Procurement Methods and Practices in Municipality Projects -An Analysis from Mandandeupur, Nepal

Sapana Khoteja [1], A. K. Mishra [2], & P. S. Aithal [3]

[1], Masters Scholar, Lumbini Engineering Management and Science College, (Pokhara University), Rupandehi, Nepal; Email: sapnakhoteja@gmail.com

[2] D.Sc. Research Scholar, Srinivas University, India, and Professor, Kathmandu College of Management, Kathmandu, Nepal,
OrcidID: 0000-0003-2803-4918; Email: anjaymishra2000@gmail.com

[3] Professor, Institute of Management & Commerce, Srinivas University, Mangalore, India,
OrcidID: 0000-0002-4691-8736; E-mail: psaithal@gmail.com

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[1], Masters Scholar, Lumbini Engineering Management and Science College, (Pokhara University), Rupandehi, Nepal; Email: sapnakhoteja@gmail.com

[2] D.Sc. Research Scholar, Srinivas University, India, and Professor, Kathmandu College of Management, Kathmandu, Nepal,
OrcidID: 0000-0003-2803-4918; Email: anjaymishra2000@gmail.com

[3] Professor, Institute of Management & Commerce, Srinivas University, Mangalore, India,
OrcidID: 0000-0002-4691-8736; E-mail: psaithal@gmail.com

ABSTRACT

Purpose: *To analyze the procurement methods and practices adopted in 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 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.*

Findings/Result: *The study also examined the bidding trends in the municipality, revealing that 56.25% of the total bids were low bids, indicating potential cost savings. Additionally, 68.75% of the bids were competitive, suggesting a healthy level of competition in the procurement process. However, 3.125% of the bids were found to be collusive, indicating the presence of unethical practices that need to be addressed.*

Originality/Value: *The study is significant to control significant low bid by asking to provide a method of statement, work schedule, and clarification for low bidding to ensure effective implementation of contract projects. The method of statement from the contractor can also help resolve negotiation/variation of conflicts.*

Paper Type: *Empirical Research*

Keywords: *Status, Trends, Collusive, Function, Control*

1. INTRODUCTION :

Public Procurement is widely considered to be one area that is most vulnerable to corruption (oced, 2016) [1-2]. The factors that affect the vulnerability are not limited to the volume of transactions and the serious financial incentives at stake. They stem from a combination of system weakness (complexity of the processes, close interactions between public officials and business), as well as implementation deficiencies (lack of transparency and ineffective information systems, poor professional capacities, weak oversight and controls).

Public procurement means the purchase by public entities of goods, consultancy services, construction works, and other services. The Public Procurement Act, 2063 B.S and Public Procurement Regulation, 2064 B.S have been enforced as the public procurement laws of Nepal to make the processes and decisions relating to public procurement transparent, objective and reliable. To obtain the maximum returns of public expenditures in an economical and rational manner by promoting competition, fairness, honesty, accountability, and reliability in public procurement processes is another objective of making these legal provisions. A Directive relating to e-Government Procurement (e-GP) Operation, 2074 B.S and another Directive relating to the Procurement through Engineering Procurement and l (E.P.C), 2078 B.S have also been enforced as the legal grounds of e-Government Procurement (e-GP). But, the implementation aspect of the prevailing procurement laws is weak. That is a major cause of corruption and irregularities (Shah, 2022) [3].

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2. STATEMENT OF PROBLEMS :

Bidding decision of bidders includes internal (ability, experience, assets, capacities, and so forth), outside (number of bidders, offering risk, kind of undertaking, income necessities, bid related factors and so on) and ecological variables (social and monetary condition, incorporate accessibility of different tasks, accessibility of qualified work, accessibility of qualified staffs, accessibility of qualified subcontractor, accessibility of hardware). These three elements intelligently influence the essential choices of cutthroat offering in development industry [4-5].

3. OBJECTIVES :

To analyze the procurement methods and practices adopted in Mandandeupur Municipality, newly formed municipality in Kavrepalanchowk district under Bagmati province of Nepal.

4. LITERATURE REVIEW :

4.1 Development of Procurement Practice in Nepal:

Procurement and the Pyramids: The first traces of procurement can be seen throughout ancient history, including the Egyptians in 3,000 BC. Though there was no designated procurement function, materials management aided in the building of the pyramids. The Egyptians used scribes to manage the supply for these massive projects. Scribes played a clerical role, recording the amounts of materials and workers needed on papyrus rolls. These scribes would track orders through fulfillment and were one of the first known in history to be in the procurement profession (Nolan, 2018) [6].

Procurement Revolution: The procurement function can be found in Charles Babage's 1832 book, *On the Economy of Machinery and Manufactures.* He points to the need for a 'materials man' in the mining sector who selects, purchases and tracks goods and services required. Essentially, Babbage called for a centralized procurement officer.

During the Industrial Revolution, procurement solidified its importance. Marshall Kirkman's 1887 book *The Handling of Railway Supplies - Their Purchase and Disposition*, detailed procurement's strategic contributions to the railroad industry, specifically in acquiring goods from developed parts of the country and bringing them south and west. In 1886, the Pennsylvania Railroad gave departmental status to the procurement function, referring to it as the 'Supplying Department.'

Once More, Obtainment Moves

Tragically, the Universal Conflicts constrained obtainment drives to move in an opposite direction from an essential job to rigorously administrative. Because of the shortage of materials during war, acquisition spun vigorously around request arrangement. During wartime and the downturn, the goal was to acquire an adequate number of unrefined components, administrations, and supplies to just keep the economy running.

