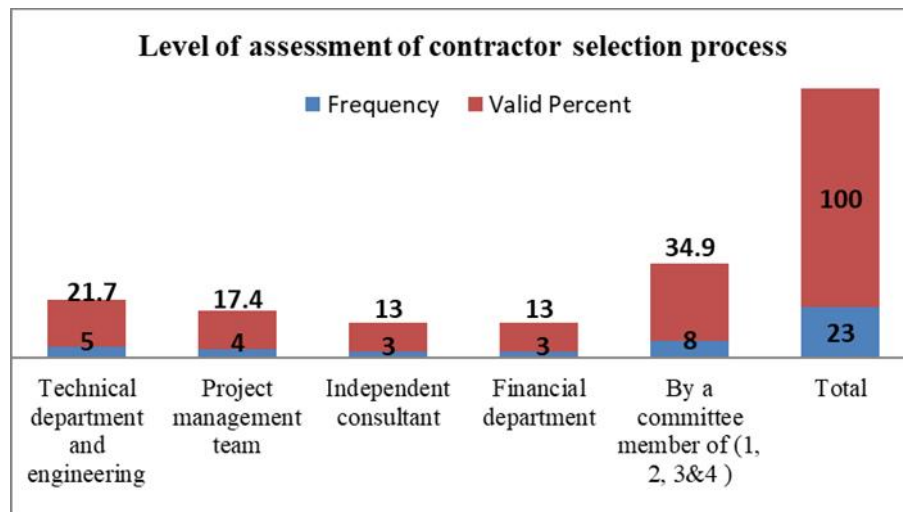


Figure 4.3 Level of assessment of contractor selection process

Figure 4.3 Shows the result obtained from public sector clients about the level of assessment that will take place in public procurement procedure by whom the responsibility to select and qualify contractors in a lowest bidder bid award system. From the participants of the clients, 34.8 % of the participants replied that the selection process is undertaken by a committee member includes Technical department and engineering, Project management team, Independent consultant and financial department. 21.7% the participants replied that the contractor assessment and selection responsibility is undertaken by Technical department and engineering. 17.4 % of the participant replied that Project management team is responsible to select and qualify contractors to a contract. Finally, 13 % of the participants replied that Independent consultant and financial department take the mandate for the assessment and selection of contractor in a lowest bidder.

4.1.2 General Information for Contractor respondents

I. Classification of Contractors in building works

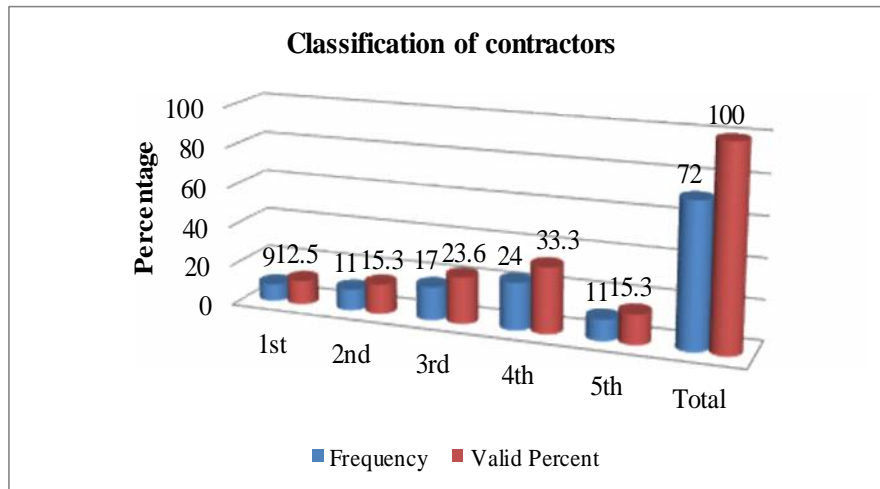


Figure 4.4 Contractor of classification

Figure 4.4 shows the classification of contractors registered as general contractor and building contractors involved in Jimma Zone public building construction projects. From the total respondents participated in the survey study, 12.5%, 15.3%, 23.6%, 33.3% and 15.3% of the respondents were grade-1, grade-2 grade-3, grade-4, and grade-5 contractors. The result shows that grade-4 contractors are higher in number than other grade of contractors.

II. Respondent position

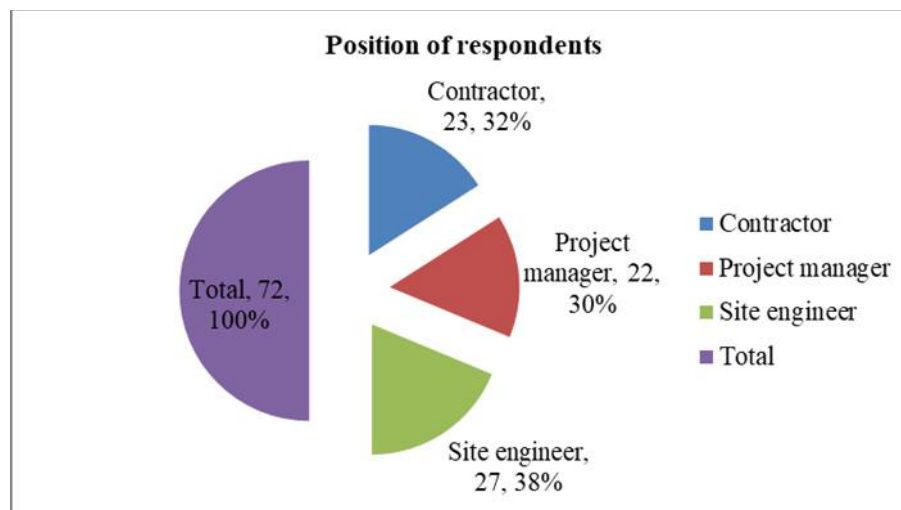


Figure 4.5 Position of respondents

Figure 4.5 shows position of respondents form the contractor’s side that participated in the survey study in Jima Zone public construction project. From the total 72 participants, 32 % of the respondents were contractors, 30 % were Project manager and 38 % were Site engineer. From the above result, most of the respondents in this study were site engineers.

III. Respondent Experience

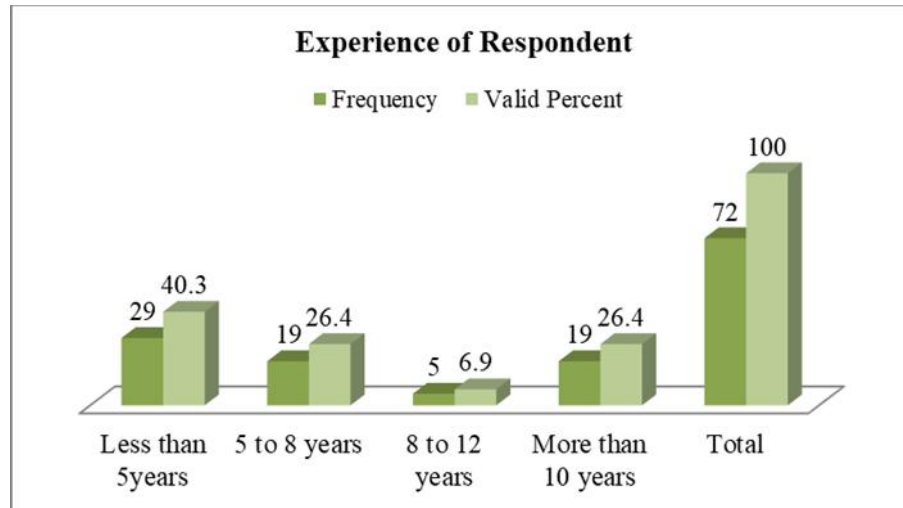


Figure 4.6 Experience of respondent

Figure 4.6 shows the result obtained from survey results of experience of respondents of contractor who were participated in Jima Zone public building construction projects for the last five years and currently under construction. The survey result shows that 40.3%,26.4%, 6.9% 26.4% of the participants with an experience are less than 5, 5 to 8, 8 to 12 and more than 12 years respectively. The result obtained from the survey indicates that the respondents with an experience Less than 5 years were maximum.

IV. Organization Experience in constructions



Figure 4.7 Organization experience

Figure 4.7 shows the result obtained from the participants of contractors about their organization experience in the construction industry. The survey result indicates that the contractor's experience from 3 to 5, 6 to 10, more than 10 years, were 22.2%, 20.8%, 56.9% respectively. From the total participants that were participated in Jima Zone public building construction projects majority of the construction organization with an experience of more than 10 years.

V. Implemented project number in the last five years

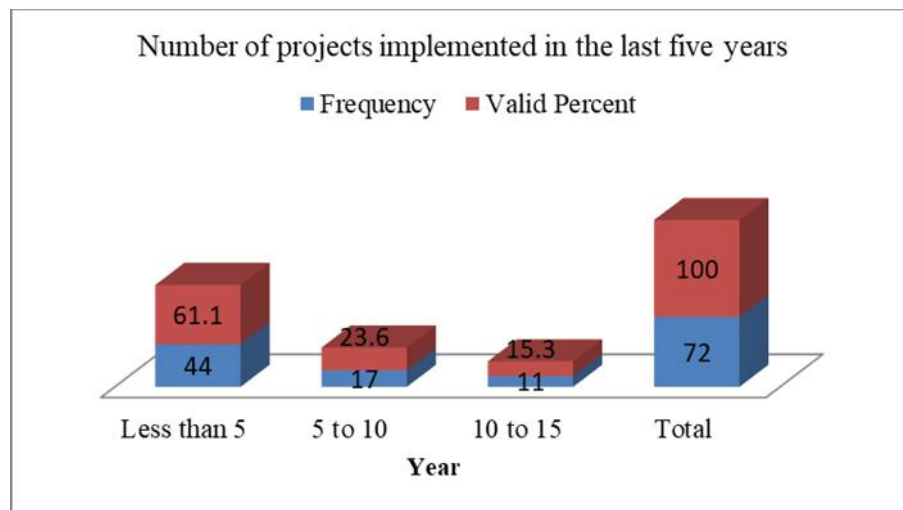


Figure 4.8 Number of projects implemented in the last five years

Figure 4.8 shows the survey result obtained from participant's contractors who were involved in Jima Zone public building construction projects for the last five years and who is currently under construction in the sector and the number of projects

implemented in the last five years by the contractor. From the participants in the survey study 61.1%,23.6%, and 15.3 % of the respondents replied that their organization participated in Less than 5, 5 to 10, and 10 to 15 projects in the last five years respectively. The above result shows that majority of the contractor’s participated in less than 5 projects in Jima Zone public building construction projects.

VI. Implemented value of projects during the last five years (in million ETB)

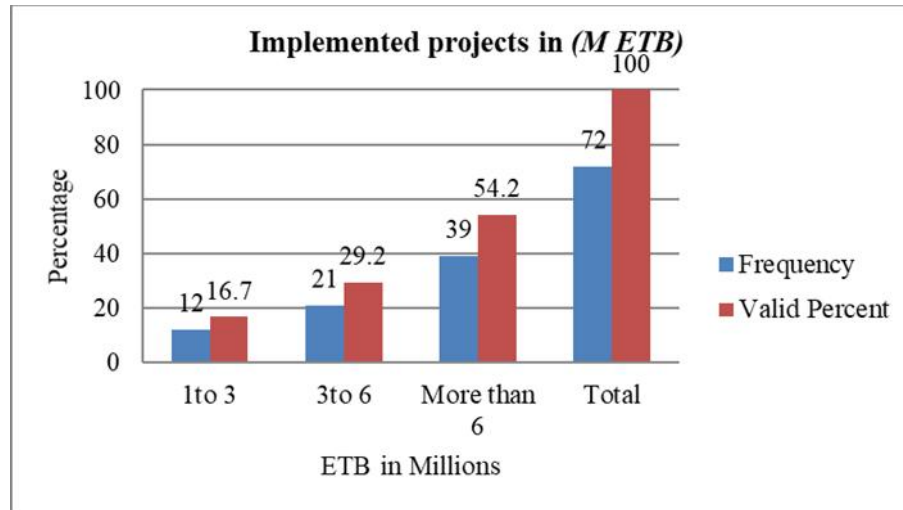


Figure 4.9 Implemented projects in (M ETB)

Figure 4.9 shows the results of survey from the contractor’s respondent about Value of implemented projects during the last five years (in million ETB) for the contractor’s company involved in Jima Zone public construction projects in the last five years and for the projects under progress. 16.7%,29.2 %,54.2%, of the contractor implemented projects in a value of 1to 3 million ETB, 3 to 6 million ETB and 6 million ETB. The result shows that majority of the contractors implemented a project in Jima Zone public building construction projects more than 6 million ETB.

VII. Rating the quality of the project completed by lowest bidder bid system in percentage

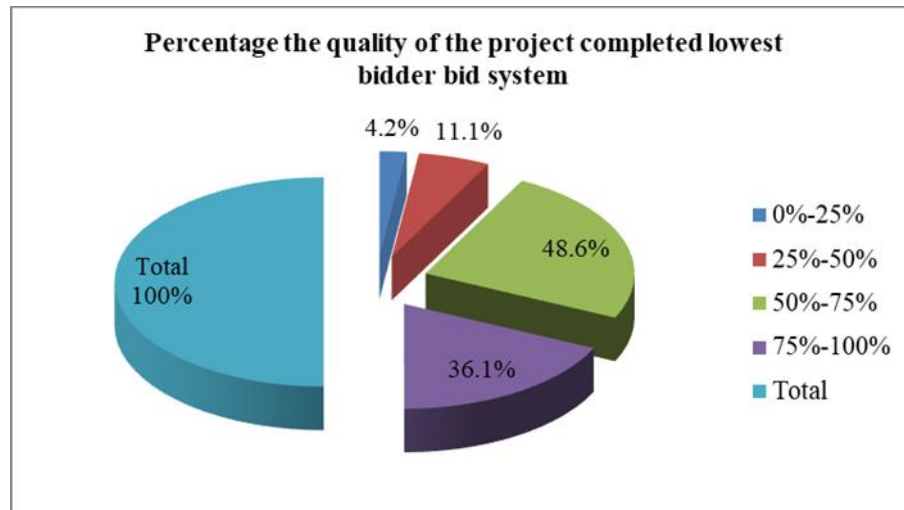


Figure 4. 10 Percentage the quality of the project completed lowest bidder bid system
The above figure shows result obtained from the survey of contractor's respondents about the experience of contractor's to the extent of percentage quality performance of their organization in Jima Zone public building construction projects. The survey result shows, 4.2%,11.1%,48.6% and 36.1% of the participants replied that the quality of projects completed were ranges from (0%-25 %), (25%-50%), (50%-75%), (75%-100%) respectively.

The result from the survey study shows that the qualities of projects completed in the last five years were from 50%-75% out of the expected quality standard of projects executed in Jima Zone building construction projects in the lowest bidder bid award system.

