

(Research Article)

# Effect and Remedies of Bidding Trend in Road and Bridge Projects

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## Abstract

Bidding trend in different categories of work in Division Road Offices, Bharatpur are different. The main purpose of the research is to analyze the existing bidding trends along with the consequences of procurement at Division Road Office Bharatpur, Chitwan. Contracts were administered in Chitwan and Dhading districts. A five ranking likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was adopted to capture the importance of various factors with help of Relative Importance Index (RII). For the improvement in existing bid awarding system based on scheduled questionnaire i.e. low bidding and collusive bidding, new bidding method would be introduced. Extra qualification criteria should be focused by assigning weighted in monitory term along with implementation of extra performance bond based on ranges of percentage below engineers' estimate through amendment of PPA (2007) and PPR (2007), asking method of statement and assuring for project performances before project implementation. The provision of bid capacity might improve with practice for discouraging low bidding trend. The expected outcome was assumed to be applicable for policy making in concerned authority.

*Keywords:* Low bid, Engineers' estimate, Bid rigging/collusive bids, E-bidding

## 1. Introduction

The construction sector is rapidly growing industry in Nepal. In 1990 Contractor's Association of Nepal (CAN) was established; later it has been changed as Federation of Contractors' Associations of Nepal (FCAN, 2018) in 1997. Nepalese Construction Industry contributed around 10 to 11 percentages to GDP of the country and it uses around 35 percent of government budget (FCAN, 2018). It is estimated that this sector is creating employment opportunities to about one million people so it generate employment next to agricultural sector in the country. Similarly about 60 percentages of the nation's development budget is spent through the use of procurement (FCAN, 2018) so, public procurement is an essential government activity that affects a country's economy. Open competitive bidding is the well accepted process in public procurement that intends to assure transparency with fair competition. In contrast it is found that in the name of competition, bidders are willing to offer exceptionally low bids for the sake of winning the bids.

PPA (2007) and PPR (2007) allows to award the contract to the lowest bidder if its bid is substantially responsive and comply the prescribed qualification criteria. It is important to review and evaluate the current performance of currently

practiced procurement process in the public sector obtaining greater value for taxpayer's money in the construction projects. The low bid award system fosters competition amongst contractors attempting to secure the projects (Mishra, et al., 2020). This competition can have positive as well as negative effects to the clients. Selecting the contractors based solely lowest bid price greatly reduces willingness of the contractors to complete the projects within the intended completion period, stipulated cost and expected quality. According to Zatush and Skitmore, three factors that determine the success of project: quality, cost and time also called the iron triangle. Performance can be judged by comparing these factors.

The research gave feedback to the policy making authorities such as Different Concerned Ministries, Public Procurement Monitoring Office and other offices which were directly and indirectly involved in procurement of works and/or related policy formulation. Findings of research will provide some insights and general information about a) What bidder think at the time of bidding, b) What is the overall performance of the low bid contracts?

The findings of the research would be useful to public procurement officials, engineers, consultants, contractors, project managers and common public who are interested in a way to utilize scarce public resources efficiently. Moreover, it would provide the guideline to lawmakers and policymakers

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of Government of Nepal to adopt better contractor selection method or review and amend provisions of existing procurement system of Public PPA (2007) and PPR (2007). It would be an informative document to the policy makers to think a proper methods to assure right level of competition during bidding that ensures better performance in implementing the public construction projects.

*1.1 Research Objectives:* To study the effect and remedies of bidding trend and current status of collusive bidding in road and Bridge projects.

## **2. Empirical Review**

Empirical Review consists of Bidding trend, collusive bidding, impact of collusive bidding, provision of bid in various countries, WB and ADB guidelines for procurement system, provision in PPA and PPR with latest amendments.

According to Banki, et al. (2008), competitive bidding is widely applied in many construction sectors besides construction. The different forms of bidding are; open bidding or sealed bidding or combination of these two.

