



Management

ASSESSMENT OF LOW BIDDING IN BRIDGE CONSTRUCTION WITH SPECIAL REFERENCE TO NEPAL

Singha Bahadur Bista ¹, Khet Raj Dahal ²

¹ Msc. Student of Construction Engineering and Management in Lumbini International Academy of Science and Technology (LIASST)

² Professor and Campus Chief of Lumbini International Academy of Science and Technology (LIASST), Lalitpur, Nepal

Abstract

A study on “Assessment of low bidding in bridge construction of Nepal” was conducted during the period from January 2018 to May 2018. The method of the study was on the basis of secondary literature received from different sources and field observation. The purpose of the study was to overview low bidding and its influences on bridge construction. It has been realized that low bidding has significant role on time delays, cost overrun and quality degrade in bridge construction and as a result, users are closely suffering from inconvenience on transportation along with scarcity, hunger and diseases. Low bidding, itself is not a problem whereas it has got wide uses in all over the world with acceptance as more scientific and reliable process. In the context of Nepal, causes like political protection, zero punishment, expectation of mobilization advance for company survival, increment of turnover and inadequate study before bidding played key role on low bidding. The study found that low bidding has huge effects like arises fraud practices, misuse of muscles and power, claims and dispute, variation order and loss of professional reputation. True practices based on right effects with right causes can unfolds the positive aspects of low bidding like promotion to healthy competition, encourages towards corporate culture, equal opportunities to all parties and utilization of saved amount on further works.

Keywords: Low Bidding; Influences; Significant; Suffering; Key Role; Effects; Unfolds.

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1. Introduction

Construction industries are gradually growing industry in Nepal. In present context, construction sector is playing a vital role in multidimensional impact on development of the country. This field fills with various aspects and sectors within. Around its widened horizon, bidding trends and its impact on contractor's performance acts as a serious subject matter [1]. This sector is expanding

day by day. When construction sector takes a shape of industry then only a country's development process will speed up. Countries are known as developed only after natural growth of construction industry. Physical infrastructure is the foundation of any country's development and construction industry has a vital role on it [2]. Based on development aspects, country's position is determined by the development of physical infrastructure so that it is impossible to open the door of development without developing construction industries. Nepal also isn't exception in this [3].

In Nepal, construction industry is contributing about 10% of GDP. More than one million people are employed in construction industries. Similarly, about 60% of national budget is spent each year and it is carried out through procurement [2]. On procurement process, Nepal government is on the top as private sectors are still struggling for full phase financial capacity. So, public procurement process acts as important as well as challenging job. It provides significant impact on country's economy. When public procurement process becomes competitive, responsible, honest, transparent and reliable then it spreads positive vibration on country's economic development [4]. So, it is crucial for economic growth rate. Realizing this stuff, government has established an organization named Public Procurement Monitoring Office (PPMO). PPMO makes public procurement work efficient and monitors also along with facilitates public procurement act (PPA) and public procurement regulation (PPR). The need for enactment of PPA can be summarized as it makes legal provisions in order to make the procedures, process and decisions relating to public procurement much more open, transparent, objective and reliable, obtain the maximum returns of public expenditures in an economical and rational manner by promoting competition, fairness, honesty, accountability and reliability in public procurement process and ensure good governance by enhancing the managerial capacity of procurement of public entities in procuring or causing to be procured, construction work and procuring goods, consultancy services and other services by such entities and by ensuring the equal opportunity for producers, sellers, suppliers, construction entrepreneurs or service provider to participate in public procurement process without any discrimination [5].

Bidding, the process of submitting a proposal to undertake an offer has both positive and negative impacts. It develops competitive environment, uses funds for intended purposes, provides best value of money with respect to economy and efficiency, provides equal opportunities, maintains transparency, encourages national companies and based on appropriate bidding methods [6]. Among various types of bidding methods, bidder selection is based on low bid award system in the case of public procurement. System of lowest bid value selection increases tendency of bidding even with unnatural low bid value. High competitive environment and due to compulsion of having contract with any cost also helps on low bidding [7]. Assuming question of life and death, strong intention of having contract is guiding towards no compromise situation. So that bidding with lower value even below than 50% with respect to engineer's estimate is 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 [8].