VIII. Rating the project cost in lowest bid system projects have exposed to change order by percentage

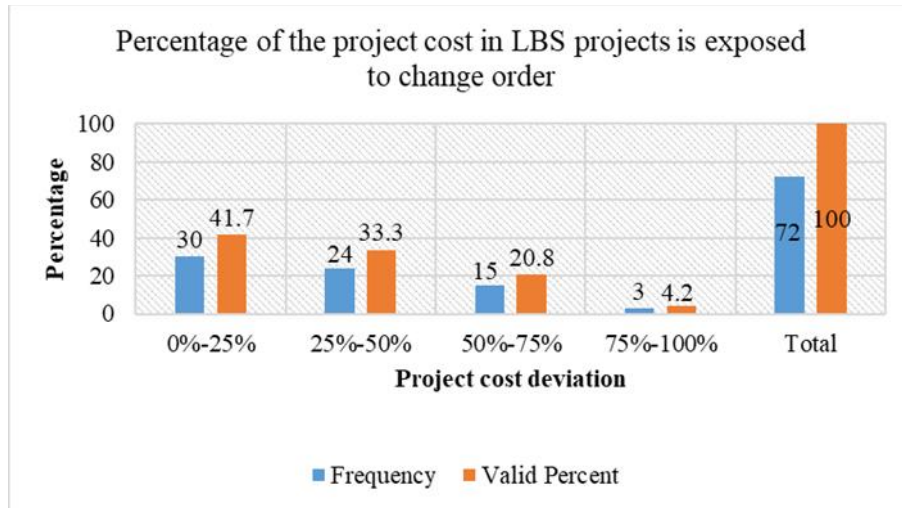


Figure 4.11 Percentage of the project cost in LBS projects exposed to change order

Figure 4.11 shows the results of percentage of project cost in lowest bid system projects exposed to change order for the responses of contractor’s participants. From the participants of contractors 41.7 %, 33.3%, 20.8%, 4.2% of the participants replied that the projects exposed to cost deviation and change order ranges from (0%-25%), (25%-50%), (50%-75%) and (75%-100%) respectively. The result obtained from the contractor’s respondents shows that the percentage of project highly exposed to cost deviation and change order is ranked from (0%-25%) for the projects executed in Jima Zone public building construction projects.

IX. Observed percentage of warranty period defects

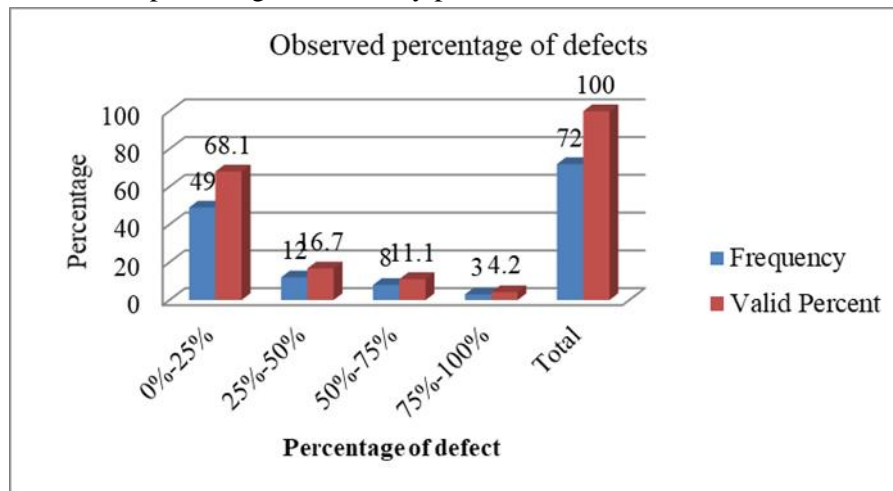


Figure 4.12 Percentage of defect

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Figure 4.12 shows the percentage of defects observed in a built facility within a warranty period in Jima Zone public building construction projects. The survey result shows that 68.1%, 16.7%, 11.1%, and 4.2% of the respondents replied that the percentage of defect ranges from (0%-25%), (25%-50%), (50%-75%) and (75%-100%) respectively. The result indicates that the highest percentage of the defect in the built facility as ranked by contractors' respondents were ranges from (0%-25 %).

X. Percentage of fair and transparent bidding procedure in Ethiopia construction industry

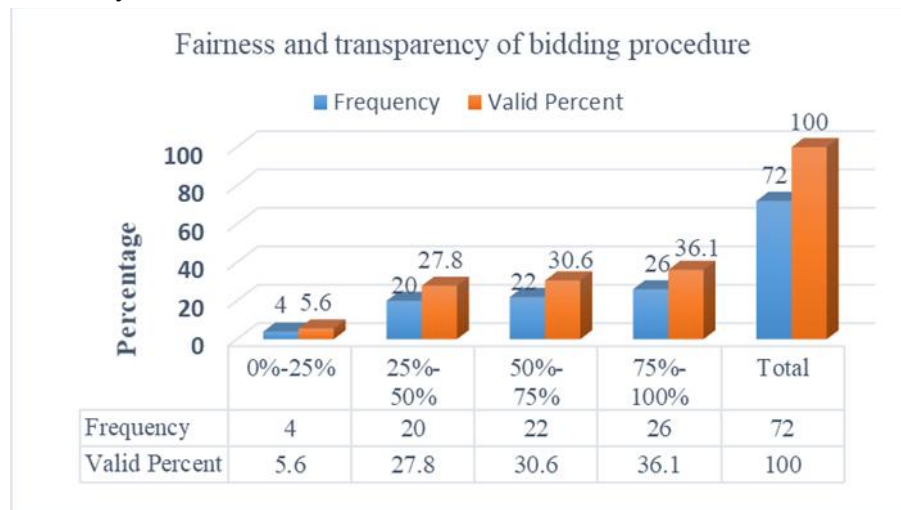


Figure 4. 13 Fairness and transparency of bidding procedure

Figure 4.13 shows the result obtained from the survey about level of fairness and transparency of bidding procedure that made in Ethiopia construction industry. From the participants of contractors, 36.1%, 30.6 %, and 27.8 % of the respondents agree that the bidding procedure is fair and transparent from (75%-100%), (50%-75%) and (25%-50%) respectively. Finally, 5.6% of respondent argues that the procurement system is not fair and transparent with a ranking scale of 0%-25 %.

XI. Level of assessment for contractor selection process take place in LBBAS

Table 4. 4 Level the assessment of contractor selection process

	Frequency	Valid Percent
Technical department and engineering	16	22.2
Project management team	8	11.1
Independent consultant	5	6.9
financial department	18	25.0
High managerial level (director)	2	2.8
a committee member consists of (1, 2, 3, 4)	23	31.9
Total	72	100.0

Table 4.4 Shows the result obtained from contractors about the level of assessment that will take place in public procurement procedure by whom the responsibility to select and qualify contractors in a lowest bidder bid award system. From the participants of the contractors, 31.9% of the participants replied that the selection process is undertaken by a committee member includes Technical department and engineering, Project management team, Independent consultant and financial department. 22.2% the participants replied that the contractor assessment and selection responsibility undertaken by Technical department and engineering. 11.1% of the participant replied those Project management teams are responsible to select and qualify contractors to a contract. 25 % of the participants replied those financial departments take the mandate for the assessment and selection of contractor in a lowest bidder bid awarding system. Finally, 2.8% of the participant replied those Project management teams are responsible to select and qualify contractors to a contract. The result discussed above shows that a committee member consists of (1, 2, 3, 4) item is selected by the majority of the respondents.

4.1.3 Consultants General Information

I. Classification of consultancy service in building construction

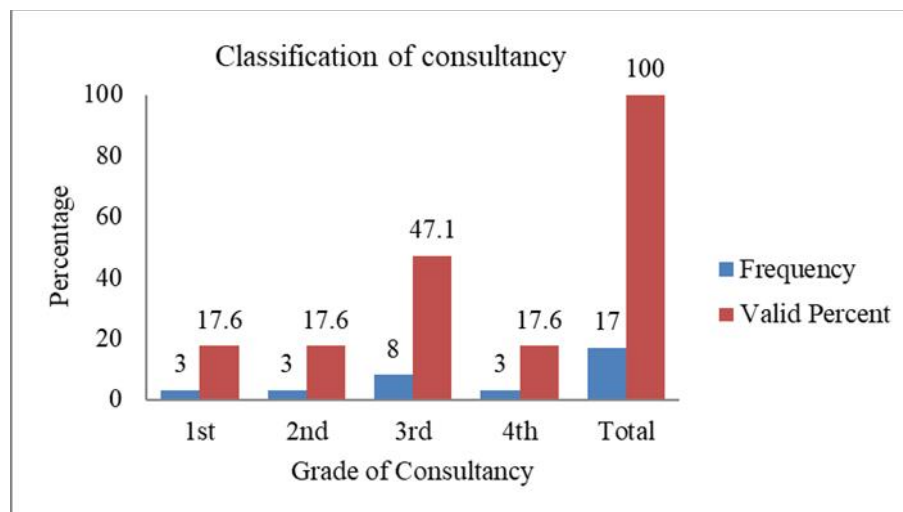


Figure 4.14 Classification of consultancy

Figure 4.14 shows the classification of consultants working under the public construction projects and privately employed by the client involved in Jima Zone public building construction projects. From the total respondents participated in the survey study, 17.6% of the respondents were grade-1, grade-2 and grade-4, while

47.1% were grade-3 consultants. The result shows that grade-3 consultants were higher in number than other grade of consultants for the last five years who were involved in Jimma Zone public building construction projects.

II. Position of respondent

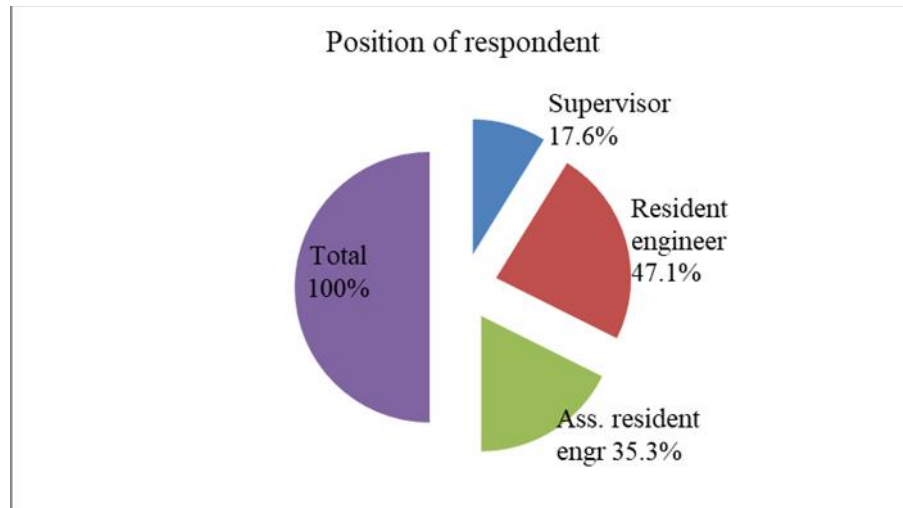


Figure 4.15 Position of respondents

Figure 4.15 shows position of respondents form the consultant’s side that participated in the survey study in Jimma Zone public construction project. From the total 17 participants, 17.6% of the respondents were Supervisor, 47.1 % were Resident engineer and 35.3 % were Assistant resident engineer. From the above result, most of the respondents in this study were Resident engineer.

III. Experience of respondent in years

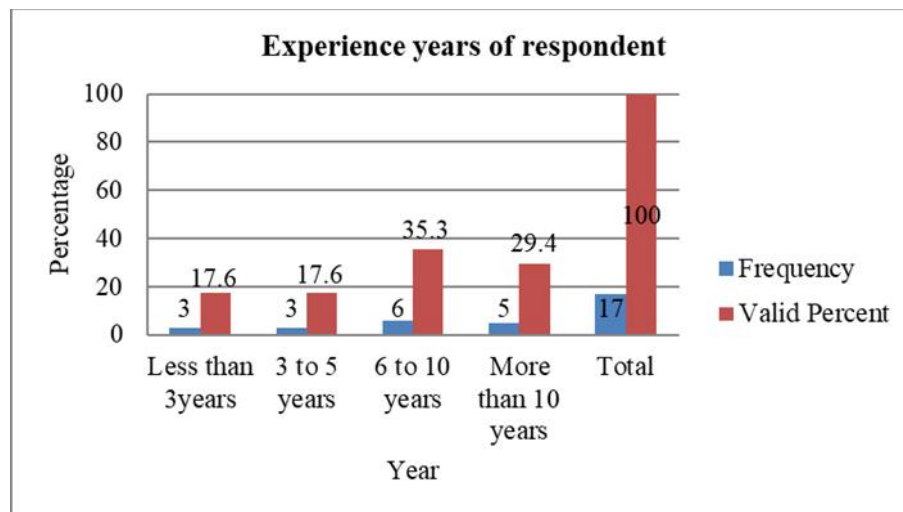


Figure 4.16 Experience years of respondent

Figure 4.16 shows the result obtained from survey results of experience of respondents of consultants who were participated in Jima Zone public building construction projects for the last five years and currently under supervision. The survey result shows that 17.6%,17.6%, 35.3%, and 29.4% of the participants with an experience of less than 3years, 3 to 5 years, 6 to 10 years and more than 10 years respectively. The result obtained from the survey indicates that the respondents with an experience from 6 to 10 years were higher in number.

IV. Number of projects consulted in the last five years

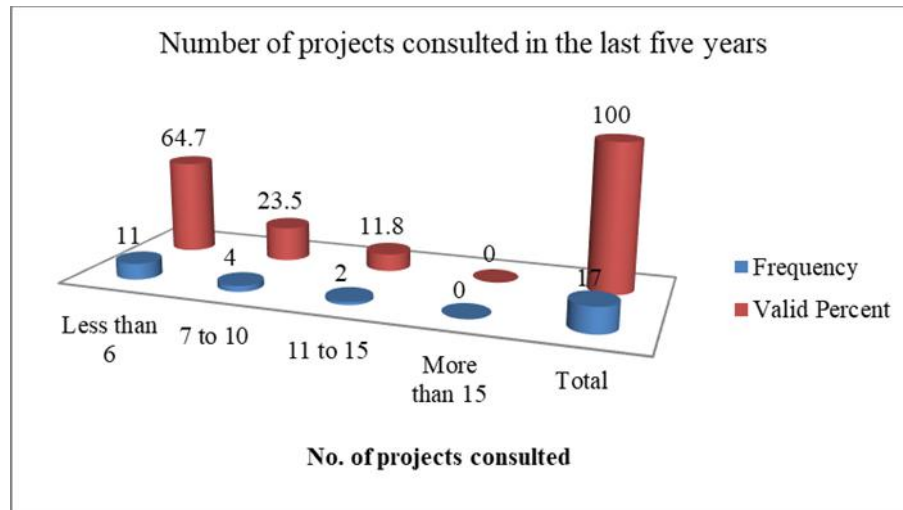


Figure 4.17 Number of projects consulted in the last five years

Figure 4.17 shows the survey result obtained from participant’s consultants who were involved in Jima Zone public building construction projects for the last five years and who is currently under supervision in the sector and the number of projects implemented in the last five years by the consultant’s organization. From the participants in the survey study 64.7%, 23.5%, and 11.8% of the respondents replied that their organization participated in Less than 6, between 7 to 10 and between 11 to 15 projects in the last five years respectively. The above result shows that majority of the contractor’s organization participated in less than 6 projects in Jima Zone public building construction projects.