Highway and construction projects that were awarded to low bidders were significantly lower than the median bidder experienced 3.5 to 4 times the cost escalation (from the low bid) than projects where low 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 (Crowley and Hancher,1995).According to Thomad (2009),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.

Mishra, et al.2020 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/claims, coordination, quality control, project cost and duration.

- In road construction projects contractor bid with the bidding price 25-40% low with respect to engineer's estimate. (K.C.M, & Mishra 2019)
- In building projects 5-15 % is normal range of bidding to obtain normal profit. (K.C.M, & Mishra 2019).
- Any bid which is lower by more than 20% of engineers estimate should be rejected to minimize the adverse impact of low bidding. (K.C.M, & Mishra 2019)
- The frequency of bid ranging 30% to 50% low with respect to engineer's estimate was the higher. (Mishra, et al.2020)

*2.1 Collusive Bidding and Its Impact:* Collusive bidding or bid rigging or cartel on bidding are explain synonymously in

various literature. The main form of collusion is bid rigging behaviour; the collusion in the public procurement market is a relationship among bidders which restricts competition and harms the public procurement. As per OECD,n.d. bid rigging (or collusive tendering) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods or services for purchasers who wish to acquire products or services through a bidding process.

Most common forms of bid rigging are described as:

- Sub-contract Bid Rigging
- Complementary Bidding
- Bid Rotation
- Bid Suppression
- Market Division
- Common Bidding

## **3. Impact of Collusive Bidding**

The collusive bidding discourages genuine price competition through which a huge sum of public money could have been saved and used in other sectors. The collusive bidding can create several disputes and claims which results in schedule delays and increasing project costs. Collusive bidding restricts from competing in quality and promotes certain group of firms only and restricts the entry of new firms who could not cartel for a job regularly.

## **4. Methodology**

*4.1 Analysis of Responses of Schedule Questionnaire:* A structured questionnaire survey approach was used to assess the respondent's views for finding relative importance regarding current bidding trend on road projects and improvement suggestions for better performance of construction projects under study. The qualitative data obtained from questionnaires were analyzed by using Likert-type Scale (Summated Scale), which is suitable for ranking the statements of respondents' views by using the relative importance index. Likert's scale of five ordinal measures of agreement towards each statement (1=Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly Agree) was used to calculate the mean score for each factor which was subsequently used to determine the relative ranking.

The Relative Importance Index (RII) for each variable was computed using equation. (4.1)

$$RII = \frac{\sum(f * S)}{(A * N)} \dots \dots \dots (4.1)$$

Where:

RII = Relative Importance Index

f = Frequency of responses for each score

S = Scores given to each factor (from 1 to 5)

A = The highest weight (equal to 5)  
 N = Total number of responses connecting each factor

Researcher used the Relative Importance Index (RII), for determining the ranking association between the two types of raters i.e. clients/engineers and contractors during the questionnaire survey analysis.

**4.2 Summary of Methodology:** Objectives set up for this research work were achieved by data collection from various sources such as official (secondary) data and primary data collection and analysis was done for the expected research output. Following Table 1 shows the way of getting research objectives.

**Table 1.** Summary of Methodology

Objectives	To study the consequences and remedies of bidding trend and current status of collusive bidding in road/bridge projects.
Data Required	Bidding data, Closed Questionnaire Data,
Collection Tools	Official records of D.R.O. , Close Questionnaires Survey
Analysis method	Descriptive, qualitative Analysing by calculating Relative Importance Index.

**5. Results and Discussion**

**5.1 Views and Suggestions of Stakeholders:** In this field survey clients, contractors and related officials were asked for their responses and their views were collected. Researcher was physically involved to most respondents for the intention to get better result by interpreting the questions in right way for getting exact and practical result.

In section 'A' of questionnaire, views of stakeholders regarding causes of low bidding were collected from clients, contractors and other related officials. Set of structured questions were given to rank with scale Strongly Agree (5), Agree (4), Neutral (3), Disagree (2) and Strongly Disagree (1) to collect different views. Responses were synthesized by calculating Relative Importance Index (RII) as given in annex-I In section 'B' of questionnaire, views of stakeholders regarding improvement of overall bidding tendency and project performance and effects of low bidding were collected from clients, contractors and other related officials and analyzed by calculating RII.

