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ACC

ANTI-CORRUPTION COMMISSION

Towards Enhanced Efficiency, Accountability and Transparency in Public Road Construction

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Corporation SDC

ANTI-CORRUPTION COMMISSION

THIMPHU: BHUTAN

December 2017

ANTI-CORRUPTION COMMISSION (ACC) BHUTAN

Anti-Corruption Commission is a constitutional body, mandated to prevent and fight corruption in Bhutan. Established on 31st December 2005, ACC's mission is to tackle corruption through leading by example, achieving excellence in partnership and mainstreaming corruption control strategies in public or private organizations.

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Executive Summary

Public infrastructure is the basis for any socio-economic development to take place. Roads play an important role in national connectivity and facilitating socio-economic development. Like any developing country, Bhutan has been witnessing huge investment in the sector ever since the launch of planned national socio-economic development in 1961. However, the huge investments made in the sector do not match the benefits that were expected to accrue. In fact, within the construction sector, roads do not have a good reputation for their quality of construction. Of the many reasons that could be attributed, studies on corruption in construction including roads, established that corruption could be one of the causes for the poor quality of roads.

There is no doubt that the Ministry of Works and Human Settlement had initiated several reforms to streamline several policies, rules and regulations, and procedures to enhance and promote quality construction in the country. With an overall objective to provide recommendations to improve efficiency, accountability and transparency in road construction, this research also evaluated the processes where corruption and illegality are most likely to occur in the project life cycle of road construction; delineated the causes and effects of corruption and illegal activities in road construction; and evaluated the costs of wrongdoings and corruption in road construction. The undertaking of this research was a culmination of the recommendations proposed by RIM-ACC Scoping Study and the complaints that ACC received in the sector besides the evidence established by the international studies on corruption in road construction.

For these, various qualitative and quantitative methods were adopted. The three key methods were desk research including analysis of three illustrative case studies, audit reports related to road construction and complaints related to construction sector received by ACC, conducting focus group discussions (FGD) and semi-structured interviews, and administering a survey questionnaire. Six rounds of focus group discussions and 24 interviews were conducted with the key stakeholders such as contractors, engineers, tender committee members etc. Further, a total of 1,178 contractors and public officials responded to the survey covering representative sample of all the stakeholders involved in road construction in all *Dzongkhags, Thromdes* and DoR Regional Offices.

This research established higher prevalence of corruption in the form of favouritism and abuse of functions although existence of bribery, abuse of privileged information, bid rigging etc. were also confirmed.

Using the Structural Equation Modelling, the findings of the research established the following causes of corruption in public road construction in Bhutan:
- Poor supervision, monitoring and enforcement;
- Undue influence;
- Dishonesty;
- Unfair practices; and
- Lack of accountability.

Besides these key findings, the research also assessed the general condition of the roads and validated the issues that stunt the efficiency and effectiveness of the roads sector from making contribution proportionate to the budgetary allocation that the government accords. Some of the key issues validated are improper planning, ineffective coordination among the agencies, lack of capacity development for engineers and contractors, lack of material price index, etc.

Simulating the amount lost to wrongdoings/corruption in the road sector, as identified by Royal Audit Authority (RAA), to the GDP contribution by road sector, this research estimated an average loss of Nu. 78.14 million per year from 2010 to 2015.

While the recommendations proposed in the report cannot be taken as an antidote to solve all the issues of corruption and wrongdoings that the road construction sector is grappling with, it is however, expected that the recommendations will help in minimizing the issues that this research identified. Hence, the following recommendations are proposed towards improving efficiency, accountability and transparency in roads construction:

- Develop Standard Operating Procedure/guidelines for effective contract implementation, supervision and monitoring;
- Review technical score system;
- Develop and enforce Quality Assurance Plan;
- Adopt and implement integrity initiatives;
- Implement Model Guidelines on Managing Conflicts of Interest in the Public Sector 2017;
- Implement The Gift Rules 2017;
- Provide training on ethics and integrity to engineers and contractors;
- Develop guidelines for deviation;
- Adopt and enforce The Debarment Rules;
- Develop and enforce contractors' accountability framework;
- Develop capacity of engineers and contractors;
- Conduct awareness on Procurement Rules and Regulations (Procuring and Law Enforcement Agencies);
- Review national wage rate;
- Develop a material price index;
- Engage community monitoring and assessment of GC and farm roads; and
- Develop data mining at the agency level.

	Issues	Recommendations
Strategic Level (Policy)	**Issues related to Policies, Laws and Rules** • Fronting a major issue. • Lack of a material price index. • Risks of deviation for corruption. • Technical score used as qualifying criteria and not for final award score. • The Debarment Rules not yet adopted. • Impractical national wage rate. • SBD – bulky and not user friendly.	• Develop a material price index. • Develop guidelines for deviation. • Review technical score system. • Adopt and enforce The Debarment Rules. • Review and revise national wage rate.
Organizational Level (Operational)	**Ineffective coordination among the agencies** • Unnecessary delays – needs assessment, clearance (forest, environment, public, etc.), feasibility study, design, implementation including supervision and monitoring. • PRR & SBD interpreted differently by different procuring agencies. • Poor communication by the procuring agencies. • Lowest evaluated bid not acknowledged by RAA & ACC.	• Conduct awareness programmes on rules and regulations.
	Human resource constraint • Non-availability of geo-technical experts. • Lack of/inadequate competent technicians for quality assurance. • Poor linkages and participation of the engineers in external construction forum. • Heavy workload for government engineers. • No experienced engineers with the contractors. • No capacity building for the contractors. • Inadequate government engineers.	• Strengthen capacity development for government engineers and contractors.

Organizational Level (Operational)		
	Poor supervision and monitoring • No proper verification of materials and personnel at the site.	• Develop SOP/guidelines for contract implementation, supervision and monitoring. • Develop and enforce quality assurance plan. • Engage community monitoring and assessment of GC and farm roads. • Develop data mining policy at the agency level.
	Unfair practices • Collusion among the tender committee members to favour a particular bidder. • Tender evaluation criteria designed to suit a particular bidder. • Terms of contract relaxed to favour a particular contractor. • Contractor selection not done by appropriate committee. • Confidential bid information disclosed to a particular bidder. • Personal relationship with the engineers help in getting the contract. • False representation. • Theft/substitution of materials. • Representation of fictitious vendors.	• Develop and enforce integrity initiatives. • Implement Model Guideline on Managing Conflicts of Interest in the Public Sector 2017. • Provide training on ethics and integrity. • Implement The Gift Rules 2017.
	Lack of accountability • Abuse of authority – opening of bid, letter of intent to award and handing taking over.	• Develop and enforce contractors' accountability framework. • Incorporate a module on ethics and integrity in issuance of new contract license.

Chapter 1: Research Background and Context

1.1   Background

For a mountainous country like Bhutan, road transport is the only viable option for transportation and the lifeline of connectivity propelling national development and social transformation. Thus, "roads are a fundamental necessity and social good" (Harvey & Knox, 2012). The Royal Government of Bhutan (RGoB) emphasized on the construction of roads since 1961 with the launch of modern socio-economic development. Phuentsholing–Thimphu road, completed in 1961, is the first motorable road Bhutan had constructed. Prior to the motor roads, the people had been dependent on traditional footpaths for movement of people and transportation of goods. The construction of roads during those times mainly involved use of traditional equipment until the onset of modernized mechanical technology.

Roads in Bhutan are classified into nine categories – expressway, primary national highways, secondary national highways, *Dzongkhag* roads, urban roads, farm roads, forest roads, access roads and power tiller tracks.

The Road Development Strategy, as enshrined in Bhutan Transport 2040, covers the following types of roads: National highways provide connections to border crossings and links to all *Dzongkhags* while *Dzongkhag* roads provide access within each *Dzongkhag* to all *Gewogs* and major villages. The farm roads provide access to all individual communities which are not otherwise served. Access roads provide access to hydropower plants, schools, health facilities and forestry land among others.

Bhutan has witnessed significant expansion of road infrastructure due to the strong emphasis placed on it in the successive plans. Today, there are 11,176.99 kilometers (KM).

Figure 1: Road network by category of roads
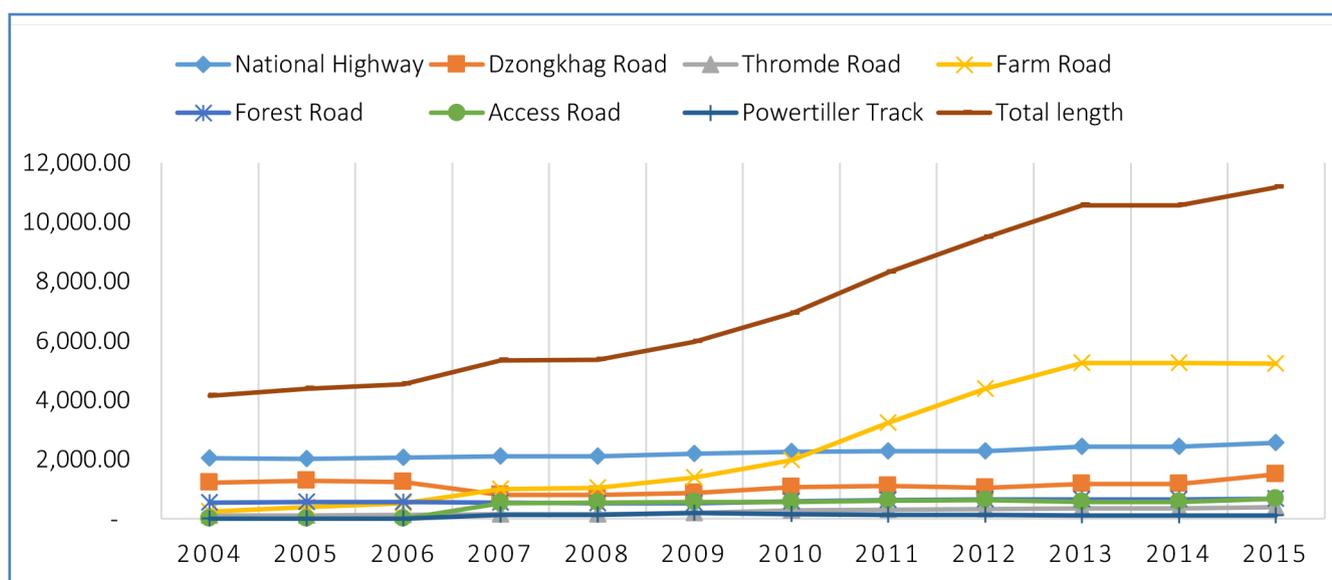
Source: Ministry of Works and Human Settlement.

As road is the national lifeline for economic growth and social development, Bhutan has witnessed increasing allocation of budget outlays in the successive plans. From a mere share of Nu. 62 million in the First Five Year Plan (1st FYP) for the road sector, the government allocated approximately Nu. 16 billion for the roads and bridges in the Eleventh Plan (11th FYP). **Figure 2** shows the budget outlay to the road sector against the total plan budget outlay. The budget allocation to the road sector has been increasing with each successive plan.

Figure 2: Road outlay against total plan outlay (Nu. million)
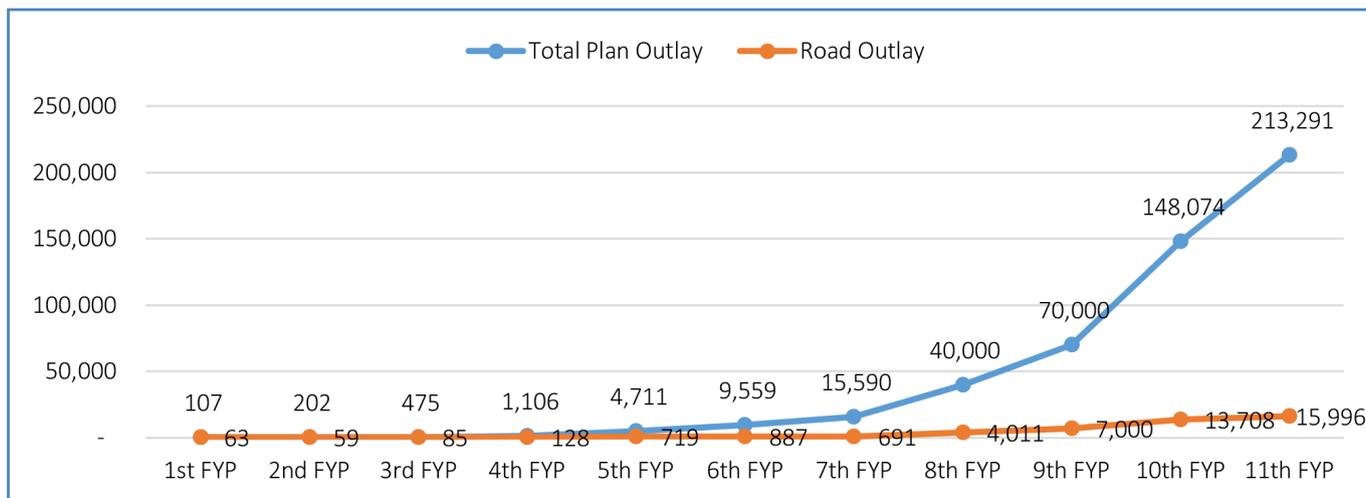
Source: www.gnhc.gov.bt

Figure 3 shows the actual expenditure by different types of construction activities over a twelve-financial year period (2005/06 – 2016/17). It can be deduced that the construction of the roads and buildings have absorbed a major share of the government spending.