V. Quality of the project completed by lowest bidder bid system in percentage

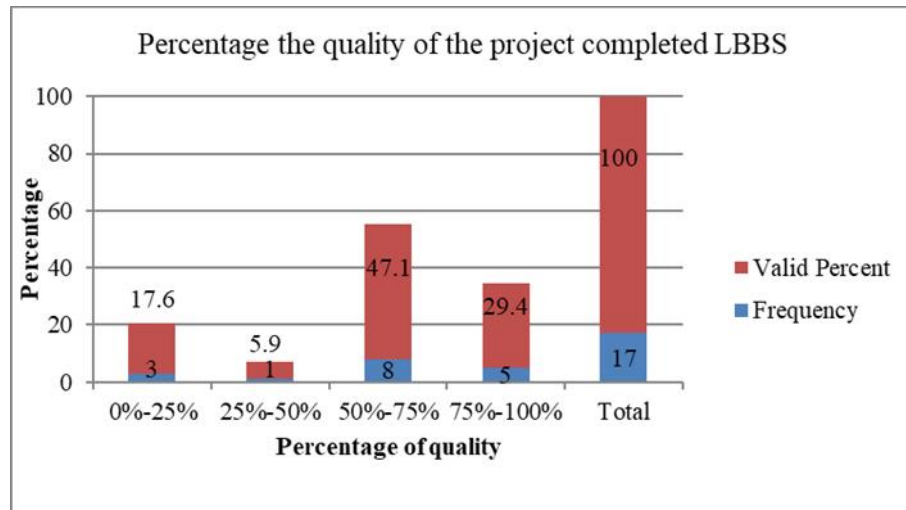


Figure 4.18 Percentage quality of the project completed LBBS

Figure 4.18 shows result obtained from the survey of consultant’s respondents about the experience of consultant’s organization to the extent of percentage quality performance of their organization in Jima Zone public building construction projects. The survey result shows that 17.6%, 5.9%, 47.1% and 29.4% of the participants argue that the quality of projects completed were ranges from (0%-25%), (25%-50%), (50%-75%) and (75%-100%) respectively. The result from the survey study shows that the qualities of projects completed in the last five years were from 50%-75% out of the expected quality standard of projects executed in Jima Zone building construction projects in the lowest bidder bid award system.

VI. Rating the project cost in lowest bid system projects have exposed to change order

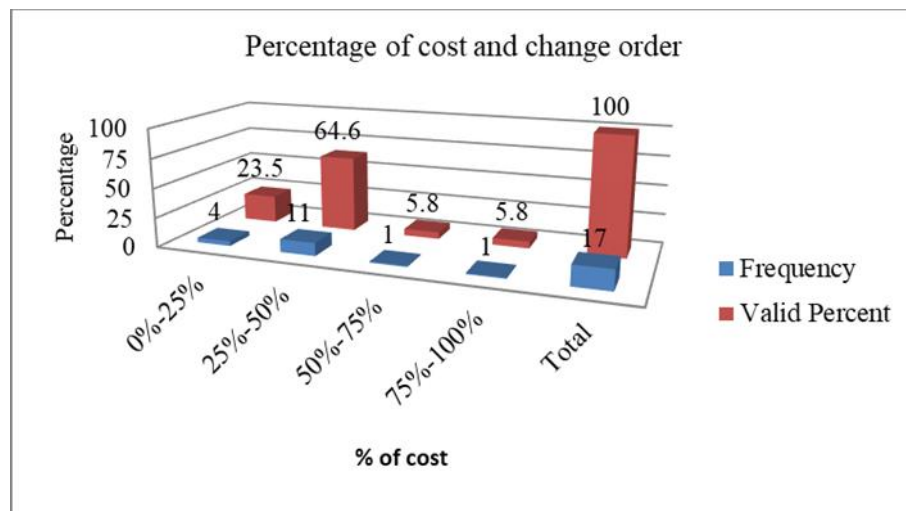


Figure 4.19 Percentage of cost and change order

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Figure 4.19 shows the percentage of project cost and change order in lowest bid system projects. From the participants of consultants, 23.5%, 64.6%, 5.8% and 5.8% replied that the projects exposed to cost deviation and change order ranges from (0%-25%), (25%-50%), (50%-75%) and (75%-100%) respectively. The result obtained from the consultant's respondents shows that the percentage of project exposed to cost deviation and change order is ranked from (25%-50%) for the projects executed in Jimma Zone public building construction projects.

VII. Percentage of defects have observed in the built facilities within the warranty period

Table 4.5 Percentage of defect in built facility

% of defect in built facility	Frequency	Valid Percent (%)
0%-25%	9	52.9
25%-50%	7	41.2
50%-75%	1	5.8
75%-100%	-	-
Total	17	100.0

As shows in Table 4.5; the results from the participants of consultants for percentage of defects observed in a built facility within a warranty period in Jima Zone public building construction projects. The survey result shows that 52.9%, 41.2% and 5.8%, and of the respondents replied that the percentage of defect ranges from (0%-25%), (25%-50%), (50%-75%), and respectively while none of the consultants replied that the percentage of defect ranges from (75%-100%). The result indicates that the percentage of the defect in the built facility as ranked by consultant respondents were ranges from (0%-25 %).

VIII. Percentage of fair and transparent bidding procedure in Ethiopia construction industry

Table 4. 6 Percentage transparency of bidding procedure

% Transparency of bidding procedure	Frequency	Valid Percent
0%-25%	-	-
25%-50%	1	5.8
50%-75%	5	29.4
75%-100%	11	64.7
Total	17	100.0

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Table 4.6 shows the result obtained from the survey about level of fairness and transparency of bidding procedure that is made in Ethiopia construction industry. From the participants of consultants, 64.7%, 29.4%, and 5.8% of the respondents agree that the bidding procedure is fair and transparent from (75%-100%), (50%-75%), (25%-50%) respectively. There is no response on fair and transparent procurement system with a ranking scale of 0%-25%.

IX. Information from contractors in order to prepare the evaluation list in the system of LBBA

Table 4.7 Evaluation list in the system of LBBA

Basic Criteria's	Score									
	Very low		Low		No idea		High		Very high	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Financial stability	-	-	-	-	-	-	6	35.3	11	64.7
Technical & management ability	-	-	-	-	-	-	5	29.4	12	70.6
Experience	-	-	-	-	-	-	6	35.3	11	64.7
Health and safety	-	-	1	5.9	4	23.5	10	58.8	2	11.8
Reputation					-	-	13	76.5	4	23.5
Culture experience	5	29.4	7	41.2	5	29.4	-	-	-	-
Total no. respondent	17									

Table 4.7 shows the result obtained from participants of consultants about the sort of information that their organization is seeking to obtain information from bidders in order to prepare the evaluation list in the system of LBBA. From the list of criteria's, the participants ranked "financial stability, Technical & management ability, Experience and Reputation" with a scale of "High" to "Very high" in order to obtain information about the bidder qualification to the specific contract. Next to the above qualification requirement, "Health and safety" issue considered as an important factor with a rank of "High". "Reputation" has ranked with a scale of "High" by consultants an important criterion for evaluation of contractor's performance. And finally, "Culture experience" was considered as a least important factor used by the public sector clients to select bidders to a contract in a lowest bidder bid awarding system in case of Jimma Zone public building construction projects.

X. Level to assess contractor selection process take place in LBBAS

Table 4.8 Responsibility for assessment of contractor

Responsibility for assessment of contractor	Frequency	Valid Percent (%)
Technical department and engineering	6	35.3
Project management team	3	17.6
Independent consultant	1	5.9
financial department	5	29.4
High managerial level (director)	1	5.9
By a committee member	1	5.9
Total	17	100.0

Table 4.8 Shows the survey result obtained from consultants about the level of assessment that will take place in public procurement procedure by whom the responsibility to select and qualify contractors in a lowest bidder bid award system. From the participants of the consultants, 35.3 % of the participants replied that the selection process is undertaken by a Technical department and engineering. A 17.6% of the participants replied that the contractor assessment, and selection responsibility is undertaken by Project management team. 29.4% of the participant replied those financial departments are responsible to select and qualify contractors to a contract. 5.9 % of the participants replied those financial departments; Independent consultant and a committee member including (1, 2, 3 & 4) take the mandate for the assessment and selection of contractor in a lowest bidder bid awarding system. The result above shows that Technical department and engineering item has selected by the majority of the respondents.

4.2 Challenges of LBBA system of PCPs

4.2.1 Owner response on challenges of LBBA system of PCPs

Table 4.9 below show challenges of lowest bidder bid selection system of public construction projects for the survey result obtained from public sector clients according to their importance level. Participants of the public sector clients ranked “Contractor's perception on variation” in the first position with a mean score of (4.30) which poses a challenge for the contractor selected by a lowest bidder bid selection system in a public construction project. In the case of lowest bid system, contractors are seeking to recover their costs from variation than the bid price they previously

submit. The respondents in the second position with a mean score of (4.26) selected “No site visit before bidding and no understanding of detail scope of work contractor”. Most contractors are filling the bid price in a closed home rather than having sufficient information about the condition of the site and availability of resource for that specific project. Due to lack of information, contractors have awarded with unrealistically low tender price for the project and finally the project going to fail. Participants from public sector client put “If the new site is adjoining in current site of the contractor and Nature of work” in the third position with a mean score of (3.70), which indicates that contractors without considering the nature of the project submitting a lowest price in favor of previously deployed resources to other projects. Contractors filling higher tender price for the specific works which was completed at an early time with a greatest proportion of the total project cost the so called the unbalanced bid situation.

Also; the table shows that person correlation coefficient and reliability of challenges of lowest bidder bid selection system of public construction projects for the response of public sector client. “Contractor’s perception on variation” was a factor with a highest mean score of (4.30) and a p- value (Sig.) = 0.002*which is smaller than the level of significance = 0.05. The result indicates that this factor is significantly important and the respondents have agreed to this factor. As shown in the table below all items in the group is statistically significant at the level significance = 0.05and 0.01. The items in the group has a Cranach’s alpha = 0.727 which has a higher internal consistency among the items in the group. Deleting the item, “Contractors have to bid low to increase annual turnover” from the group will increase the Cronbach’s alpha coefficient from (0.23 to 0.72). The result indicates that the items in the group have high internal consistency, which is greater than (0.70) and no need of deleting the item from the group.

Table 4.9 Challenges of LBBS system of PCPs (Owners Response)

Item	Owners response				
	Mean	p-value	Total Correlatio	Cr. Alpha if Item Deleted	Rank
Contractor's perception on variation	4.30	0.002**	0.88	0.74	1
No site visit before bidding and no understanding of	4.26	0.001**	0.71	0.72	2

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detail scope of work contractor					
If the new site is adjoining in current site of the contractor	3.70	0.000**	0.80	0.71	3
Nature of work	3.70	0.028*	0.86	0.73	3
Imprecise and ambiguous contract documentation	3.65	0.001**	0.79	0.72	4
Lack of information for contractors' past performance, volume of currently contracted work and their financial situation	3.65	0.001**	0.51	0.70	4
With increasing number of contractors and competition among them	3.61	0.001**	0.84	0.71	5
Bureaucratic process used in the current government purchasing system	3.57	0.032*	0.86	0.70	6
Weak contract administration by the client	3.43	0.047*	0.37	0.75	7
Preparing tenders by using estimates of historical data and traditional norms	3.43	0.001**	0.42	0.74	7
Lack of experience of the tendering staff	3.41	0.001**	0.64	0.69	8
Contractors have to bid low to increase annual turnover	3.35	0.040*	0.83	0.72	9
Favoritism and corruption	3.26	0.011*	0.88	0.72	10
Insufficient details of design, specification and contract document for projects	3.26	0.047*	0.77	0.71	10
To rely on the utilization of contractor's ideal resource to bid in low price	3.22	0.015*	0.89	0.73	11
Shortcomings in professional contractors	3.21	0.004**	0.89	0.72	12
Exclusion of tender(s) on the basis of corruption, collusion, and false declarations	3.00	0.043*	0.56	0.73	13
Discriminatory and non-quantifiable criterion	3.00	0.023*	0.36	0.73	13
Non-use of PPA or FIDIC Standard Forms of Contracts	2.74	0.046*	0.53	0.69	14
Contractors' classification is not accurate	2.61	0.013*	0.67	0.68	15
Minutes/ records of proceedings for the project are accessible to tendered	2.57	0.024*	0.54	0.72	16
N	23				
Cronbach's Alpha	0.727				

Source: SPSS V25

4.2.2 Contractors response on challenges of LBBS system of PCPs

Table 4.10: shows a survey results obtained from contractors' respondent about the challenges of lowest bidder bid selection system of public construction projects in the level of their mean average scale in case of Jima Zone public building construction projects which were completed for the last five years. and unfinished constructions

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projects. “No site visits before bidding and no understanding of detail scope of work by contractor”, have ranked in the first position with a mean score of (4.15). Indicates that contractors are not well updated with the existing condition of the project environment with respect to market condition, suitability of the site for access of different facility and security and related issues. “Contractor's perception on variation” placed in the second position by the contractor’s respondent with a mean score of (3.97). This indicates that contractors are pretty Shore for the tender price they fill was not enough to cover/ complete the project. The one they relay is to compensate with variation order. Weak contract administration of client, Work in hand and favorable location of site may affect the bid price and increasing number of contractors and competition among bidders were among the factors which are posing a challenge to a lowest bidder bid award system as prioritized by the respondents in case of Jima Zone public building construction projects.

Table 4.10 shows the Pearson correlation coefficient and reliability of challenges of lowest bidder bid selection system of public construction projects for the response of contractors participating in Jima Zone public building construction projects. As shown in the table below all items in the group is statistically significant at the level significance = 0.05 and 0.01. The items in the group has a Cronbach’s alpha = 0.795, which indicates that there is a higher internal consistency among the items in the group. The result indicates that the items in the group have high internal consistency, which is greater than (0.70) and no need of deleting the item from the group.