The 1980s saw a huge expansion in provider contest. This provided associations with the advantage of putting more spotlight on provider quality and constancy. Provider the board turned into a significant consider acquirement and remains so today. By the last part of the 1990s, the job of acquisition had started its change into vital obtaining. Acquirement authorities viewed at provider as accomplices and long haul contracts were supported. This was the start of acquisition's current advancement (Nolan, 2018) [6].

4.2 Brief History of Public Acquirement in Nepal:

Rules (Technique) With respect to Public Asset Burning through 2016 was executed in 1958/59, which was the primary regulation connected with public acquisition. This guideline alloted the acquirement exercises of the service to the concerned secretary. To resolve the issues connected with public obtainment, for example, straightforwardness, seriousness and responsibility, monetary organization related Act and Guidelines were changing from time to time. The Monetary Organization Rules 1985/86, Monetary Organization Rules 1995/96 and Monetary Organization Rules 1999 were the models. In the ceaseless course of bringing public acquirement change in Nepal, as in greater part nations of the locale, Public Acquisition Act 2063 (PPA) was authorized in 2007.Following are some of the major reasons for enactment of separate procurement law:

- To make procurement process more competitive.
- To reduce the time consumed in procurement process.
- To make the procurement process result-oriented and based on adequate preparation.

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- To promote the competitiveness in public procurement.
- For proper allocation of risks
- To select qualified bidder rather than to select the lowest bidder,
- To promote accountability, transparency and justice in public procurement;
- To assure good and quality procurement.

Public procurement is very important discipline and is very prone to corruption making practicing this (gradually becoming) profession requiring individuals possessing high integrity and decision-making capability. The environment within the country is not supportive towards professional approach and consequently corruption and fraudulent practices are experienced in many major procurement decisions along with non-compliance behavior (Adhikari, 2015) [7].

4.3 Procurement and Public Procurement:

Obtainment, as a general rule, is a demonstration of getting or purchasing labor and products that incorporates planning and handling of an interest as well as the end receipt and endorsement of installment. Worth of cash, morals, contest, straightforwardness and responsibility are characterized as five key standards connected with acquirement. Conventional acquisition process is gradually being supplanted by E-Obtainment.

Obtainment is the method involved with executing arranging and recruiting worker for hire, provider, and advisor or administrations supplier for concerned work. Public Obtainment Act (PPA) and Public Acquirement Guideline (PPR) in 2007 was distributed to make the acquisition framework straightforward, cutthroat, fair, responsible and dependable in open obtainment process giving equivalent open door to the bidder with no segregation.

Viable acquisition is significant in guaranteeing gatherings accomplish their goals, show worth of cash and convey advantages to the local area while buying labor and products. Obtainment likewise accompanies dangers and difficulties in guaranteeing the bought labor and products convey to assumptions.

Every objective and motivation behind open acquisition is extraordinary and talked about independently. Nonetheless, it is essential to remember that they frequently have solid interlink ages. Cost and an incentive for cash will continuously be significant elements in acquirement choices.

The primary regulation connected with public acquisition was presented in 1958/59 in Nepal. It resolves the issues like straightforwardness, intensity and responsibility and monetary organization. The public authority obligation to guarantee and advance economic improvement with economy and way of life by using accessible assets in the most productive, straightforward and moral habits. The principal objective of the public acquirement is to limit cost through greatest contest, straightforwardness, safeguarding public asset and furthermore diminishing and disposing of defilement (Gyawali, et al, 2018) [8].

As indicated by acquirement regulation, acquisition execute, arranging of products, administrations and works, get ready quote and obtainment plan, select obtainment strategy according to state of work and spending plan and welcome bidders. As per PPA; the approved collection of acquisition process (wanting to execution and handover) in Nepal is Public Acquirement Checking Office (PPMO). It was laid out under the Workplace of the State leader and Board of Clergyman (OPMCM) in august 20, 2017. PPMO is completely dedicated to enabling public acquisition elements to convey its administrations with additional straightforwardness proficiency and intensity. The PPMO is assuming a significant part in further developing relations between the legislatures and its provider project workers, specialists and administrations give toward building a climate of trust and certainty.

The lawful structure for public acquirement in Nepal was laid out in 2007, however has as of late been changed and is probably going to go through additional correction in future. The legitimate structure right now comprises of:
- The Public Acquirement Act, 2007 (PPA)
- The Public Acquirement Guideline, 2007 (PPR)

The Public Obtainment Act (PPA) characterizes a scope of acquisition strategies, with inclination for serious offering and different techniques reasonable for high and low qualities and for consultancy administrations as well as merchandise, works and non-consultancy administrations. Limits are given in the Public Acquirement Guideline (PPR) and the parting of prerequisite to stay away from this edge

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is precluded. The primary allowed strategies for merchandise, works and non-consultancy administrations are:

- Open Public Offering; the favored strategy, which might include a couple of stage offering the last option for complex prerequisites.
- Open Global Offering; which is required where the things are not accessible at cutthroat cost in Nepal, no offers were gotten under offering, where a giver required obtainment from unfamiliar source or the things are complicated and requires worldwide offering. Archive should be in English for this cycle.
- Fixed citations for acquirement up to Rupees 1,000,000.
- Direct Buy; which restricted to explicit conditions, some of which requires endorsement by an administration board.
- Through investment of clients panel or recipient bunch where this expands economy, quality or supportability.
- Force represent normal insignificant work of a common nature.