Figure 3: Expenditure pattern by different types of construction (Nu. million)
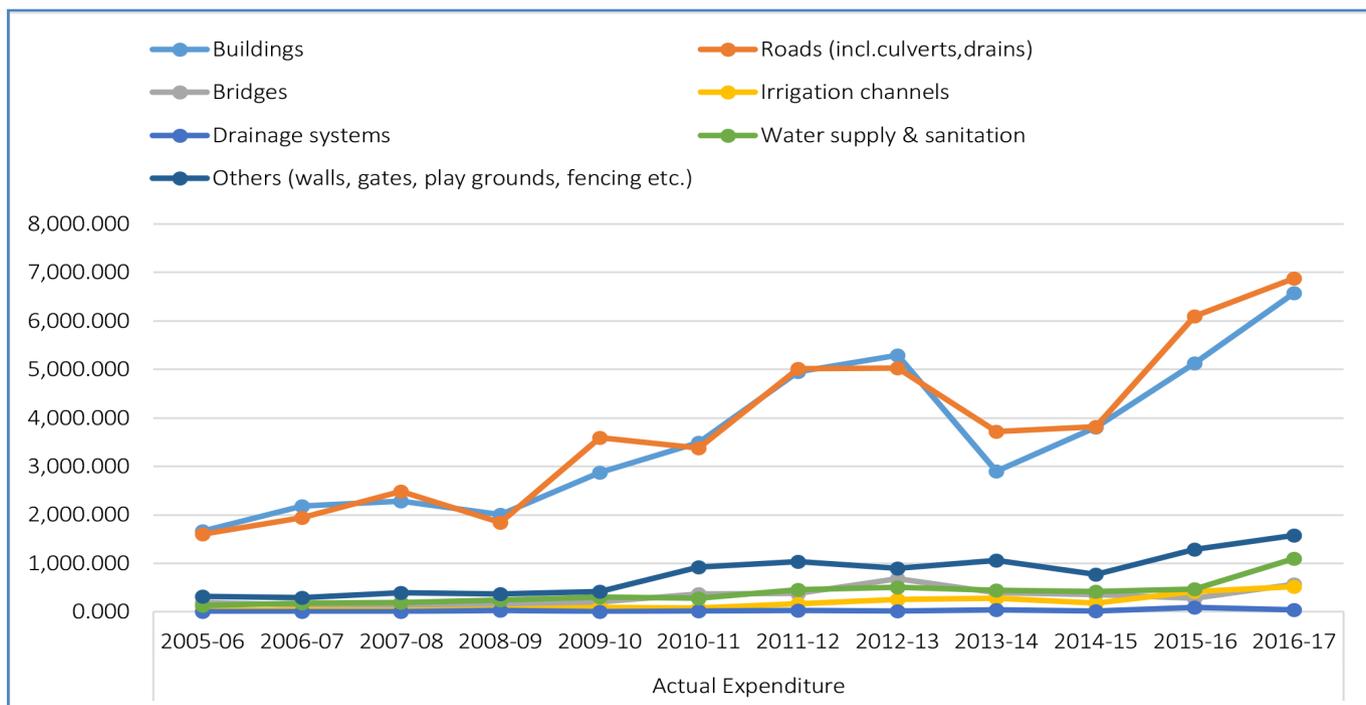
Source: Department of National Budget, Ministry of Finance.

In proportion to the priority accorded to it by the government, the roads and bridges have also contributed their share of return to GDP. From 6.5% in 2008, its contribution has increased to 11.2% in 2015. In 2017, the construction sector contributed 16.86% to GDP.

Figure 4: Contribution of roads and bridges to GDP
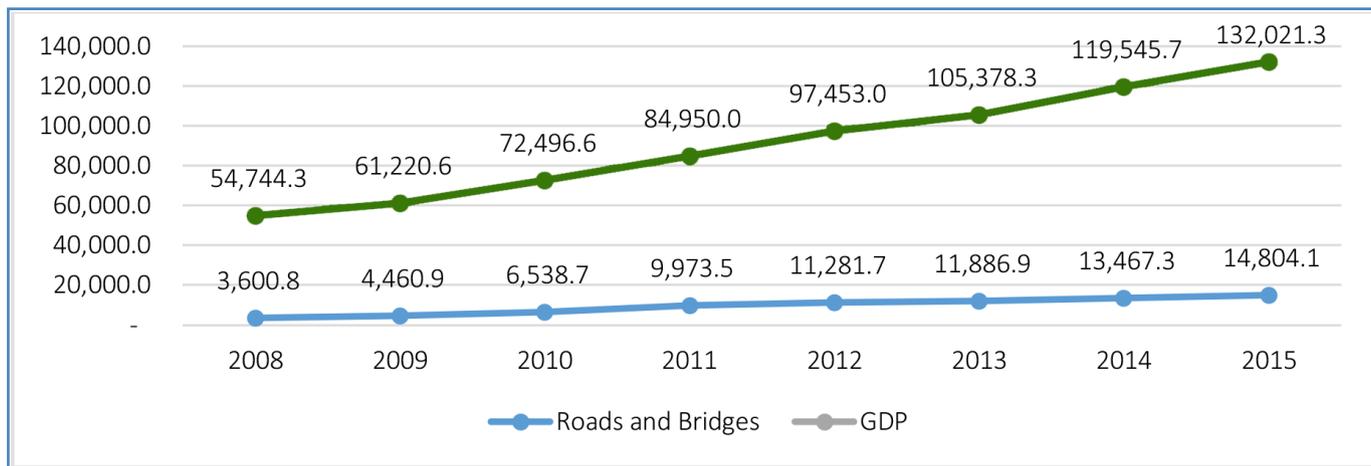
Source: National Statistics Bureau.

The 11th FYP envisions the construction sector to "deliver high quality infrastructure to the citizens in order to facilitate the socio-economic development of Bhutan, while strengthening the local industry and creating local jobs, through processes that are efficient, technologically advanced, and environmentally friendly, so as to showcase Bhutan as an example of modern, innovative and green construction practices with a favourable ecological footprint".

As a result of the importance accorded by the government and the significant investment in the sector, Bhutan has witnessed the growth of the following trades to equally partake in the development activities:

Table 1: Types of construction trade

Trade	No.
Arbitrator	28
Consultant	20
Contractor	3865
Architect	20
Specialized Trade	20

Source: Construction Development Board (As of 2016).

1.2   Policies and Rules Governing Public Road Construction Sector

The Road Act of Bhutan 2013 governs the overall road construction in Bhutan. The Department of Roads (DoR), Ministry of Works and Human Settlement (MoWHS) is the parent agency that is mandated to setting the standards and specifications in all types of road construction. It is further supported by the Road Rules and Regulations (2016) and the Road Master Plan (2007 – 2027). As regards municipal roads, the respective *Thromdes* work closely with DoR. The Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities (2009) lays down "ownership and roles of various agencies involved in planning, budgeting, implementing and maintaining the national road network".

The government, in its effort to reduce rural poverty, envisioned larger connectivity of the rural parts of Bhutan to the mainstream road network. Towards this, the government undertook the construction of farm roads to "link farmland areas/villages to an existing road of equal or higher classification to enable the transportation of inputs to the farm and agriculture produce to the markets" (Ministry of Agriculture and Forests, 2013). Bhutan witnessed rapid construction of farm roads since 2008 and it has been expanding ever since. The focus on farm road will continue to remain a priority for the government for some time.

In assessing farm roads, the following documents were referred:

- Guidelines for Farm Road Development Revision (2013);
- Technical Specification & Standard Drawing for the Construction of Farm Roads (2009);
- Guidance Note & Formats for the Preparation of BoQ and Estimates for Farm Roads (2009); and
- Farm Road Maintenance Manual (2009).

The procurement of works, including road construction and maintenance, is governed by the Procurement Rules and Regulations 2009 (PRR) and Standard Bidding Documents 2009 (SBD) with subsequent amendments. PRR aims to ensure efficient procurement system and achievement of better value for money through the prescription of various procurement processes.

1.3 Procurement Process in Public Road Construction

Existing procurement process is explained in **Figure 5**.

Figure 5: Procurement process for public road construction
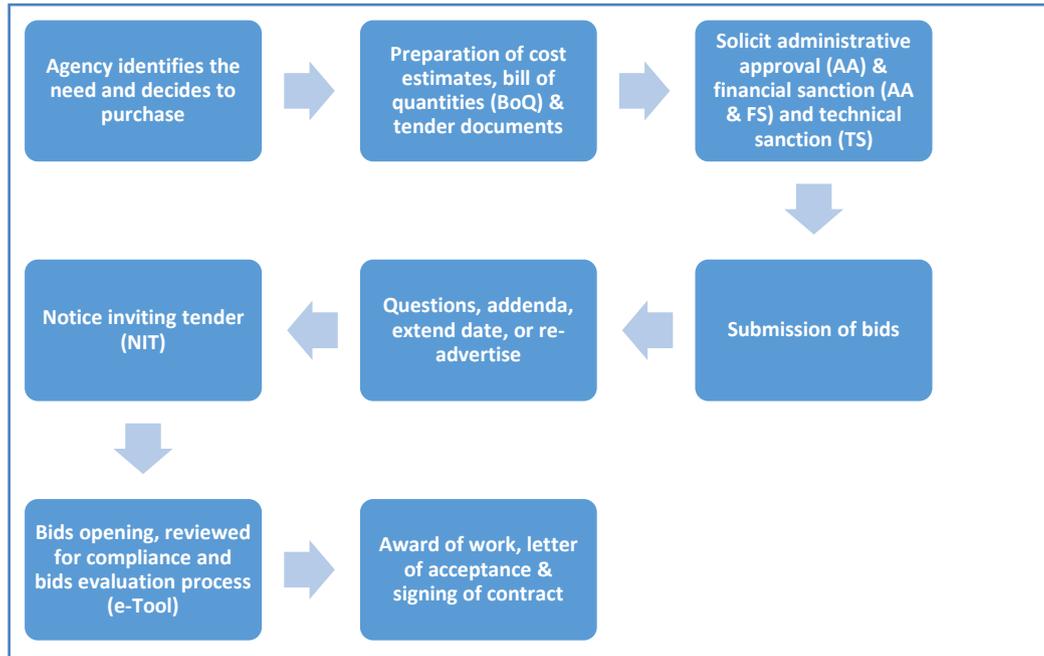
As outlined in PRR, depending upon the value of the estimated cost, DoR follows two models of procurement - centralized and decentralized procurement. In striving to fulfill the centralized procurement, DoR headquarter handles all the procurement activities while in the decentralized model, the procurement decisions are controlled by the Regional Offices. Irrespective of the procurement models, the processes

prescribed in **Figure 5** is uniformly applied. Majority of the road contracts executed thus far are done through the National Competitive Bidding (NCB). International competitive bidding (ICB) is applied only for those projects that are donor funded, complex in nature and require specialized skill. The Joint Venture (JV) model between the national contractor and international contractor is also adopted.

However, JV has not served its objective of transferring capacity to the local partners. In fact, the international partners take away their share of commission and have never been active in transferring the knowledge and skills to the local partners.

Structure of Road Works

The sequence of activities that govern road contract is as shown in **Figure 6**.

Figure 6: Structure of public road works
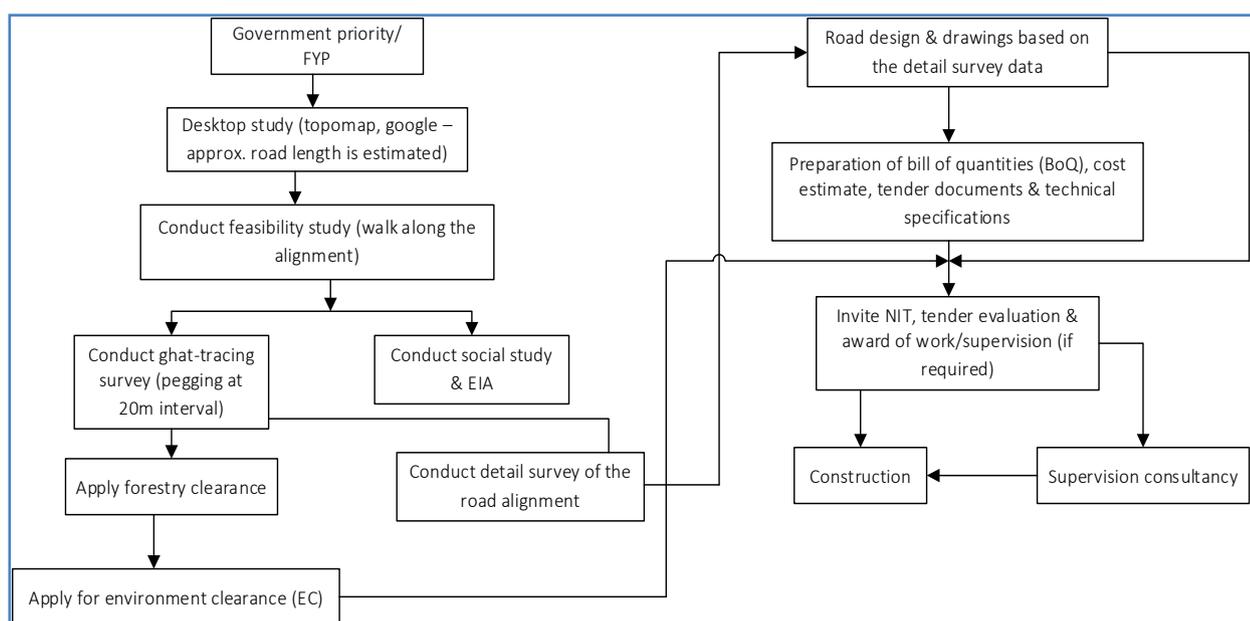
Although it is mandatory to conduct social study and environment impact assessment (EIA) for any road project, it is often left out for small road projects implemented through RGoB funding. However, it is also mandatory for donor-funded projects such as Asian Development Bank (ADB), World Bank (WB) and so forth. It is processed once the ghat tracing survey report is produced along with EIA report. Geo-technical studies are also undertaken at the time of feasibility study i.e., walking along the best-chosen road alignment.