Table 4. 10 Challenges of LBBS system of PCP (Contractors Response)

ITEMS	Mean	p-value	Total Correlation	Cr. Alpha if Item Deleted	Rank
No site visit before bidding and no understanding of detail scope of work by contractor	4.15	0.000**	0.61	0.79	1
Contractor's perception on variation	3.97	0.015*	0.72	0.78	2
Weak contract administration of client	3.86	0.004**	0.42	0.79	3
Work in hand and favorable location of site may affect the bid price	3.83	0.014*	0.75	0.79	4

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With increasing number of contractors and competition among bidders	3.74	0.000**	0.46	0.78	5
Favoritism and corruption	3.71	0.016*	0.68	0.79	6
Lack of information for contractors' past performance, volume of currently contracted work and their financial situation	3.71	0.023*	0.67	0.79	6
Bureaucratic process used in the current government purchasing system	3.71	0.002**	0.72	0.79	6
There was exclusion of tender(s) on the basis of corruption, collusion, and false declarations	3.69	0.037*	0.82	0.79	7
Lack of experience of the tendering staff	3.68	0.027*	0.84	0.78	8
Imprecise and ambiguous contract documentation	3.57	0.050*	0.86	0.79	9
Preparing tenders by using estimates of historical data and traditional norms	3.53	0.039*	0.77	0.80	10
Nature of work	3.44	0.014*	0.71	0.80	11
Insufficient details of design, specification and contract document for projects	3.42	0.015*	0.53	0.78	12
Shortcomings in professional contractors	3.31	0.022*	0.85	0.78	13
Contractors have to bid low to increase annual turnover	3.26	0.021*	0.83	0.77	14
Discriminatory and non-quantifiable criterion	3.25	0.028*	0.81	0.79	15
Contractors' classification is not accurate	3.15	0.032*	0.66	0.78	16
To rely on the utilization of contractor's ideal resource to bid in low price	3.10	0.048*	0.67	0.79	17
Minutes/ records of proceedings for the project are accessible to tendered	3.04	0.043*	0.80	0.79	18
Non-use of PPA or FIDIC Standard Forms of Contracts	2.93	0.001**	0.53	0.80	19
N	72				
Cronbach's Alpha	0.795				

Source: SPSS V25

4.2.3 Challenges of LBBS system of PCPs (Consultants Response)

Table 4.11 shows the survey result of consultants participated in Jima Zone public building construction projects about the challenges of lowest bidder bid selection system of public construction projects. Participants of the consultants ranked “No site visit before bidding and no understanding of detail scope of work by contractor” in

the first position with a mean score of (4.41). Most contractors are underestimating the importance of site visit and pre- bid meeting for clarification from the client about the project before deciding to participate in the bidding process. Actual information about the project helps on the bidding and no bidding decision. “Contractors have to bid low to increase annual turnover and Contractor's perception on variation”. Have placed in the second position with a mean score of (4.00) in which the lowest bidder bid award system is the one that allows unqualified contractors could win the contract by coating a least bid price to improve their annual turnover and to compensate their profit through claiming for variation. “Shortcomings in professional contractors” ranked in the third position with a mean score of (3.88).

Table 4.11 shows the Pearson correlation coefficient and reliability of challenges of lowest bidder bid selection system of public construction projects for the response of consultants participating in Jima Zone public building construction projects. As shown in the table below all items in the group is statistically significant at the level significance = 0.05 and 0.01. The items in the group has a Cronbach’s alpha = **0.857**, which indicates that there is a moderate internal consistency among the items in the group. The result indicates that the items in the group have high internal consistency, which is greater, than (0.70).

Table 4. 11 Challenges of LBBA system for the response of consultants

Item	Consultants Response				
	Mean	p-value	Total Correlation	Cr. Alpha if Item Deleted	Rank
No site visit before bidding and no understanding of detail scope of work by contractor.	4.41	0.00**	0.58	0.86	1
Contractors have to bid low to increase annual turnover	4.00	0.031*	0.69	0.86	2
Contractor's perception on variation	4.00	0.035*	0.78	0.85	2
Shortcomings in professional contractors	3.88	0.047*	0.49	0.85	3

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Preparing tenders by using estimates of historical data and traditional norms	3.76	0.00**	0.52	0.85	4
Weak contract administration of client	3.71	0.005**	0.75	0.85	5
There was exclusion of tender(s) on the basis of corruption, collusion, and false declarations.	3.59	0.038*	0.31	0.86	6
Lack of information for contractors' past performance, volume of currently contracted work and their financial situation	3.59	0.041*	0.72	0.85	7
Bureaucratic process used in the current government purchasing system	3.59	0.014*	0.52	0.85	7
Favoritism and corruption	3.53	0.012*	0.51	0.85	8
Work in hand and favorable location of site may affect the bid price	3.53	0.006**	0.42	0.85	8
Nature of work	3.47	0.035*	0.45	0.85	9
increasing number of contractors and competition among them	3.41	0.007**	0.73	0.85	10
Lack of experience of the tendering staff	3.35	0.041*	0.82	0.84	11
Imprecise and ambiguous contract documentation	3.24	0.000**	0.73	0.86	12
Insufficient details of design, specification and contract document for projects.	3.18	0.033*	0.52	0.85	13
To rely on the utilization of contractors ideal resource to bid in low price	3.18	0.025*	0.67	0.85	13
Discriminatory and non-quantifiable criterion	3.00	0.024*	0.77	0.86	14
Minutes/ records of proceedings for the project are accessible to tendered	2.88	0.000**	0.45	0.85	15
Non-use of PPA or FIDIC Standard Forms of Contracts	2.82	0.044*	0.88	0.85	15
Contractors' classification is not accurate	2.82	0.025*	0.88	0.83	15
Valid N	17				
Cronbach's Alpha	0.857				

Source: SPSS V25

4.2.4 Summary of Challenges of LBBS system on PCPs

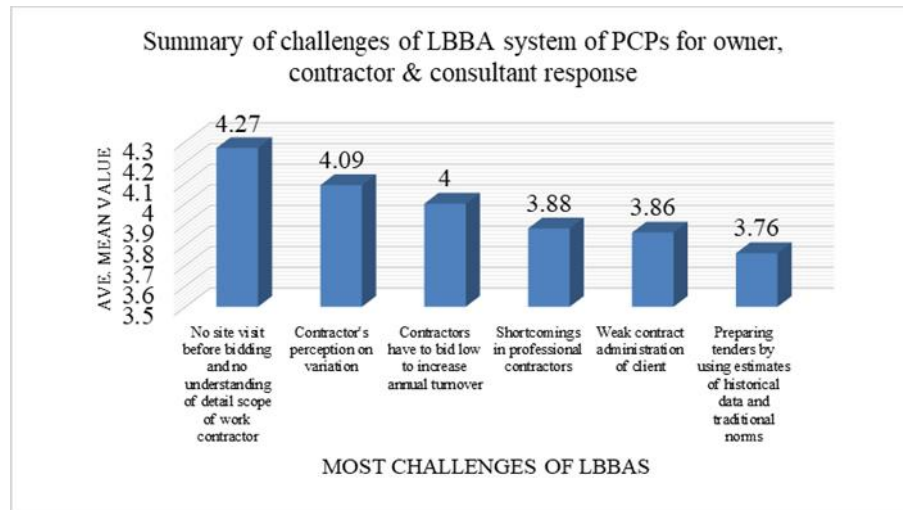


Figure 4. 20 Summary of challenges of LBBS system of PCPs

As shown in the above figure 4.20, the most Challenges of the LBBA system on the performance of the public projects of Jimma zone has listed by rank, which was, calculated the average mean of all individual's value response of client, consultant, and contractors. Therefore, no site visits before bidding, no understanding of detail scope of work contractor, Contractor's perception on variation, Contractors have to bid low to increase annual turnover, Shortcomings in professional contractors, Weak contract administration of client, and Preparing tenders by using estimates of historical data and traditional norms respectively.

4.3 Impacts of LBBA System

4.3.1 Impacts of LBBA System (owners' response)

Table 4.12 shows the survey results of public sector client about the impacts of lowest bidder bid awarding system according to the level of effect for the performance of public building construction projects. Respondents from the client side ranked "Delay on project completion (more severe than cost)" the first most important effecting factor in the case of lowest bidder bid awarding system with a mean score of (4.52). As the result indicates that contractor's performance period has extended due to a number of claims related with variation and financial incapability of contractors to complete with previously planned project duration. "Unsatisfactory quality of work" was ranked by the participants in the second position with a mean score of (4.26),

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which indicates that it is known that the quality of work is compromised because of unrealistically low bid price were accepted is higher in the current procurement system of awarding the lowest competitive bidder. “Increase in no of change request/orders, Chances of illegal work and Failed Projects, and increased disputes and claims between contracting parties” has placed from third to fifth position with a mean score of (4.22, 4.09 and 4.04).

Additionally; the above table shows the Pearson correlation coefficient and reliability of effects of lowest bidder bid awarding system of public construction projects for the response of public sector client. “Delay on project completion (more severe than cost)” was the first effecting factor with a mean score of (4.52) and a p- value (Sig.) = 0.000**which is smaller than the level of significance = 0.01. The result indicates that this factor is significantly important and the respondents have agreed to this factor. As shown in the table below all items in the group is statistically significant at the level significance = 0.05 and 0.01. The items in the group has a Cronbach’s alpha = 0.798, which indicates that there is a higher internal consistency among the items in the group. Deleting the item “Long tendering durations may cause the withdrawal of contractors due to increasing price changes and Increase in maintenance and operational costs” from the group will increase the Cronbach’s alpha coefficient from (0.20 to 0.80 and 0.21 to 0.80). The result indicates that the items in the group have high internal consistency, which is greater than (0.70) and no need of deleting the item from the group.

Table 4. 12 Impacts of LBBA System (owner’s response)

Item	Mean	p-value	Total Correlation	Cr. Alpha if Item Deleted	Rank
Delay on project completion (more severe than cost)	4.52	0.000**	0.44	0.81	1
Unsatisfactory quality of work	4.26	0.033*	0.41	0.79	2
Increase in no of change request/orders	4.22	0.003*	0.81	0.72	3
Chances of illegal work	4.09	0.030*	0.32	0.80	4
Failed Projects	4.09	0.004*	0.83	0.79	4
Increased disputes and claims between contracting parties	4.04	0.000**	0.87	0.77	5

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Underachievement in project performance	4.00	0.000**	0.70	0.78	6
Select of inefficient contractors	3.96	0.040*	0.41	0.79	7
Compromising quality and making unnecessary claims	3.96	0.018*	0.89	0.79	7
Unsatisfactory quality of work	3.96	0.033*	0.46	0.75	7
Failure to achieve the project objectives	3.91	0.024*	0.54	0.78	8
Shortages in resources (labors, equipment, materials...etc.)	3.91	0.000*	0.87	0.77	8
Cost overrun	3.91	0.018*	0.86	0.79	8
Financial loss for owner	3.91	0.029*	0.80	0.76	8
Evasion of social contribution and tax	3.70	0.003*	0.89	0.80	9
Financial loss for contractor	3.70	0.040*	0.32	0.79	9
Re-tendering for projects several times	3.65	0.000**	0.48	0.81	10
Long tendering durations may cause the withdrawal of contractors due to increasing price changes	3.22	0.048*	0.20	0.80	11
Increase in maintenance and operational costs	3.17	0.000**	0.20	0.80	12
Financial difficulty in effective contract management	3.00	0.005**	0.40	0.79	13
Serious question on public safety	3.00	0.002**	0.45	0.78	13
N	23				
Cronbach's Alpha	0.798				

Source: SPSS V25

4.3.2 Impacts of LBBA System (Contractors response)

Table 4.13 show a survey result obtained from contractors' respondent about effects of lowest bidder bid awarding system in Jima Zone public construction projects for the items listed below in the table based on their effect in terms average mean scores. "Delay on project completion (more severe than cost)" placed in the first position with a mean score of (4.44). the survey result shows that; Increased disputes and claims between contracting parties, compromising quality and making unnecessary claims, Cost overrun, Underachievement in project performance and Failed Projects were among the effects lowest bidder bid awarding system that contributing for the poor performance of public construction projects.

Also below table shows; the Pearson correlation coefficient and reliability of impacts of lowest bidder bid selection system of public construction projects for the response

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of contractors participating in Jima Zone public building construction projects. As shown in the table below all items in the group is statistically significant at the level significance = 0.05 and 0.01. The items in the group has a Cronbach's alpha = 0.813, which indicates that there is a higher internal consistency among the items in the group. The result indicates that the items in the group have high internal consistency, which is greater than (0.70) and no need of deleting the item from the group.

Table 4. 13 Impacts of LBBA System (Contractors response)

Items	Contractors response					
	Mean	p-value	Correlation	Alpha if Item Deleted	Rank	
Delay on project completion (more severe than cost)	4.44	0.000*	0.72	0.82	1	
Increased disputes and claims between contracting parties	4.19	0.000*	0.57	0.80	2	
Compromising quality and making unnecessary claims	4.17	0.032*	0.58	0.80	3	
Cost overrun	4.13	0.028*	0.67	0.81	4	
Underachievement in project performance	4.07	0.000*	0.46	0.80	5	
Failed Projects	4.03	0.000*	0.84	0.80	6	
Financial loss for owner	4.01	0.013*	0.82	0.79	7	
Select of inefficient contractors	4.01	0.000*	0.50	0.80	7	
Chances of illegal work	4.00	0.011*	0.70	0.82	8	
Increase in no of change request/orders	4.00	0.017*	0.72	0.82	8	
Failure to achieve the project objectives	3.92	0.037*	0.67	0.81	9	
Unsatisfactory quality of work	3.90	0.020*	0.44	0.80	10	
Shortages in resources (labors, equipment, materials...etc.	3.83	0.017*	0.76	0.80	11	
Financial loss for contractor	3.79	0.011*	0.70	0.80	12	
Re-tendering for projects several times	3.67	0.011*	0.70	0.80	13	
Evasion of social contribution and tax	3.65	0.018*	0.89	0.82	14	

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Financial difficulty in effective contract management	3.61	0.020*	0.70	0.81	15
Serious question on public safety	3.36	0.000* *	0.87	0.81	16
Long tendering durations may cause the withdrawal of contractors due to increasing price changes	3.36	0.017*	0.85	0.81	16
Increase in maintenance, replacement and operational costs	3.22	0.000* *	0.78	0.81	17
N	72				
Cronbach's Alpha	0.813				

Source: SPSS V25

4.3.3 Impacts of LBBA System (Consultants response)

Table 4.14 shows the survey results obtained from consultants about the effects of lowest bidder bid awarding system who were participated in Jima Zone public building construction projects for the last five years and currently under construction in the study area. “Delay on project completion (more severe than cost)” was placed in the first position with a mean score of (4.53). Most public sector construction projects have not completed with the contracted duration because of contractor’s incapability to finance the project with agreed contract amount. The reason back to this was the contact amount was unrealistic and abnormally low to complete the project with targeted cost, quality and time period. “Cost overrun, increase in no of change request/orders and compromising quality and making unnecessary claims” were the other most effecting factor that contributes to the poor performance public construction projects in case of contractors selected with lowest bidder bid award system.

The table also shows the Pearson correlation coefficient and reliability of effects of lowest bidder bid awarding system of public construction projects for the response of consultants participating in Jima Zone public building construction projects. As shown in the table below all items in the group is statistically significant at the level significance = 0.05 and 0.01. The items in the group has a Cronbach’s alpha = 0.816, which indicates that there is a moderate internal consistency among the items in the

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group. The result indicates that the items in the group have high internal consistency, which is greater, than (0.70).