The primary allowed strategies for consultancy administrations are:

- Serious recommendations, which might be public or global and regardless of distribution of a notification mentioning articulations of interest
- Direct exchange, which is allowed for administrations under Rupees One Lakhs or with the endorsements of a more elevated level authorities in different conditions.
- The PPA contains set of rules for public authorities associated with public obtainment and for bidders. The Previous expects authorities to act unbiasedly and in the public interest, stay away from irreconcilable circumstance, keep up with privately and not commit bad, fake or deceitful practices. The general set of principles for bidders covers pay off, deception, compulsion, arrangement, disrupting different bidders, trying to impact the Public Elements and irreconcilable situation or legitimate activity for misrepresentation or debasement and expects offers to be dismissed in cases for plot (Deuja, 2013)[9].
- The conventional obtainment process is gradually being supplanted by E-acquirement. Public Electronic Government obtainment (E-GP) is electronic acquisition gateway covering different exercises of public acquirement life cycle including enlistment of bidder, Acquisition arranging, e-offering, on-line assessment contract grant and the board and so on. Public Acquisition act B.S 2063, 69 guarantees the utilization of Electronic offering for labor and products including consulting, request for proposal. Expression of interest that can be achieve for lawful purpose, having high degree of security that will not limit the competition recognized by Public Procurement regulation B.S 2064, clause 24 (Gyawali, et al, 2018)[8].
- The benefits of e-Procurement and government procurement reform represent a significant economic value add for business by lowering cost and making is easier to do business. The use of electronic workflows and improved access can significantly reduce the time it takes to complete procurement process, leading to transactional efficiency for both supplier and governments. Procurement transparency leads to lower government cost, improved value for money and reduced corruption. E-Procurement can lead to substantial cost and administrative saving, wider market access and enhanced accountability.
- E-Government Procurement (E-Gp) system is defined as the use of information technology system by government in conducting their procurement relationships with suppliers and contractors for the procurement of works, goods, consulting services and other services required by the public sector. E-Gp is the application of an efficient high quality management framework to public sector procurement, facilitated through online information and process. It has the potential to strengthen the accountability, transparency, efficiency and effectiveness of this sensitive high value government function.
- Partial benefits of e- Governance are simpler documentation, faster responses, greater reach of services, public participation, simplified transactions, simplified interactions and less chance of corruption (Ulak, 2020) [10].

Technical objectives of E- Gp systems are:

- To improve the transparency, efficiency and effectiveness of the public procurement system

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- To improve public access to business opportunities through an online bidding facility and integrating public procurement system with e-government framework.
- To simplify administrative process by reducing bid processing time including bid collection, evaluation, awarding and execution of contracts
- To assist the planning and oversight process by providing relevant and timely information
- To design and implement a sustainable capacity building program for the management of new system [11].

It is concerned of any government to achieve and enhance the effectiveness, efficiency, transparency and equality in public procurement because public procurement affects all aspects of people's loves and assumes large share of government budget. The Government of Nepal (GoN) is the largest procuring (Goods, works and services) institution in the country [1,11,7].

E-governance is also about imparting a single window for government Offerings at all stages. It is associated with generating a streamlined framework for authority offices and groups. The technology like Information & Communication Technology (ICT) Developments is changing all aspects of traditional societies. One of such generation, primarily based governmental carrier is the e-Government services. ICT has additionally been enabling the introduction of latest offerings, better, effective and quicker delivery of current ones and costless and more effective communications between distinctive parties and government bodies. Digital authorities also have challenges and possibilities to exchange each the operational manner of government, and the nature of governance itself. It influences on maximum capabilities in authorities activities and groups, the private region and civil society. It has the capacity to definitely trade the government operations and the interaction of citizens and businesses with government. Hence; every of three ranges of presidency desires suitable method and making plans so that it will implement e-Government correctly to broaden the use (Bhagat, et al, 2022) [12].

4.4 Trend of Bidding:

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 (Bista and Dahal, 2018). According to PPA (2007) and PPR (2007) public procurement system is based on low bid award system. It is important. The low bid award system fosters competition amongst contractors to secure the project [13-17].

4.5 Types of bidding:

Low Bidding

It is the act of offering in development work where the project workers submit most minimal cost feasible for finish 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 worker for hire. This is most broadly utilized type of designing agreement and is reasonable for designing tasks where the nature and degree of the work under the agreement can be plainly recognized [4-5].

Average Bidding Method

According to Ioannou and Awwad [4-5] to address problems of low bidding, some countries have adopted variety of bidding methods based on the average of the bids submitted or consideration for quality apart from cost estimate. In the average bidding method, the contract is awarded to the contractor whose bid is relative to the average of all the bid prices. There are certain varieties of average bidding depending on the criteria set for determining the winning bid. For instance, the winning bid may either be any price closest to the average price, or below average bid which is the price closest to as well as lower than the average price [4-5].

Best Value Method

A Best Value must arrange to secure continuous improvement in the way in which its functions are exercised, having regard to a combination of economy, efficiency and effectiveness {section 3(1), LGA 1999, Gov. UK., 1999}. Best value is a procurement process where price and other key factors are considered in the evaluation and selection 15 process to minimize impacts and enhance the long-term

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performance and value of construction. It is considered an innovative bidding method, which overcomes the drawbacks of traditional low-bidding system and emphasizes on the quality of product rather than cost alone. The prequalification process of best value method considers determination of capacity of contractors to deliver quality products and not just quantitative financial evaluation [4-5].

4.6 Detailed Project Report (DPR):

Detailed Project Report (DPR) are the results of arranging and configuration period of a venture. DPR is an extremely point by point and elaborate arrangement for a task demonstrating in general program, various jobs and obligations, exercises and assets expected for the undertaking.

A DPR is a last, nitty gritty examination report on the venture 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 done 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 doable undertaking thought and eventually a benefit making venture. The top administration strategy rules, its effect on the venture life, evaluation as far as monetary feasibility are managed exhaustively. The DPR is the fundamental of particular, contract drawings, nitty gritty specialized attainability, monetary possibility, execution of venture according to useful perspective. The DPR ought to likewise feature the idea of inborn dangers in the undertaking and potential outer dangers that will impact the result of the task. Additionally, the DPR ought to give the actions for risk the executives and chance moderation.

