Impact of Procurement Practice Adopted on Budgetary Utilization

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ABSTRACT

Purpose: *To analyze the impact of Procurement practice adopted on budgetary utilization with a case of Mandandeupur Municipality, newly formed municipality in Kavrepalanchowk district under Bagmati province of Nepal.*
Design/Methodology/Approach: *A structured set of questionnaires were developed in order to analyze the impact of Procurement practice adopted on budgetary utilization with a case of Mandandeupur Municipality, newly formed municipality in Kavrepalanchowk district under Bagmati province of Nepal through regression and chi-square.*
Findings/Result: *The relation between the number of bidders and budget utilization was found to be not correlated, below the engineer's estimate. And budget utilization was found to be strongly correlated; engineer's estimate and budget utilization were found to be significantly correlated; and the combined relation of the number of bidders below engineer's estimate, engineer's estimate and budget utilization was found to be significant, whereas below engineer's estimate was most significant.*
The contract administration part of the contract seemed to be weak in the parts of safety and plan and strong in the case of document management. The contract administration of large budget contracts seems to follow the process, whereas projects with a small budget seem to skip the process of contract administration.
Originality/Value: *The pragmatic recommendations can help improve the budget utilization trend analysis and contract administration practices at the local level, leading to more effective and efficient implementation of development projects.*
Paper Type: *Empirical Research*
Keywords: Budget utilization, Engineer's estimate, Number of bidders, Contract administration, Control

1. INTRODUCTION :

Public Acquisition is broadly viewed as one region that is generally powerless against defilement (Mishra, 2020) [1]. The variables that influence the weakness are not restricted to the volume of exchanges and the serious monetary motivators in question. They originate from a blend of framework shortcoming (intricacy of the cycles, close communications between open authorities and business), as well as execution inadequacies (absence of straightforwardness and ineffectual data frameworks, unfortunate expert limits, feeble oversight and controls). Public acquirement implies the buy by open substances of merchandise, consultancy administrations, development works, and different administrations. The Public Obtainment Act, 2063 B.S and Public Acquirement Guideline, 2064 B.S have been upheld as the public acquisition laws of Nepal to settle on the cycles and choices connecting with public obtainment straightforward, level headed and dependable. To acquire the greatest returns of public consumptions in a prudent and judicious way by advancing rivalry, reasonableness, trustworthiness, responsibility, and unwavering quality in open acquisition processes is one more unbiased of making these lawful arrangements. An Order connecting with e-Government Obtainment

(e-GP) Activity, 2074 B.S and one more Mandate connecting with the Obtainment through Designing Acquirement and Development (E.P.C), 2078 B.S have likewise been implemented as the lawful grounds of e-Government Obtainment (e-GP). In any case, the execution part of the overall acquisition regulations is feeble. That is a significant reason for debasement and inconsistencies [2-7]. Offering choice of bidders incorporates inside (mastery, experience, assets, abilities, and so on), outer (number of bidders, offering risk, kind of undertaking, income necessities, bid related factors and so forth) and ecological elements (social and monetary condition, incorporate accessibility of different activities, accessibility of qualified work, accessibility of qualified staffs, accessibility of qualified subcontractor, accessibility of hardware). These three elements intelligently influence the essential choices of serious offering in development industry [8].

2. OBJECTIVES :

- To analyze the impact of Procurement practice adopted on budgetary utilization.

3. LITERATURE REVIEW :

3.1 Development of Procurement practice in Nepal:

Public Acquisition is broadly viewed as one region that is generally powerless against defilement (Mishra, 2020) [1]. The variables that influence the weakness are not restricted to the volume of exchanges and the serious monetary motivators in question. They originate from a blend of framework shortcoming (intricacy of the cycles, close communications between open authorities and business), as well as execution inadequacies (absence of straightforwardness and ineffectual data frameworks, unfortunate expert limits, feeble oversight and controls). The PPA contains overarching set of principles for public authorities engaged with public acquirement and for bidders. The Previous expects authorities to act fairly and in the public interest, stay away from irreconcilable situation, keep up with privately and not commit bad, false or tricky practices. The governing set of principles for bidders covers pay off, deception, pressure, plot, impeding different bidders, trying to impact the Public Substances and irreconcilable situation or lawful activity for extortion or defilement and expects offers to be dismissed in cases for conspiracy [9-10]. The conventional acquisition process is gradually being supplanted by E-obtainment. Public Electronic Government acquisition (E-GP) is online acquirement gateway covering different exercises of public obtainment life cycle including enlistment of bidder, Acquisition arranging, e-offering, on-line assessment contract grant and the board and so forth. Public Acquisition act B.S 2063, 69 guarantees the utilization of Electronic offering for labor and products including counseling, demand for proposition. Articulation of interest that can be accomplish for legitimate reason, having serious level of safety that won't restrict the opposition perceived by Open Obtainment guideline B.S 2064, statement 24 [11-13]. The advantages of e-Obtainment and government obtainment change address a critical financial worth add for business by bringing down cost and making is more straightforward to carry on with work. The utilization of electronic work processes and further developed admittance can fundamentally lessen the time it takes to finish acquisition process, prompting value-based productivity for both provider and legislatures. Obtainment straightforwardness prompts lower government cost, further developed incentive for cash and decreased defilement. E-Acquirement can prompt significant expense and authoritative saving, more extensive market access and improved responsibility. E-Government Obtainment (E-Gp) framework is characterized as the utilization of data innovation framework by government in leading their acquirement associations with providers and workers for hire for the acquisition of works, products, counseling administrations and different administrations expected by the public area. E-Gp is the utilization of a productive great administration system to public area acquirement, worked with through internet based data and cycle. It can possibly fortify the responsibility, straightforwardness, proficiency and adequacy of this delicate high worth government capability. Halfway advantages of e-Administration are less difficult documentation, quicker reactions, more noteworthy reach of administrations, public cooperation, improved on exchanges, worked on associations and less possibility of debasement (Ulak, 2020)[14]. Specialized targets of E-Gp frameworks are:

(1) To work on the straightforwardness, proficiency and viability of the public acquirement framework
(2) To work on community to business valuable open doors through a web-based offering office and incorporating public acquirement framework with e-government structure.
(3) To work on authoritative interaction by lessening bid handling time including bid assortment,

assessment, granting and execution of agreements
(4) To help the preparation and oversight process by giving significant and convenient data
(5) To plan and execute an economical limit building program for the administration of new framework (Sharma, (2022). [15]).

It is worried of any administration to accomplish and improve the viability, productivity, straightforwardness and equity in open obtainment since public acquisition influences all parts of individuals' loves and accepts enormous portion of government financial plan. The Public authority of Nepal (GoN) is the biggest obtaining (Products, works and administrations) foundation in the nation (Sharma, (2022). [15]). E-administration is likewise about conferring a solitary window for government Contributions at all stages. It is related with producing a smoothed out structure for power workplaces and gatherings. The innovation like Data and Correspondence Innovation (ICT) Advancements is changing all parts of conventional social orders. One of such age, principally based administrative transporter is the e-Taxpayer supported organizations. ICT has also been empowering the presentation of most recent contributions, better, powerful and speedier conveyance of current ones and costless and more successful correspondences between unmistakable gatherings and government bodies. Computerized specialists additionally have provokes and potential outcomes to trade each the functional way of government, and the idea of administration itself. It effects on greatest capacities in specialists exercises and gatherings, the confidential locale and common society. It has the ability to exchange the public authority activities and the connection of residents and organizations with government most certainly. Subsequently; everything about scopes of administration wants appropriate technique and making arrangements so it will carry out e-Government accurately to widen the utilization (Bhagat, et al, (2022). [16]).

3.2 Trend of Bidding:

Offering, the most common way of presenting a proposition to embrace a deal has both positive and adverse consequences. It creates serious climate, involves assets for expected purposes, offers best benefit of cash concerning economy and productivity, gives equivalent open doors, keeps up with straightforwardness, energizes public organizations and in light of proper offering techniques [2-6]. As per PPA (2007) and PPR (2007) public obtainment framework depends on low offered grant framework. It is significant. The low offered grant framework cultivates rivalry among workers for hire to get the task [2&5].

3.3 Types of bidding:

Low Bidding

It is the act of offering in development work where the project workers submit most reduced cost feasible for consummation of given plans and determinations and such the least provided cost estimate is acknowledged for execution of the task (Development Word reference, 2011). The honor of agreement is made to the most minimal responsive bidder and an arrangement is arrived at between the client and the project worker. This is most generally utilized type of designing agreement and is reasonable for designing ventures where the nature and degree of the work under the agreement can be obviously recognized [6&8].

Average Bidding Method

As per Ioannou and Awwad (2010), to resolve issues of low offering, a few nations have taken on assortment of offering techniques in view of the normal of the offers submitted or thought for quality separated from quote. In the normal offering strategy, the agreement is granted to the worker for hire whose bid is comparative with the normal of the relative multitude of offered costs. There are sure assortments of normal offering relying upon the standards set for deciding the triumphant bid. For example, the triumphant bid may either be any value nearest to the typical value, or less than ideal bid which is the value nearest to as well as below the normal cost [6&8].