Table 4. 14 Impacts of LBBA System (Consultants response)

Item	Consultants Response				
	Mean	P-value	Total Correlation	Alpha if Item Deleted	Rank
Delay on project completion (more severe than cost)	4.53	0.000**	0.14	0.82	1
Cost overrun	4.41	0.027*	0.46	0.81	2
Increase in no of change request/orders	4.29	0.029*	0.37	0.37	3
Compromising quality and making unnecessary claims	4.18	0.026*	0.70	0.79	4
Increased disputes and claims between contracting parties	4.18	0.031*	0.57	0.80	4
Select of inefficient contractors	4.12	0.015*	0.47	0.80	5
Unsatisfactory quality of work	4.06	0.000**	-0.09	0.83	6
Underachievement in project performance	4.00	0.043*	0.56	0.80	7
Chances of illegal work	3.88	0.012*	0.10	0.82	8
Failed Projects	3.76	0.015*	0.66	0.79	9
Financial loss for owner	3.76	0.037*	0.51	0.80	9
Financial loss for contractor	3.76	0.000**	0.45	0.80	9
Shortages in resources (labors, equipment, materials...etc.)	3.71	0.003**	0.17	0.82	10
Failure to achieve the project objectives	3.71	0.000**	0.55	0.80	10
Evasion of social contribution and tax	3.59	0.039*	0.34	0.81	11
Financial difficulty in effective contract management	3.47	0.021*	0.69	0.79	12
Long tendering durations may cause the withdrawal of contractors due to increasing price changes	3.41	0.009**	0.24	0.82	13
Re-tendering for projects several times	3.41	0.000**	0.16	0.82	13

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Serious question on public safety	3.35	0.001**	0.40	0.81	14
Increase in maintenance, replacement and operational costs	3.00	0.009*	0.35	0.81	15
N	17				
Cronbach's Alpha	0.816				

Source: SPSS V25

4.3.4 Summary of Impacts of LBBA System on PCPs

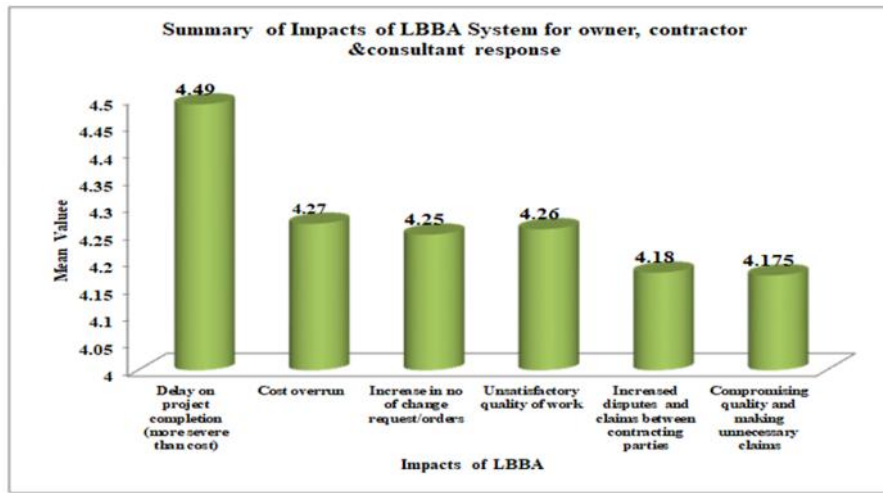


Figure 4. 21 Summary of Impacts of LBBA System on PCPs

As discussed in figure 4.21, it indicates that the complete summary of the average mean of impacts listed by rank that was calculated the individual response of client, consultant, and contractors. Therefore, delay on the project completion (more severe than cost), would be the most impacts of the LBBA on the performance of the Jimma zone project that was obtained from the 21 questioned survey. In addition to this, cost overrun, increase in no of change request/orders it obtained that the most impacts of, and unsatisfactory quality of work were ranked 2, 3, and 4 correspondingly.

4.3.5 Case Study

Case Study One

Project Name: Jimma Zone Health Office (G+3 Building)

Client: ZZZZ

Contractor: XXXX

Consultant: YYYY

Main contract cost: 7,020,980.08

Supplementary contract: 1,142,500.40

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Variation order: 1,755,245.02

Total project cost: 9,918,725.50

Date of signing of the contract: 18/03/2016 G.C

Date of final acceptance: 04/07/2019 G.C

Date when the contractor took possession of the site: 21/04/2016 G.C

Commencement date: 21/05/2016 G.C

Agreed length of completion date: 540 calendar days

Actual completion date: 21/01/2019 G.C

Total completion date: 930 calendar days

Total number of delay: 390 calendar days

From the guideline above we can calculate the percentage of delay on project completion and cost overrun as follows:

$$\% \text{age of delay on completion} = \frac{\text{Actual completion days} - \text{Contract duration}}{\text{Contract duration}} * 100$$

$$\text{Percentage of delay on completion} = \frac{930 - 540}{540} * 100$$

$$\text{Percentage of delay on completion} = 72.22\%$$

The Jimma zone health office G+3 building awarded to the contractor XXXX by lowest bidder bid awarding system on the date of 18/03/2016 G.C, and the agreed completion date of the project was 540 calendar days, but the contractor completed the given project in 930 calendar days. One can easily calculate the number of delays for this project which is 390 calendar days. Therefore, the percentage of delay on completion for this project was 72.22%, this value indicates that the lowest bidder bid selection system leads to delay the completion date of the project above half percentage from the agreed completion date of the project.

The cost overrun for this case was calculated by using the following formula:

$$\text{Percentage cost overrun} = \frac{\text{Total actual cost} - \text{main contract}}{\text{Main contract}} * 100$$

$$\% \text{age cost overrun} = \frac{(7,020,980.08 + 1,755,245.02 + 1,142,500.40) - 7,020,980.08}{7,020,980.08} * 100$$

$$\text{Percentage cost overrun} = 41.27\%$$

This project was awarded to the contractor with the contract price of 7,020,980.08. The contractor receives supplementary and variation order payments of 1,142,500.40 and 1,755,245.02 respectively. Calculating the percentage of cost overrun for this project using the above numerical values we obtain 41.27%, this value indicates that the project completion cost increases by about 41% from the main agreed contract price.

Case Study Two

Project Name: Jimma City Finance Office Building (G+3)

Client: AAAA

Contractor: XXXX

Consultant: BBBB

Main contract cost: 7,784,924.83

Supplementary contract: 2,335,477.45

Variation order: 1,946,231.21

Total project cost: 12,066,633.49

Date of signing of the contract: 17/02/2015 G.C

Date of final acceptance: 10/06/2019 G.C

Date when the contractor took possession of the site: 24/06/2015 G.C

Commencement date: 08/07/2015 G.C

Agreed length of completion date: 365 calendar days

Actual completion date: 12/06/2018 G.C

Total completion date: 1070 calendar days

Total number of delay: 705 calendar days

From the guideline above we can calculate the percentage of delay on project completion and cost overrun as follows:

$$\% \text{age of delay on completion} = \frac{\text{Actual completion days} - \text{Contract duration}}{\text{Contract duration}} * 100$$

$$\text{Percentage of delay on completion} = \frac{1070 - 365}{365} * 100$$

$$\text{Percentage of delay on completion} = 193.2\%$$

The Jimma City Finance Office G+3 Building was awarded to the contractor XXXX by lowest bidder bid awarding system on the date of 17/02/2015 G.C, and the agreed completion date of the project was 365 calendar days, but the contractor completed

the given project in 1070 calendar days. One can easily calculate the number of delays for this project, which is 705 calendar days. Therefore, the percentage of delay on completion for this project was 193.2%, this value indicates that the lowest bidder bid selection system leads to delay the completion date of the project above 190 percentages from the agreed completion date of the project.

The cost overrun for this case can calculate using the following formula:

$$\text{Percentage cost overrun} = \frac{\text{Total actual cost} - \text{main contract}}{\text{Main contract}} * 100$$

$$\% \text{age cost overrun} = \frac{(7,784,924.83 + 2,335,477.45 + 1,946,231.21) - 7,784,924.83}{7,784,924.83} * 100$$

$$\text{Percentage cost overrun} = 55.0\%$$

This project was awarded to the contractor with the contract price of 7,784,924.83. The contractor receives supplementary and variation order payments of 2,335,477.45 and 1,946,231.21 respectively. Calculating the percentage of cost overrun for this project using the above numerical values we obtain 55.0%, this value indicates that the project completion cost increases by about 55% from the main agreed contract price.

From the interview and case analysis conducted with the client, contractor, and consultant the following points was identified as the major causes of cost overrun and delay for the completion of the project.

- ❖ The system of awarding the bid to the contractor, which is the lowest bidder bid awarding system.
- ❖ Problems associated with the preparation of contract documents like lack of clear and understandable specification, and poor design of the project.
- ❖ Conditionally varying the quantity of work during the preparation of tender documents so that the contractors provides unbalanced rate for the execution of the specified quantity;
- ❖ Pre-loading the contract rate on the activities of the project, which executed in the initial stages of the construction process Contractor receives higher amount of the project cost before executing the major parts of the construction.
- ❖ Change of the specification of the work.

- ❖ Lack of proper supervision for administering projects;
- ❖ Price escalation due to project completion delays, like materials price increases as the duration to complete the projects delays.
- ❖ Lack of incorporating and including, the required scope of the work during design period.

From the results of two cases analysis and interview conducted with contractors, consultants, and clients that both project completion date and main contract price is not complete on the agreed completion date, and project contract price respectively. The project completion date was delayed by about 132.71 average percentages for the two cases. The main contract price of the two case projects was increased by about 48.13 average percentage of the contract price. From this result, we can conclude that projects awarded by using lowest bidder bid awarding system fails to complete the project within the agreed contract completion date and within the contract agreed amount.

4.4 Comparison of LBBA System with Other Bid Awarding System

The following are interview results conducted with public sector clients, contactors and consultants who were participated in Jima Zone public building construction projects for the last five years and currently under construction in the sector. Among the participants in this research, 5 participants from public sector client, 10 from contractors and 5 from consultants.

4.4.1 Owners Interview Result

A. Mostly used method of bid selection procedure of contractor for the project award

Table 4. 15 Method of bid

	Frequency	Valid Percent
Low Bid Method	4	80.0
Negotiated bidding	1	20.0
Total	5	100.0

Table 4.15 result obtained from the interview show that all the participants public sector clients agree that mostly used bid award system is a low bid (price based) method for the projects they were participated than other alternative bid award system (The Average Bid Method and Negotiated bidding). All public construction projects

have awarded through lowest bidder bid award system because of that it is a government procurement policy applicable in a national level.

B. Types of bidding system that have positive changes as compared to the lowest bidding

Table 4. 16 Positive changes compared to lowest bidding

	Frequency	Valid Percent
Competitive Negotiated Bidding	1	20.0
Multi Parameter Bidding Method (Based on price and “other” factors)	1	20.0
Competitive Average Bidding	3	60.0
Total	5	100.0

As the interview result shows, 60 % of the participant agreed that Competitive Average Bidding is the best alternative to bring up a positive change over the lowest bidder bid award system from other alternative bidding system. 20% of the interviewee selected Multi Parameter Bidding Method (Based on price and “other” factors) and Competitive Negotiated Bidding as an alternative over the lowest bid method of contractor selection system.

C. Description for organization’s bid evaluation procedure

Table 4. 17 Organization’s bid evaluation procedure

Item	Frequency	Valid Percent
Based on bid price and responsiveness	2	40.0
Based on bid price, responsiveness, and other factors	3	60.0
Based on bid price only	-	-
Total	5	100.0

The table 4.17 above describes the interview results of respondents from the public sector client about their organization bid evaluation procedure. Among the alternative criteria’s given in the table, 60 % of the participants replied that their organization had an experience of evaluation procedure for bidders is Based on bid price, responsiveness, and other factors. The other 40% said that their organization bidding procedure has based on bid price and responsiveness.

D. Currently uses of bid evaluation procedure for organization satisfaction

Table 4. 18 Satisfaction of bid evaluation procedure

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Item	Frequency	Valid Percent
Yes	3	60.0
No	2	40.0
Total	5	100.0

Table 4.18 shows that from participants of the public sector clients, 60% of the interviewee replied that they were satisfied with bid evaluation procedure currently used by their organization. The other 40% of the participants were argued that the current bid evaluation procedure used by their organization is not to their satisfaction and need to be revised with the growth of the construction industry and if possible, to the current procurement will bring a positive changed over the current bid evaluation and awarding criteria's.

E. Prioritized lists of bid methods in terms of giving high concern of qualitative, technical and sustainable aspects of the tender submission as well as price when reaching an award decision

Table 4. 19 Prioritizing bid methods by qualitative, technical and sustainable aspects

Bid Methods	Rank									
	1		2		3		4		5	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Competitive Low Bidding (Price-based)	-	-	-	-	-	-	-	-	5	100
Competitive Average Bidding (Price-based)	2	40	3	60						
Multi Parameter Bidding Method (Based on price and "other" factors)	4	80	1	20						
Competitive Negotiated Bidding					4	80	1	20		
Non-Competitive Negotiated Bidding			3		1	20			1	20
Total	5									

Table 4.19 shows the interview results of public sector clients about their level priority for the bid methods in terms of giving high concern of qualitative, technical and sustainable aspects of the tender submission as well as price when reaching an award decision. The interviewees put Competitive Average Bidding (Price-based) and

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Multi Parameter Bidding Method (Based on price and “other” factors) in the first and second position in which the two alternative bidding system has given a higher concern in terms of achieving qualitative, technical and sustainable aspects than the other bidding procedures. In contrary Competitive Low Bidding (Price-based) ranked at the fifth position as a least important for achieving the given parameters.

F. Prioritized lists of bid methods in terms of hitting the statted objective of the project with best performance, more secured and less risk when reaching an award decision and on construction phase

Table 4. 20 Prioritizing in terms of hitting the statted objective of the project

Bid Methods	Rank									
	1		2		3		4		5	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Competitive Low Bidding (Price-based)	-	-	-	-	-	-	-	-	5	100
Competitive Average Bidding (Price-based)			1	40	4	60				
Multi Parameter Bidding Method (Based on price and “other” factors)	3	60	2	40						
Competitive Negotiated Bidding			4	80	1	20				
Non-Competitive Negotiated Bidding	3	60	1	20	1	20				
Total	5									

Table 4.20 shows the interview results obtained from participants of public sector clients about their experience and understanding to give a priority on the alternative bidding systems in terms of hitting the statted objective of the project with best performance, more secured and less risk when reaching an award decision and on construction phase. According to the interview result obtained, Multi Parameter Bidding Method. (Based on price and “other” factors), and Non-Competitive Negotiated Bidding ranked by the participants in the first and second position when compared with the other bidding methods in terms of their best performance with respect to stated project objectives and which minimize project risk at a time reaching award decision and during construction stage. Here is also Non-Competitive Negotiated Bidding has given less emphasis was given by the public sector clients in

suspect of achieving the project objective with best performance and the level of risks not reduced for the client in all phase of the project execution activity.