Arrangement of DPR

The arrangement of DPR requires wide assortment of ability. Various choices are connected together. For instance: necessity and preparing plan is reliant upon the idea of the innovation, accessibility in the overall work market in the area, need for unfamiliar coordinated effort and preparing, degree of specific plant and gear provided from abroad and so on.

Financials necessities are subject to 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 workers for hire. If by some stroke of good luck nearby and territorial gatherings are in picture, the degree and ward for debates gets confined.

In any event, for medium estimated project, it is essential that an able counseling firm is depended with the undertaking of forming the DPR (Ganguly, 2016) [18].

5. METHODOLOGY :

5.1 Research Design:

This was an analytical (ex post facto) research design to look up and to decide on trends of Budget utilization with respect to budget allocation of municipality, Engineers estimate, awarded bidding amount on the projects that lies under the Detailed Project Report (DPR). This research was based on projects where Detailed Project Report (DPR) were done and specially focused on the budgetary trend on procurement practice on these projects. The research was done by the review of the annually published budget book of Mandandeupur Municipality, data from related project record files and asking the project manager about the project.

The first step of the method involved review of secondary information sources that led to identification of research questions, setting out the study objectives and identification of the appropriate sets of tools for achieving the objectives. 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.

5.2 Study Area:

Mandandeupur Municipality is the youngest newly formed municipality in Kavrepalanchowk district under Bagmati province. It is located 55Km northeast of Kathmandu, the capital of Nepal. It covers 89 sq.km and Mandandeupur Municipality come into existence on B. S 2073 Falgun 27 (10 march, 2017)

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after its publication in Rajpatra.It is bounded on the east by Bhumlu Rural Municipality, and the west by Bhaktapur and Kathmandu, on north by Sindhupalchowk district and on the South by Banepa and Pachkhal Municipality.
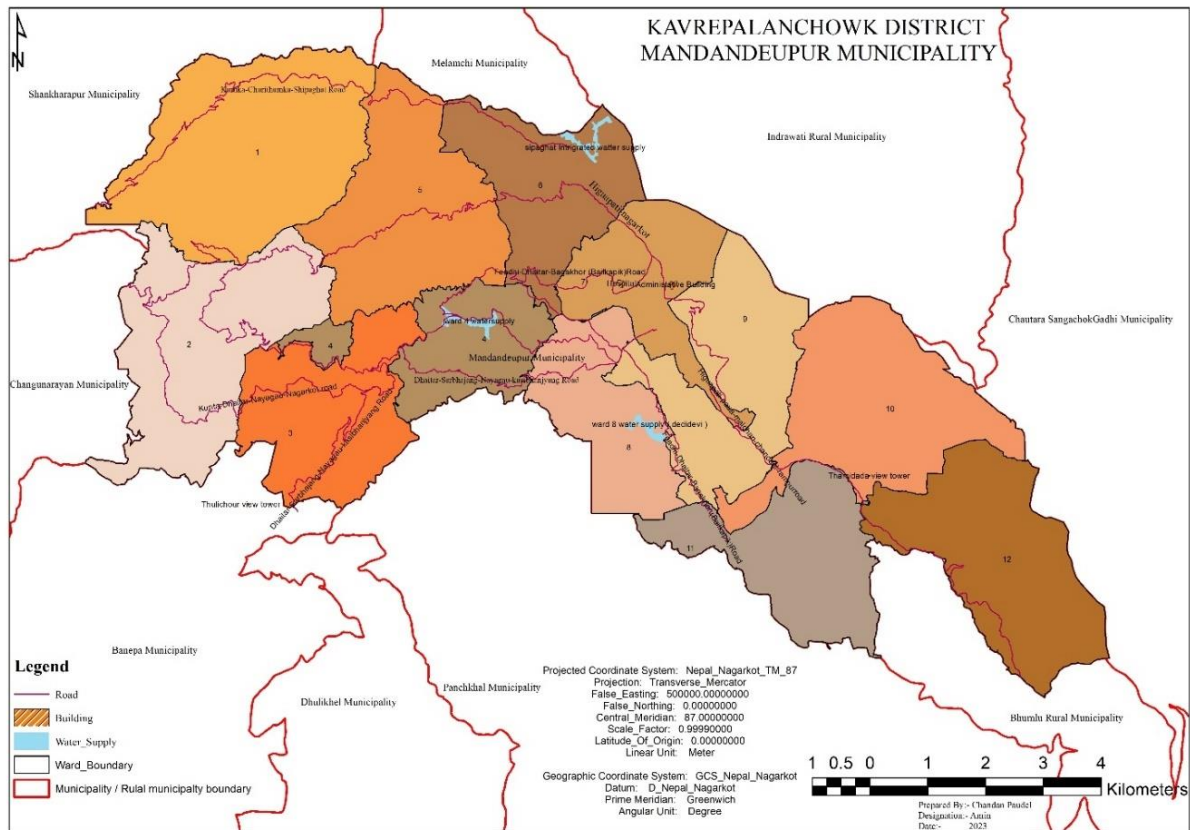
Fig. 1: Map of Mandandeupur Municipality with indication of DPR Project

5.3 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.