Evaluation of project's overall performance, it can be decided project as successful or vice versa. Completing projects with achieving objectives is an indication of efficiency, but it is a challenge. As it has a wider scope, the construction process is subject to many variables and unpredictable factors which result from many sources. According to Zatush and Skitmore [9], three factors that determine the success of project: quality, costs and time, also called the iron triangle [10].

Performance can be judged by comparing these factors. For this, project should be finish on scheduled time, expenditure should be within estimated budget and quality should be within prescribed standard [11]. A few projects are successful to get completion by fulfilling all the parameters as per Nepal's present trend. Generally every project is suffering from the problem of somewhere cost, somewhere time and somewhere quality. For reason behind this, various challenges are playing catalyst role. Some challenges faced by Nepali contractor that include: strike, lack of construction material, scarcity of fuel, absence of balance on standard bidding document, unclear government rules and regulations, taxation system, delayed payment, lack of skilled and unskilled worker and equipments etc [3]. It seems too late for solution of these problems which causing bad name of whole construction sector day- by -day. Disappointed clouds are badly surrounding it. Supposed to be, existence of difficult situation for showing the example of an ideal construction project can be said as to be ashamed. It provides large ground for damaging its good name towards declination [1].

The aim of this study is to assess the causes of low bidding along with its effects including contractor's performance of bridge projects in terms of time, cost and quality in Nepali Construction Industry. This study will recommends for implementation of alternative bid evaluation process, improving steps towards low bidding and contract award procedures for the construction industry.

2. Low Bidding and its Impact

It is 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 [12]. The award of contract is made to the lowest responsive bidder and an agreement is reached between the client and the contractor. This is most widely used form of engineering contract and is suitable for engineering projects where the nature and extent of the work under the contract can be clearly identified [1].

As every system has two folds, there are definite benefits and drawbacks to the low-bid award system. Promoting competition amongst contractors, compelling contractors to lower their costs, usually through innovation are clear benefits to the process. In addition, the process is beneficial specifically to the public sector because of the fairness and transparency, important criterion of public policy [13]. Low bidding forces contractors to continuously lower the costs by adopting cost saving technological and managerial innovations. These savings are then passed to the owner through the competitive process [14].

However, allowing projects to be awarded based on the least price has inherent flaws. Delays in meeting the contract duration, increment of the final project cost due to high variations, tendency to compromise quality, and spoiled relationship among contracting parties are the major drawbacks associated with the process [15]. Such low bids are submitted seldom accidentally and more often deliberately to win the contract. It is 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 [16]. This leads to excessive claims and disputes and results in increased cost and schedule delays [14]. The use of bid prices as the basis for contractor selection is the major critique of current selection practice in many countries [17].

Accepting the lowest price is the basic cause of the project completion problems due to very 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 [18].

As the public sector client is accountable to the public, an open competitive bidding process that is 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 [19]. According to Carr [20], low bid price as the sole award criterion encourages unqualified contractors to submit bids.

The impact of time overrun is more severe in public building projects than cost overrun in the low bidding award system and to boost the condition of construction industry the contractors must make normal or fair bid through which they could earn reasonable profits so that they can deliver the project within required time, cost and quality [21].

Khadka [22] states that 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 of Khadka [22] to avoid low bidding.

The major drawback of the low bid method, often used for competitive bidding in the construction industry, is the possibility of awarding a construction contract to a contractor that submits, either accidentally or carefully, an unrealistically low bid price. Often, such an occurrence works to the owner's and contractor's harm by promoting disputes, increased costs, and schedule delays [21]. Low bidding causes time overrun, increase disputes and claims, non-compliance on specification declines the reputation of contractor, harms construction industry and reverse impact on the economy of nation [23]. Construction industry participants have started identifying that accepting the least price bid does not guarantee at the most value. Inferior quality of construction facilities, high incidence of claims and litigation, and frequent cost and schedule overruns have become the main features of public construction works contractions due to accepting low bids [19].