1.4 Issues and Challenges in Public Road Construction Sector

Given the complexity of the construction industry in general and road construction in particular, as well as the priority investment that is made in it, the road sector in Bhutan is not without challenges.

The construction sector is beset with many issues. For the purpose of this research, the following issues were identified:
- Poor quality of construction;
- Lack of real competition among the contractors; and
- Proliferation of undesirable practices such as fronting and collusion.

The 11th Plan envisages the following two challenges:

- Poorly perceived for employment; and
- Limited capacity and poor quality.

1.5 Issues in PRR and SBD

The primary objective of public procurement is to obtain quality work and service to support effective and efficient government and ensure prudent use of the limited public funds.

The public procurement process has undergone several reforms over time with the establishment of the Construction Development Authority (CDA) [now Construction Development Board (CDB)] and Public Procurement Policy Division (PPPD) [now Government Property & Procurement Management Division (GPPMD)], Department of National Property (DNP) under the Ministry of Finance (MoF). PRR and SBD have become handy documents for the procuring agencies in implementing the works within the limited resources at hand.

However, there are areas for improvement so as to deliver its expectation. The following are some of the general weaknesses that were identified at the focus group discussions (FGD) with the stakeholders:

- Lack of professionalism;
- Poor contract management and administration with non-uniform procurement method;
- Absence of coordinated training of private sector in areas of planning and bidding strategies;
- PRR requires the contract to be awarded to the lowest evaluated bid; however the award decision is taken based on the 90% weightage given to the financial parameter and 10% to the price preference parameter. It does not consider the technical score to decide the award of the contract;
- Traditional procurement is cumbersome and requires substantial lead times with little or no flexibility;
- The Debarment Rules is not yet adopted. This allows the disqualified/failed contractors to bid again; and sometimes even win the contract;
- Exclusion clause in SBD is not explicit;
- The procurement system does not allow pre-selection system, it rather provides open space for any contractor to participate in the tender. This allows the newly licensed contractors to bid for any type of road work. For instance; the Department of Highways, Bangkok has a separate system to pre-select the contractors especially for the road works and the bids are invited from the pre-selected bidders only;
- Lack of accountability on the contractors' part leads to poor quality of work; and
- Lack of construction policy.

Besides the general weaknesses as stated above, it is also equally important to assess the weaknesses in the various procurement stages as stated hereunder:

Needs assessment and planning: Needs assessment and planning is one of the crucial processes given that any procurement should ensure maximum value for money and derive optimum benefit out of every chhetrum spent. There were instances of wastage of public money due to lack of proper needs assessment and a procurement plan. In the absence of realistic needs assessment and a proper procurement plan, either the procured assets remain idle/is not being used as planned or there is failure in procurement leading to wastage of scarce resources.

Budget approval and procurement plan: Based on the needs assessment and the plan, the procuring agencies are required to prepare and propose annual procurement budget. Before the proposal is submitted to the Department of National Budget (DNB), Ministry of Finance for its final approval, it should be thoroughly discussed at the agency level to ensure that the proposal is in sync with the plan and that the proposed budget is genuinely required for the purpose. However, there were instances where the approved budget is either diverted or is spent for some other unplanned activities which are often driven by vested interests.

Preparation of tender documents by the procuring agency: Preparation of tender documents is basically intended to set the criteria to recruit contractors to undertake the works. The procuring agencies will have to entrust this job to a reliable and an appropriate official with the required skills. A weak bid document will have vague selection criteria leading to poor project delivery. Further, there were instances where unethical officials set the criteria to favour bidders of his or her choice and collude with the bidders. Therefore, it is important for the head of the procuring agency to ensure that the bid document is prepared strictly in accordance with PRR.

Notice inviting tender: PRR prescribes that the information on the tender opportunity be given uniformly to all the bidders and that no particular bidder be favoured. Providing required information on time is crucial as it helps the bidders to prepare realistic and substantially responsive bids. There were instances where the bidder(s) frequently complained that the information about the bid opportunity is shared with some favoured bidders before it is made public. The procuring agencies then intentionally set unreasonable bid submission time, making it difficult for other bidders to prepare and submit the bid.

Issue of tender documents: Unlike in the past, most of the procuring agencies prefer to upload the tender documents in their websites and in case of works, on the website of CDB. There are also some procuring agencies and bidders who prefer to have the printed copy and in such cases the procuring agencies should ensure that bid documents are readily available to all the bidders from the day the notice inviting tender is made. However, there were instances where the bidders complained that when they visit the office of the procuring agencies, they either do not meet the relevant official or even if the relevant official is present in the office, they do not issue the bid document but cite several excuses. In the process, they limit the competition to their favoured ones.

Preparation of tender documents by the bidders: Based on the instruction given in the bid documents, the bidders are required to prepare their bids. Before preparing the tender, the bidders are instructed to visit the proposed construction site to study and understand the practical situation. Additionally, the bidders are to carry out thorough market research to know the availability of the required materials and their prices. However, most of the bidders do not undertake proper market research and instead rely on the outdated information or prepare the bid assuming the market rates on their own which results in substantially high or abnormally low bid. On the other hand, if the bidder and the procuring agency collude, they can manipulate the bill of quantities (BoQ) and quote only for those items with low rates just to keep their quoted amount low and win the contract. However, during the contract execution, they execute the unquoted, profitable items as additional works which entail huge financial loss to the procuring agencies.

Submission, opening and evaluation of tenders: Once the bid is prepared, the bidders are required to submit the bid to the procuring agency and the bids are opened on the same day. Those bidders wishing to attend the bid opening can do so and raise their concerns, if they observe anything against the criteria in the bid document. Upon opening the bid, the original copies are to be kept with the head of the procuring agency in a secure place and the copies are to be handed over to the evaluation committee for evaluating

the bid. However, in practice, there were instances where the contractors complained that both the original and copies of the bids are given to the evaluation committee, increasing the risks of manipulating the bid documents.

Award decision: On completion of the bid evaluation, the evaluation committee prepares an evaluation report as per the format provided in PRR and presents it to the award committee. The award committee's decision is based on the evaluation report. The award committee members often do not cross check the documents and the criteria to authenticate the report. There are risks of unintentional mistake or opportunities for manipulation by the evaluation committee which may lead to biased award decision. In most of the cases, the evaluation committee members do not declare if the bidder is known to him or her which leads to unfair practices.

Contract signing and execution: The letters of intent to award and acceptance are issued, based on the award decision by the tender committee, to the winning bidder with a copy to all the participating bidders. The participating bidders are allowed to lodge any complaint if they disagreed with the decision. The aggrieved party can seek clarification from the procuring agency and also lodge the complaint within 10 days to an Independent Review Body (IRB) from the date of receipt of the letter of intent to award. If there is no complaint or upon settlement of the complaint, the procuring agency issues the letter of acceptance and signs the contract on receipt of performance security.

On signing the contract, the construction site is formally handed over to the contractor so that he or she can start the work based on the contract terms and conditions. There were instances where the terms and conditions in the contract document were not honoured by the contractors and failing to mobilize the specified equipment, human resources and the materials, thereby compromising the duration and quality of the works. Further, in most cases, the procuring agencies pay far more than the quoted amount mainly due to execution of additional works. There are frequent cases of additional works exceeding the permissible threshold of 20% per item and sometimes the amount of additional works exceed 100% per item. Additional works arise mainly due to unforeseen site conditions, poor technical estimate or collusion between the contractor and the dealing officials.

1.6   Research Context

As stated in **Figure 3**, the government's expenditure on construction of roads account for a major share of construction activities signifying the priority it gets for a mountainous country like Bhutan. Until Bhutan has a safe, reliable and efficient road network, the sector will continue to remain an important thrust of the development efforts and enjoy maximum share of the development spending.

Developing countries spend approximately US $ 250 billion annually on infrastructure development. Construction, including roads, is a big and complex undertaking involving huge amount of money.

The Global Infrastructure Anti-Corruption Centre has identified 13 features that make construction particularly prone to corruption. These include:

- **"Uniqueness:** No two construction projects are the same making comparisons difficult and providing opportunities to inflate costs and conceal bribes;

- **Complex transaction chains:** The delivery of infrastructure involves many professional disciplines and trades-people and numerous contractual relationships that make control measures difficult to implement;

- **Work is concealed:** Materials and workmanship are often hidden, e.g. steel reinforcing is cast in concrete, masonry is covered with plaster and cables and pipes enclosed in service ducts;
- **Official bureaucracy:** Numerous approvals are required from government in the form of licenses and permits at various stages of the delivery cycle, each one providing an opportunity for bribery; and
- **The scale of infrastructure investments:** Investments in economic infrastructure such as dams, airports and railways can cost tens of billions of dollars making it easier to conceal bribes and inflate claims".

Transparency International states that construction is the single sector most prone to corruption. It also highlights the devastating impact of corruption in construction such as asset misappropriation, financial misrepresentation, corruption and bribery, money laundering, industrial espionage and information, product piracy and counterfeiting. In fact, corrupt practices can be found at every stage in construction projects, for example in the planning stage, the awarding of construction contracts as well as the operation and maintenance of projects after the construction is completed.

In Bhutan, most contractors and regulatory authorities agree that corruption exists in the construction sector including road construction. At FGD, the contractors pointed out that they are treated as "second class citizens" which does not allow them to be "good performers". It was also pointed out that while the current systems provide for penalizing the contractors it does not equally incentivize the good performers in the sector.

The Corruption Perception Survey (CPS), 2007 revealed that bribery, in the form of cash, in availing construction services was second highest as compared to availing other services.

In a scoping research undertaken jointly by the Anti-Corruption Commission of Bhutan (ACC) and Royal Institute of Management (RIM) in 2015, construction was identified as one of the sectors vulnerable to corruption. Similarly, ACC received 503 complaints related to construction since 2006 to 2016. Of this, 117 complaints were related to roads.

In combating corruption, ACC uses a three-pronged strategy. While the current focus on investigation will continue, preventive measures through systemic review studies is also being emphasized besides education and advocacy. This research is, thus, a first of its kind to be undertaken in Bhutan's construction sector in general and roads in particular.

1.7 Research Question and Objectives

Given the priority accorded by the government coupled with significant plan outlays and its pivotal role in spearheading national socio-economic development, this research is expected to address the following question:

Are current systems and processes in public road construction adequate to prevent corrupt practices?

The objective of the research is to provide systemic recommendations to enhance efficiency, accountability and transparency in road construction by:
- Evaluating the processes where corruption and illegality are most likely to occur in the project life cycle of road construction;
- Delineating the causes and effects of corruption and illegal activities in road construction; and
- Evaluating the costs of corruption and wrongdoings in road construction.

Chapter 2: Research Methodology

2.1   Research Design

This section presents the research methodology that were followed for this research. Drawing upon the key research objectives of investigating the existing policies and practices, understanding the nature of efficiency, accountability and transparency, and estimating the cost of corruption in public road construction, a mixed - method approach was chosen that consisted of desk research, qualitative and quantitative methods.

Corruption is a complex and multifaceted phenomenon with various causes and effects. According to Torsello (2016), it takes on various forms in different contexts which are hidden in nature, making it difficult to study. It is also difficult considering the unclear definition of corruption that implies challenges to carry out comparative analysis. This problem, according to Andvig (2000), has also spiraled the researchers in many countries where access to reliable information are either limited or inherently biased. Thus, measuring corruption with confidence, accuracy and with minimal resources, due to its hidden nature, is a challenge. Despite these challenges, Trapnell (2015) noted that there has been progress in measuring corruption and anti-corruption by various experts and organizations.

Some of the common methods used in measuring corruption are:

- Surveys: Transparency International's Bribe Payers' Survey, Global Barometer Survey, etc.;
- Expert Surveys: Transparency International's Corruption Perception Index, Global Integrity Rating, Open Budget Index, etc.;
- Monitoring and Evaluation Systems: Anti-Corruption Agencies Assessment, UNCAC Assessment, etc.;
- Crowdsourcing: Paid a bribe, national level reporting platforms, etc.;
- Compliance Review/Tests: Open Society Justice Initiative, RTI Assessment, etc.;
- Indicator/Score Card Case Studies: Social Audits, Community Score Cards, World Bank Public Accountability Mechanisms; and
- Hybrid Approaches: Barometer Data, South Korea's Integrity Assessment, etc.