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Fig. 2: Research Onion

5.4 Sampling:

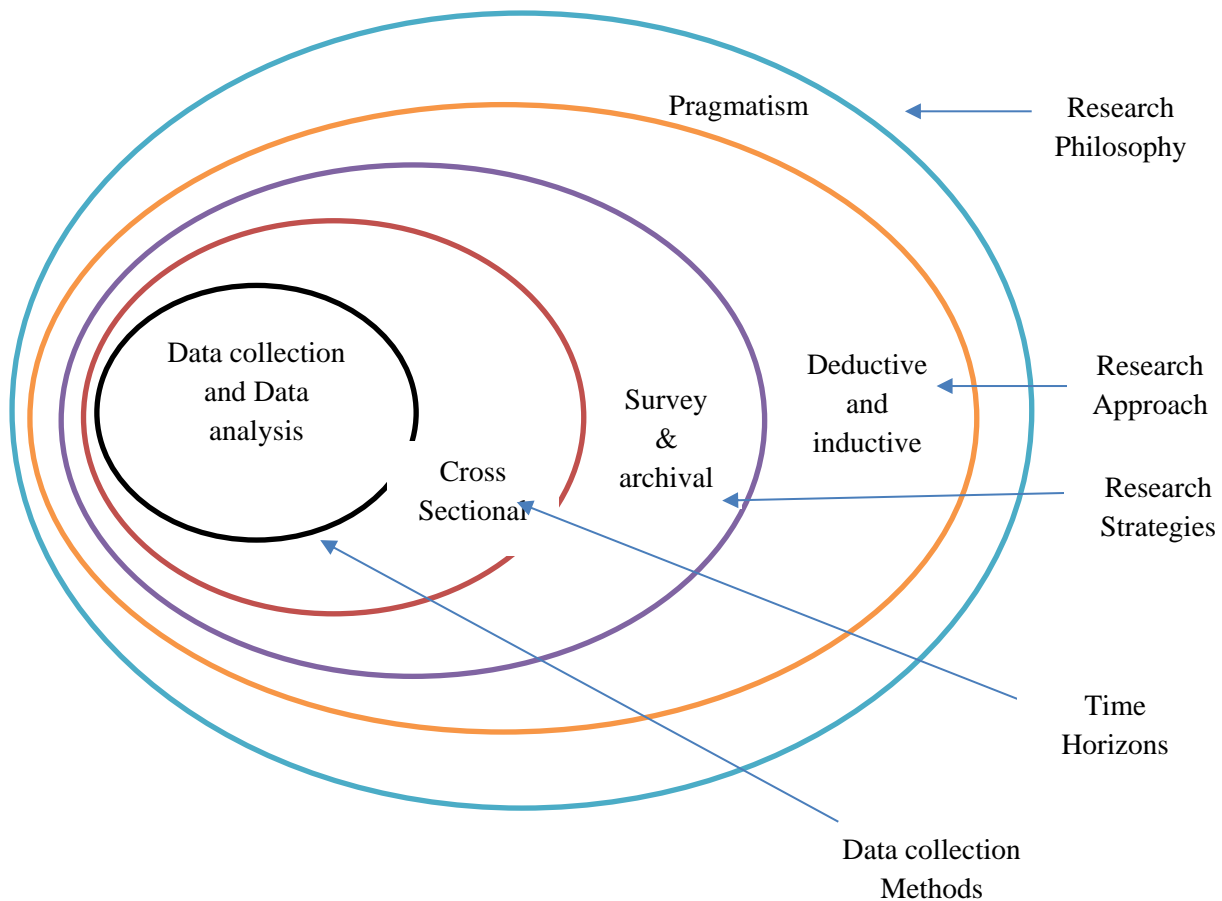Representative samples were the base of any findings; Statistical inquiry can be a census type or a sample type. Checking every item of the whole population was the main feature of a census inquiry but due to limitation of time, energy, money and other constraints, sometime it becomes impossible to consider all the population. But, this research study included all population secondary data of the study area for better analysis and better results setout objectives.

There were several numbers of projects (road, public building, water supply and sanitary, bus park and stadium) whose DPR were conducted and budget allocation as well as budget utilization done on one tenure periods of F/Y 2074/075 B.S, 2075/076 B.S, 2076/077 B.S, 2077/078 B.S & 2078/79 B.S. The data was collected in various ways like annual budget book of municipality, record file, and questionnaire and focused group discussion.

5.5 Data collection:

The research method was designed to collect the data for analysis that helps to produce a complete set of research, which fulfilled the aims and objectives of the study. 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.

The secondary source was collected from Published annual budget book of Municipality and other available records in the municipality. Various tools; questionnaires, formal/ informal interviews of technical/ non-technical staff and elected representative involving in procurement and budgeting process was collected. Additional information was collected from related articles, journals books, and websites. Several related literatures are reviewed before the start of research work. Reports and documents relevant to the projects were studied to generate idea about the research problems and issues at the same time to get the ideas of data needed for the research work. Journal articles, publications, textbooks, online reading materials, websites, social medias are used for the collection of secondary data.

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5.5.1 Design of Questionnaire:

A structured set of questionnaires were developed with the help of several studies[19-27] 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.

5.5.2 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.

The data collected was coded and entered in Ms Excel. To minimize the error during data entry, the validation & consolidation command was applied. Data checking was done using filter command in Ms Excel.

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 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) = $A + (\sum Uxf / \sum f) \times h$ …….{eq.1}

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.