**5.2 Views of Stakeholders:** In this questionnaire, specific information about contractors tendency to bid as low bidding were collected from clients and contractors. Views regarding causes of low bidding, which were analyzed by calculating Relative Importance Index (RII) for clients', contractors' and related experts' responses and combined of both group of responses then ranking were assigned to them. Calculation of RII and their individual and combined ranking were presented in table 3.

**5.2.1 Reasons for low bidding:** In this questionnaire, specific information about contractors tendency to bid as low bidding were collected from clients and contractors. Views regarding causes of low bidding, which were analyzed by calculating Relative Importance Index (RII) for clients', contractors' and combined of both group of responses then ranking were assigned to them. Calculation of RII and their individual and combined ranking as presented in annex-I.

Considering contractors tendency to bid as low bidding individual ranking of stakeholders, clients' and contractors' respondents were focused on:

The main reason behind low bidding by the views of both clients and contractors is Due to current legal provision of awarding low bid, if they bid normally there is no chance of winning bid. Hence they were forced to low bid.

Contractors have their view the least important reason for low bidding is found as to take advance payment and utilize it into other business where as Clients have their view on the least important reason of low bidding as insufficient knowing of project scope and no site visit before bidding.

**5.2.2 Choice of Contract Award Method:** In this question of questionnaire, specific information about method of contract award for recommendation in context of Nepal were collected from clients, contractors and experts of related fields.

**Table 2.** Recommended method of contract award in%

	Client	Contractor	Related Officers
Existing low bid method	12	16	8
Average Bid Method	60	52	68
Threshold % value apply	16	12	16
Others	12	20	8

By the table 2, the result as existing bid awarding method is only 12, 16 & 8% okay for clients, contractors and related officers respectively. Where they had suggested for revised method for award as Average Bid Method as 60% of clients, 52% of contractors and 68 % of other related technical experts. As other it may be suggested that the difference of engineers' estimate and bid price should not be allowed more than 1 standard deviations.

**5.3 Suggestions of Stakeholders:** Suggestions of clients and contractors were collected and analyzed to ranking the suggestions both group of respondents as given in table 2. The objective of this sets of questionnaire was to understand the

suggestions for improvement of present bidding tendency and overall project performance in road/bridge projects. Questionnaire covers somewhat about selection of contractor, scheduling of project, monitoring and evaluation and improving project environment for the successful completion of project.

*5.3.1 Rank of Suggestions for improvement of bidding trend and performance:* Ranking of responses given by employers as shown in annex -II.

- Practice to adequate training for bidders and government officials.
- For the successful completion of project use realistic project monitoring and evaluation method.
- Develop the strong penalty provision.

*5.3.2 Likewise Engineer focused on:*

- Change the current bid evaluation practice; in addition to the legal based and technical qualification criteria should be adopted.
- For the successful completion of project, external project environment other than internal project environment should be assured by Authority.
- To calculate the duration of project, use scientific method of project planning.

Combined RII was determined to rank the suggestions of respondents and they were focused on.

- Practice to adequate training for bidders and government officials.
- Change the current bid evaluation practice; in addition to the legal based and technical qualification criteria should be adopted.
- For the successful completion of project, external project environment other than internal project environment should be assured by Authority.

*5.4 Effects of low bidding:* In this section of Questionnaire, six structured questions were asked to employers, official experts. Information were collected and analyzed to ranking the suggestions both group of responses then ranking were assigned to them. Calculation of RII and their individual and combined ranking were presented in table 3. The objective of this sets of questionnaire was to know and rank the effects of present bidding trends.

Ranking of responses given by employers focused on.

- Prolonged contract duration should be adopted.
- Compromise in quality.
- Stakeholders' involved are victimized.