Similarly, ACC also carried out research in Human Resource Management and the Mining Sector in 2015 using a mixed-method approach and the National Integrity Assessments since 2009.

For the purpose of this research, given the lack of or inadequate source of reliable data and the challenges to access data, the mixed-method approach comprising of qualitative, quantitative and desk research was adopted to achieve the objectives and improve reliability and robustness. The mixed method also helped to triangulate data by methods of data collection as well as data sources. A summary of the research methods are presented in **Figure 7** and each of the methods used are explained briefly under the data collection methods.

Figure 7: Research design
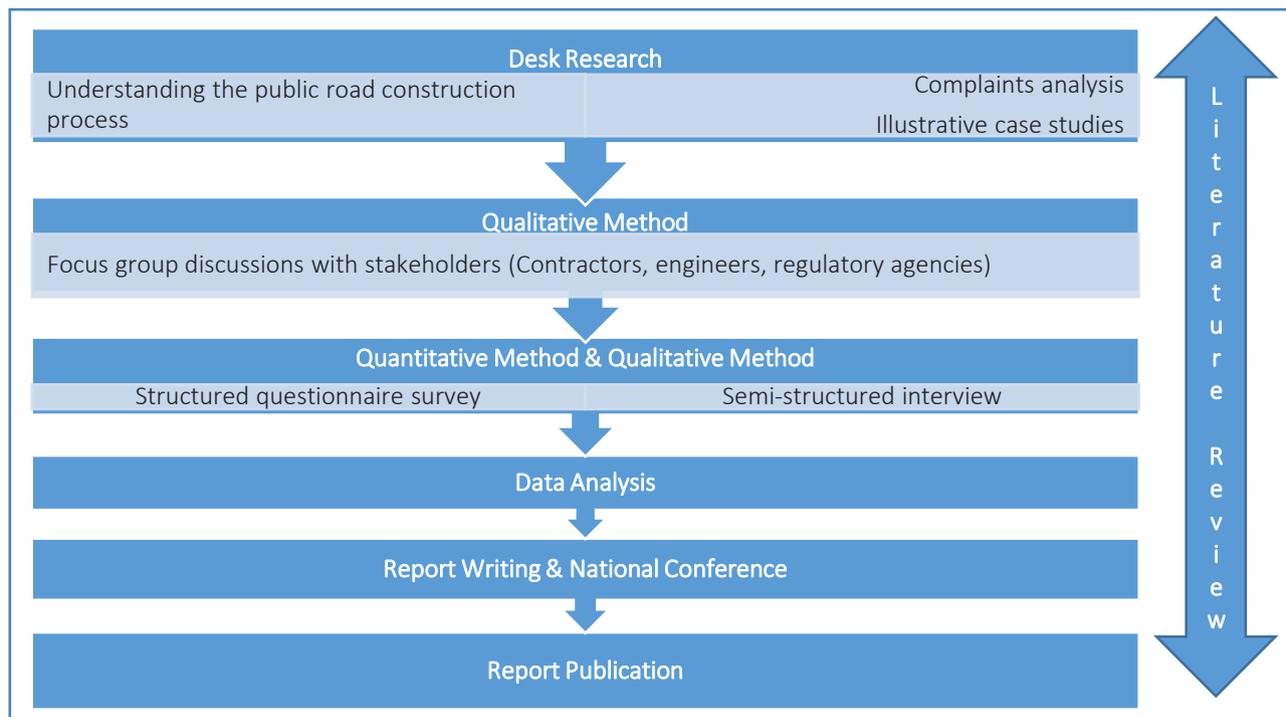
Given the key objective to secure systemic reforms in the public road construction sector based on the findings of the research, it was imperative to bring on board the key stakeholders that play a pivotal role in the sector. ACC, therefore, spearheaded this research, in collaboration with the following agencies, to enhance ownership in taking forward the recommendations culminating from the research:

1. Department of Roads, Ministry of Works and Human Settlement;

2. Government Procurement & Property Management Division, Department of National Properties, Ministry of Finance; and

3. College of Science and Technology, Royal University of Bhutan.

A representative each from these agencies, a national consultant and the researchers of ACC undertook this research from November 2016. This collaborative approach fostered clear understanding of the contexts, issues, challenges and opportunities. It also helped to minimize the inherent bias of the organizations and researchers as it helped in the triangulation of data by the researchers in addition to data sources and methods. A research committee, comprising members from RUB, National Statistics Bureau (NSB) and ACC, was instituted to provide overall direction in ensuring quality checking and abiding by the highest research ethics.

2.2 Ethical Considerations

Ethical considerations are an important aspect for conduct of any research and this research is no exception inspite of the sensitivities that surround it. All the researchers, including the enumerators who were recruited for the survey, were trained on the need to maintain proper codes of research and ethics. The principle of voluntary participation was strictly followed to ensure voluntary participation of the respondents. This is a critical consideration as ACC also has an enforcement mandate and it needed to ensure that this authority is not used to insist on the participation of the respondents.

Confidentiality of the data and anonymity of the respondents were protected in every step of the research. The data collected were stored and backed up securely. The data were used only for the purpose of research and deriving systemic improvements. Access to raw data was limited only to the members of the core research team.

2.3 Sampling Procedures

This research was a complex undertaking in terms of determining the population of the key stakeholders due to the involvement of many stakeholders and the lack of proper records. At the outset, the stakeholders were identified and population analyses carried out for each category. The sample size and methods were determined based on the analyses of the population and the research methods to be used. For the purpose of the semi-structured qualitative interviews, the respondents were selected purposively considering their work experience, position, qualification and working agencies so as to gather in-depth views and seek recommendations.

The key stakeholders identified for this study were the government civil engineers (DoR, *Dzongkhags, Dungkhags* and *Thromdes*), W1 contractors (Roads and bridges), committee members (opening, evaluation and award), Environment Officers, private engineers working for the construction firms and road users (bus and taxi drivers and farmers).

For the purpose of the structured questionnaire survey, two types of sampling methods were used based on the population analysis and the scope of the research. Stratified simple random sampling was used for key stakeholders for which the population was known and purposive sampling for the unknown population. For random sampling, the sample size was calculated using an online sample size calculator (Survey Monkey) considering 95% confidence level and 5% margin of error. To determine the actual number of respondents to be interviewed, 70% response rate was considered.

A summary of sample and response rate for various categories of respondents is as given in **Table 2**.

Table 2: Summary of survey respondents

Respondent	Population	Sample size (95% Confidence Level & 5% Margin of Error)	Respondents Contacted (Considering 70% response rate)	Actual Respondent	Response Rate (%)
DoR engineers	230	145	207	207	100.0
Dzongkhag and *Thromde* engineers	306	171	244	216	88.5
Contractors (W1 category)	2,019	323	461	290	62.9
Environment officers (Compliance)	25	24	25	17	68.0
Tender committee members	167	117	167	129	77.2
Total	**2,747**	**780**	**1,104**	**859**	
Community contractors	Unknown	16 from each region	160	157	98.1
Engineers of construction firms	Unknown	8 from each region	80	43	53.8
Road users	Unknown	12 from each region	120	119	99.2
Total			**360**	**319**	**283.6**
Grand Total			**1,464**	**1,178**	**80.9**

2.4   Demographic Profile of the Respondents

Representativeness is the core of any research. Hence, this research was undertaken with strict adherence to international research protocols and the objective for which it was undertaken.

From a sample of 1,464, a total of 1,178 respondents were interviewed over a period of one month (May of 2017). **Table 3** presents a summary of the demographic profile of the respondents covered by the survey:

Table 3: Demographic profile of the respondents

Gender	N=1178	%
Male	995	84.5
Female	183	15.5
Age (Years)W		
18 – 25	75	6.4
26 – 33	366	31.1
34 – 41	309	26.2
42 – 49	236	20.0
50 – 57	137	11.6
58 – 65	49	4.2
Above 66	6	0.5
Education		
No education	188	16.0
Functionally literate	44	3.7
Primary	130	11.0
High school	153	13.0
Diploma/certificate	351	29.8
Graduate	231	19.6
Postgraduate	81	6.9
Agency		
Construction firm	376	31.9
Ministry of Works and Human Settlement	245	20.8
Community contractor	157	13.3
Dzongkhag	198	16.8
Dungkhag	12	1.0
Gewog	30	2.5
Thromde	40	3.4
NEC	1	0.1
Users	119	10.1
A member in the following committees		
Opening	82	7.0
Evaluation	107	9.1
Tender	87	7.4
Opening & Evaluation	31	2.6
Opening, Evaluation & Tender	33	2.8
Opening & Tender	20	1.7
Evaluation & Tender	5	0.4
Occupation		
Contractor	290	24.6
Environment/forest official	17	1.4
Consultant/designer	3	0.3
Community contractor	157	13.3
Engineer	423	35.9
Administration	101	8.6
Finance	28	2.4
Manager of construction firm	4	0.3
Site engineer of construction firm	34	2.9
Site supervisor of construction firm	2	0.2
Others	119	10.1

2.5 Data Collection Methods

As discussed in the previous section, a mixed-method approach comprising of desk research, quantitative and qualitative methods were used for this research. For quantitative data collection, enumerators were recruited and trained to collect data from the field. Data collection was carried out using Open Data Kit (ODK) tools on mobile tablets. The use of tablets not only helped to ensure data quality but also monitor data quality and progress on a regular basis by the supervisors who were appointed for the different regions where DoR regional offices are located.

Official letters from ACC and the Director General of the Department of Local Government (DLG), Ministry of Home and Cultural Affairs (MoHCA) were sent to the targeted organizations namely Government Secretaries, Heads of the Autonomous Agencies, *Dzongdags* and *Thrompons*. The letter explained that the focus of the research was mainly on public road construction with a view to provide evidence-based support in deriving systemic reforms.

In addition to the letters to all the stakeholder agencies, the respondents were contacted by telephone ahead of the interview dates to establish their willingness and convenience. This was systematically and meticulously carried out throughout the fieldwork. There were instances where some of the respondents could not be traced while some did not consent to be interviewed. As a result, the final response rate was 80.9%.

The specific methods used in this research are discussed in the following sections:

2.5.1 Understanding the Public Road Construction Processes

The first step of this research was to review the road construction processes. It was carried out through desk research by reviewing and analyzing relevant documents; discussions within the core team members to understand the actual process and examining the rules and regulations related to the road construction processes. These consisted of PRR (2009) and amended sections incorporated in 2015, SBD (2009) and amended sections of 2015, Review Reports of Procurement Systems by the National Council, ACC and the Royal Audit Authority (RAA). The team then documented a flow chart of various road construction processes. The research team reviewed written reports, laws, by-laws, policy documents and other related documents.

The research team also collected additional information to complement the documentation through FGD with key stakeholders such as the contractors and engineers involved in road construction. FGD helped the researchers to understand the road construction context in terms of its current state and the opportunities from diverse perspectives. It also helped to clarify key issues in the policies, procedures and implementation including opportunities for corruption and wrongdoings that were identified through literature review.

2.5.2 Complaints Analysis

One of the steps in the desk research was to analyze the complaints received by ACC related to construction over a period of almost 11 years since the establishment of ACC (2006) until December 2016. A database of the complaints, related to construction in general and public road construction in particular, was created after seeking necessary permission from the Commission. This was then followed by a thorough segregation of the complaints. Each complaint was studied carefully and segregated by types of allegations, allegations against different agencies, allegations against the various position holders, and the allegations in different processes of road construction.

The data from the complaints were used to compare, contrast and substantiate with that of the research findings. SPSS version 24 was used to analyze the complaints.

2.5.3   Structured Questionnaire Survey

One of the major steps in this research was to understand the perception of key stakeholders involved in road construction regarding various policies, procedures, processes and corruption in the public road construction. This was carried out through a structured survey questionnaire which was conducted from March to May 2017. Stakeholders included the contractors, DoR Engineers, Civil Engineers of *Dzongkhags* and *Thromdes*, Environment Officers involved in compliance monitoring, Tender Committee Members of the government agencies involved in road construction (MoWHS, DoR, Regional DoR Offices, *Dzongkhags* and *Thromdes*), Engineers working for Contractors, Community Contractors and Road Users (Drivers and Farmers) as the study intended to capture perceptions of all the key stakeholders involved in road construction.

A questionnaire was developed based on literature review of survey instruments and findings in the procurement and construction sector covering topics such as Factors Contributing to Corruption in Construction (Nawawi, 2011), Causal Relationships between Causes of and Vulnerabilities to Corruption (Ming Shang, 2014), Corruption and Road Construction (World Bank, 2009), Integrity Assessment (ACC, 2012), Corruption (Facundo, 2010) and Identifying Corruption in Public Procurement (European Union, 2013).

A pilot test of the questionnaire was carried out manually (paper-based) with 30 respondents of various key stakeholders and the consequent improvement made to the questionnaire based on the test. During the pilot testing, observations in terms of the time taken to answer each of the questions, clarity and difficulty of answering questions and appropriateness of questions were noted. Based on the test, some questions, certain words and phrases were reformulated.