Best Value Method

A Best Worth should orchestrate to get constant improvement in the manner by which its capabilities are worked out, having respect to a mix of economy, productivity and viability {section 3(1), LGA 1999, Gov. UK., 1999}. Best worth is an obtainment cycle where cost and other key variables are viewed as in the assessment and determination 15 cycles to limit effects and upgrade the drawn out presentation and worth of development. It is viewed as an inventive offering strategy, which defeats the

downsides of conventional low-offering framework and underscores on the nature of item instead of cost alone. The prequalification interaction of best worth strategy considers assurance of limit of project workers to convey quality items and not simply quantitative monetary assessment [6&8].

3.4 Detailed Project Report (DPR):

Detailed Project Report (DPR) are the results of arranging and configuration period of an undertaking. DPR is an exceptionally itemized and elaborate arrangement for an undertaking showing generally speaking system, various jobs and obligations, exercises and assets expected for the venture. A DPR is a last, itemized evaluation report on the task and a blue print for its execution and inevitable activity. It gives subtleties of the fundamental program the jobs and obligations, every one of the exercises to be completed and the assets required and conceivable gamble with prescribed measure to counter them. The plan stage is a blue print, which on paper gives an extraordinary length and detail how must be changed over the corporate interest in a plausible task thought and at last a benefit making venture. The top administration strategy rules, its effect on the undertaking life, evaluation as far as monetary suitability are managed exhaustively. The DPR is the essential of particular, contract drawings, itemized specialized possibility, monetary achievability, execution of venture according to down to earth perspective. The DPR ought to likewise feature the idea of inborn dangers in the task and potential outside gambles with that will impact the result of the venture. Additionally, the DPR ought to give the actions for risk the executives and hazard alleviation.

Preparation of DPR:

The readiness of DPR requires wide assortment of mastery. Various choices are connected together. For instance: prerequisite and preparing plan is subject to the idea of the innovation, accessibility in the overall work market in the district, need for unfamiliar cooperation and preparing, degree of particular plant and hardware provided from abroad and so on. Financials necessities are reliant upon the time plan for the execution of the undertaking. The idea of issue to be remembered for the business agreements rely upon the degree of the spread of the project workers. If by some stroke of good luck neighborhood and provincial gatherings are in picture, the extension and locale for debates gets confined. In any event, for medium estimated project, it is vital that a skilled counseling firm is endowed with the errand of figuring out the DPR (Ganguly, (2016). [11]).

4. METHODOLOGY :

4.1 Research Design:

A shown in figure 1, the various tools (questionnaire formal/informal interview of the technical/non-technical persons who were involved on procurement and budget allocation by any means) were used to collect primary and secondary information (data which are main basis of research) relevant to the objectives of the study. These research tools were selected based on the information they could provide to achieve the setout study objectives. The limitation of the resources available for the study was also considered while selecting these tools. The general flow of the research methodology is presented in the following figure 1.

4.3 Research onion:

The research onion was developed by Saunders et al. in 2007 to illustrate the various stages required before developing an effective methodology. The first layer in the research onion is research philosophy and the research philosophy of this study is pragmatism, which focuses on the practical point of view. Research approaches are boarder methods used in research and the research approach of this study is deductive as it begins with the theory. Research strategies are another layer of the research onion and as the most effective method, surveys as well as archival data are used. Time horizons are the fourth layer of the research onion and in this research, a cross-sectional method is used as data are collected at a snapshot point in time. Finally, the Centre of the onion is reached, where techniques and procedures are selected for data collection and analysis for this study.

4.4 Data collection

The sources for the data was from the focus group discussion, questionnaire survey and formal/informal interviews with technical team of municipality and also other staff involved in the procurement process as well as the planning of annual budgeting of the municipality.

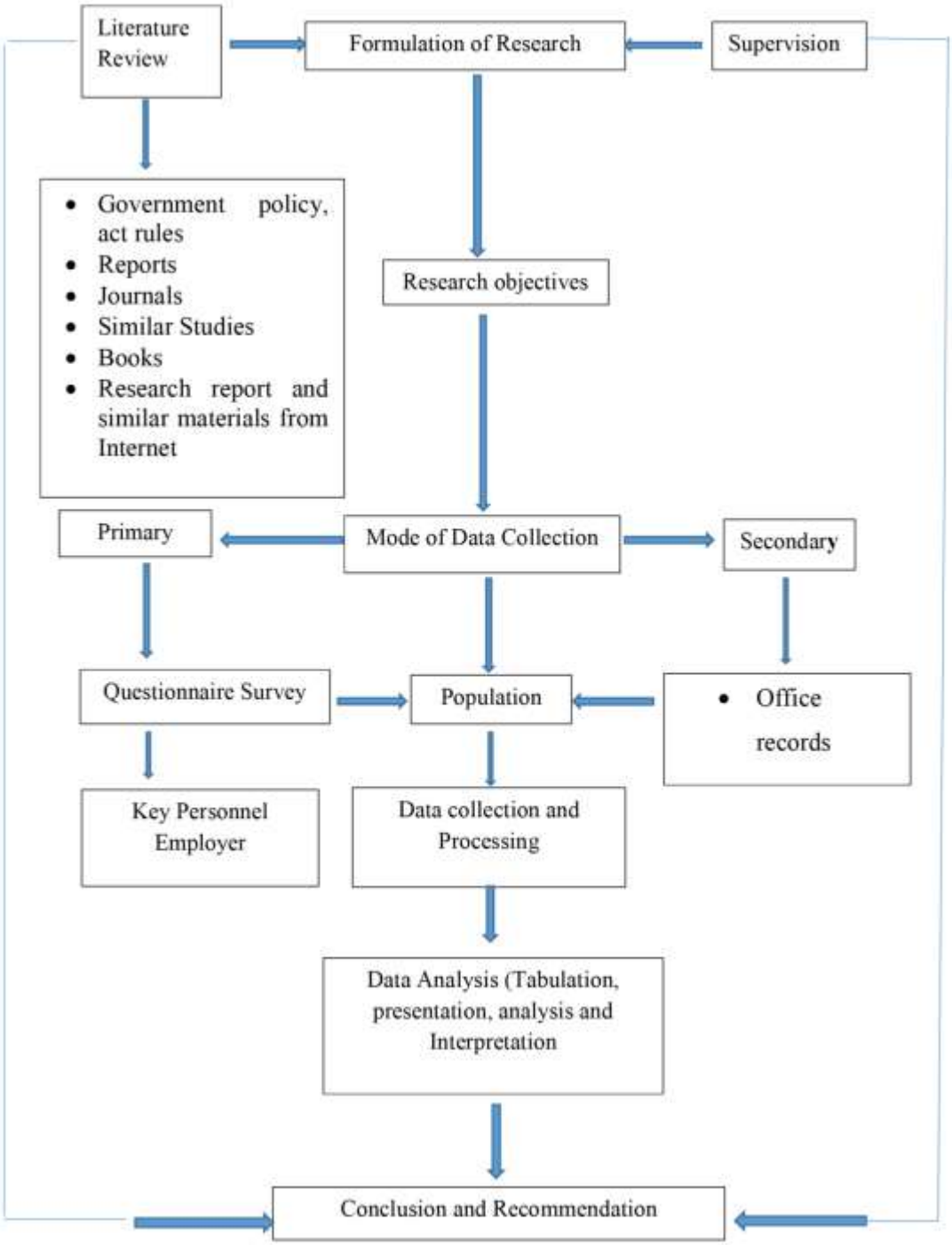

Fig. 1: Methodological Framework of Study

4.4.1 Design of Questionnaire:

A structured set of questionnaires were developed in order to assess the practice of contract administration functions in the contract project conducted by the Mandandeupur Municipality in the F/Y 2074/075 B.S, 2075/076 B.S, 2076/077 B.S, 2077/078 B.S & 2078/079 B.S.

The questionnaires were distributed to the respective project manager of the municipality for the finding of actual condition in practice of contract administration function, as it was also essential part of procurement practice.

4.5 Data analysis and Presentation:

After the data collection, data were arranged based on type of procurement conducted and categorized

contract work to construction of road, public building, water supply and sanitation, Bus Park and stadium.

The secondary population data were collected accurately for this study from Mandandeupur Municipality related to fiscal years i.e. F/Y 2074/075 B.S, 2075/076 B.S, 2076/077 B.S, 2077/078 B.S and 2078/079 B.S. Adequate efforts was made so that the data would be complete, consistent, accurate and homogenous as far as possible.