The acceptance of the lowest price in bid evaluation stage is the main reason for project delivery problems, as contractors desperately quote low prices by reducing their quality of work, and hope to be compensated by submitting claims. Reliance on bid prices alone as a discriminating factor between bidders is, however, somewhat risky and shortsighted [17]. Quality worths more but lack of quality worths even more. Cheaper construction without taking care of quality may reduce the initial investment but lends to have higher operating and maintenance cost, causing high total cost of the construction projects [24]. Similarly, Sandquist [25] noted that construction firms, in the competitive bidding process, bid the work as cheaply as the designer's specifications, design and drawings can reasonably be interpreted. This often-unidentified fact can influence the quality of construction extremely. The low-bid contractor often has hidden values such as not using quality

materials or not using the appropriate technique that can result in high costs. Researchers argue that the competitive bidding system does not guarantee the amicable relationship and coordination among clients and contractors and dispute between the parties might rise [26].

Traditional competitive procurement causes adversarial relationships and many problems in several stages of the procurement process. The cold relationship between them may exist after the unethical contractors winning the contract use inferior quality materials as opposed to the specification and tends to compensate their loss through various claims. As a result, the construction projects are unlikely to be successful because they may be obstructed for many years and retendered in order to select new-contractors. Competitive low bidding sometimes leads to the selection of incompetent contractors with excessive claims [27].

Professionals agreed that due to low bidding, the overhead cost of contractor is swept out so that contractor cannot contribute in contract management significantly and tends to search the loop holes for omitting some items or quantities of works, compromising quality and making unnecessary claim as a result of which either intended result in terms of project constraint i. e. cost, quality and time cannot be achieved or disputes may arise among contracting parties. The omitting of any items or any quantities of some works may diminish the stipulated quality of work and unnecessary claims from contractors and disputes among contracting parties make the time overrun which results ultimately the cost overrun [1].

As per PPA [5], contract is awarded to lowest evaluated substantively responsive bid. Generally, the contract is awarded to the lowest bidder, even though according to the bidding document other factors are also to be considered during the bid evaluation.

3. Trend of Bidding

Competitive bidding is widely applied in many sectors as well construction. The different forms of bidding are: open bidding or sealed bidding or combination of these two. Open bidding employs an repetitive negotiation process, whereby each contractor freely negotiates a contract price with the client. Consultation among competing contractors is allowed, and contractors are allowed to revise their bid for as long as the client has not come to a decision on which bid to accept. The open form of bidding is extensively used in the commercial sector. On the other hand, sealed bids are more typical of the construction sector. In sealed bids, each contractor is allowed to submit only one bid, and negotiation between the client and competing contractors is blocked. Equally, discussion related to the project under bid between the competing contractors is not allowed. Each contractor's bid is submitted by a specified date, and once submitted (usually in a sealed envelope) cannot be revised [28].

The process of strategic decision making in bidding incorporates some factors: Internal, external and environmental factors. Internal factors are those related to the company such as the capacities, specialization, capacities, experience, etc. External factors, outside the company, include the project type, number of bidders, cash flow requirements, bidding risk, cash flow requirements, etc. Similarly, environmental factors with social and economic condition include availability of other projects, availability of qualified labor, availability of qualified staffs, availability of qualified subcontractor, availability of equipment [29].

One of the most frequently used procedures for selecting contractors is competitive bidding, where the lowest reasonable bidder from a range of bids is awarded the contract. In some places, the foundation of this method can be traced back to the 19th century. For example, the State of New York has been using this method for the last 150 years [30].