6. RESULTS AND DISCUSSIONS :

6.1 Distribution of Contract:

The data for Mandandeupur Municipality was taken within one tenure period of the newly formed municipality. The data from five fiscal years where detailed project reports were prepared for the execution of the project were taken. In one tenure period, about 26 DPRs report were prepared in different fields, out of which the municipality allocated budgets for 18 projects. In addition, out of these 18 DPRs, six projects were completed and the other 12 were in progress as multiyear projects. The execution of the project was done by following different types of procurement methods. Table 1 shows the total number of projects with different types of procurement methods.
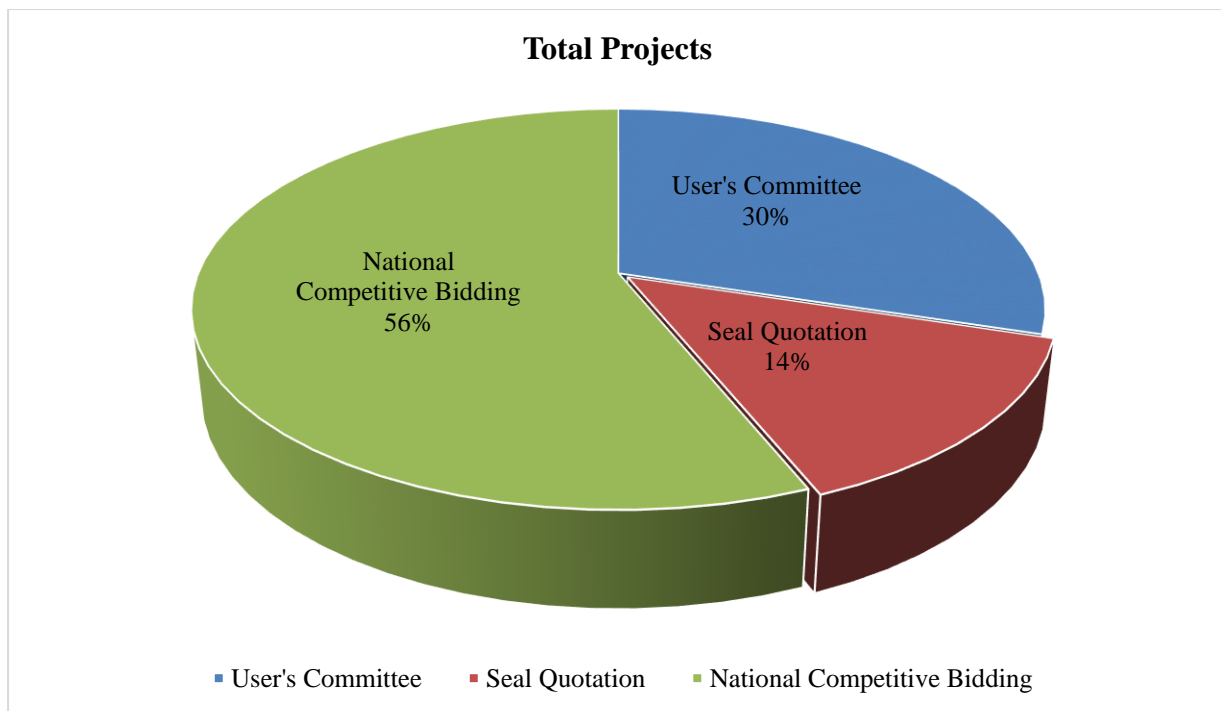
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Fig. 3: Pie chart of Distribution of contract based on Procurement method

From the above pie chart, it was clear that most of the projects were conducted through National competitive bidding (NCB) method. From the table 1, it stated that 56% of the projects were executed by the NCB, 14% by Seal Quotation and 30% by the user's committee. This shows that the attempts for making bidding is scientific are praise worthy.

Table 1: Distribution of Contract based on Procurement Method

S. No.	Types of Procurement	Number
1	User's Committee	17
2	Seal Quotation	8
3	National competitive Bidding	32
	Total	57

Similarly, table 2 shows the distribution of contracts based on the nature of the work.

Table 2: Distribution of contract based on nature of works

S. No.	Types of Procurement	Number	Road (A)	Public Building (B)	Water Supply and Sanitation (C)	Bus Park	Stadium
1.	User's Committee	17	11		4	1	1
2.	Seal Quotation	8	8				
3.	National competitive Bidding	32	24	4	4		
	Total	57	43	4	8	1	1

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From the table 2, the budget allocation and project execution of the municipality seem to focus on the construction of the road as the majority of contracts were related to the road. By calculation, 75.44% of the contracts were related to roads, 7.02% were related to public buildings, 14.03% were related to water supply and sanitation and 1.75% were related to bus parks and stadiums.

6.2 Bidding Trend:

Bidding trends for different categories were accessed first based on the contractor's overhead as a threshold. Furthermore, categorical bidding trends were also assessed based on the range of percentages below the engineer's estimate. Data from one tenure period, i.e., fiscal year 2074/075 B.S, 2075/076 B.S, 2076/077 B.S, 2077/078 B.S and 2078/079 B.S of Mandandeupur municipality, were used for analysis.

6.2.1 Average Percentage below Engineer' Estimate:

As per methodology set out, calculation of average percentage of bidding amount was done assuming the mid value, A is 15 %(percentage below engineer's estimate).
Table shows the calculation of average percentage of bidding below engineer's estimate using data of fiscal year 2074/075 B.S, 2075/076 B.S, 2076/077 B.S, 2077/078 B.S and 2078/079 B.S of Mandandeupur municipality.
This chapter broadly deals with the bidding trends analysis and status of collusive bidding in Mandandeupur Municipality, Kavrepalanchok by conducting quantitative data analysis for the previous construction projects that were awarded to the contractors.
Firstly, assessment of bidding trend of overall projects was done based on the award of contract to substantially evaluated lowest responsive bid. Secondly, categorical bidding trend was assessed based on ranges of percentage below engineers estimate and percentage of number of bidders. Data of fiscal year 2074/075 B.S, 2075/076 B.S, 2076/077 B.S, 2077/078 B.S and 2078/079 B.S of Mandandeupur municipality were used for analysis. Details of the contract data are given in Appendix B. As per PPA 2007 and PPR 2008, the contractor's overhead and profit is considered a 15%. So, it is assumed the value if assumed mean (A) as the 15 for the purpose of the statistical analysis using the prescribed formula.