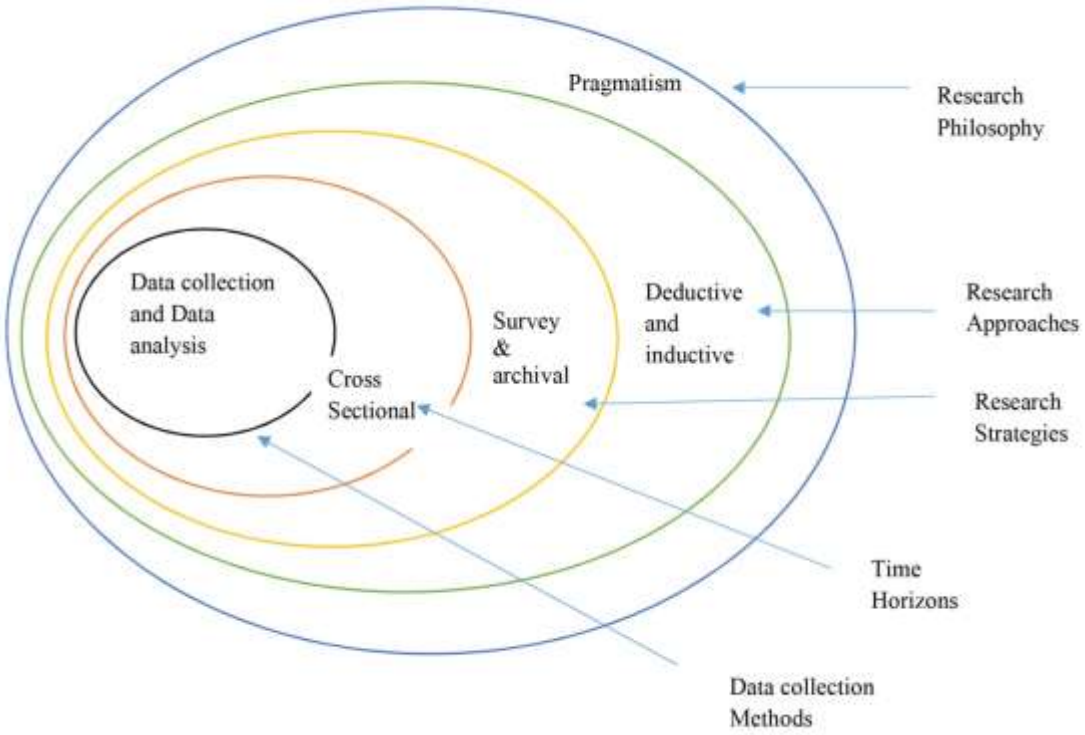

Fig. 3: Research Onion

According to schedule 1 of PPR,2007 (norms of government of Nepal), bidder's overhead including profit (if any) is 15% of laborers' cost + construction material cost + rent of mechanical equipment (including oily matters). Thus, calculation of average percentage of bidding amount assuming mid value of average percentage of bidding amount is equal to 85% (i.e., average percentage of percentage below engineers' estimate is equal to 15%) was done using equation 3.1. Thus, calculation was done assuming the bid up to 15% below in comparison to the engineer's estimate as the normal bid.

Average percentage below engineers' estimate (y) = A + (∑ Uxf / ∑f) ×h

Assume A= 15%. Conversely, if A=85% then y is average percentage of bidding amount.

Where, f= occurrence of contracts within specified range of % below engineer's estimate

U= $(X - A)/h$, Class interval (h) is assumed as 5 and X = mid value of class interval.

5. RESULTS AND DISCUSSIONS :

This section includes the results supported by the analysis and discussions based on the set out objectives. The first part deals with the budgetary trend:

5.1 Impact of Procurement Practice:

To analyze the impact of the procurement practice adopted on budget utilization trends, relation between number of bidders below the budget estimate and the engineer's estimate in response to budget utilization was analyzed by the correlation and regressing equation. The multiple regression is calculated from the number of bidders below the engineer's estimates and the engineer's estimate with budget utilization.

A schedule of questionnaires was prepared, and responses were collected for each NCB contract project for the analysis of contract administration practice of the 32 contracts and the chi-square test was performed for percentage data validity.

5.2 Relation between Number of bidders and Budget Utilization:

To analyze relation between the number of bidders and budget utilization, National competitive bidding (NCB) contract data of Mandandeupur Municipality was used. A correlation calculation among 32 contracts for five consecutive fiscal years with budget utilization was carried out, and an analysis of budget utilization trends in relation with the number of bidders was carried out, as was an analysis of the budgetary trend of the contract. The details of the contract data are given in Appendix B.

With the analysis of 32 contracts in Mandandeupur Municipality, the regression chart between the number of bidders and budget utilization was found to be:

Regression equation fitting all the data of Mandandeupur Municipality for five consecutive fiscal years

Y= 956.53x+9009.5

Where, Y= Budget Utilization and

Square of R i.e., R2=0.039

Following is a representation of the correlation between the number of bidders and budget utilization.

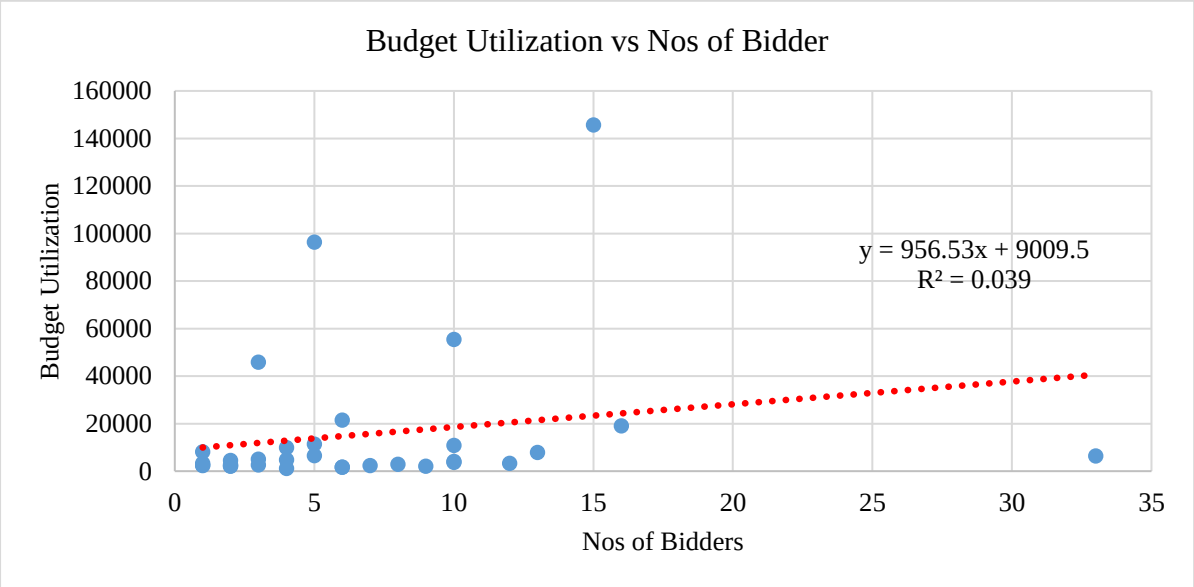

Fig. 4: Scatter Plot of Budget utilization vs. no's of bidders

From the above graph, the correlation between the number of bidders and budget utilization is positive (the coefficient of correlation is 0.2). The data revealed that there is very low correlation between these two variables. For the budget utilization, number of bidders was about 3.9% responsible, which is relatively insignificant.

5.3 Relation between below engineers estimate and Budget Utilization:

To analyze the relation between the below engineer's estimate and budget utilization, contract data from Mandandeupur Municipality was used. A correlation calculation among all 32 contracts for the five fiscal years with budget utilization was carried out, and an analysis of the budgetary trend with respect to the below-engineering estimate, i.e., the contract awarded amount, was analyzed. The details of the contract data are given in Appendix B**.**

With analysis of all 32 contracts of Mandandeupur Municipality, the regression chart between the below engineer's estimate and budget utilization was found to be a regression equation fitting all the data of Mandandeupur Municipality.