The final survey was carried out using mobile tablets by the enumerators. For ease of monitoring and improving data quality, data collection was carried out by a team of enumerators in 10 DoR regions. A total of 1,178 respondents have responded to the survey.

2.5.4   Semi-Structured Interview

Semi-structured interview guides were developed for two different target groups consisting of public officials (engineers & tender committee) and private firms and its personnel (contractors, engineers working for construction firms and community contractors).

The purposive sampling was used for the interview. This means that specific respondents were purposely chosen since they may have interesting and diverse views on the research topic. The selection of the respondents was made to represent various key functions or hierarchies of the ministries, autonomous agencies, *Dzongkhags* and *Thromdes*.

2.6 Data Analysis

Data collected through the methods described in **Section 2.5** were analyzed using various techniques and software. For the purpose of the semi-structured interviews, thematic analysis was carried out by identifying recurring themes and patterns. In the case of the complaints and survey data, descriptive and inferential analysis were carried out using Statistical Package for Social Science (SPSS). Amos 24.0 was used for SEM.

2.6.1 Structural Equation Model

In order to determine the causes of corruption in the public road construction, SEM was carried out using the responses from 767 respondents comprising of engineers, contractors and tender committee members.

SEM is a statistical methodology that is widely used in modeling complex relationships between directly and indirectly observed (latent) variables by the researchers in the social, behavioural and educational sciences. It was first introduced in the 1970s as a result of a marriage between psychometrics and econometrics. Psychometrics in SEM allows for latent variables with multiple indicators and using econometrics in SEM allows for multiple equations, possibly with feedback loops. In the current SEM software, the models are so general that they encompass most of the statistical methods that are currently used in the social and behavioral sciences.

In recent years, SEM has been extensively used in corruption studies as it has the advantage to treat corruption as a latent variable that is directly related to its underlying causes and effects. The causes and effects of corruption have attracted increasing attention over the years from both the academics and policy makers. Central in the discussion on the causes and consequences of corruption are perception-based indices.

Since every technique in SEM family is different, there is no standard rule to use SEM. The following steps are commonly used in SEM:

Model Specification

A SEM model is made up of two main components, namely the structural model and the measurement model. The former shows the potential causal dependencies between the endogenous and exogenous variables while the latter shows the relationships between the latent variables and their indicators. Exploratory and confirmatory factor analysis models contain only the measurement part while path diagrams contain the structural part.

To specify pathways in a model, the modeler posits two types of relationships: (i) free pathways – where hypothesized causal relationships between variables are tested, and (ii) relationships between variables that are already fixed in the model, based on the accepted studies.

Estimation of Free Parameters

Parameter estimation is done by comparing the actual covariance matrices representing the relationship between the variables and the estimated covariance matrices of the best fitting model. This is obtained through numerical maximization of a fit criterion as provided by maximum likelihood estimation, quasi-maximum likelihood estimation and weighted least squares.

Assessment of Model and Model Fit

In order to determine how well an estimated model models the data, it is important to examine the fit of the estimated model. Forming the basis for accepting or rejecting the models is a basic task in SEM modeling. Assessment of fit essentially calculates how similar the predicted data are to the matrices containing the relationship in the actual data. Formal statistical tests and fit indices have been developed for these purposes and the commonly used measures of fit include: Chi-Squared, Akaike information criterion (AIC), Root Mean Square of Approximation (RMSEA), Standardized Root Mean Residual (SRMR), and Comparative Fit Index (CFI).

Model Modification

To help improve the fit, the model may need to be modified by estimating the most likely relationships between the variables. Modifications to the structural model are the changes made to the theory claimed to be true. Therefore, modifications must make sense in terms of the theory being tested. Changes to the measurement model effectively claims that the items/data are impure indicators of the latent variables specified by the theory.

The selected set of models are then interpreted so that claims about the constructs can be made, based on the best fit model. It helps to explain why some of the factors in the hypothetical model were left out in the final model. In this stage, the variables from the hypothetical model that struggle to load significantly on any factor (communalities of $0.0 - 0.4$) are removed.

3.1   Complaint Analysis

One way of looking at corruption and wrongdoings in the public road construction is from the number of complaints that ACC received. **Figure 8** shows the number of complaints related to construction and public road construction that ACC received from 2006 to 2016. Of the 503 construction complaints that ACC received, 117 comprised of complaints that were related to the public road construction.

Figure 8: Number of complaints related to construction and public road construction (2006 - 2016)
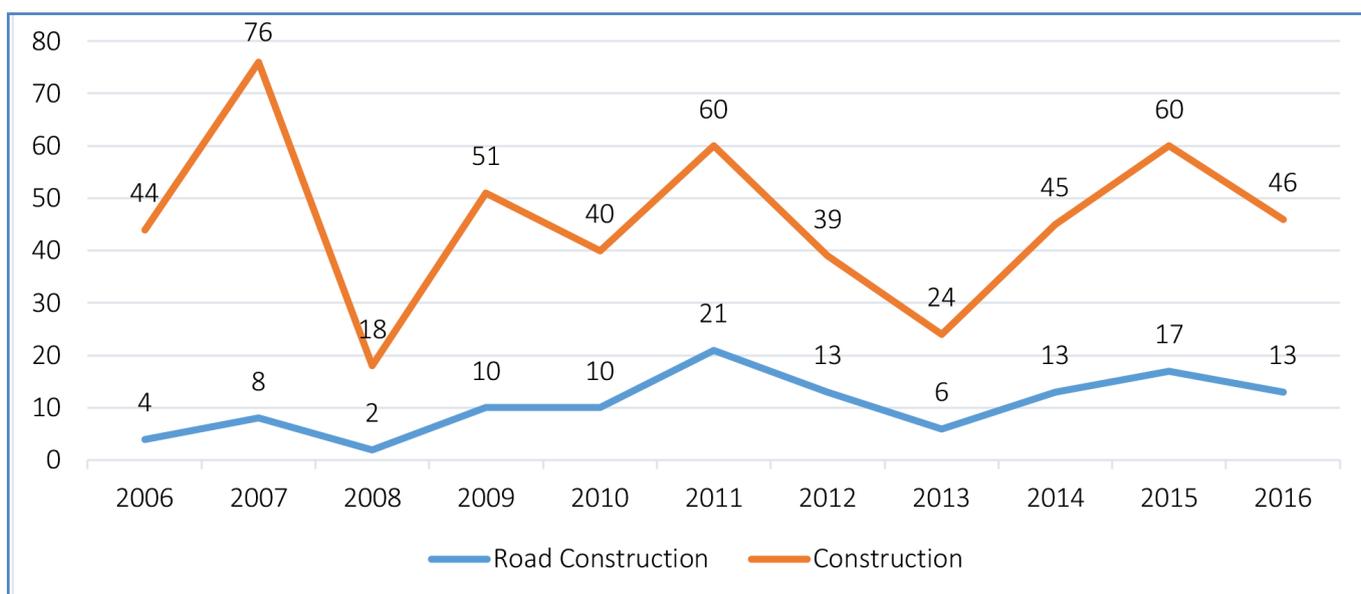
Figure 9 shows the percentage of complaints by allegations against the agencies. The complaints related to the *Gewogs* constituted the highest at 47% followed by the *Dzongkhags* (25.6%), Ministries (12.8%), private construction firms (6.8%) and private (5.1%). Corporations and *Thromdes* had the least complaints levelled against them.

Figure 9: Percentage of complaints related to roads against the agencies
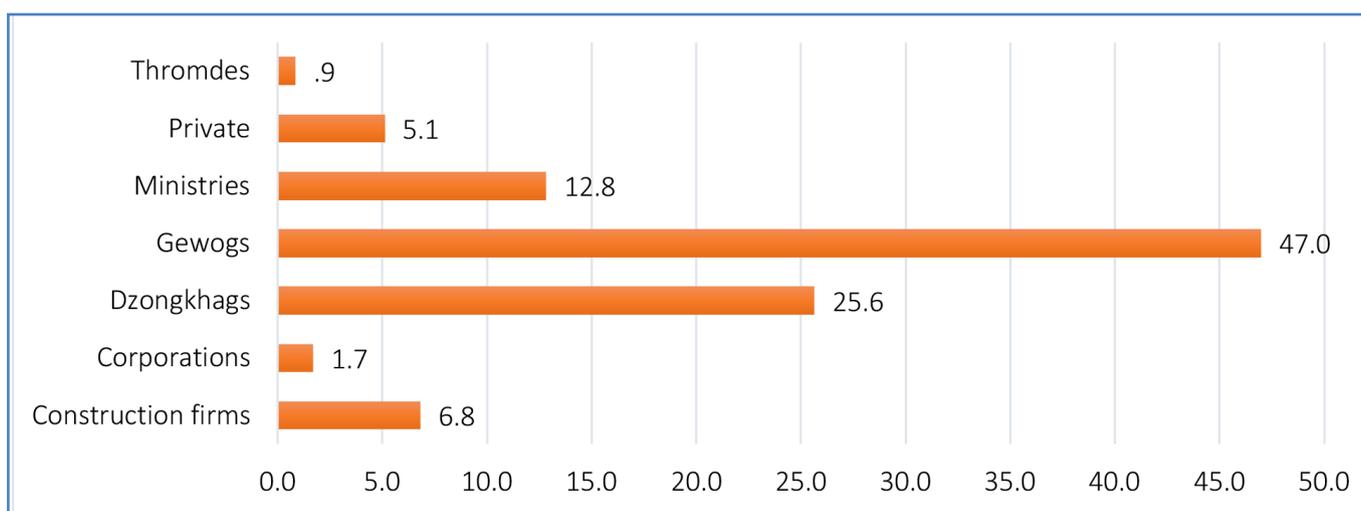
Figure 10 shows the percentage of complaints related to roads by allegations against various position holders. It shows that complaints against local leaders comprised the highest at 31.6% followed by the complaints against the management of the procuring agencies (24.8%), contractors (8.5%) and government engineers (7.7%). Not specified complaints that constituted 2.6% of the complaints are those that were not specified in the complaints lodged to ACC.

Figure 10: Percentage of complaints related to road construction against various position holders
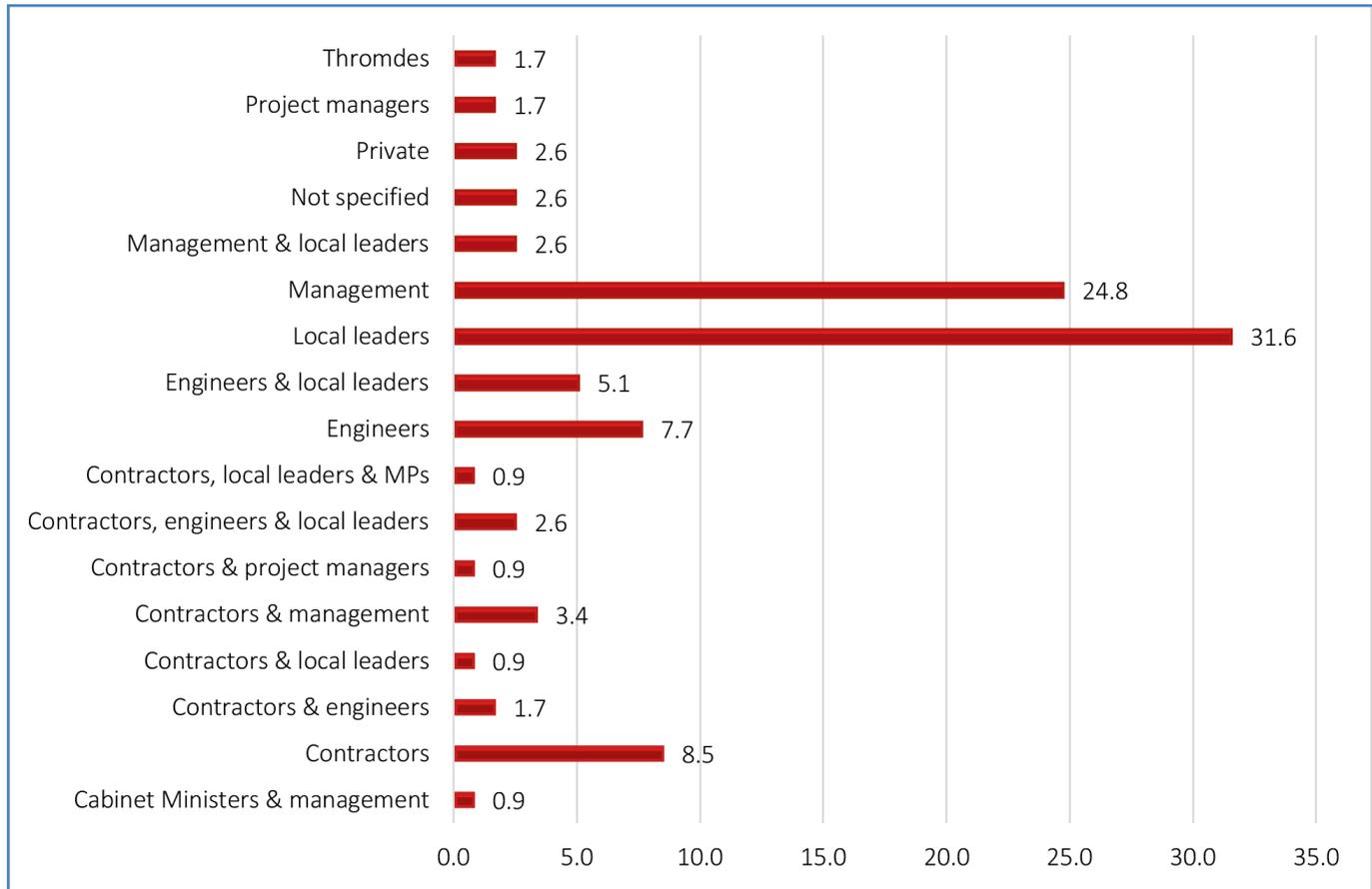
For the purpose of this research, the complaints that ACC received were further segregated by the types of allegations as shown in **Figure 11**. Misuse of authority tops the type of complaints that ACC received constituting 41% of the complaints followed by collusion (29.9%), embezzlement (7.7%) and deception (6.8%).