6.2.2 Average Percentage below Engineers Estimate (Based on all the Bids):

Average percentage below of bidding amount was calculated by step deviation method of continuous series data. All bids for the contract were considered to analyze the general bidding percentage of all contractors. The observed data were arranged based on class group of percentage below engineers estimate and calculation were done assuming the mid value

Average percentage below engineers estimate (y) =A+ (ΣU x f/ Σf) x h (in %)

Assumed Mean (A) was taken 15% (percentage below engineer's estimate). Table below shows the calculation and results of the calculation of average percentage of bidding amount-using data of Mandandeupur Municipality of one tenure periods.

Table 3: Average percentage below Engineer's Estimate (Based on all Bids)

Bidding Trend					
Average Bidding % Below Calculation					
SN	% Below Engineer's Estimate	Mid Value(X)	Number of Bidders (f)	U= (X-A)/5	U x f
1	0 to 5	2.5	3	-2.5	-7.5
2	5 to 10	7.5	2	-1.5	-3
3	10 to 15	12.5	8	-0.5	-4
4	15 to 20	17.5	13	0.5	6.5
5	20 to 25	22.5	13	1.5	19.5
6	25 to 30	27.5	20	2.5	50

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7	30 to 35	32.5	28	3.5	98
8	35 to 40	37.5	24	4.5	108
9	40 to 45	42.5	26	5.5	143
10	45 to 50	47.5	16	6.5	104
11	50 to 55	52.5	20	7.5	150
12	55 to 60	57.5	5	8.5	42.5
13	60 to 65	62.5	3	9.5	28.5
Total			Σf =181		ΣU x f =735.5
Note: Assumed Mean(A)=15					
Average Award % Below Engineers Estimate	=A+ (ΣU*f/Σf)*h (%)				
	=35.32%				
	No of Normal Bids	93	56.02%		
	No of Low Bids	73	43.98%		
	Total	166	100.00%		

From the calculation in table 3, the average percentage of the bidding amount was found to be (100%–35.32%), or 64.68%. Among 181 bids on 32 contracts of Mandandeupur Municipality in one tenure period, 93 (56.02%) bids were normal bids, whereas 73 (43.98%) bids were low bids.

6.2.3 Average Percentage below Engineers Estimate (Based Award of Contract):

The average percentage below the bidding amount was calculated by the step-deviation method of continuous series data. The observed data were arranged based on a class group percentage below the engineer's estimate, and the calculation was one assuming the mid value. The assumed mean (A) was taken at 15% (a percentage below the engineer's estimate). Table 4 below shows the calculation of the average percentage of the bidding amount using Mandandeupur municipality, Kavrepalanchok.

Table 4: Average Percentage below Engineers Estimate (Based on Award of Contract)

Bidding Trend					
Average Award % Below Calculation					
SN	% Below Engineer's Estimate	Mid Value(X)	Number of Bidders (f)	U= (X-A)/5	U x f
1	0 to 5	2.5	1	-2.5	-2.5
2	5 to 10	7.5	1	-1.5	-1.5
3	10 to 15	12.5	1	-0.5	-0.5
4	15 to 20	17.5	0	0.5	0
5	20 to 25	22.5	1	1.5	1.5
6	25 to 30	27.5	3	2.5	7.5
7	30 to 35	32.5	4	3.5	14
8	35 to 40	37.5	3	4.5	13.5
9	40 to 45	42.5	8	5.5	44
10	45 to 50	47.5	2	6.5	13
11	50 to 55	52.5	4	7.5	30
12	55 to 60	57.5	2	8.5	17

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1	60 to 65	62.5	2	9.5	19
Total			Σf =32		ΣUx f
Note: Assumed Mean(A)=15					
Average Award % Below Engineers Estimate	=A+ (ΣU*f/Σf)*h (%)				
	=39.22%				
	No of Normal Bids	14	43.75%		
	No of Low Bids	18	56.25%		
	Total	32	100.00%		

From the calculation in table 4, the award of the contract occurs at an average percentage of the bidding amount of (100%–39.22%), or 60.78%. Among the 32 contracts of Mandandeupur Municipality, only 14 (i.e. 43.75% bids) were normal bids, whereas the other 18 (i.e., 56.75% bids) were low bids.

6.2.4 Average Numbers of Bidders per Contract:

To calculate whether the contracts are competitive or not, the average number of bidders per contract was analyzed by statistical analysis. The number of bidders per contract was grouped in class interval of size 4 and the average number of bidders was calculated by the step deviation method of continuous data. Table 5 shows the calculation of the average number of bidders per contract based on contracts of Mandandeupur Municipality in one tenure period of elected representatives in the newly formed municipality, i.e., fiscal year 2074/075 B.S, 2075/076 B.S, 2076/077 B.S, 2077/078 B.S and 2078/079 B.S.

Table 5: Average Number of Bidders Per Contract

Bidding Trend					
Average Number of Bidders per Contract					
SN	% Below Engineer's Estimate	Mid Value(X)	Number of Bidders (f)	U= (X-A)/5	U x f
1	0 to 4	2	11	-0.5	-5.5
2	4 to 8	6	10	0.5	5
3	8 to 12	10	6	1.5	9
4	12 to 16	14	3	2.5	7.5
5	16 to 20	18	1	3.5	3.5
6	20 to 24	22	0	4.5	0
7	24 to 28	26	0	5.5	0
8	28 to 32	30	0	6.5	0
9	32 to 36	34	1	7.5	7.5
Total			Σf =32		ΣUxf
Note: Assumed Mean(A)=4					
Average Award % Below Engineers Estimate	=A+ (ΣU*f/Σf)*h (%)				
	=7.38 (approx. 7)				
	No of Competitive Bids	22	68.75%		
	No of Non Competitive Bids	10	31.25%		

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	Total	32	100.00%	

From the calculation of table 5, the average number of bidders was found to be 7.38 (approx. 7) per project. Among the 32 contracts of Mandandeupur Municipality, 22 bids (i.e., 68.75%) in respective contract were competitive bids and 20 bids (i.e. 31.25%) in respective contracts were non-competitive bids. Similar to that of Studied conducted in Road [4, 5, 11].