Y= 1.0288x – 484.59

Where Y=Budget Utilization and

Square of R i.e., R2=0.9986

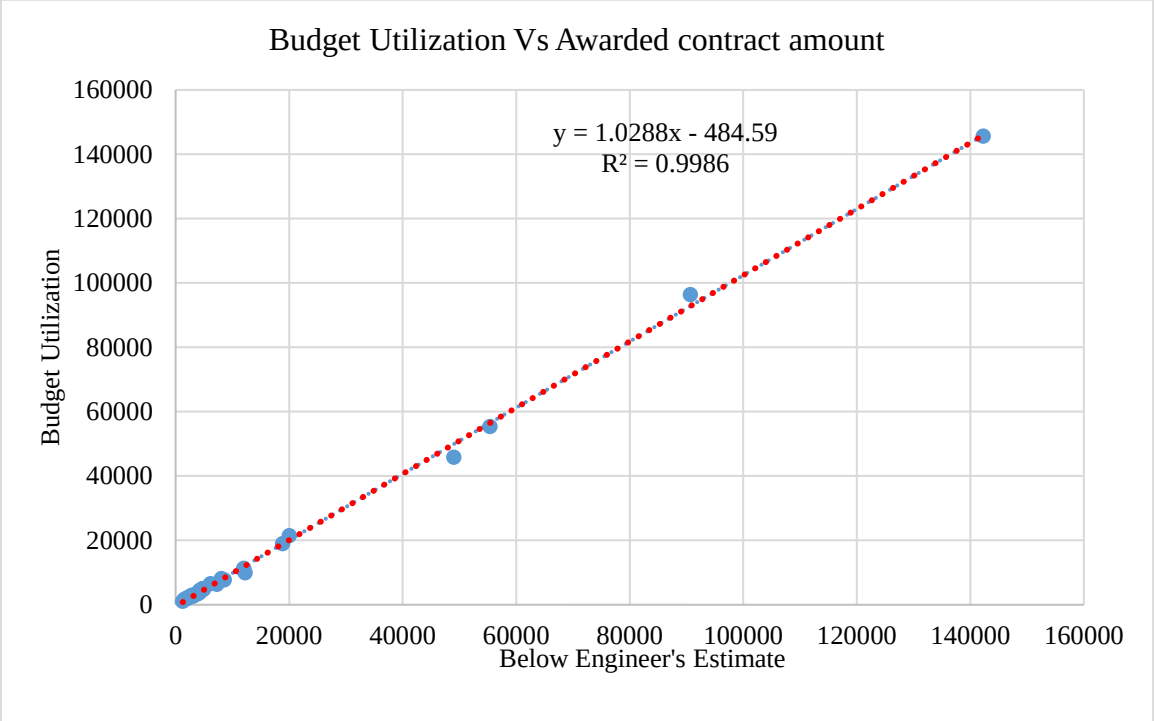

Fig. 5: Scatter plot of budget utilization vs below engineer's estimate

From the above figure, the correlation between budget utilization and the below engineer estimate was found to be positive (the coefficient of correlation is 0.99). The data reveals that there was a strong correlation between these two variables. Simply put, it could be stated that the budget utilization in terms of the below engineer's estimate and the awarded contract amount of the project was 99.86%.

5.4 Relation between engineers estimate and Budget Utilization:

To analyzed relation between the engineer's estimate and budget utilization, contract data from Mandandeupur Municipality was taken. A correlation calculation among all project contracts for five consecutive fiscal years with the budget utilization engineer's estimate of the project was carried out. The details of the contract data are given in Appendix B**.**

With the analysis of 32 contracts in Mandandeupur Municipality, the regression chart between the number of bidders and budget utilization was found to be:

Regression equation fitting all the data of Mandandeupur Municipality for five consecutive fiscal years

Y=0.6744x-1105.9

Where Y=Budget Utilization and

Square of R i.e R2=0.9864

From the below plot, the correlation between the engineer's estimate and budget utilization was found to be positive (the coefficient of correlation is 0.9864). The data revealed that there was a significant correlation between these two variables. Simply it can be stated that the budget utilization in terms of the engineer's estimate of the project was 98.64%.

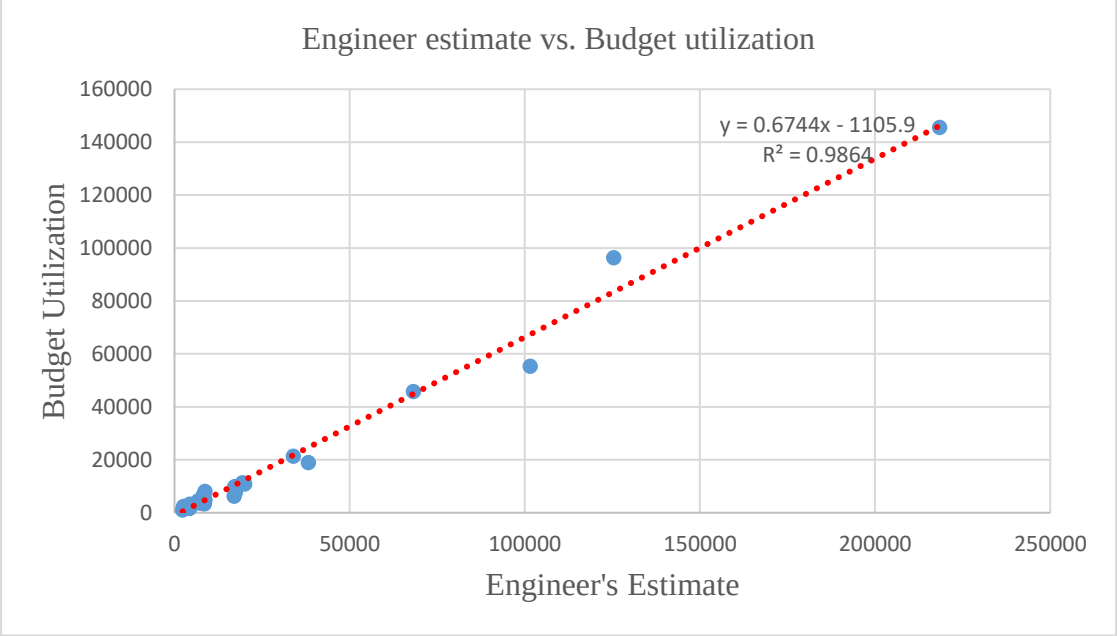

Fig. 6: Scatter plot of Budget Utilization vs. Engineer's estimate.

5.5 Relation between number of bidder, below engineer's estimate, engineers estimate and budget utilization:

To analyze relation between the numbers of bidders, below is the engineer's estimate and the engineer's estimate with budget utilization contract data of Mandandeupur Municipality of F/Y 2074/075 B.S, 2077/076 B.S, 2076/077 B.S, 2077/078 B.S and 2078/079 B.S are used. The details of the contract data are given in Appendix B**.**

Multiple regression was used to analysis the data, and results were found. From the P-value (probability), we can see that the below engineer's estimate was most significant in the budget utilization whereas the number of bidders and the engineer's estimate were not significant to the budget utilization.

Regression Statistics:

Table 1: Summary Output

Multiple R	0.999
R Square	0.999
Adjusted R Square	0.998
Standard Error	1198.271
Observations	32.000

Table 2: Anova

	df	SS	MS	F	Significance F
Regression	3	2.9E+10	9798378317	6824.07792	3.40561E-40
Residual	28	4E+07	1435853.81		
Total	31	2.9E+10			

Table 3: Regression Statistics

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-387.46	326.64	-1.19	0.25	-1056.54	281.62	-1056.54	281.62
x1 (Nos of Bidder)	-5.77	40.12	-0.14	0.89	-87.95	76.42	-87.95	76.42
x2 (Below engineer estimate)	1.11	0.08	13.75	0.00	0.94	1.27	0.94	1.27
x3 (Project Amount)	-0.05	0.05	-0.96	0.34	-0.16	0.06	-0.16	0.06

5.6 Contract Administration Practice:

For the study of contract administration and contract management, questionnaires were prepared related to contract administration and the responses of each NCB contract were noted by their respective project managers. Following were the results as discussed with different contract activities.

5.7 Significance Practice of Meeting in Projects:

As per the general theory of contract administration, there should be regular meetings, such as kick off meetings before the construction of the following weekly meeting, monthly meetings and management meetings. Chi-square = ∑ (Oi-Ei) 2/Ei

Table 4: Response of questionnaires on meeting

S. N.	Modules	Responses	
		Adopted	Not adopted
1	Kickoff meeting	32	-
	Weekly	-	32
	Monthly	4	28
	Management	24	8

Null hypothesis (H0) = There is no significant practice of meeting in the project of Mandandeupur Municipality.
Alternative hypothesis (H1) = There is significant practice of meeting in the project of Mandandeupur Municipality.

Table 5: Chi square test of meeting

Description	Oi	E_i	O_i-E_i	$(O_i-E_i)^2$	$(Oi-Ei)^2/Ei$
Kick off Meeting	32	16	16	256	16
	0	16	-16	256	16
	∑ Oi =32	∑ E_i =32			∑ $(Oi-Ei)^2/Ei$ =32
Weekly	0	16	-16	256	16
	32	16	16	256	16
	∑ Oi =32	∑ E_i =32			∑ $(Oi-Ei)^2/Ei$ =32

Monthly	4	16	-12	144	9
	28	16	12	144	9
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum (Oi-Ei)^2/Ei$ =18
Management	24	16	8	64	4
	8	16	-8	64	4
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum (Oi-Ei)^2/Ei$ =8

Degree of freedom (n-1) =1
Table value of Chi-square at 0.05 for 1d. f=3.84

Result: From the Chi-squared analysis, it was found that the kick off meeting was significantly practiced in the contract project of the Mandandeupur Municipality. Whereas the weekly and monthly meetings were not significantly practiced. In addition, management meetings were significantly practiced.