Figure 11: Percentage of complaints related to roads by types of allegations
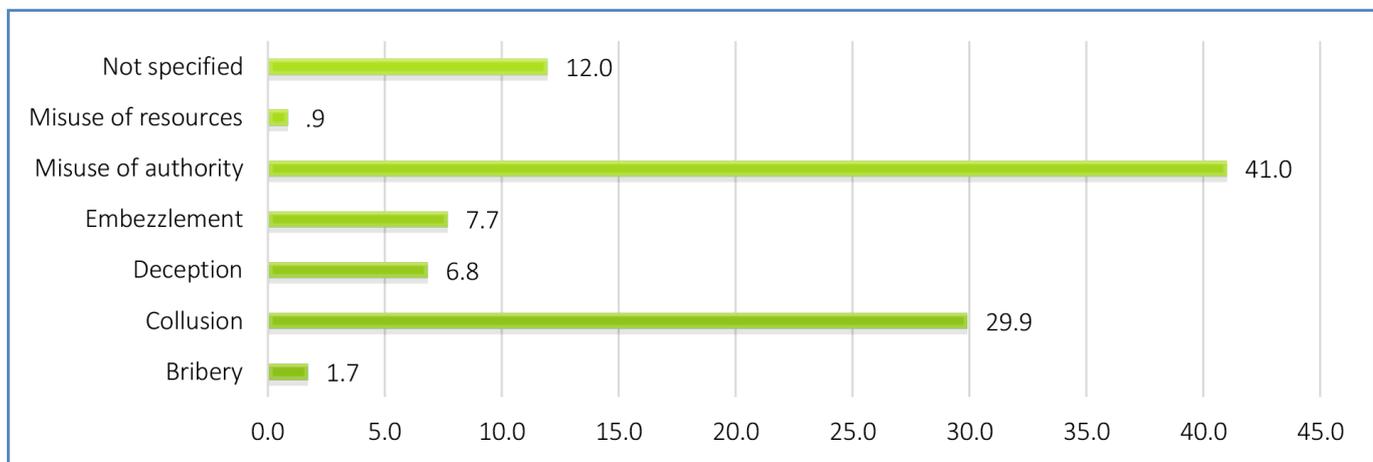
Figure 12 shows the percentage of complaints by types of roads. Majority of the complaints were related to farm roads (74.36%) followed by access roads (7.69%) and *Dzongkhag* roads (5.98%).

Figure 12: Percentage of complaints by types of road
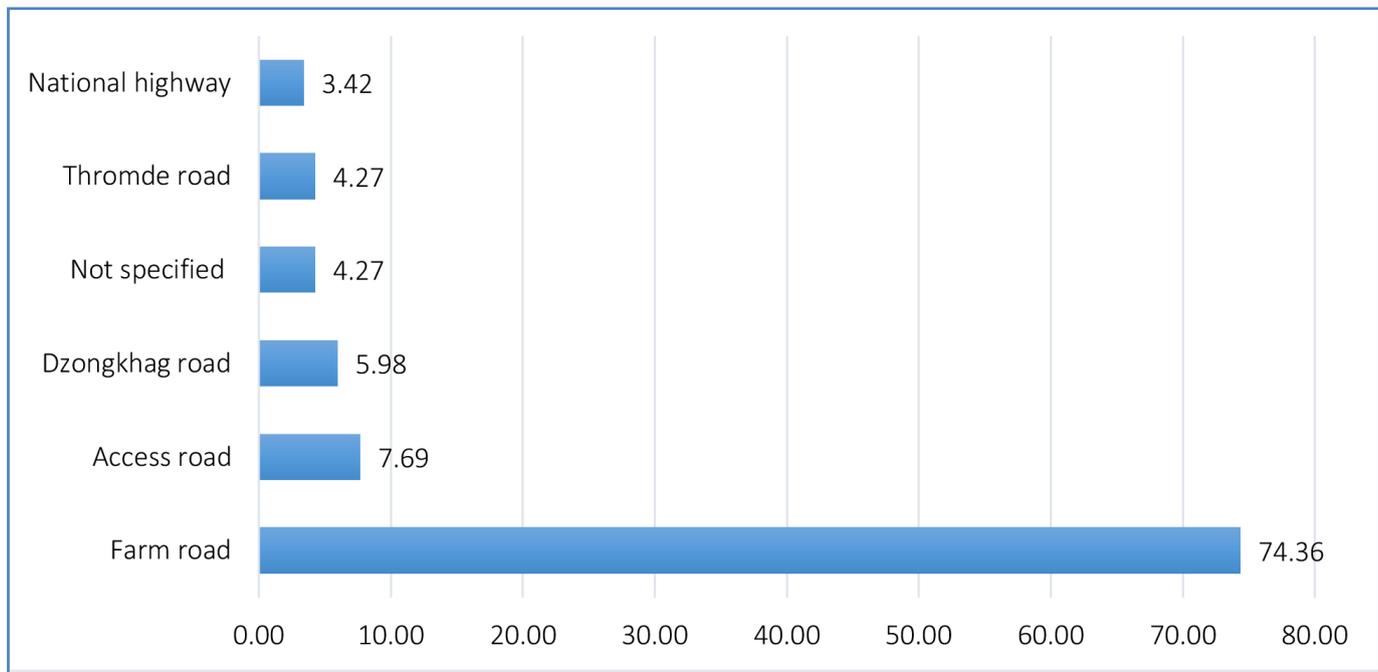
Figure 13 shows the percentage of complaints received at various stages of road construction. The implementation stage saw the highest percentage of complaints (23.9%) followed by supervision (20.5%), award of work (19.7%), planning (12.8%), evaluation and feasibility (6% each) stages.

Figure 13: Percentage of complaints in various stages of road construction
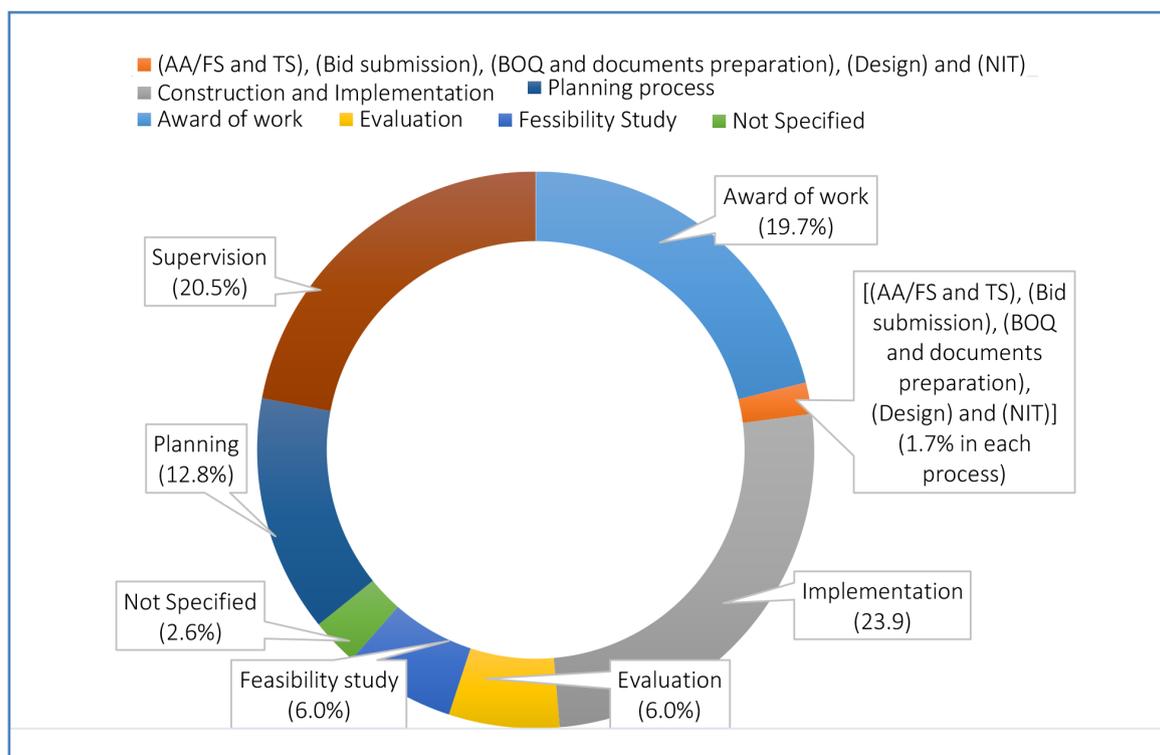
3.2　Illustrative Case Studies

Case study is a study of an existing issue within the real-life context (Yin, 2003; Meyer, 2001) and are often used in organizational studies (Meyer, 2001). Although the case studies are used either as a type (Starman, 2013) or method (Asimirin, 2014) in qualitative research, this research categorized it as desk research. The illustrative cases are used either to depict the corruption cases that were adjudicated or the success or failure of road construction projects.

The analysis of real case studies help to understand corruption in the context of public road construction and derive opportunities to improve road construction projects of corruption and wrongdoings.

Three case studies are presented in this section. The first case is based on the complaints that ACC investigated and forwarded to the Office of the Attorney General for prosecution for which the court judgment had been issued. It illustrates the corrupt practices and wrongdoings. The other two cases are based on DoR project report. Unlike the first case, these two cases do not illustrate corrupt practices per se; however the cases depict the role of (im)proper planning, execution and management in road construction projects. The confidentiality of the persons involved in all the cases were maintained.

3.2.1　The Case of Bribery

Summary

Context: Solicitation and acceptance of bribes.

Facts:
- Solicited bribe by marking quality issue even if there was no issue of quality; and
- Solicitation and acceptance of bribe to allow resumption of the work by using unacceptable construction materials.

Background

The project for the construction of the road was funded by an external development bank. A stretch of the project was awarded to Firm Y. Firm Z was awarded the contract for double bituminous surface treatment. The project was supervised by the consulting firms from both within and outside the country.

Who were involved?
- The Resident Engineer from country X representing the consultant firm. He was to administer the works and also to undertake quality assurance;
- The Material Engineer from country X also representing the consultant firm. He was responsible for managing the regional project laboratory;
- The Proprietor of Firm Y; and
- The Project In-charge of Firm Z.

How did it happen?

The road work was stalled by the Resident Engineer on the grounds that the contractor was alleged to have used unacceptable construction materials. This was used as a pretext to solicit bribe of Nu. 2,000,000. The contractor expressed his inability to pay that amount. The Resident Engineer negotiated the amount to Nu. 1,500,000 and agreed to allow the contractor to resume the work. The Resident Engineer received the cash of Nu. 1,000,000 and advised the contractor on how to go ahead with the resumption of the work.

Investigation Findings

The investigation by ACC established that the Resident Engineer and the Material Engineer were found soliciting and accepting bribe from the local contractors in their capacity as engineers overseeing the project execution. The Resident Engineer solicited bribe in consideration for allowing the contractor to recommence the work that was previously stalled for allegedly using unacceptable construction materials as well as for allowing the resumption of the work using materials that deviated from the specification.

Outcome

The accused were ordered the following:

- The Resident Engineer was convicted for three years. Further, he was ordered to restitute Nu. 2,125,035;
- The Material Engineer was convicted for two years besides the order to restitute Nu. 674,000; and
- The Project In-charge of construction firm Z was convicted for two years and 360 days.

3.2.2 The Case of Good and Bad Practices in the National Highway Construction

Summary

Two firms participated in the execution of the contract. Firm A performed exceedingly well within the stipulated budget and time. Proper management, planning and the division of responsibilities among the workers played a vital part in the successful execution of the contract. On the contrary, firm B failed to complete the contract within the given time and specified quality. It was attributed to poor contract planning, execution and management of the contract. The contractor was levied 10% penalty, the upper limit, as per the provision of the Contract.

Introduction

As part of its objective to reduce travel time, the government had instructed DoR to construct a by-pass road and design a double lane conforming to the standards of the primary national highway. The by-pass road reduced the travel distance by 24 kilometers (KM). The government funded the construction. The work included the formation cutting, base coarse, permanent works (retaining walls, culverts, lined drains, etc.), bituminous works and bio-engineering.

Project Detail and when did it happen?