G. Prioritized lists of bid methods in terms of difficult to understand

Table 4. 21 PLOBM in terms of DTU how that contractor could complete the JP

Bid Methods	Rank									
	1		2		3		4		5	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Competitive Low Bidding (Price-based)	5	100	-	-	-	-	-	-	-	-
Competitive Average Bidding (Price-based)			2	40	3	60	1	20		
Multi Parameter Bidding Method (Based on price and “other” factors)	-	-	-	-	-	-	1	20	4	80
Competitive Negotiated Bidding	-	-	-	-			2	40	3	60
Non-Competitive Negotiated Bidding	-	-			1	20			4	80
Total	5									

Table 4.21 shows the interview results from the public sector clients in Jima Zone public building construction projects to prioritize the bid method in terms of difficult to understand how that contractor could complete the job profitably. The interview result shows that Competitive Low Bidding (Price-based) ranked by the participant in the first level in terms its difficulty to complete the project and being a profitable with a contract value that they won the project. The reason is that in the lowest bidder bid award system contractors are submitting the least price from the competing contractor with or without considering the approximated project cost and profit margins and only to win except hidden tricks of compensating their respective gain from the project. Multi parameter bidding method (based on price and “other” factors), competitive negotiated bidding and non-competitive negotiated bidding has ranked by participants in the fifth place in their expectation not difficult to understand the contractor bid price and the level of profitability in comparison with the client’s engineer estimates to arrive at decision on the contractor’s qualification.

H. Indication of frequency in percent (%), for work awarded under project delivery and bid-award methods by organization

Table 4. 22 Organization’s frequency in % work awarded under different PD and BAM

No	Please indicate Frequency, in %, of your organization’s work awarded under the following project delivery and bid-award methods.	0% to 25%	25% to 50%	50% to 75%	75% to 100%
1	Competitive method of awarding contract to the lowest responsive bidder	*	*	20%	80%
2	Negotiation with one or more preselected contractors)	80%	20%	*	*
3	Request for Proposal/Request for Qualification- Inviting proposals from contractors for prequalification and/or negotiation.	40%	60%	*	*
Total		5			

Table 4.22 the interview results obtained from public sector clients about the frequency of their organization participated in the different types of alternative bid award system. The interview result shows that most of the participants agree that their organization was mostly participated in the form of competitive method of awarding contract to the lowest responsive bidder, which indicates that public construction projects are passes under the traditional procurement system (lowest bidder bid award system). Request for Proposal/Request for qualification inviting proposals from contractors for prequalification and/or the participants ranked negotiation next the lowest bidder bid award system in their organization.

I. Result for existence of cost overrun on the project by client

Table 4. 23 Frequency and Valid percent of cost overrun responded by client

Item	Frequency	Valid Percent
Yes	4	80
No	1	20
No Idea	0	0
Total	5	100

Table 4.23 shows that from participants of the public sector clients, 80% of the interviewee replied that they were cost overrun on the public project of Jimma zone projects. The other 20% of the participants were argued that there was not exist the cost overrun on the projects. Therefore, those percentages indicate that more than half of the project that was built in Jimma zone and which was the contract awarded by the lowest bidder bid awarding system were showed cost overrun.

Table 4. 24 Frequency and Valid average percentage of cost overrun replied by client

Items	Frequency	Valid Percent
30-60%	3	60
60-100%	1	20
100-200%	1	20
Total	5	100.0

As above stated on the table 4.24 shows that from participants of the public sector clients, 60% of the interviewee replied that it happened from 30 up to 60% cost overrun on the public project of Jimma zone projects. And, the 20% of the participants were argued that, it happened from 60 up to 100% cost overrun on the public project of Jimma zone projects. The remaining 20% of the respondent were argued that the cost overrun happened between 100 and 200 by percent. Therefore, from the above discussion we can say that, mostly the cost overrun happened on the Jimma zone construction projects were between 30 and 60 by percent.

J. Result for existence of delay on the project replied by owner

Table 4. 25 Frequency and Valid percentage of project delay

Item	Frequency	Valid Percent
Yes	4	80
No	1	20
No Idea	0	0
Total	5	100

Table 4.25 shows that from participants of the public sector clients, 80% of the interviewee replied that they were delay on the public project of Jimma zone projects. The other 20% of the participants were argued that there was not exist the delay on the projects. Therefore, those percentages indicate that more than half of the project

that was built in Jimma zone and which was the contract awarded by the lowest bidder bid awarding system were showed delayed.

Table 4. 26 Frequency and valid average percentage of project delay response by client

Items	Frequency	Valid Percent
50-75%	2	40
75-100%	3	60
100-200%	0	0
Total	5	100.0

As above stated on the table 4.26 shows that from participants of the public sector clients, 40% of the interviewee replied that it happened from 50 up to 75% delay on the public project of Jimma zone projects. The remaining 60% of the respondent were argued that the delay happened between 75 and 100 by percent. Therefore, from the above discussion we can say that, mostly delay happened on the Jimma zone construction projects were between 75 and 100 by percent.

4.4.2 Contractors interview result

- I. Mostly used method of bid selection procedure of contractor for the project award

Table 4. 27 Involvement of contractor in method of bid

Item	Frequency	Valid Percent
The Average Bid Method	1	10.0
Low Bid Method	9	90.0
Total	10	100.0

Table 4.27 shows the interview result obtained from participants of contractors who were involved in Jima Zone public building construction projects for the last five years and currently under construction. The interview result shows that 90% of the participants from contractors agree that mostly used bid award system is a low bid (price based) method for the projects they were participated than other alternative bid award system (The Average Bid Method and Negotiated bidding). All public construction projects have awarded through lowest bidder bid award system because of that it is a government procurement policy applicable in a national level. Only one participant replied that he had an experience with Average Bid Method.

II. Types of bidding system that have positive changes as compared to the lowest bidding

Table 4. 28 Types of positive changes of bidding system compared to the lowest bidding

Item	Frequency	Valid Percent
Competitive Negotiated Bidding	1	10.0
Non-Competitive Negotiated Bidding	2	20.0
Multi Parameter Bidding Method (Based on price and “other” factors)	5	50.0
Competitive Average Bidding	2	20.0
Total	10	100.0

Table 4.28 shows the interview results obtained from participants of contractors under public building construction projects in Jima Zone. As the interview result shows, 50% of the participant agreed that Multi Parameter Bidding Method (Based on price and “other” factors) is the best alternative to bring up a positive change over the lowest bidder bid award system from other alternative bidding system. 20% of the interviewee selected Non-Competitive Negotiated Bidding and Competitive Average Bidding as an alternative over the lowest bid method of contractor selection system.

III. Description for organization’s bid evaluation procedure

Table 4. 29 Organization’s bid evaluation procedure

Item	Frequency	Valid Percent
Based on bid price only	1	10.0
Based on bid price and responsiveness	6	60.0
Based on bid price, responsiveness, and other factors	3	30.0
Total	10	100.0

Table 4.29 shows the interview results of respondents from contractors who were involved under Jima Zone public building construction projects about their organization bid evaluation procedure. Among the alternative criteria’s given in the table, 60% of the participants replied that their organization had an experience of evaluation procedure for bidding in the public construction project is Based on bid price and responsiveness. The other 30% replied that their organization is evaluated through bidding procedure of based on bid price and responsiveness. Only one

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participant replied that, their organization has an experience evaluation through Based on bid price only awarding procedure was used.

IV. Currently uses of bid evaluation procedure for organization satisfaction

Table 4. 30 Satisfaction of bid evaluation procedure currently in use

Item	Frequency	Valid Percent
Yes	1	10.0
No	7	70.0
No Idea	2	20.0
Total	10	100.0

Table 4.30 shows that from participants of the contractors, 70% of the interviewee replied that they were not satisfied with bid evaluation procedure currently used. 10% of the participant was argued that the current bid evaluation procedure used is satisfactory. The other 20% of the interviewees had no idea about the bid evaluation procedure currently used. The interview result shows that contractors are not satisfied with the current public procurement system.

V. Prioritized lists of bid methods in terms of giving high concern of qualitative, technical and sustainable aspects of the tender submission as well as price when reaching an award decision

Table 4. 31 Prioritizing bid methods by qualitative, technical and sustainable aspects

Bid Methods	Rank									
	1		2		3		4		5	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Competitive Low Bidding (Price-based)	-	-	-	-	-	-	1	10	9	90
Competitive Average Bidding (Price-based)	1	10	3	30	1	10	7	70	1	10
Multi Parameter Bidding Method (Based on price and “other” factors)	4	40	4	40	2	20	-	-	-	-
Competitive Negotiated Bidding	2	20	5	50	3	30	-	-	-	-
Non-Competitive Negotiated Bidding	3	30	1	10	4	40	2	20	-	-
Total	10									

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Table 4.31 shows the interview results of contractors about the level priority for the bid methods in terms of giving high concern of qualitative, technical and sustainable aspects of the tender submission as well as price when reaching an award decision. The interviewees put Multi Parameter Bidding Method (Based on price and “other” factors) and Competitive Negotiated Bidding in the first and second position in which the two alternative bidding systems has given a higher concern in terms of achieving qualitative, technical and sustainable aspects than the other bidding procedures. In contrast Competitive Low Bidding (Price-based) and Competitive Average Bidding (Price-based) ranked at the fourth and fifth position as a least important alternative for achieving the given parameters.

VI. Prioritized lists of bid methods in terms of hitting the steted objective of the project with best performance, more secured and less risk when reaching an award decision and on construction phase

Table 4. 32 Prioritizing in terms of hitting the steted objective of the project

Bid Methods	Rank									
	1		2		3		4		5	
	Freq	%	Freq	%	Fre q.	%	Freq	%	Fre q.	%
Competitive Low Bidding (Price-based)	-	-	-	-	-	-	1	10	9	90
Competitive Average Bidding (Price-based)	-	-	-	-	3	30	7	70	-	-
Multi Parameter Bidding Method (Based on price and “other” factors)	3	30	4	40	3	30	-	-	-	-
Competitive Negotiated Bidding	5	50	5	50	-	-	-	-	-	-
Non-Competitive Negotiated Bidding	2	20	1	10	4	40	2	20	1	10
Total	10									

Table 4.32 shows the interview results obtained from participants of contractors about their experience and understanding to give a priority on the alternative bidding systems in terms of hitting the steted objective of the project with best performance, more secured and less risk when reaching an award decision and on construction

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phase. According to the interview result obtained. Multi Parameter Bidding Method (Based on price and “other” factors) and Competitive Negotiated Bidding ranked by the participants in the first and second position when compared with the other bidding methods in terms of their best performance with respect to stated project objectives and which minimize project risk at a time reaching award decision and during construction stage. Competitive Low Bidding (Price-based) and Competitive Average Bidding (Price-based) had given less emphasis by the contractors in suspect of achieving the project objective with best performance and the level of risks not reduced for the client in all phase of the project execution activity.

VII. Prioritized lists of bid methods in terms of difficult to understand

Table 4. 33 PLOBM in terms of DTU how that contractor could complete the JP

Bid Methods	Rank									
	1		2		3		4		5	
	Freq.	%	Freq.	%	Freq.	%	Fre q.	%	Fre q.	%
Competitive Low Bidding (Price-based)	8	-	2	-	-	-		-		
Competitive Average Bidding (Price-based)	1		8		1					
Multi Parameter Bidding Method (Based on price and “other” factors)					2		4		4	
Competitive Negotiated Bidding					3		4		3	
Non-Competitive Negotiated Bidding	1				4		2		3	
Total	10									

Table 4.33 shows the interview results of contractors involved in Jima Zone public building construction projects to prioritize the bid method in terms of difficult to understand how that contractor could complete the job profitably. The interview result shows that Competitive Low Bidding (Price-based) and Competitive Average Bidding (Price-based) ranked by the participant in the first and second level in terms its difficulty to complete the project and being a profitable with a contract value that they won the project. Multi parameter bidding method (based on price and “other” factors), competitive negotiated bidding and non-competitive negotiated bidding had ranked by

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participants from third to fifth place in their expectation not difficult to understand the contractor bid price and the level of profitability in comparison with the client's engineer estimates to arrive at decision on the contractor's qualification.

VIII. Indication of frequency in percent (%), for work awarded under project delivery and bid-award methods by organization

Table 4. 34 Organization's frequency in % work awarded under different PD and BAM

No	Please indicate Frequency, in %, of your organization's work awarded under the following project delivery and bid-award methods.	0% to 25%	25% to 50%	50% to 75%	75% to 100%
1	Competitive method of awarding contract to the lowest responsive bidder	*	*	40%	60%
2	Negotiation with one or more preselected contractors)	70%	30%	*	*
3	Request for Proposal/Request for Qualification- Inviting proposals from contractors for prequalification and/or negotiation.	70%	30%	*	*
Total		10			

Table 4.34 the interview results obtained from contractors about the frequency of their organization participated in the different types of alternative bid award system. The interview result shows that most of the participants agree that their organization was mostly participated in the form of competitive method of awarding contract to the lowest responsive bidder, which indicates that contractors participating under public construction projects are passes through traditional procurement system. Negotiation with one or more preselected contractors) and Request for Proposal or request for qualification inviting proposals from contractors for prequalification and/or negotiation were a rare case especially in public construction projects as ranked by the participants of contractors.

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XI. Result for existence of cost overrun on the project by contractor

Table 4. 35 Frequency and Valid percent of cost overrun replied by contractor

Items	Frequency	Valid Percent
Yes	9	90
No	1	10
No Idea	0	0
Total	10	100

As stated above Table 4.35 shows that from participants of the contractor, 90% of the interviewee replied that, they were cost overrun on the public project of Jimma zone projects. In addition, the remaining 10% indicate that, there was no cost overrun on the projects. Therefore, above half of the contractor argued that there was a cost overrun on the Jimma zone public construction projects that was awarded using the lowest bidder bid awarding system.

Table 4. 36: Frequency and Valid average % of cost overrun replied by contractor

Items	Frequency	Valid Percent
50-75%	6	60
75-100%	2	20
100-200%	2	20
Total	10	100.0

As mentioned on table 4.36 indicate that the percentage happened the cost overrun on the Jimma zone public projects, which was responded from the contractor side. Therefore, cost overrun by 30-60%, 60-100%, and 100-200% were happened that was 60, 20, and 20% of the respondent were argued from the contractor's side respectively.

XII. Result response for existence of delay on the project by contractor

Table 4. 37 Frequency and valid percent for project delay replied by contractor

Item	Frequency	Valid Percent
Yes	10	100
No	0	0
No Idea	0	0
Total	10	100

As stated above table 4.37 shows that from participants of the contractor, 100% of the interviewee replied that they were delay on the public project of Jimma zone projects.

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Therefore, the entire contractor argued that there was a delay on the Jimma zone public construction projects that was awarded using the lowest bidder bid awarding system.