From the responses, it was determined that the kick off meeting of all the projects was held as it is essential in every project, small or large, whereas weekly meetings were not included in any of the projects due to the limited progress of construction within a week and the time limit of the project managers and other related persons.
From the questionnaires, the management meetings were not held in the following projects:

1. 06/WORKS/NCB/076/077,
2. 07/WORKS/NCB/MDM/076/077,
3. 02/WORKS/NCB/MDM/076/077,
4. 10/WORKS/NCB/MDM/076/077,
5. 01/ WORKS/NCB/MDM/078/079,
6. 09/WORKS/NCB/MDM/076/077,
7. 11/WORKS/NCB/MDM/077/078,
8. 13/WORKS/NCB/MDM/077/078.

Because these projects are the least complicated and the work was completed in a short period of time.

Also, according to the responses to the questionnaires, monthly meetings were held only for these projects:

1. 12/WORKS/NCB/077/78,
2. 03/WORKS/NCB/MDM/076/77,
3. 01/ WORKS/NCB/MDM/078/79, and
4. 11/WORKS/NCB/MDM/076/77.

As these are complicated as well as the priority projects of the municipality with a huge amount of budget.

5.8 Significance practice of Submittals in projects:

The submittal review process plays a crucial role in the construction phase of a project. It allows for the review and approval of various documents and materials to ensure they meet the project requirements and specifications.

Table 6: Response of questionnaires on Submittals

S.N.	Modules (Required Documents)	Responses	
		Adopted	Not
2	Pre-construction Submittals: Insurance policy Methodologies Organization chart Working schedule	32	- -
	Construction Submittals: Test reports Material sources identification and approval Test formats Other standard formats Progress report formats Bill formats	22	10
	Closeout Submittals: Warranty and guarantee documents Punch-list completion Taking over letter	19	13
	Record Keeping: All the documents, including emails and samples	26	6

Null hypothesis (H0) = There is no significant practice of submittals in the project of Mandandeupur Municipality.
Alternative hypothesis (H1) = There is significant practice of submittals in the project of Mandandeupur Municipality.

Table 7: Chi square test of Submittals

Description	Oi	E_i	O_i-E_i	$(O_i-E_i)^2$	$(Oi-Ei)^2/Ei$
Pre-construction	32	16	16	256	16
	0	16	-16	256	16
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum (Oi-Ei)^2/Ei$ =32
Construction submittals	22	16	6	36	2.25
	10	16	-6	36	2.25
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum (Oi-Ei)^2/Ei$ =4.5
Closeout submittals	19	16	3	9	0.5625
	13	16	-3	9	0.5625
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum (Oi-Ei)^2/Ei$ =1.125
Record Keeping	26	16	10	100	6.25
	6	16	-10	100	6.25
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum (Oi-Ei)^2/Ei$ =12.5

Degree of freedom (n-1) =1
Table value of Chi-square at 0.05 for 1d. f=3.84

Result: From the Chi-square test, it was found that the pre-construction, construction submittals and record keeping were significantly practiced, whereas the closeout submittals were not significantly practiced in the projects of Mandandeupur Municipality.

From the responses, it was found that post-construction submittals were submitted for all the projects. Construction submittals are not available in

1. 07/WORKS/NCB/MDM/076/077,
2. 11/WORKS/NCB/MDM/077/078,
3. 08/WORKS/NCB/MDM/077/078,
4. 11/WORKS/NCB/MDM/076/077,
5. 07/WORKS/NCB/MDM/077/078,
6. 04/WORKS/NCB/MDM/078/079,
7. 07/WORKS/NCB/MDM/075/076,
8. 04/WORKS/NCB/MDM/076/077,
9. 12/WORKS/NCB/MDM/077/078 and
10. 06/WORKS/NCB/MDM/077/078.

Similarly, the closeout submittals are not available in:

1. 07/WORKS/NCB/MDM/076/077,
2. 09/WORKS/NCB/MDM/076/077,
3. 04/WORKS/NCB/MDM/077/078,
4. 11/WORKS/NCB/MDM/077/078,
5. 03/WORKS/NCB/MDM/078/079,
6. 08/WORKS/NCB/MDM/077/078
7. 10/WORKS/NCB/MDM/075/076,
8. 07/WORKS/NCB/MDM/077/078,
9. 04/WORKS/NCB/MDM/078/079,
10. 07/WORKS/NCB/MDM/075/076,
11. 04/WORKS/NCB/MDM/076/077,
12. /WORKS/NCB/MDM/077/078,
13. 06/WORKS/NCB/MDM/077/078 and
14. 07/WORKS/NCB/MDM/076/077.

Record keeping was not done in the following projects:

1. 12/WORKS/NCB/077/078,
2. 6/WORKS/NCB/076/077,
3. 02/WORKS/NCB/MDM/076/077,
4. 10/WORKS/NCB/MDM/076/077 and
5. 11/WORKS/NCB/MDM/077/078

5.9 Significance practice in interpretation and modification in projects:

A change to an existing contract is a modification. A contract modification could change the scope of the contract, the price of the contract, or both.

Table 8: Response of questionnaires on Interpretation and Modification

S.N.	Modules (Required Documents)	Responses	
		Adopted	Not adopted
3	Interpreting contract documents (Drawings, agreement documents, specifications)	15	17
	Contract modifications (Drawings, change in scope)	7	25
	Substitution (Works, materials, technique, workmanship)	3	29

Null hypothesis (H0) = There is no significant no practice of interpretation and modification in the project of Mandandeupur Municipality.
Alternative hypothesis (H1) = There is significant no practice of interpretation and modification in the project of Mandandeupur Municipality.
Degree of freedom (n-1) =1

Table value of Chi-square at 0.05 for 1d. f=3.84
Result: From the test, it was found that interpreting contract documents was significant, whereas contract modification and substitution were not significant in the practice of projects.

Table 9: Chi square test of Submittals

Description	Oi	E_i	O_i-E_i	$(O_i-E_i)^2$	$(Oi-Ei)^2/Ei$
Interpreting contract documents	15	16	-1	1	0.0625
	17	16	1	1	0.0625
	∑ Oi =32	∑ E_i =32			∑ $(Oi-Ei)^2/Ei$ =0.125
Contract modification	7	16	-9	81	5.0625
	25	16	9	81	5.0625
	∑ Oi =32	∑ E_i =32			∑ $(Oi-Ei)^2/Ei$ =10.125
Substitution	3	16	-13	169	10.5625
	29	16	13	169	10.5625
	∑ Oi =32	∑ E_i =32			∑ $(Oi-Ei)^2/Ei$ =21.125

Contract modification was done for 16 projects and among these contract documents were interpreted in the following contract projects.
And interpretation of contract documents was done for the following contacts:

1. 04/WORKS/NCB/MDM-RBN/075/076,
2. 06/WORKS/NCB/076/077
3. 01/WORKS/NCB/MDM/077/078,
4. 03/WORKS/NCB/MDM/076/077,
5. 10/WORKS/NCB/MDM/076/077,
6. 01/Works/NCB/MDM/078/079,
7. 09/WORKS/NCB/MDM/076/077,
8. 04/WORKS/NCB/MDM/077/078,
9. 11/WORKS/NCB/MDM/077/078,
10. 13/WORKS/NCB/MDM/077/078,
11. 09/WORKS/NCB/MDM/077/078,
12. 08/WORKS/NCB/MDM/077/078,
13. 11/WORKS/NCB/MDM/076/077,
14. 07/WORKS/NCB/MDM/077/078 and
15. 04/WORKS/NCB/MDM/078/079 as per requirement of the projects.

The contract modifications were conducted on the following contractual project:

1. 06/WORKS/NCB/076/077,
2. 02/WORKS/NCB/078/079,
3. 01/WORKS/NCB/MDM/077/078,
4. 03/WORKS/NCB/MDM/076/077,
5. 10/WORKS/NCB/MDM/076/077,
6. 01/Works/NCB/MDM/078/079 and
7. 11/WORKS/NCB/MDM/077/078 as there were issues on construction process of these projects.

Substitution were occurred in the following contract:

1. 01/WORKS/NCB/MDM/077/078,
2. 03/WORKS/NCB/MDM/076/077and
3. 10/WORKS/NCB/MDM/076/077.

4.3.1.1 Significance practice of executing the work in projects

After the apparent lowest responsible bidder for competitive and informal bids has been determined and approval has been received to award the contract, the bidder is sent the agreement and other contract documents to execute.

Table 10: Response of questionnaires on Executing works

S. N.	Modules (Required Documents)	Responses	
		Adopted	Not adopted
4	Field engineering (Surveying & layout data, complete set of drawings)	22	10
	Coordination & Supervision (Site Monitoring) (Daily site report, job approval cards, site diary, instructions, memo, minutes, change/variation order, request forms)	23	9
	Scheduling (Master schedule, weekly, monthly, cash flow chart, progress tracking records)	8	24
	Communication (Organization chart with hierarchical order, communication procedures and channels, duration to response)	32	0
	Material Handling and Storage (Material receive records, stockpile records, daily consumption records)	5	27
	Examination and verification (Standard format for inspection at the site/offsite)	11	21
	Testing & inspection (Standard test formats, Testing records, instruction of acceptance /rejection)	20	12
	Record keeping (All the documents including email, samples etc.)	32	-

Null hypothesis (H0) = There is no significant practice of these modules in executing the works in the project of Mandandeupur Municipality.
Alternative hypothesis (H1) = There is significant practice of these modules in executing the works in the project of Mandandeupur Municipality.