- The 6.25 KM was departmentally executed by DoR.
- The 0-13 KM stretch was contracted out to Firm A through the competitive bidding process at the quoted price of Nu. 182.311 million. The contract period was 28 months with 3 years maintenance period.
- The 13-26 KM stretch was contracted out to Firm B through the competitive bidding process at the quoted price of Nu. 194.04 million. The contract period was 28 months with 3 years maintenance period.

Site Management by the Two Firms

Both the firms had availed 10% mobilization advance as per the contract provision. Firm A used the money for constructing the camps, mobilizing machines & workers. As per the report from the Regional Office, Firm B had not sensibly utilized the money for mobilization of resources and materials and construction of the camps.

Firm A had set up a comfortable camp with basic amenities at the project site. Different mess facilities for the family and bachelors were established inside the camp area mainly to accelerate the efficiency of the workers by minimizing the cooking time. Firm B did not have a proper plan for setting up camps and installation of crusher plants. Even those camps that were constructed for the workers and site engineers, were not well connected with the basic amenities. Lack of proper site management and cooperation between the engineers and the people at the site contributed to the failure of the project.

Project Management by the Two Firms

As per the contract, Firm A had submitted a comprehensive work plan and organization chart of the project. The firm employed experienced Project Manager, Project Engineer and Site Engineers with a clear chain of command in the construction sequence and reporting. The activities were undertaken as per the approved plan and any non-conformity were instantly rectified. The work plan was reviewed on a monthly, quarterly basis and adjusted accordingly. Quality Assurance Plan (QAP) was prepared from the start of the construction work and all tests were performed according to QAP.

On the other hand, Firm B was never serious about the work plan, although it submitted the plan that too upon several reminders by the DoR Regional Office concerned. While the firm had employed a senior and experienced project manager, he was not given the power to handle the site independently. The owner of the company controlled everything and there was no clear chain of command in the construction sequence and reporting. The activities were undertaken randomly without heeding to the work plan. The firm completely lacked resource allocation concept in achieving the project target. The project also suffered from the shortage of labourers, with the non-national labourers frequently deserting the work due to delayed payment.

Execution of Work by the Two Firms

The work started with the formation cutting from two ends with the aim to fast track the construction time. Alongside the formation cutting, Firm A also started collecting usable materials from the cutting area. The aggregates of various sizes were crushed from the crusher plant installed at the campsite. On the other hand, no appreciable progress was made by Firm B. There was frequent break-down of the old machines deployed for the formation cutting. Since the contractor was never serious about the work plan, there was no sequential undertaking of the planned activities and the execution was most of the time ad-hoc.
Various tests, as required by the contract provision and the technical specification, were done on the materials at site before use for the work. Mix design for concrete drains and walls were carried out well in advance as well as other pre-tests as per QAP by Firm A.

Firm A maintained proper sequencing of work flow such as starting the construction of concrete drain when about 50% of the formation cutting was done, preparation of sub-grade, laying of granular sub-base & wet mix macadam and laying of bituminous layers during the dry season. Whereas Firm B did not prepare the QAP and therefore, timely testing of materials could not be done. Random tests hampered the work progress. Further, the stone crusher was installed only towards the end of the contract period which severely delayed the completion of the project. In many cases, the site was left to the control of the Project Manager who did not have either the financial or physical authority with regard to the execution of various items of the work.

Conclusion

The construction of the 13 km road was completed one month ahead of the contract duration by Firm A. The total cost of the project was Nu. 185.527 million with 1.76% increase from the quoted amount. The minimal increase in cost was due to a few additional items of the work as a result of the site condition which could not be captured during the estimation. On the other hand, Firm B took long time to complete the work. The construction was completed after a delay of about 16.5 months for the quoted amount. The firm was levied a penalty of 10% of the quoted amount which is currently being recovered.

The work executed by Firm A did not require any major maintenance works to be carried out during the three years period apart from few slides as a result of heavy rainfall. Even after 4 years that the road had been put into various traffic loadings, no significant deterioration had been observed. In contrast, Firm B had to repair the base course and riding surface due to poor quality of the work it delivered. The maintenance cost was also high in its case as it had to repeatedly repair the pavement layers.

The contract was designed on "build and maintain". It included a defect liability period of one year and maintenance period of three years, both of which were quoted in the contract package. Hence, besides the delay, there was no additional cost implication.

4.1 Determining the Causes of Corruption Using SEM

In the absence of a plausible theory about the causes of corruption in the public road construction sector in Bhutan, an Exploratory Factor Analysis (EFA) was performed to determine the correlation among the variables in public road construction research dataset. EFA provides a factor structure (a grouping of variables based on strong correlations), thereby preparing the variables for use in SEM.

Factor loadings are of primary importance in EFA. 'Rotation' causes factor loadings to be more clearly differentiated which is necessary to facilitate interpretation. In this research, a 'Rotation' of 'Promax' was used as it is computationally faster than other 'Rotation' types. It can also handle a large set of data. In 'Factoring methods,' a 'Maximum Likelihood (ML)' method was deployed. ML maximizes the difference between the factors and provides model fit estimates.

Kaiser-Meyer-Olkin (KMO) test was performed to check the suitability of the data for EFA. The test measures sampling adequacy for each variable in the model and for the complete model.

Table 4: Kaiser-Meyer-Olkin test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.874
Bartlett's Test of Sphericity	Approx. Chi-Square	11985.392
	Df	528
	Sig.	.000

KMO returns values between 0 and 1. A rule of thumb for interpreting the statistics:

- KMO values between 0.8 and 1 indicate the sampling is adequate.
- KMO values less than 0.6 indicate the sampling is not adequate. This calls for exploration of remedial actions.
- KMO values close to 0 implies that there are large partial correlations compared to the sum of correlations. In other words, there are widespread correlations which will cause problem for factor analysis.

As shown in **Table 4**, KMO value of 0.874 indicates that the data is 'meritorious' for EFA. A significant result (Sig. <0.05) indicates that the matrix is not an identity matrix; i.e., the variables do relate to one another enough to run a meaningful EFA.

A communality is the extent to which an item correlates with all other items. Higher communalities are better. If communalities for a particular variable are low (between 0.0-0.4), then that variable may struggle to load significantly on any factor. In **Table 5**, low values in the "Extraction" column have been identified and then removed after examining the pattern matrix.

Table 5: Communality test of variables

Observed variable	Code	Communalities Initial	Communalities Extraction
• Print media as a source of information to access tender.	t2	1.000	.806
• Administrative procedures at contract implementation stage.	t4	1.000	.456
• Administrative procedures at letter of intent award stage.	a2	1.000	.883
• Administrative procedures at handing taking over stage.	a3	1.000	.840
• Administrative procedures at opening of bid stage.	a4	1.000	.907
• Inadequate level of commitment, diligence and professionalism from contractors.	a5	1.000	.632
• Inadequate actions/penalties are taken against contractors in case of failure to execute work as per contract agreement.	a6	1.000	.534
• Inadequate level of commitment, diligence and professionalism from the public officials.	a7	1.000	.591
• Unnecessary delay at award decision stage.	e1	1.000	.864
• Unnecessary delay at contract award stage.	e2	1.000	.871
• Unnecessary delay at submission of bid stage.	e3	1.000	.775
• There are no standard operating procedures (SoP) for monitoring and supervision.	pr5	1.000	.615
• The procedures to ensure checks and balance in making decision in all the stages of the road construction is ineffective.	pr6	1.000	.618
• Tender committee members collude to favor a particular contractor/supplier/consultant.	ei1	1.000	.722
• Tender evaluation criteria is designed to suit a particular contractor/supplier/consultant.	ei2	1.000	.640
• Personal relationship with the engineers help in getting contract in road construction.	st2	1.000	.540
• Undue influence by head of division/section.	ui2	1.000	.708
• Undue influence by Govt. Secretaries.	ui3	1.000	.679
• Undue influence in notice inviting tender	ui4	1.000	.731
• Undue influence in design and preparation of bid documents.	ui5	1.000	.740
• There is no proper verification of materials at the site as per the contract agreement.	sme1	1.000	.742
• There is no proper verification of personnel at the site as per the contract agreement.	sme2	1.000	.759
• Requirement of technical staff at site is not followed as per contract agreement by contractors.	sme3	1.000	.612
• There is no proper monitoring during contract execution.	sme4	1.000	.480
• False representation.	d1	1.000	.645
• Theft or substitution of materials.	d2	1.000	.598
• Fictitious vendors.	d3	1.000	.598
• Business firms involved in road construction generally engage in various types of corruption in order to compete effectively.	c1	1.000	.787
• For business firms involved in road construction, engaging in various corruption practices is a normal part of doing business.	c2	1.000	.704
• Business firms involved in road construction who do not engage in corruption will be at a competitive disadvantage compared to firms that do.	c3	1.000	.743
• It is a must to involve in corruption to get a contract.	c4	1.000	.710
• Trend of corruption in road construction.	c5	1.000	.743
• Corruption measures adopted by procuring agencies.	c6	1.000	.623

Extraction Method: Principal Component Analysis.

Factor structure is the inter-correlations among the variables that are used for test in EFA. Using the pattern matrix presented in **Table 6**, the variables were grouped into factors- more precisely, they "load" onto factors. It is a clean factor structure in which convergent and discriminant validitities are evidently demonstrated by high loadings within the factors, and without any major cross-loadings between the factors (i.e., a primary loading should be at least 0.200 larger than secondary loading).

Table 6: Pattern matrix

	Component									
	1	2	3	4	5	6	7	8	9	10
ei1	.907									
ei2	.882									
d2	.736									
d1	.722									
d3	.641									
st2	.636									
a4		.971								
a2		.935								
a3		.895								
sme2			.850							
sme1			.815							
sme3			.791							
sme4			.601							
ui2				.824						
ui5				.815						
ui3				.810						
ui4				.747						
e1					.947					
e2					.944					
e3					.868					
ct5						.870				
ct4						.842				
ct6						.749				
c1							.859			
c3							.793			
c2							.766			
a5								.777		
a7								.664		
a6								.620		
pr5									.721	
pr6									.691	
t4									.618	
t2										.912

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.
Rotation converged in 7 iterations.

Convergent Validity

Convergent validity implies that the variables within a single factor are highly correlated. This is evident by the factor loadings. Sufficient/significant loadings depend on the sample size of the dataset. **Table 7** outlines the thresholds for sufficient/significant factor loadings. Generally, the smaller the sample size, the higher the required loading. Regardless of sample size, it is best to have loadings greater than 0.500 and averaging out to greater than 0.700 for each factor.

Table 7: Significant factor loadings based on sample size

Sample Size	Sufficient Factor Loading
50	0.75
60	0.70
70	0.65
85	0.60
100	0.55
120	0.50
150	0.45
200	0.40
250	0.35
350	0.30

This study's dataset is comprised of 747 samples and all of the factor loadings are above 0.5.

Discriminant Validity

Discriminant validity refers to the extent to which the factors are distinct and uncorrelated. The rule is that variables should relate more strongly to their own factor than to another factor. Two primary methods exist for determining discriminant validity during an EFA. The first method is to examine the pattern matrix. Variables should load significantly only on one factor. If "cross-loadings" do exist (variable loads on multiple factors), then the cross-loadings should differ by more than 0.2. The second method is to examine the factor correlation matrix, as shown in **Table 8**. Correlations between the factors should not exceed 0.7. A correlation greater than 0.7 indicates a majority of shared variance (0.7 * 0.7 = 49% shared variance).

Table 8: Component correlation matrix

Component	1	2	3	4	5	6	7	8	9	10
1	1.000	.176	.369	.303	.317	.413	.334	.154	.380	-.028
2	.176	1.000	.191	.410	.294	.080	.304	.148	.251	-.049
3	.369	.191	1.000	.270	.270	.386	.409	.292	.335	-.078
4	.303	.410	.270	1.000	.398	.253	.413	.234	.255	-.145
5	.317	.294	.270	.398	1.000	.154	.280	.225	.242	-.067
6	.413	.080	.386	.253	.154	1.000	.372	.179	.203	-.128
7	.334	.304	.409	.413	.280	.372	1.000	.201	.255	-.061
8	.154	.148	.292	.234	.225	.179	.201	1.000	.198	-.111
9	.380	.251	.335	.255	.242	.203	.255	.198	1.000	.029
10	-.028	-.049	-.078	-.145	-.067	-.128	-.061	-.111	.029	1.000

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.

Using the methods described above for determining discriminant validity, variables are loaded significantly only on one factor in the pattern matrix and no cross-loadings existed. Further, there is no correlation greater than 0.7 in the component correlation matrix in **Table 8**.

Face Validity

As can be seen from the pattern matrix, similar variables load together on the same factor. Exceptional ones are easy to explain and label. Thus, the factors make sense.

Reliability

Reliability refers to the consistency of the item-level errors within a single factor or construct. Cronbach's alpha has been computed for every construct to test the reliability.

Table 9: Cronbach's alpha validity

Construct	Cronbach's Alpha
• Unfair practices – f1	0.859
• Lack of accountability – f2	0.935
• Inefficiency – f3	0.903
• Dishonesty – f4	0.778
• Poor supervision, monitoring and enforcement – f5	0.799
• Undue influence – f6	0.821
• Corruption – f7	0.834

Cronbach's alpha of all the constructs are above 0.7 which indicates that the factors are consistent.