**Table 3.** Rank of Effects of low bidding

Sr. No	Description	Employer		Official/ Expert		Combined	
		RII	Rank	RII	Rank	RII	Rank
1	Prolonged contract duration should be adopted.	0.74	1	0.73	5	0.74	2
2	Increasing Contract Price	0.70	3	0.76	3	0.73	3
3	Degrade in intended quality of the project.	0.71	2	0.77	2	0.69	4
4	Probability of more litigations.	0.64	5	0.74	3	0.69	4
5	Tendency of contractors to avoid low rate items.	0.63	6	0.68	6	0.66	6
6	Stakeholders' involved are victimised.	0.70	3	0.82	1	0.76	1

Ranking of responses given by Official/experts focused on.

- Stakeholders' involved are victimized.
- Compromise in quality.
- Increasing Contract Price.

Combined RII was determined to rank the effects of low bidding and they were focused on.

- Stakeholders' involved are victimized.

- Prolonged contract duration should be adopted
- Increasing Contract Price.

## 6. Conclusions

In the context of public procurement in Nepal, there is rare chance for contractors to get work if they do not bid low price.

No. of participating bidders are responsible for increasing percentage below engineer's estimate.

By calculating average no. of bidders and average percentage below engineer's estimate majority of bids were found to be low bids whereas competitive versus non-competitive bids were found almost equal and the study shows collusive bidding exists in road projects.

**7. Recommendations**

Following are the recommendations of this research study.

- To overcome the problem of low bidding and collusive bidding, e-bidding should be promoted and should be changed the current bid evaluation practice i.e. bid should be awarded based on average bidding method, best value method.
- It should be asked to the contractors who takes project with low bidding for the details of working schedule, method of statement and clarification of low bidding which might help for the effective implementation of contract project.
- There should be practiced for adequate training to the bidders as well as government officials involved in

procurement activities which might develop their capacity based on updated bid evaluation system.

- PPA (2007) and PPR (2007) should emphasize the audit of calculation of engineers' estimated cost. Likewise, the government should always revise and update norms and analysis to better estimated cost.
- There should be revised the standard specifications for different category of works and should develop the strong penalty provision for completion of projects successfully in time.

*7.1 Proposed future studies:*

- Study on effects of low bidding on quality and time in comparison to normal bid.
- Study the role of contractors association to collusive bidding.
- Study on factors contributing to low bidding trend other than no. of bidders, types of projects.
- Study on suitability of Average Bid Method, Best Value Method.
- Enhanced revision study of standard specifications for different categories of works and norms and rate analysis of Department of Road.

**Annex-I.** Views of Clients and Contractors on the reasons for low bidding.

Sr. No	Description	Clients		Contractors	
		RII	Rank	RII	Rank
1	To Get Experience.	0.73	3	0.72	2
2	To Utilize human and other idle resources.	0.74	2	0.67	3
3	Due to current legal provision of low bid	0.78	1	0.76	1
4	To increase Turnover	0.72	4	0.66	4
5	Insufficient knowing on project scope and no site visit before bidding	0.62	6	0.64	5
6	To take advance payment and utilize it in other business.	0.71	5	0.62	6

**Annex-II.** Rank of Suggestions for improvement of bidding trend and performance

Sr. No	Description	Employer		Engineer/Stakeholder		Combined	
		RII	Rank	RII	Rank	RII	Rank
1	Change the current bid evaluation practice; in addition to the legal based and technical qualification criteria should be adopted.	0.73	5	0.85	1	0.79	2
2	Practice to adequate training for bidders and government officials.	0.81	1	0.78	4	0.80	1

3	For Different category of work standard specification should be revised.	0.74	4	0.76	5	0.75	6
4	To calculate the duration of project, use scientific method of project planning.	0.73	5	0.79	3	0.76	5
5	For the successful completion of project, external project environment other than internal project environment should be assured by Authority.	0.72	7	0.83	2	0.79	2
6	For the successful completion of the project use realistic project monitoring and evaluation method.	0.79	2	0.76	5	0.78	4
7	Develop the strong penalty provision.	0.75	3	0.71	7	0.73	7

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