Table 11: Chi square test of executing works

Description	Oi	E_i	O_i-E_i	$(O_i-E_i)^2$	$(Oi-Ei)^2/Ei$
Field Engineering	22	16	6	36	2.25
	10	16	-6	36	2.25
	∑ Oi =32	∑ E_i =32			∑$(Oi-Ei)^2/Ei$ =4.5
Co-ordination and Supervision	23	16	7	49	3.063
	9	16	-7	49	3.063
	∑ Oi =32	∑ E_i =32			∑$(Oi-Ei)^2/Ei$ =6.125
Scheduling	8	16	-8	64	4
	24	16	8	64	4
	∑ Oi =32	∑ E_i =32			∑$(Oi-Ei)^2/Ei$ =8

Communication	32	16	16	256	16
	0	16	-16	256	16
	∑ Oi =32	∑ E_i =32			∑$(Oi-Ei)^2/Ei$ =32
Material handling and storage	5	16	-11	121	7.563
	27	16	11	121	7.563
	∑ Oi =32	∑ E_i =32			∑$(Oi-Ei)^2/Ei$ =15.125
Examination and verification	11	16	-5	25	1.563
	21	16	5	25	1.563
	∑ Oi =32	∑ E_i =32			∑$(Oi-Ei)^2/Ei$ =3.125
Testing and inspection	20	16	4	16	1
	12	16	-4	16	1
	∑ Oi =32	∑ E_i =32			∑$(Oi-Ei)^2/Ei$ =2
Record keeping	32	16	16	256	16
	0	16	-16	256	16
	∑ Oi =32	∑ E_i =32			∑$(Oi-Ei)^2/Ei$ =32

Degree of freedom (n-1) =1
Table value of Chi-square at 0.05 for 1d. f=3.84
Result: It was found that field engineering, co-ordination and supervision, communication testing and inspection and record keeping were significantly practice whereas scheduling and material handling were not significantly practiced in the projects of the municipality.
In the process of executing the work, field engineering was not done in the following contact:

1. 05/WORKS/NCB/MDM/075/076,
2. 07/MDM/074-075,
3. 03/WORKS/NCB/MDM/075/076,
4. 10/WORKS/NCB/MDM/077/078,
5. 05/WORKS/NCB/MDM/077/078,
6. 02/WORKS/NCB/MDM/076/077,
7. 10/WORKS/NCB/MDM/076/077,
8. 7/WORKS/NCB/MDM/075/076 and
9. 04/WORKS/NCB/MDM/076/077 as they were low budget projects, as well as some being continuations of projects where field engineering was done in previous related projects.

Coordination and site supervision are not done in the following contract:

1. 06/WORKS/NCB/MDM/075/076,
2. 06/WORKS/NCB/MDM/075/076,
3. 07/WORKS/NCB/MDM/076/077,
4. 10/WORKS/NCB/MDM/076/077,
5. 01/Works/NCB/MDM/078/079,
6. 13/WORKS/NCB/MDM/077/078,
7. 08/WORKS/NCB/MDM/077/078,

8. 07/WORKS/NCB/MDM/077/078 and
9. 12/WORKS/NCB/MDM/077/078 as these were projects that were completed within a week and carried smaller budgets.

Scheduling was not done in most of the projects and was conducted only in the following:

1. 05/WORKS/NCB/MDM/077/078,
2. 02/WORKS/NCB/078/79,
3. 01/WORKS/NCB/MDM/077/078,
4. 03/WORKS/NCB/MDM/076/077,
5. 04/WORKS/NCB/MDM/077/078,
6. 11/WORKS/NCB/MDM/077/078,
7. 13/WORKS/NCB/MDM/077/078 and
8. 07/WORKS/NCB/MDM/075/076.

These were the projects with a high budget and complicated works that were priority projects for the municipality.

All the projects are executed through communication and record keeping of these stages were kept safely.

Materials handling and storage were carried out while executing the work for the following projects:

4 02/WORKS/NCB/078/079,
5 01/WORKS/NCB/MDM/077/078,
6 03/WORKS/NCB/MDM/076/077,
7 04/WORKS/NCB/MDM/077/078 and
8 07/WORKS/NCB/MDM/077/078 as they were the priority project of municipality with high budget.

Examination and verification were conducted for the following projects:

1. 02/WORKS/NCB/078/079,
2. 01/WORKS/NCB/MDM/077/078,
3. 03/WORKS/NCB/MDM/076/077,
4. 05/WORKS/NCB/MDM/077/078 and
5. 07/WORKS/NCB/MDM/077/078 because these projects are important and certain examinations and verifications were needed as per the contract agreement.

5.10 Significance practice of Quality Assurance/ Quality control in projects:

The quality of the project depends on the quality assurance plan, quality control process and quality check. Here, the study of the significance of the practices of quality assurance and quality control was done.

Table 12: Response of questionnaires on Quality Assurance/ Quality control

S. N.	Modules (Required Documents)	Responses	
		Adopted	Not adopted
5	Quality assurance plan (Quality assurance plan, flowcharts, Recapitulative test schedule, list of lab staffs, sources of materials)	27	5
	Quality control processes (non-conformity detection and verification documents)	13	19
	Quality check (Standard specifications, field test reports, inspection reports)	23	9

Null hypothesis (H0) = There is no significant practice of quality assurance and quality control in the project of Mandandeupur Municipality.

Alternative hypothesis (H1) = There is significant practice of quality assurance and quality control works in the project of Mandandeupur Municipality.

Table 13: Chi square test of Quality Assurance/Quality control

Description	Oi	E_i	O_i-E_i	$(O_i-E_i)^2$	$(Oi-Ei)^2/Ei$
Quality Assurance Plan	27	16	11	121	7.563
	4	16	-12	144	9
	∑Oi=32	∑Ei=32			$\sum(Oi-Ei)^2/Ei$ =16.563
Quality Control Process	13	16	-3	9	0.563
	19	16	3	9	0.563
	∑Oi=32	∑Ei=32			$\sum(Oi-Ei)^2/Ei$ =1.125
Quality check	23	16	7	49	3.0625
	9	16	-7	49	3.0625
	∑ Oi =32	∑ E_i =32			$\sum(Oi-Ei)^2/Ei$ =6.125

Degree of freedom (n-1) =1
Table value of Chi-square at 0.05 for 1d. f=3.84
Result: From the Chi Square analysis, it was found that the quality assurance plan and quality check were significantly practiced in the projects of contract, whereas the quality control process was not significantly practiced in the projects of the municipality.
A quality assurance plan was conducted for most of the project. But not conducted in the following projects:

1. 12/WORKS/NCB/077/078,
2. 14/WORKS/NCB/077/078,
3. 3/WORKS/NCB/MDM/075/076,
4. 10/WORKS/NCB/MDM/076/077and
5. 04/WORKS/NCB/MDM/077/078 as these projects are related to road construction and are especially focused on quality checks.

However, quality control processes are not done in the majority of the projects; they are done in the following projects:

1. 06/WORKS/NCB/MDM/075/076,
2. 06/WORKS/NCB/076/077,
3. 05/WORKS/NCB/MDM/075/076,
4. 07/MDM/074-075,
5. 3/WORKS/NCB/MDM/075/076,
6. 10/WORKS/NCB/MDM/077/078,
7. 01/WORKS/NCB/MDM/077/078
8. 03/WORKS/NCB/MDM/076/077,
9. 01/Works/NCB/MDM/078/079,
10. 09/WORKS/NCB/MDM/076/077,
11. 03/WORKS/NCB/MDM/078/079,
12. 07/WORKS/NCB/MDM/075/076 and
13. 04/WORKS/NCB/MDM/076/077.

These were the projects that were prioritized by the municipality.
And quality checks were not done in the following projects as they had the project with less budget:

1. 04/WORKS/NCB/MDM-RBN/075/076,
2. 3/WORKS/NCB/MDM/075/076,
3. 02/WORKS/NCB/078/079,
4. 07/WORKS/NCB/MDM/076/077,
5. 09/WORKS/NCB/MDM/076/077,
6. 11/WORKS/NCB/MDM/077/078,
7. 03/WORKS/NCB/MDM/078/079,
8. 13/WORKS/NCB/MDM/077/078 and

9. 06/WORKS/NCB/MDM/077/078.

5.11 Significance practice of Measurement and Payment:

Measurement and payment are the processes in construction where payment is done in accordance with obtaining measurements from the site. Measurement and payment are conducted with the necessary documents.