Table 4. 38 Frequency and valid percentage for project delay replied by contractor

Item	Frequency	Valid Percent
50-75%	1	10
75-100%	8	80
100-200%	1	10
Total	10	100.0

As mentioned on Table 4.38 indicate that the percentage happened the delay on the Jimma zone public projects, which was responded from the contractor side. Therefore, delay by 50-75%, 75-100%, and 100-200% were happened that was 10, 80, and 10% of the respondent were argued from the contractor's side respectively.

4.2.3 Consultants interview result

- a. Mostly used method of bid selection procedure of contractor for the project award

Table 4. 39 Involvement of contractor in method of bid by consultant

Item	Frequency	Valid Percent
The Average Bid Method	-	0
Low Bid Method	5	100.0
Total	5	100.0

Table 4.39 shows the result obtained from the interview show that all the participants of consultants agreed that mostly used bid award system is a low bid (price based) method for the projects they were participated than other alternative bid award system. All public construction projects are awarded through lowest bidder bid award system; because of that, it is a government procurement policy applicable in a national level.

- b. Types of bidding system that have positive changes as compared to the lowest bidding

Table 4. 40 Positive changes compared to lowest bidding by consultant

Item	Frequency	Valid Percent
Multi Parameter Bidding Method (Based on price and "other" factors)	3	60.0
Competitive Average Bidding	2	40.0
Total	5	100.0

Table 4.40 show as the interview result shows, 60% of the participant agreed that Multi Parameter Bidding Method (Based on price and “other” factors) is the best alternative to bring up a positive change over the lowest bidder bid award system from other alternative bidding system. 40% of the interviewee selected Competitive Average Bidding as an alternative over the lowest bid method of contractor selection system.

c. Description for organization’s bid evaluation procedure

Table 4. 41 Organization’s bid evaluation procedure by consultant

Item	Frequency	Valid Percent
Based on bid price and responsiveness	4	80.0
Based on bid price, responsiveness, and other factors	1	20.0
Total	5	100.0

The above table describes the interview results of respondent’s consultants about the bid evaluation procedure in the organization they were involved. Among the alternative criteria’s, 80% of the participants replied that they had an experience of evaluation procedure for bidders is Based on bid price and responsiveness. The other 20% said that their organization bidding procedure has Based on bid price, responsiveness, and other factors.

d. Currently uses of bid evaluation procedure for organization satisfaction

Table 4. 42 Satisfaction with the bid evaluation procedure currently in use

	Frequency	Valid Percent
Yes	1	20.0
No	2	40.0
No Idea	2	40.0
Total	5	100.0

Table 4.42 shows that from participants of consultants who were involved in Jima Zone public building construction projects, 40% of the interviewee replied that they were not satisfied with bid evaluation procedure currently used. 20% of the participant were agreed that the current bid evaluation procedure used is satisfactory. The other 20% of the interviewees had no idea about the bid evaluation procedure currently used.

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- e. Prioritized lists of bid methods interims of giving high concern of qualitative, technical and sustainable aspects of the tender submission as well as price when reaching an award decision

Table 4. 43 Prioritize the lists of bid methods

Bid Methods	Rank									
	1		2		3		4		5	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Competitive Low Bidding (Price-based)	-		-		-	-			5	100
Competitive Average Bidding (Price-based)	1	20	1	20	2	40	1	20		
Multi Parameter Bidding Method (Based on price and “other” factors)	4	80	1	20			-		-	-
Competitive Negotiated Bidding			3	60	2	40	-		-	-
Non-Competitive Negotiated Bidding					1	20	4	80	-	-
Total	5									

Table 4.43 shows the interview results of consultants about the level priority for the bid methods interims of giving high concern of qualitative, technical and sustainable aspects of the tender submission as well as price when reaching an award decision. The interviewees put Multi Parameter Bidding Method (Based on price and “other” factors) and Competitive Negotiated Bidding in the first and second position in which the two alternative bidding systems has given a higher concern in terms of achieving qualitative, technical and sustainable aspects than the other bidding procedures. In contrast, Competitive Low Bidding (Price-based) and Non-Competitive Negotiated Bidding ranked at the fourth and fifth position as a least important alternative for achieving the given parameters.

- f. Prioritized lists of bid methods interims of hitting the steted objective of the project with best performance, more secured and less risk when reaching an award decision and on construction phase

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Table 4. 44 PLOBM interims hitting the steted objective of the project

Bid Methods	Rank									
	1		2		3		4		5	
	Freq.	%	Freq.	%	Fre q.	%	Fre q.	%	Fre q.	%
Competitive Low Bidding (Price-based)	-	-	-	-	-	-	-	-	5	100
Competitive Average Bidding (Price-based)	-	-	1	20	-	-	4	80	-	-
Multi Parameter Bidding Method (Based on price and “other” factors)	2	40	2	40	1	20	-	-	-	-
Competitive Negotiated Bidding	2	40	2	40	1	20	-	-	-	-
Non-Competitive Negotiated Bidding	1	20	-	-	3	60	1	20	-	-
Total	5									

Table 4.44 shows the interview results obtained from participants of consultants about their experience and understanding to give a priority on the alternative bidding systems interims of hitting the steted objective of the project with best performance, more secured and less risk when reaching an award decision and on construction phase. According to the interview result obtained from consultants. Multi Parameter Bidding Method (Based on price and “other” factors) and Competitive Negotiated Bidding ranked by the participants in the first and second position when compared with the other bidding methods in terms of their best performance with respect to stated project objectives and which minimize project risk at a time reaching award decision and during construction stage. Competitive Low Bidding (Price-based) and Competitive Average Bidding (Price-based) had given less emphasis by the consultants in suspect of achieving the project objective with best performance and the level of risks not reduced for the client in all phase of the project execution activity.

g. Prioritized lists of bid methods in terms of difficult to understand

Table 4. 45 PLOBM in terms of DTU how that contractor could complete the JP

Bid Methods	Rank										
	1		2		3		4		5		
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
Competitive Low Bidding (Price-based)	5	100	-	-	-	-	-	-	-	-	-
Competitive Average Bidding (Price-based)	-	-	4	80	1	20	-	-	-	-	-
Multi Parameter Bidding Method (Based on price and “other” factors)	-	-	-	-	4	80	1	10	-	-	-
Competitive Negotiated Bidding	-	-	-	-	-	-	3	60	2	40	-
Non-Competitive Negotiated Bidding	-	-	1	20	-	-	1	20	3	60	-
Total	5										

Table 4.45 shows the interview results of consultants involved in Jima Zone public building construction projects to prioritize the bid method in terms of difficult to understand how that contractor could complete the job profitably. The interview result shows that Competitive Low Bidding (Price-based) and Competitive Average Bidding (Price-based) ranked by the participant in the first and second level in terms its difficulty to complete the project and being a profitable with a contract value that they won the project. Multi parameter bidding method (based on price and “other” factors), competitive negotiated bidding and non-competitive negotiated bidding has ranked by participants from third to fifth place in their expectation not difficult to understand the contractor bid price and the level of profitability in comparison with the client’s engineer estimates to arrive at decision on the contractor’s qualification.

h. Indication of frequency in percent (%), for work awarded under project delivery and bid-award methods by organization

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Table 4. 46 Organization’s work awarded under the following PD and BAMs

No	Please indicate Frequency, in %, of your organization’s work awarded under the following project delivery and bid-award methods.	0% to 25%	25% to 50%	50% to 75%	75% to 100%
1	Competitive method of awarding contract to the lowest responsive bidder	*	*	20%	80%
2	Negotiation with one or more preselected contractors	80%	20%	*	*
3	Request for Proposal/Request for Qualification- Inviting proposals from contractors for prequalification and/or negotiation.	40%	60%	*	*

Table 4.46 the interview results obtained from consultants about the frequency of their organization participated in the different types of alternative bid award system. The interview result shows that most of the participants agree that their organization was mostly participated in the form of competitive method of awarding contract to the lowest responsive bidder, which indicates that public construction projects are passes under the traditional procurement system (lowest bidder bid award system). Request for Proposal or request for qualification inviting proposals from contractors for prequalification and/or the participants ranked negotiation next the lowest bidder bid award system in their organization.

i. Result for existence of cost overrun on the project by Consultant

Table 4. 47 Frequency and Valid percent of cost overrun responded by consultant

	Frequency	Valid Percent
Yes	5	100
No	0	0
No Idea	0	0
Total	5	100

Table 4.47 shows that from participants of the public sector clients, 100% of the interviewee replied that they were cost overrun on the public project of Jimma zone projects. Therefore, those percentages indicate that the entire consultant argued that

there was a cost overrun on the Jimma zone public construction projects that was awarded using the lowest bidder bid awarding system.

Table 4. 48 Frequency and Valid percentage of cost overrun reply by consultant

Item	Frequency	Valid Percent
30-60%	4	80
60-100%	1	20
100-200%	0	0
Total	5	100.0

As above stated on the Table 4.48 indicate that the percentage happened the cost overrun on the Jimma zone public projects which was responded from the consultant side. Therefore, the 80% of the interviewer replied that it happened from 30 up to 60% cost overrun on the public project of Jimma zone projects. In addition, the remaining 20% of the respondent were argued that the cost overrun happened between 60 and 100 percent. Therefore, from the above discussion we can conclude that, frequently the cost overrun happened between 30 and 60 by percent.

j. Result for existence of delay on the project response by consultant

Table 4. 49 Frequency and valid percentage for project delay replied by consultant

Item	Frequency	Valid Percent
Yes	5	100
No	0	0
No Idea	0	0
Total	5	100

Table 4.49 shows that from participants of the public sector clients, 100% of the interviewee replied that they were delay on the public project of Jimma zone projects that was awarded by lowest bidder bid awarding system.

Table 4. 50 Frequency and valid average % for project delay responded by consultant

Item	Frequency	Valid Percent
50-75%	2	40
75-100%	3	60
100-200%	0	0
Total	5	100.0

As above stated on the Table 4.50 indicate that the percentage happened the delay on the Jimma zone public projects which was responded from the consultant side. Therefore, the 40% of the interviewer replied that it happened from 50 up to 75% delay on the public project of Jimma zone projects. In addition, the remaining 60% of the respondent were argued that the cost overrun happened between 75 and 100 by percent.

4.4.3 Summary of Comparison of LBBA System on PCPs

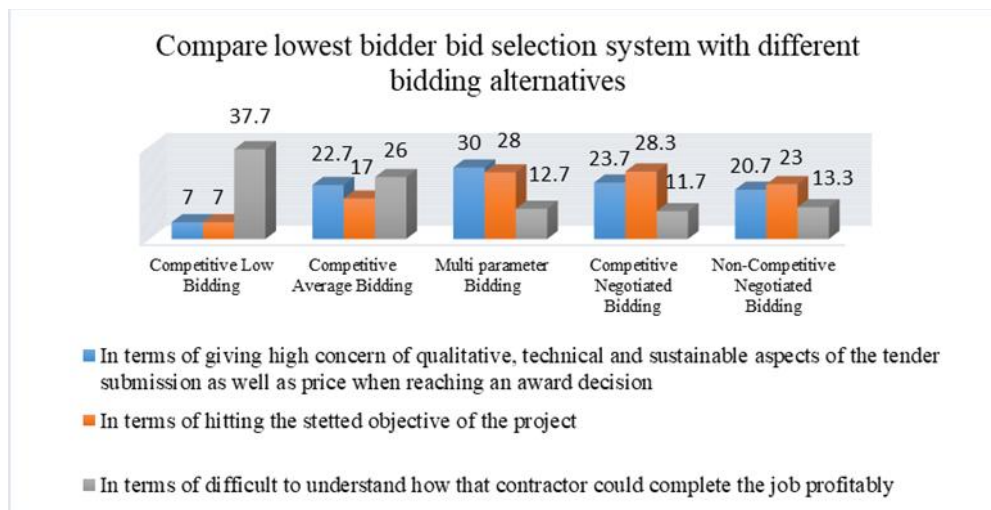


Figure 4. 22 Summary of Comparison of LBBA System on PCPs

The above figure shows that; the percentage results of the respondent based on; in terms of giving high concern of qualitative, technical and sustainable aspects of the tender submission as well as price when reaching an award decision, hitting the stetted objective of the project and difficult to understand how that contractor could complete the job profitably. So according to their average percentage 23.57% for multi parameter bidding, 21.9% for competitive average bidding, 21.23% for competitive negotiated bidding, 18.77% for non-competitive negotiated bidding and 17.23% for competitive low bidding.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This study analyze the effect of the lowest bidder bid awarding system in the performance of public construction projects that are located in Jimma zone: And to identify the challenges, impacts of the lowest bidder bid selection system over the life cycle of construction projects and compare the lowest bidder bid selection system with different bidding alternatives.

From considered challenges, relatively six high challenges of lowest bidder bid awarding system in public construction projects were identified. These are; no site visits before bidding and no understanding of detail scope of work contracts, contractor perception on variation, contractors have to bid low to increase annual turnover, shortcoming in professional contractors, weak contract administration of client, and preparing tenders by using estimations of historical data and traditional norms were ranked respectively.

Also the study identified that; delay on project completion 87.5%, cost overrun, 45%, increase in number of change order, unsatisfactory quality of work, increased disputes and claims between contracting parties, compromising quality and making unnecessary claims; are six most top impacts of lowest bidder bid selection system on the life cycle of construction projects in Jimma Zone.

Furthermore; this research identified two bidding methods those are more secured and less risk: These are multi parameter and competitive negotiated bidding method are more preferred lowest bidder bid selection system from different biding alternatives interims of achieving organization objectives, qualitative, technical and hitting the steted objective of the project with best performance.

Finally, to select qualified contractors and to achieve the stated project objectives of the lowest bidder bid awarding system needs to be improved.

5.2 Recommendation

The following are recommendation from the study findings, this research titled Performance Study of Lowest Bidder Bid Awarding System in Jimma Zone Public Construction Projects for public sector client, contractors and consultants.

5.2.1 Recommendation for public sector clients

Clients should -

- Carefully prepare bid document, select qualified bidders based on their technical capacity and financial capability in a way to achieve the project objective with respect to quality, cost and time.
- Prepare accurate project cost estimate, in-depth information about the project site location and required input,
- Make a fair and transparent procurement procedure that is free from corruption and favoritism
- Organized and submit post project auditing depends on reliable data and report to concerned policy maker to use as input.

5.2.2 Recommendation for the contractors

Contractors should -

- Conduct a site visit and pre-bid meeting before deciding to participate to in the bidding process
- Gather detail information about the project environment like access to the project site, labor market and distance from the center.
- Submit an estimated bid price by considering the current market condition and project cost variation to complete the project with agreed contract requirement.
- Develop the culture of fair competition to win the project, which is free from corruption and tricks to compensate over the abnormality of the bid price.

5.2.3 Recommendation for consultant

Consultants should -

- Give effective advice and contract administration for the client to reduce the risk.
- Minimize awarding unqualified contractors and contractual problems during the construction stage.
- Play role in handling the legal issues coming from contractors in the performance period due to financial incapability of contractor to complete the project with the standard of the contract agreement.
- Enhance pre-cost control issue at early stage of project to reduce claim stoppage time of project.