Instead of accepting low bid, some states in the USA are adopting the provision of surety bond from surety companies which are available entities that can share responsibility with contractors in front of owners. They conduct thorough financial analysis of contractor's financial data to be sure that contractor is unlikely to fail so they can, as a third party, guarantee owners the payment of additional funds in case the contractor really fails. Some of public owners in USA resort to surety companies alone, which can pay a maximum liability reaching 100% of the contract amount [31].

However, there are some modifications to this single objective decision-making procedure based on lowest bid price. For instance, in France and Portugal, bid prices that one considered abnormally lower than the engineer's estimate by the project owner are excluded. They define abnormally low as any bid whose price appears very lower than the engineer's estimate and consequently may cause implementation problems [30].

Bulow and Klemperer [32], Hong and Shum [33] state an increase in the number of bidders have two counteracting effects on equilibrium bidding behavior. First, the increased competition leads to more aggressive bidding, as each potential bidder tries to maintain her chances of winning against more rivals: this is the competitive effect. Second, the winner's curse becomes more severe as the number of potential bidders increases, and rational bidders will bid less aggressively in response: this is the winner's curse effect.

Researchers have summarized the long list of factors that can influence a contractor's decision to bid and the price they submit [34, 35]. In addition to the many factors involved in determining a price, there are a number of reasons that the bid submitted could be considered abnormally low. Imprecise and ambiguous contract documentation (including incomplete drawings) may cause a contractor to make a serious omission in calculating costs. Errors may also arise due to insufficient time to prepare the bid. One of the most concerning reasons is the practice of a contractor intentionally submitting an artificially low bid in anticipation of making their profit through change orders and claims [36].

Dowle and DeStephanis [37] stated that the 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 equated to a gambit strategy in chess: making a small sacrifice early to setup up the opponent to be in a vulnerable position later [38].

Highway road construction projects that were awarded to low bidders that were significantly lower than the median bidder experienced 3.5 to 4 times the cost escalation (from the low bid) than projects where the low bidder was close in price to the median bid price [38]. According to Thomas [15], an open bidding process unrestricted by prequalification of contractors did not provide a

public sector client with increased value. Prequalification is correlated with lower cost escalation and avoiding low bids.

The tendency of contractors to bid lowering the bid price is high in road construction projects and found that such tendency is even higher in the case of new construction type road projects in comparison to other types like rehabilitation, maintenance etc. Most of the contractors bid with the bidding price ranges from 25 % - 40 % low with respect to engineer's estimate and try to manage their overhead and profit with price escalation, variation and claims. They have also tendency to extend contract period with some justification in order to achieve more price adjustments [3].

According to Kadariya [21], contrary to popular belief, low bidding projects occur less frequently than normal bidding in the public building project as the 81.42% of the project under five division office in Central Development Region of Department of Urban Development and Building Construction (DUDBC) in the fiscal years from 2064/065 to 2066/067 are normally bided projects. This shows a tendency of contractor bidding in a normal range in public building project under DUDBC which is contrary to the belief of public client organizations in majority that there are low bided projects in their organizations. It is also seen from the analysis of reviewed projects by Kadariya [21] that contractors generally feel that 5%-15% lower amount than the original engineer's estimate is normal range for bidding to obtain nominal profit in building projects and below that range bid is considered as a low bid.

According to Bhatta [39], there is no any uniformity in the definition of low bid and abnormally low bid (ALB). In India, the bid is considered low bid that vary 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 is considered as ALB. According to National legislation of United Kingdom, low tender abnormally is the one which 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 law adopted in Lithuania in 2009 provides that a tender is abnormally low either if it is 15% or more lower than the average of the other tendered prices, or if it is 30% or more lower than the authority's original estimate.

According to Rimal [3], 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.