Table 14: Response of questionnaires on measurement and payment

S. N.	Modules (Required Documents)	Responses	
		Adopted	Not adopted
6	Measurement (Measurement book, BOQ)	32	-
	Progress payment (Bill/voucher, approved change order, support drawings, records of extra works and other supporting documents)	32	-
	Retention/ Mobilization repayment (Contract documents, bill, mobilization receipt)	32	-
	Withholding payment (Letter stating the causes)	7	25
	Liens (Enquiry/ non-acceptance letter)	0	32
	Liquidated damages/Penalty/Bonus (Working schedule, contract documents, time of completion records)	21	11
	Final Payment (Final Bill/voucher, approved change orders, support drawings, records of extra works and other supporting documents, certification of completion)	32	-

Null hypothesis (H0) = There is no significant practice of measurement and payment in the project of Mandandeupur Municipality.
Alternative hypothesis (H1) = There is significant practice measurement and payment in the project of Mandandeupur Municipality.

Table 15: Chi square test of Measurement and Payment

Description	Oi	E_i	O_i-E_i	$(O_i-E_i)^2$	$(Oi-Ei)^2/Ei$
Measurement	32	16	16	256	16
	0	16	-16	256	16
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum(Oi-Ei)^2/Ei$ =32
Progress payment	32	16	16	256	16.000
	0	16	-16	256	16.000
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum(Oi-Ei)^2/Ei$ =32
Retention/Mobilization repayment	32	16	16	256	16
	0	16	-16	256	16
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum(Oi-Ei)^2/Ei$ =32
Withholding payment	7	16	-9	81	5.0625

	25	16	9	81	5.0625
	∑ Oi =32	∑ E_i =32			∑$(Oi-Ei)^2$/Ei =10.125
Liens	0	16	-16	256	16.000
	32	16	16	256	16.000
	∑ Oi =32	∑ E_i =32			∑$(Oi-Ei)^2$/Ei =32
Liquidated damages/Penalty/Bonus	21	16	5	25	0.563
	13	16	-5	25	0.563
	∑ Oi =32	∑ E_i =32			∑$(Oi-Ei)^2$/Ei =1.125
Final payment	32	16	16	256	16
	0	16	-16	256	16
	∑ Oi =32	∑ E_i =32			∑$(Oi-Ei)^2$/Ei =32

Degree of freedom (n-1) =1
Table value of Chi-square at 0.05 for 1d. f=3.84
Result: the results showed that measurement, progress payment, retention/mobilization repayment, liquidated damages and final payment were significantly practiced whereas withholding payment and liens were not practiced in the projects of the municipality.
Measurement, progress payment and retention payment were done for the entire project for the payment.
In addition, withholding payment was done when some issues occurred with the quality of the construction in the following project:

1. 14/WOKS/NCB/077/078,
2. 10/WORKS/NCB/MDM/077/078,
3. 05/WORKS/NCB/MDM/077/078,
4. 02/WORKS/NCB/MDM/076/077,
5. O9WORLS/NCB/MDM/076/077,
6. 04/WORKS/NCB/MDM/077/078 and
7. 04/WORKS/NCB/MDM/076/077.

Liquidated damages did not occur in the following projects:

1. 12/WORKS/NCB/077/078,
2. 06/WORKS/NCB/MDM/075/076,
3. 04/WORKS/NCB/MDM-RBN/075/076,
4. 05/WORKS/NCB/MDM/077/078,
5. 02/WORKS/NCB/078,
6. 01/WORKS/NCB/MDM/077/078,
7. 10/WORKS/NCB/MDM/076/077,
8. 01/Works/NCB/MDM/078/079,
9. 09/WORKS/NCB/MDM/076/077,
10. 11/WORKS/NCB/MDM/077/078,
11. 11/WORKS/NCB/MDM/077/078,
12. 04/WORKS/NCB/MDM/076/077 and
13. 06/WORKS/NCB/MDM/077/078 as these projects were completed within the contract period.

The final payments were done with all the required processes in all the contracts.

5.12 Significance practice of Claims and Disputes:

Construction claims can be defined as a request by either party to the contract, usually the contractor, for the compensation for damages caused by failure of the other party to fulfill his part of obligation as specified in the additional payment or an extension of time [2-5]. Technically, a dispute implies assertion of a claim by one party and repudiation thereof by another. Thus, neither a mere claim without

repudiation, nor a pair of claim and counter claim, can be called a dispute [6-9].

Table 16: Response of questionnaires on Claims and Disputes

SN	Modules (Required Documents)	Responses	
		Adopted	Not adopted
7	Claim & Dispute entitlement (Notice to the either parties)	21	11
	Claim documents filed (Burden of Proof, Basis of claim documents, Substantiation claim)	21	11
	Resolving Claim & Disputes (Mutual understanding for the dispute resolution by Adjudication/Arbitration/Litigation, All the documents in chronological order)	21	11

Null hypothesis (H0) = There is no significant no cases of claims and disputes in the project of Mandandeupur Municipality.
Alternative hypothesis (H1) = There is significant no cases of claims and disputes in the project of Mandandeupur Municipality.

Table 17: Chi square analysis of Claim and Disputes

Description	Oi	E_i	O_i-E_i	$(O_i-E_i)^2$	$(Oi-Ei)^2/Ei$
Claim & Dispute entitlement	21	16	5	25	0.563
	11	16	-5	25	0.563
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum(Oi-Ei)^2/Ei$ =1.125
Claim documents field	21	16	5	25	0.563
	11	16	-5	25	0.563
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum(Oi-Ei)^2/Ei$ =1.125
Resolving Claim & Disputes	21	16	5	25	0.563
	11	16	-5	25	0.563
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum(Oi-Ei)^2/Ei$ =1.125

Degree of freedom (n-1) =1
Table value of Chi-square at 0.05 for 1d. f=3.84
Result: From the Chi square test, it was found that there were significant cases of claims and disputes. Claims and disputes did not occur in the form of claims; the extension of time and variation in the projects were resolved by mutual understanding and adjudication, arbitration, or litigation were not practice in any of the projects. Following are the projects that were completed without claims or disputes:

1. 12/WORKS/NCB/077/078,
2. 06/WORKS/NCB/MDM/075/076,
3. 04/WORKS/NCB/MDM-RBN/075/076,
4. 05/WORKS/NCB/MDM/077/078,
5. 02/WORKS/NCB/078/079
6. 01/WORKS/NCB/MDM/077/078,
7. 10/WORKS/NCB/MDM/076/077,
8. 01/Works/NCB/MDM/078/079,
9. 09/WORKS/NCB/MDM/076/077,

10. 11/WORKS/NCB/MDM/077/078,
11. 11/WORKS/NCB/MDM/077/078,
12. 04/WORKS/NCB/MDM/076/077 and
13. 06/WORKS/NCB/MDM/077/078

5.13 Significance practice of Health and Safety:

With proper management of construction site hazards, employers and workers can minimize risks at the workplace. In doing so, we prevent injuries and fatalities. Occupational health and safety in construction involves the identification, assessment, and control of hazards to minimize the risk of injury and illness to workers. It is essential to ensure that all workers have the necessary training, knowledge, and equipment to work safely.

Table 18: Response of questionnaires on Health and Safety

S. N.	Modules (Required Documents)	Responses	
		Adopted	Not adopted
8	Safety Plan (Contractor Site Safety Management Plan (CSSMP), Emergency action plan, Public safety management plan, Transport Management Plan)	-	32
	Safety Control (Safety Training records, Orientation (Pre-work & Pre-job), Checklist and inspection reports, instructions)	-	32
	Accident Reporting (Injury register, Photographs, Accident Report)	-	32

Null hypothesis (H0) = There is not significantly no practice health and safety in the project of Mandandeupur Municipality.
Alternative hypothesis (H1) = There is significantly no practice health and safety in the project of Mandandeupur Municipality.

Table 19: Chi square test of Health and safety

Description	Oi	E_i	O_i-E_i	$(O_i-E_i)^2$	$(Oi-Ei)^2/Ei$
Safety Plan	0	16	-16	256	16
	32	16	16	256	16
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum(Oi-Ei)^2/Ei$ =32
Safety Control	0	16	16	256	16
	32	16	16	256	16
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum(Oi-Ei)^2/Ei$ =32
Accident Report	0	16	-16	256	16
	32	16	16	256	16
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum(Oi-Ei)^2/Ei$ =32

Degree of freedom (n-1) =1
Table value of Chi-square at 0.05 for 1d. f=3.84
Result: From the chi-square test, it was determined that there were no significant practice of health and

safety in the construction projects of the municipality.
The aspect of health and safety seems to be poor and not taken seriously in any of the projects.

5.14 Significance practice of Project Closeout:

Construction project closeout is the final phase of a construction project and a vital part of construction management services. The comprehensive list of closeout documents required for construction projects it is divided into three primary categories: pre-construction, during-construction and post-construction closeout documents. Project closeout is the final phase in the construction project management process. It happens after the physical building has been completed but before you hand over the project to the owner.