5.2.4 Recommendation for Regulatory Body

- The findings of the research show the low level performance of public construction contracts in LBBAS. The researcher recommends to Federal Government of Ethiopia should look for other alternative bid evaluation and bid award procedures.
- As of all participants in the study, agreed that the Government should allow different bid evaluation and contract award procedures depending on the size and complexity of the project.
- Based on identified findings the researcher shared the idea of adopting the multi parameter and negotiated bid method of awarding contracts among responsive bidders which are supported by many construction professionals included in the study. On the other hand, the engineering estimation should use to minimize abnormally low bid contracts among contractors.
- Finally, the concerned government body should consult professionals in this area on whether there is a need to modify/change the current legislation for procurement of works and service.

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APPENDIX

Appendix-1: Questionnaire Survey

JIMMA UNIVERSITY

JIMMA INSTITUTION OF TECHNOLOGY

SCHOOL OF GRADUATE STUDIES

FACULTY OF CIVIL AND ENVIRONMENTAL ENGINEERING

CONSTRUCTION ENGINEERING AND MANAGEMENT CHAIR

Dear Participant,

Thank you for agreeing to participate in this research study. My name is **Tiruneh Tadesse Hirpo**. I am a MSc candidate at Jimma University, Jimma Institute of Technology, School of Civil & Environmental Engineering, Construction Engineering and Management Stream. For the fulfillment of my MSc degree in Construction Engineering and management, I am conducting a research on the topic of **Performance Study of Lowest Bidder Bid Awarding System in Public Construction Projects; In case of Jimma Zone**. The objective of this survey is to collect information on appropriate **effect of the lowest bidder bid awarding system in the performance of public construction projects, which are located in Jimma zone for the academic purpose only**. Your feedback is needed to help better understand the effects of lowest bidder bid awarding system for various projects. Participation in this research survey is voluntary and there are no direct benefits for your participation, but I appreciate your time and effort. The survey includes **Chooses and prioritizations list question, which is** intended not to take more than 15 minutes of your time. Questions can be skipped, and you can stop at any point. There are no foreseeable risks to your participation. To protect your confidentiality, no names or company affiliation will be collected.

With regards,
Tiruneh Tadesse

If you have any questions regarding the questionnaire you can contact **Tiruneh Tadesse Hirpo** at tirunehtadesse19@gmail.com;

Cell Phone: (+251912 22 39 07) or (+2519 38 37 4 08)

QUESTIONNAIRES SURVEY

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Part-1 General for Owner

Project Name: _____

1. The contract was awarded to the lowest bidder because one or more of the following:

(x or)

Description	Remark
It is a government practice	
The contractor was pre-qualified	
The offer was close to our estimate	
It was a reasonable competitive offer (No large difference from others)	
The contractor was the most competent	
The client (yourself) had good experience with the contractor	
The contractor was classified	
If Others, please specify:	

2. Major Difficulties Encountered During the Construction Process.

Major Difficulties by Type	Yes	No	Unknown
Material Shortage			
Equipment Shortage			
Cash Shortage			
Man Power Shortage			
Employer Interference			
Design/Drawing related			
Supervision Related			
Other's			

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3. Evaluation of the Contractor's Performance

	Excellent	V. Good	Good	Fair	Poor
Quality of work					
Adherence to construction and specification					
Organization					
Activity work follow-up and submission					
Cooperation with owner					
Progress of work					

4. What sort of information that your organization is seeking to obtain from the contractors in order to prepare the evaluation list in the system of LBBA?

(1) Very low (2) Low (3) No Idea (4) high (5) Very high

Basic Criteria's					
	1	2	3	4	5
Financial stability					
Technical & management ability					
Experience					
Health and safety					
Reputation					
Culture experience					
For other reasons, please specify					

5. How much (in %age) fair and transparent of Bidding procedure that is made in the construction industry of Ethiopia?

0%-25% 25%-50% 50%-75% 75%-100%

6. At which level the assessment of contractor selection process take place in LBBAS (Lowest Bidder Bid Awarding System). (tick one or more)

- Technical department and engineering financial department
 Project management team High managerial level (director)
 Independent consultant by a committee member
 Other reasons, please specify

Part-1 General Questioner for Contractor

1. Classification of Contractors in building works:

1st 2nd 3rd 4th 5th

2. Title of position of respondent

Contractor Project manager Site engineer

If others, (specify)_____

3. Experience years' respondent

Less than 5years 5 to 8years 8to 12 years More than 12 years

4. Experience years of the organization in constructions:

Less than 3years 3 to 5 years 6to 10 years More than 10 years

5. Number of projects implemented in the last five years.

Less than 5 5 to 10 10 to 15 More than 15

6. Value of implemented projects during the last five years (in million ETB):

Less than 1 1to 3 3to 6 More than 6

7. In your experience, how do you rate in percentage, the quality of the project completed lowest bidder bid system?

0%-25% 25%-50% 50%-75% 75%-100%

8. In your experience how do you rate in percentage of the project cost in lowest bid system projects are exposed to change order.

0%-25% 25%-50% 50%-75% 75%-100%

9. How much percent defects are observed the built facilities within the warranty period?

0%-25% 25%-50% 50%-75% 75%-100%

10. How much (in %age) fair and transparent of Bidding procedure that is made in the construction industry of Ethiopia?

0%-25% 25%-50% 50%-75% 75%-100%

11. At which level the assessment of contractor selection process take place in LBBAS (List Bid Bidder Awarding System). (tick one or more)

Technical department and engineering financial department

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- Project management team High managerial level (director)
 Independent consultant a committee consist of (1, 2, 3, 4)
 Other reasons, please specify

Part-1 General Questioner for Consultants /Regulatory Body

1. Classification of consultancy service in building works:
 1st 2nd 3rd 4th
 Less 5th
2. Title or position of respondent: _____
3. Experience years' respondent
 Less than 3years 3 to 5 years 6 to 10 years More than 10 years
4. Number of projects consulted in the last five years.
 Less than 5 5 to 10 10 to 15 More than 15
5. In your experience how do you rate in percentage the quality of the project completed lowest bidder bid system?
 0%-25% 25%-50% 50%-75% 75%-100%
6. In your experience how do you rate in percentage of the project cost in lowest bid system projects are exposed to change order?
 0%-25% 25%-50% 50%-75% 75%-100%
7. How much percent defects are observed the built facilities within the warranty period?
 0%-25% 25%-50% 50%-75% 75%-100%
8. How much (in %age) fair and transparent of Bidding procedure that is made in the construction industry of Ethiopia?
 0%-25% 25%-50% 50%-75% 75%-100%
9. What sort of information that your organization is overseeing in seeking to obtain from the contractors in order to prepare the evaluation list in the system of LBBA?

	Rank (1to7)
Financial stability	
Technical & management ability	
Experience	

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Health and safety	
Reputation	
Culture experience	
For other reasons, please specify	

10. At which level the assessment of contractor selection process take place in LBBAS. (Lowest Bidder Bid Awarding System) (tick one or more)

- Technical department and engineering financial department
 Project management team High managerial level (director)
 Independent consultant By a committee member
 Other reasons, please specify

Part 2: Challenges of Lowest bidder bid selection system of public construction projects

1. Lists of challenges of LBBAS for the study are mentioned below. From your experience, please tick the appropriate cell by indicating how much you agree to listed challenge that you are facing in the construction industry specifically in Jimma zone.

- (1) Very low (2) Low (3) No Idea (4) High (5) Very High

No.	Challenges of Lowest bidder bid selection system ^{1*}	Scale of challenges				
		1	2	3	4	5
1	Lack of information for contractors' past performance, volume of currently contracted work and their financial situation					
2	Imprecise and ambiguous contract documentation may cause a contractor to make a serious omission in calculating costs.					
3	With increasing number of contractors and competition among them, bidders quote low prices to get the contract anyhow to remain in business					
4	To have utilization of their ideal resource machine, equipment's and vehicles enforces					

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	contractors to bid in low price in construction business of public sector					
5	Work in hand and favorable location of site may affect the bid price.					
	If no work in hand, lower is the bid price and					
	If the new site is adjoining in current site of the contractor, this can be a big factor for low bid.					
6	Nature of work i.e. lower bid in works only with earthworks and simple structures than in works with major structural works.					
7	Contractor's perception on variation Contractors initially go for abnormally low bid with the intention of recovering their losses through change orders and claims					
8	Contractors' classification is not accurate					
9	Insufficient details of design, specification and contract document for projects.					
10	Weak contract administration of client leading to assumption that specified work quality need not be maintained					
11	Lack of experience of the tendering staff					
12	Inflexibility/ Bureaucratic process used in the current government purchasing system					
13	No site visit before bidding and no understanding of detail scope of work by contractor.					
14	Shortcomings in professional contractors					
15	Contractors have to bid low to increase annual turnover					
16	Non-use of PPA or FIDIC Standard Forms					

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	of Contracts					
17	Discriminatory and non-quantifiable criterion was used for evaluating tenders for the project.					
18	Minutes/ records of proceedings for the project are accessible to tendered					
19	There was exclusion of tender(s) on the basis of corruption, collusion, and false declarations.					
20	Favoritism and corruption cannot be avoided if negotiated bid procedure is used.					
21	Preparing tenders by using estimates of historical data and traditional norms causes errors in estimation and usually price is under estimate.					

¹* Singha Bahadur Bista , Khet Raj Dahal, .Assessment of Low Bidding in Bridge Construction with Special Reference to Nepal, International Journal of Research – GRANTHAALAYAH, Vol.6 , Iss.10,October 2018.

Part 3: Impact of LBBAS (Lowest Bidder Bid Awarding System)

1. Lists of impact of LBBAS for the study are mentioned below. From your experience, please tick the appropriate cell by indicating how much you agree to listed impacts that influence to the construction in Jimma zone.

(1) Very low (2) Low (3) No Idea (4) High (5) Very High

No.	IMPACT OF LBBAS ^{1*2*}	Scale of Impact				
		1	2	3	4	5
1	Delay on project completion (more severe than cost)					
2	Re-tendering for projects several times					
3	Select of inefficient contractors					
4	Failed Projects					
5	Shortages in resources (labors, equipment, materials...etc					
6	Increased disputes and claims between contracting					

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	parties					
7	Underachievement in project performance					
8	Financial loss for owner					
9	Financial loss for contractor					
10	Failure to achieve the project objectives					
11	Long tendering durations may cause the withdrawal of contractors due to increasing price changes					
12	Increase in maintenance, replacement and operational costs					
13	Serious question on public safety					
14	Financial difficulty in effective contract management					
15	Cost overrun					
16	Increase in no of change request/orders					
17	Chances of illegal work					
18	Evasion of social contribution and tax					
19	Unsatisfactory quality of work					
20	Compromising quality and making unnecessary claims makes intended result in terms of project constraints (time, cost and quality) difficult to achieve.					

^{1*} Singha Bahadur Bista , Khet Raj Dahal, .Assessment of Low Bidding in Bridge Construction With Special Reference to Nepal, International Journal of Research – GRANTHAALAYAH, Vol.6 , Iss.10,October 2018

^{2*} TariqHussain Khan& Abdul Qadir Khan, Effects of Lowest Bidding Bid Awarding System in Public Sector Construction Projects in Pakistan, Global Journal of Management and Business Research: G Interdisciplinary Volume 15, Issue 1, Year2015.

Appendix-2: Interview Question

Part-1: compare lowest bidder bid selection system with different bidding alternatives

1. Type of Organization

Clients Contractor Consultant and/or regulatory bodies

2 In your experience which method of bid are used mostly in your selecting procedure of contractor for the project award?

The Average Bid Method Low Bid Method Negotiated bidding

If other, please specify _____

3. Which type of bidding system can bring upon positive changes as compared to the lowest bidding.

Competitive Negotiated Bidding

Non-Competitive Negotiated Bidding

Multi Parameter Bidding Method (Based on price and “other” factors)

Competitive Average Bidding

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) _____

5. In your experience as in a contractor side in which method of bid are mostly you are involved for the project awarding?

The Average Bid Method Low Bid Method Negotiated bidding

If other, please specify _____

6. Are you satisfied with the bid evaluation procedure currently in use in your organization?

A. Yes.

B. No.

C. No Idea

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7. Prioritize the lists of bid methods interims of giving high concern of qualitative, technical and sustainable aspects of the tender submission as well as price when reaching an award decision (1,2,3,4,5)

Bid Methods	Rank
Competitive Low Bidding (Price-based)	
Competitive Average Bidding (Price-based)	
Multi Parameter Bidding Method (Based on price and “other” factors)	
Competitive Negotiated Bidding	
Non-Competitive Negotiated Bidding	

8. Prioritize the lists of bid methods interims of hitting the steted objective of the project with best performance, more secured and less risk when reaching an award decision and on construction phase. (1,2,3,4,5)

Bid Method	Rank
Competitive Low Bidding (Price-based)	
Competitive Average Bidding (Price-based)	
Multi Parameter Bidding Method (Based on price and “other” factors)	
Competitive Negotiated Bidding	
Non-Competitive Negotiated Bidding	

9. Prioritize the lists of bid methods interims of difficult to understand how that contractor could complete the job profitably. (1,2,3,4,5)

Bid Method	Rank
Competitive Low Bidding (Price-based)	
Competitive Average Bidding (Price-based)	
Multi Parameter Bidding Method (Based on price and “other” factors)	
Competitive Negotiated Bidding	
Non-Competitive Negotiated Bidding	

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10. Please indicate Frequency, in %, of your organization's work awarded under the following project delivery and bid-award methods.

No	Please indicate Frequency, in %, of your organization's work awarded under the following project delivery and bid-award methods.	0% to 25%	25% to 50%	50% to 75%	75% to 100%
1	Competitive method of awarding contract to the lowest responsive bidder				
2	Negotiation with one or more preselected contractors)				
3	Request for Proposal/Request for Qualification- Inviting proposals from contractors for prequalification and/or negotiation.				

Part – Two: - Interview guideline for Cost overrun and delay on projects completion.

1. Did your organization encounter a cost overrun on the building construction projects that was awarded by the lowest bidder bid awarding system?

- A. Yes B. No C. No Idea

2. If your answer for equation No-1 is yes, by what average percent it was happens.

- A. 0-30% B.30-60% C. 60-100% D. please specify if any other_____

3. Did your organization experiences a delay on the building construction projects that was awarded by lowest bidder bid awarding system?

- A. Yes B. No C. No Idea

4. If your answer for equation No-3 is yes, by what average percent it was happens.

- A.0- 50% B.50-75% C. 75-100% D. please specify if any other_____

Appendix-3: Case Study Guideline

Project Name: _____

Client: _____

Contractor: _____

Consultant: _____

Main contract cost: _____

Supplementary contract: _____

Variation order: _____

Total project cost: _____

Date of signing of the contract: _____

Date of final acceptance: _____

Date when the contractor took possession of the site: _____

Commencement date: _____

Agreed length of completion date: _____

Actual completion date: _____

Total completion date: _____

Total number of delay: _____