4. Factors Causing Low Bidding

According to Bhatta [39], some of the major factors causing low bidding are as follows:

- 1) Imprecise and ambiguous contract documentation (including incomplete drawings) may cause a contractor to make a serious omission in calculating costs.
- 2) Preparing tenders by using estimates of historical data and traditional norms causes errors in estimation and usually prices are under estimated.
- 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, equipments and vehicles enforces 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, also known as predatory bidding [38].
- 8) Weak contract administration of client leading to assumption that specified work quality need not be maintained.
- 9) No site visit before bidding and no understanding of detail scope of work by contractor.
- 10) According to Rimal [3], contractors have to bid low to increase annual turnover, to engage and train staff and to utilize equipments and their claim is that they manage their company effectively so that there will be optimum use of resources and they will be benefited even if they bid low.

5. Effects of Low Bidding

According to Bhattarai [1], some of the major effects of low bidding are as follows:

- Delay on project completion (more severe than cost)
- Cost overrun
- Low quality work
- Claims
- Disputes
- Financial difficulty in effective contract management
- Searching loop holes for omitting some items or quantities of work
- Compromising quality and making unnecessary claims makes intended result in terms of project constraints difficult to achieve

Similarly, according to Rimal [3], major effects of low bidding are as follows:

- Delay on project completion (more severe than cost)
- Cost overrun
- Increase in no of dispute
- Increase in no of claims
- Increase in no of change request/orders
- Chances of illegal work
- Evasion of social contribution and tax
- Unsatisfactory quality of work
- Increase in maintenance and replacement cost

6. Conclusions

As its uses in large scale in all over the world itself speaks importance of low bidding. It is also not in far to the statement that every methods has two folds as positive and negative. Negativity

should be minimized by proper modification as per times demand and learning from practices. Horizon of improvement has never ends. Within proper ground and environment, low bidding can unfold its wider scope smoothly.

In the context of Nepal, real low bidding practices has not been started yet. For that, large number of existing variables like unrealistic norms, unrealistic district rates, ambiguities in contract document and social acceptance should be minimized. Such variables and performance acts as inversely proportional to each other in this case.

Implementation of specification should be perfect. Contract administration should be strong and uniform all over the country. It is much more essential to maintain smooth system rather that depends on skill of human resources. When system starts speaking then a lot of problem starts to solve automatically. Similarly, misuse of muscles and powers should be controlled. There should be provision of reward and punishment and it should be strictly followed with impartiality. Healthy atmosphere should be such a maintained where genuine bidder can survive and get growth easily.

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References

- [1] Bhattarai B. Effects of Low Bidding in Public Owned Construction Project: A Case Study of Rural Reconstruction and Rehabilitation Sector Development Project. M.Sc. Thesis, Nepal Engineering College-Centre for Post Graduate Studies, Pokhara University; 2015.
- [2] Baral S. Nepalese Construction Industry: Challenges and Opportunities; 2009.
- [3] Rimal AM. Impact of Low Bidding in Road Projects in Nepal. M.Sc. Thesis, Nepal Engineering College-Centre for Post Graduate Studies, Pokhara University; 2009.
- [4] Adhikari RP. Public Procurement Issues and Challenges in Nepal; 2015.
- [5] Public Procurement Monitoring Office. Yearly Report; 2018.
- [6] Adhikari RP. Public Procurement Challenges under Federal Structure in Nepal; 2018.
- [7] Shrestha SK. Average Bid Method – An Alternative to Low Bid Method in Public Sector Construction Procurement in Nepal; 2016.
- [8] Khan MN, Akkoc Y. An Analysis of Bid Evaluation Procedure of Contemporary Models for Procurement in Pakistan; 2016.
- [9] Hatush Z, Skitmore M. Criteria for Contractor Selection. Construction Management and Economics; 2006.
- [10] Sheikh EI, Pryke S. Identifying communication gaps in a construction project; 2010.
- [11] TfNSW. Transport for New South Wales Annual Report; 2014.
- [12] Harris CM, Dictionary of Architecture and Construction, Fourth Edition; 2006.
- [13] Ioanno PG, Awward RE. Below -Average Bidding Method. Construction Engineering and Management; 2010.
- [14] Ioannou PG, Leu SS. Average -Bid Method: Competitive Bidding Strategy. Journal of Construction Engineering and Management; 1993.
- [15] Thomas B. Analysis of Low Bid Award System in Public Sector Construction Procurement. Master of Applied Science. University of Toronto. Canada; 2009.
- [16] Sidney S. Best Value Construction Methods for Highway Construction. National Cooperative Highway Research Program, Transportation Research Board; 2006.