Table 20: Response of questionnaires on Project closeout

S.N.	Contract Administration Functions	Modules (Required Documents)	Responses	
			Yes	No
9	Are Project Closeout done as Per these modules?	Punch list (List of nonconformities of the works, inspection record)	4	28
		Closeout meeting/closeout (Agenda, minutes, successful completion report of the punch list, Certificate of completion, Release of the Guarantees, Letter of commencing of the DLP)	10	22
		Post construction services (Warranty, Guarantee documents, services contact list, maintenance manuals, operation manuals)	32	-
		Document Archive (All the documents of the contract administration throughout the project)	32	-
		Taking over (Request letter, Taking Over certificate)	32	-

Null hypothesis (H0) = There is no significant practice of project close out in the project of Mandandeupur Municipality.
Alternative hypothesis (H1) = There is significant practice of project close out in the project of Mandandeupur Municipality.

Table 21: Chi square test of Project Close out.

Description	Oi	E_i	O_i-E_i	$(O_i-E_i)^2$	$(Oi-Ei)^2/Ei$
Punch list	4	16	-12	144	9
	28	16	12	144	9
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum(Oi-Ei)^2/Ei$ =18
Closeout meeting	10	16	-6	36	2.25
	22	16	6	36	2.25
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum(Oi-Ei)^2/Ei$ =32
Post construction services	32	16	16	256	16
	0	16	-16	256	16
	$\sum$ Oi =32	$\sum E_i$ =32			$\sum(Oi-Ei)^2/Ei$ =32

Document Archive	32	16	16	256	16
	0	16	-16	256	16
	∑ Oi =32	∑ E_i =32			∑$(Oi-Ei)^2/Ei$ =32
Taking over	32	16	16	256	16
	0	16	-16	256	16
	∑ Oi =32	∑ E_i =32			∑$(Oi-Ei)^2/Ei$ =32

Degree of freedom (n-1) =1
Table value of Chi-square at 0.05 for 1d. f=3.84
Result: From the Chi square test, it was revealed that for the close-out of the project, the punch list and close-out meeting were not significantly practiced, whereas other components, such as post-construction services, document archives, and taking over were significantly practiced.
For the project closeout, the punch list was listed only for the following projects:

1. 07/MDM/074-075,
2. 07/MDM/074-075,
3. 01/WORKS/NCB/MDM/077/078 and
4. 03/WORKS/NCB/MDM/076/077 as they were the project with the preference as well as the high budget of the municipality.

Closeout meetings were done in the following projects:

1. 04/WORKS/NCB/MDM-RBN/075/76,
2. 14/WORKS/NCB/077/78,
3. 07/MDM/074-075,
4. 07/MDM/074-075
5. 10/WORKS/NCB/MDM/076/77,
6. 04/WORKS/NCB/MDM/077/78,
7. 09/WORKS/NCB/MDM/077/78,
8. 11/WORKS/NCB/MDM/076/77,
9. 07/WORKS/NCB/MDM/077/78 and
10. 04/WORKS/NCB/MDM/078/79.

The post construction services, documents archive and taking over were done on all the projects.

6. CONCLUSION :

The relation between the number of bidders and budget utilization was found to be not correlated, below the engineer's estimate. And budget utilization was found to be strongly correlated; engineer's estimate and budget utilization were found to be significantly correlated; and the combined relation of the number of bidders below engineer's estimate, engineer's estimate and budget utilization was found to be significant, whereas below engineer's estimate was most significant.
The contract administration part of the contract seemed to be weak in the parts of safety and plan and strong in the case of document management. The contract administration of large budget contracts seems to follow the process, whereas projects with a small budget seem to skip the process of contract administration. Kick-off meetings and management meetings were significantly practiced, whereas weekly and monthly meetings were not significantly practiced. For the submittals, pre-construction, construction and record keeping were significantly practiced whereas closeout submittals were significantly practiced. Interpretation and modification were not in practiced significantly. For executing the work, field engineering, co-ordination and supervision, communication, testing, inspection, and record keeping were significant in practice whereas scheduling and materials handling were not. For quality assurance and quality control, quality assurance plans and quality checks were practiced significantly, whereas quality control processes were not practiced significantly. For measurement and payment, measurement, progress payment, retention/mobilization repayment,

liquidated damage and final payment were significantly practiced whereas withholding payment and liens were not significant in practice. Claims and disputes were significant in the projects of Mandandeupur Municipality. Health and safety were not practiced significantly in the projects of the Mandandeupur Municipality. For project closeout, punch lists and closeout meetings were not significant practiced whereas post-construction services, document archives, and taking over were significant practiced in the project of Mandandeupur Municipality.

7. RECOMMENDATION :

Health and safety issues should be given special consideration in the projects of the local government. Proper training and skill development programs are needed for the employees of the local level to handle contract documents effectively.
Regular meetings, including weekly and monthly meetings, should be practiced to ensure effective communication and coordination among the stakeholders.
Quality control processes should be improved, and quality control plans should be implemented to ensure the quality of the project.

REFERENCES :

[1] Mishra A. K. (2020). Project management: theory and practice from different countries. Project management: theory and practice from different countries. Tamilnadu: DK International Research Foundation. 2020. http://doi.org/10.5281/zenodo.4817542.

[2] Mishra, A. K. (2019). Status of Collusive Bidding in World Bank Funded Road Projects of Nepal. *Solid State Technology, 62*(2). Retrieved from http://www.solidstatetechnology.us/index.php/JSST/issue/view/10

[3] Mishra, A. K. (2022). Effect and Remedies of Bidding Trend in Road and Bridge Projects. *International Journal of Darshan Institute on Engineering Research and Emerging Technologies, 11*(1), 01-07. https://doi.org/10.5281/zenodo.6538011

[4] Mishra, A. K., & Aithal, P. S., (2022). Effectiveness of Arbitration in Construction Projects. *International Journal of Management, Technology, and Social Sciences (IJMTS), 7*(1), 96-111. https://doi.org/10.5281/zenodo.6246129

[5] Mishra, A. K., & Singh, K. N. (2019). Bidders' Competitiveness in Rural Road Projects in Nepal: A Case Study of World Bank Funded Project. *Solid State Technology, 62*(1). http://www.solidstatetechnology.us/index.php/JSST/issue/view/9

[6] Mishra, A.K., K.C., M.B., & Aithal, P.S. (2020). Association of Number of Bidders and Minimum Bid Ratio (AEr) with Effect of E-bidding of Different Project. *International Journal of Management, Technology, and Social Sciences (IJMTS), 5*(2), 201-215.

[7] OECD. (2000). Public Procurement Review Procedures. Paris: available at https://www.oecd-ilibrary.org/public-procurement-review-procedures_5kml60w0qbvf.pdf

[8] Bahadur, K. C. M., & Mishra, A. K. (2019). Bidding Trends of Contracts based on Types andSizes of Projects under Road Divisions Butwal and Shivapur. *J Adv Res Const Urban Arch, 4*(3&4), 7-16. DOI: https://doi.org/10.24321/2456.9925.201905.

[9] Adhikari, R.P. (2015). 'Public Procurement Issues and Challenges in Nepal'. Available at: https://www.academia.edu/10033565/Public_Procurement_Issues_and_Challenges_in_Nepal (Accessed: 26 July 2023).

[10] Deuja, D., Birendra (2013). Study of national procurement system, Nepal. Available at: https://openjicareport.jica.go.jp/pdf/12087599.pdf (Accessed: 26 July 2023).

[11] Ganguly, A. K. (2016). Detailed project reports (DPR). Available at: https://www.linkedin.com/pulse/detailed-project-reports-dpr-anil-kumar-ganguly (Accessed: 27 July 2023).

[12] Gyawali, E., Dahal, K. and Maharjan, R. (2018). Procurement Process and Its Impact on Development with Special Focus on Nepal. *Journal of Entrepreneurship & Organization Management,* 07. Available at: https://doi.org/10.4172/2169-026X.1000243.

[13] Kayastha, G. (2014). Importance of Contract Administration for Timely Construction of Hydropower Projects without Disputes', Hydro Nepal: *Journal of Water, Energy and Environment,* 14. Available at: https://doi.org/10.3126/hn.v14i0.11265.

[14] Ulak, E.A. (2020) 'Elec tronic Government Proc urement (e-GP) in Nepal'. https://api.giwms.gov.np/storage/247/posts/1695284071_24.pdf

[15] Shah, R.B. (2022) Issues of Public Procurement in Nepal, My Republica. http://myrepublica.nagariknetwork.com/news/122847/

[16] Bhagat, C., Mishra, A. K., & Aithal, P. S., (2022). Model for Implementation of e-Government Services in Developing Countries like Nepal. *International Journal of CaseStudies in Business, IT, and Education (IJCSBE), 6*(2), 320-333. DOI: https://doi.org/10.5281/zenodo.7139657

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