6.2.5 Status of Collusive Bids:

The criteria for study of collusive bids were set out as bidding amounts less than 5% below the engineer's estimate being taken as collusive bids. With such criteria, the total number of collusive bids was found to be 1 out of 32 and in percentage, it came out as 3.125% for Mandandeupur Municipality. Depending upon the analyses, the data is categorized as Normal bid, Low bid, Competitive bid, Non-Competitive bid and collusive bid of Mandandeupur Municipality was found as:
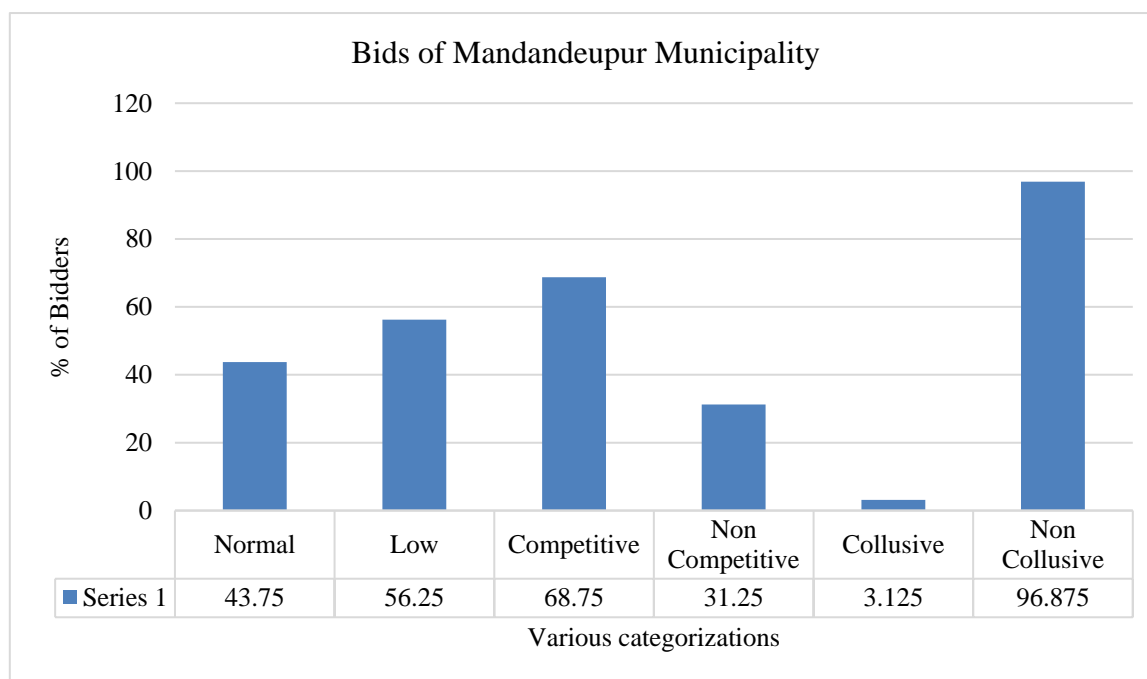

Bids of Mandandeupur Municipality

	Normal	Low	Competitive	Non Competitive	Collusive	Non Collusive
Series 1	43.75	56.25	68.75	31.25	3.125	96.875

Fig, 4: Bidding status of Mandandeupur Municipality

In this result, it was seen that low bidding was more than normal bidding and based on the average number of bidders per project, which was the barrier line for determining competitive bid and non-competitive bid, there was more project sounding to be competitive bid, which supports the fact that there was less collusive bidding, and in exact 3.125%, only one out of 32 bids was collusive. This represents National condition as in Department of Road; it was noticed [16-17].

7. CONCLUSION :

By analyzing the data of five consecutive years of data from Mandandeupur Municipality in the F/Y 2074/075 B.S, 2075/076 B.S, 2076/077 B.S, 2077/078 B.S and 2078/079 B.S, 26 DPRs were prepared. Out of 26 DPRs, 18 DPRs projects were implemented in the field, where six projects were completed, and 12 DPRs are being executed as multiyear projects and are not completed till the period of study. The project of 18 DPRs was executed in the form of 57 contracts, of which 17 were procured by the user's committee, 8 by seal quotation, and 32 by national bidding competition. The main focus was given to the construction of roads among the other Detailed Project Reports (DPR), where by analysis it was found 75.44% of the contracts were related to roads, 7.02% were related to public buildings, 14.03% were related to water supply and sanitation, and 1.75% were related to bus parks and stadiums. Bidding trend analysis is also conducted, as it is also part of procurement practice. By analysis of the five F/Y data of Mandandeupur Municipality, 56.25% of total bids are found to be low bids, 43.25%

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are normal bids, 68.75% are competitive bids and non-competitive bids are found as 31.25%. 3.125% of bids was found to be collusive bidding.

The analysis of the data from Mandandeupur Municipality over five consecutive fiscal years provided valuable insights into the budget allocation and utilization, bidding trends, and contract administration practices in the construction projects. The findings of this study contribute to a better understanding of the challenges and opportunities in project management and budgeting in the context of the municipality.

The study revealed that there were variations between the budget allocation and the actual cost of construction in completed projects. This difference can be attributed to factors such as changes in construction methods and designs during project execution, as well as unforeseen elements that were not included in the Detailed Project Reports (DPR).

Local governments should focus on other aspects of development besides road construction for economic growth. Irrigation projects should be given priority for economic development, and budget allocation for these projects should be increased.

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