- [17] Skitmore M. Criteria for Contractor Selection: Construction Management and Economics. London. UK: Taylor and Francis Group; 1997.
- [18] Hyuang X. An Analysis of the Selection of Project Contractor in the Construction Management Process. International Journal of Business and Management; 2011.
- [19] Khan HT, Khan QA. Effects of Lowest Bidding Bid Award System in Public Sector Construction Projects in Pakistan. Global Journal Management and Business Research; 2015.
- [20] Carr PG. Investigation of Bid Price Competition Measured through Pre-Bid Project Estimates, Actual Bid Prices and Number of Bidders. Construction Engineering and Management; 2005.
- [21] Kaderia PP. Impact of Low Bidding on Schedules and Costs, Study on Public Building Construction Projects. M.Sc. Thesis, Nepal Engineering College-Centre for Post Graduate Studies, Pokhara University; 2011.
- [22] Khadka B. Analysis of Competitive Bidding System for the Department of Urban Development and Building Construction Projects in Nepal. M.Sc. Thesis, Nepal Engineering College-Centre for Post Graduate Studies, Pokhara University; 2014.
- [23] Lama AD. The Contractor and Low Bidding: An Analysis. Nepalase Construction Souvenir; 2014.
- [24] Hardie M, Saha S. Builders' Perceptions of the Impact of Procurement Method on Project Quality. London. UK: Taylor and Francis Group.
- [25] Sandquist R. Qualifications -Based vs Low Bid Contractor Selection. The architect's Handbook of Professional Practices;1993.
- [26] Bedford T. Analysis of the Low-Bid Award System in Public Sector Construction Procurement; 2009.
- [27] Errikson, Lann. Effects of Procurement on Project Performance. A Survey of Swedish Construction Clients; 2009.
- [28] Banki MT, Esmaeeli B, Ravanshadnia M. The Assessment of Bidding Strategy. International Journal of Management Science and Engineering Management; 2008.
- [29] Barr RS. General Construction Contractor Bidding Strategy Variations Based on Market Conditions. M.Sc. Thesis, Georgia Institute of Technology, Georgia; 1990.
- [30] Herbsman Z, Ellis R. Multi-Parameter Bidding System-Innovation in Contract Administration. Journal of Construction Engineering and Management; 1992.
- [31] Bazaber M. Contractor Selection in Saudi Arabia. World Academy of Science, Engineering and Technology; 2012.
- [32] Bulow J, Klemperer P. Auctions Versus Negotiations. American Economic Review; 1996.
- [33] Hong M, Shum M. Increasing Competition and the Winners's Curse: Evidence from Procurement. Review of Economic Studies; 2002.
- [34] Chua DKH, Li D. Key Factors in Bid Reasoning Model. Journal of Construction Engineering and Management; 2000.
- [35] Fayek A, Ghoshal I, Abourizk S. A Survey of the Bidding Practices of Canadian Civil Engineering Construction Contractors. Canadian Journal of Civil Engineering; 1998.
- [36] Zack JG. Claimsmanship: Current Oersoective. Journal of Construction Engineering and Management; 1993.
- [37] Dowle WJ, Destephanis A. Preparing Bids to Avoid Claims-Construction Bidding Law. New Yourk, USA: John Wiley and Sons; 1990.
- [38] Crowley LG, Hancher DE. Risk Assessment of Competitive Procurement. Journal of Construction Engineering and Management; 1995.
- [39] Bhatta I. Issues Related to Selection of Contractors in Public Construction Procurement. Rural Infrastructure; 2014.

*Corresponding author.
E-mail address: bista_sb9@ hotmail.com