As of this stage, the validation of the measurement instrument was adequately satisfied. In order to confirm the factor structure extracted in EFA, a Confirmatory Factor Analysis (CFA) was performed using AMOS 24. The results of CFA was used to evaluate the model fit of the measurement model to confirm the hypothesized structure.

Measurement Model

The measurement model in **Figure 14** comprise of 7 factors. Each factor is measured by a minimum of 3 to a maximum of 6 observed variables, the reliability of which is influenced by a random measurement error. Each of these observed variables is regressed into its respective factor. All the 7 factors are shown to be inter-correlated.

Figure 14: Hypothetical model
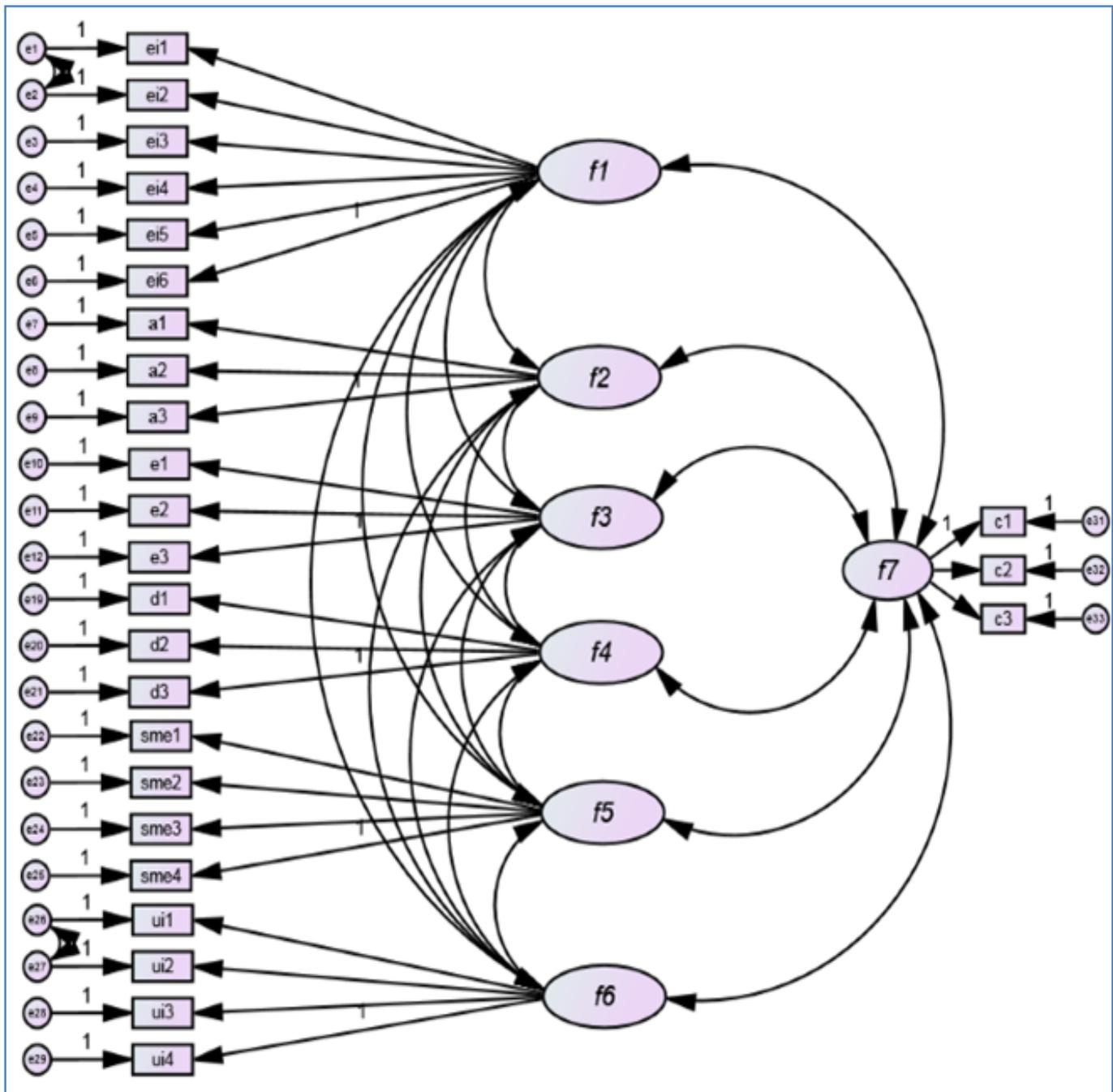
Model Fit

Model fit refers to how well the proposed model accounts for the correlations between the variables in the dataset. As per the cutoff criteria, it appears that there is a good fit.

Model Fit Measures

Table 10: Model fitness measures

Measure	Estimate	Threshold	Interpretation
CMIN (chi-square)	693.212	--	--
DF	276	--	--
CMIN/DF	2.512	Between 1 and 3	Excellent
CFI (comparative fit index)	0.961	>0.95	Excellent
SRMR (standardized root mean square residual)	0.054	<0.08	Excellent
RMSEA (root mean square of approximation)	0.045	<0.06	Excellent
PClose (P is a test of close fit, while P is a test of exact fit)	0.975	>0.05	Excellent

Cutoff Criteria

Table 11: Cutoff criteria

Measure	Terrible	Acceptable	Excellent
CMIN/DF	> 5	> 3	> 1
CFI	<0.90	<0.95	>0.95
SRMR	>0.10	>0.08	<0.08
RMSEA	>0.08	>0.06	<0.06
PClose	<0.01	<0.05	>0.05

Model Validity Measures

Table 12: Model validity measures

	CR (Composite Reliability)	AVE (Average Variance Extracted)	MSV (Maximum Shared Variance)	MaxR(H)	f1	f2	f3	f4	f5	f6	f7
f1	0.851	0.512	0.313	0.861	**0.700**						
f2	0.936	0.831	0.250	0.945	0.192	**0.911**					
f3	0.905	0.761	0.156	0.919	0.335	0.156	**0.872**				
f4	0.789	0.556	0.313	0.798	0.560	0.261	0.395	**0.746**			
f5	0.809	0.523	0.259	0.856	0.482	0.500	0.421	0.479	**0.723**		
f6	0.799	0.518	0.250	0.890	0.294	0.211	0.220	0.380	0.469	**0.719**	
f7	0.836	0.631	0.259	0.845	0.282	0.351	0.280	0.335	0.508	0.457	**0.795**

No validity concerns here.

Structural Model

The structural model shown in **Figure 15** has the hypotheses formulated. In total, there are 7 unobserved latent factors and 26 observed variables. These 26 observed variables function as indicators of their respective underlying latent factors.

Figure 15: Structural model – Hypotheses testing
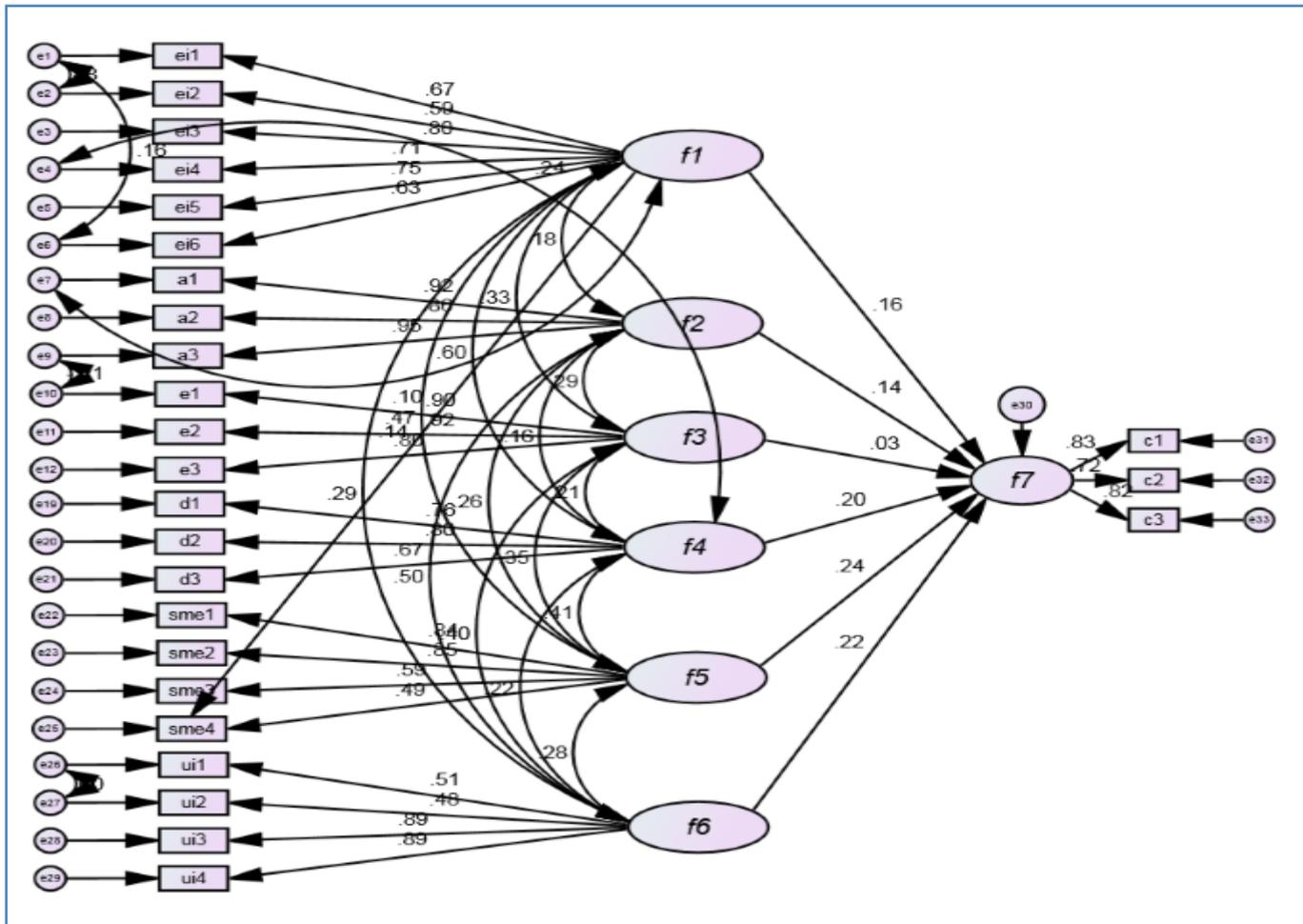
Standardized Regression Estimates of the Hypotheses Tested

Table 13: Standard regression estimates of the hypothesis tested

Sl. No.	Hypothesis	Path coefficient (value)	Supported/not supported
H1	Unfair practices cause corruption	0.16	Supported
H2	Lack of accountability causes corruption	0.14	Supported
H3	Inefficiency causes corruption	0.03	Not supported
H4	Dishonesty causes corruption	0.20	Supported
H5	Poor supervision, monitoring and enforcement causes corruption	0.24	Supported
H6	Undue influence causes corruption	0.22	supported

***Significant at 0.01 level

Except for h3, all other hypotheses are accepted as postulated.

Latent Factors and Observed Variables Coding

Table 14: Latent factors and observed variables coding

Latent Factor	Code	Observed Variable	Code
Unfair practices	f1	Tender committee members collude to favour a particular contractor/supplier/consultant.	ei1
		Tender evaluation criteria is designed to suit a particular contractor/supplier/consultant.	ei2
		The terms of the contract are relaxed to favour a particular contractor.	ei3
		The selection of contractors is not done by appropriate committee.	ei4
		Confidential information of bidding is disclosed to a particular bidder.	ei5
		Personal relationship with the engineers help in getting contract in road construction.	ei6
Lack of accountability	f2	How frequent is the abuse of authority in the following stages of road construction? (a) Opening of bids.	a1
		(b) Letter of intent to award.	a2
		(c) Handing taking over.	a3
Inefficiency	f3	There is unnecessary delay in the following stages of Public Road Construction. Please rate: (a) Award decision.	e1
		(b) Contract award.	e2
		(c) Submission of bids.	e3
Dishonesty	f4	Rate the frequency of the following types of corruption/wrongdoing in public road construction: (a) False representation.	d1
		(b) Theft or substitution of materials.	d2
		(c) Fictitious vendors.	d3
Poor supervision, monitoring and enforcement	f5	There is no proper verification of materials at the site as per the contract agreement.	sme1
		There is no proper verification of personnel at the site as per the contract agreement.	sme2
		Requirement of technical staff at site is not followed as per contract agreement by contractors.	sme3
		There is no proper monitoring during contract execution.	sme4
Undue influence	f6	Rate the frequency of undue influences by the following in road construction works: (a) Head of divisions/sections.	ui1
		(b) Government Secretaries.	ui2
		Rate the frequency of undue influences in the following in road construction works: (c) Notice inviting tender.	ui3
		(d) Design and preparation of bid documents.	ui4
Corruption	f7	How would you rate your level of agreement with the following statements? (a) Business firms involved in road construction generally engage in various types of corruption in order to compete effectively.	c1
		(b) For business firms involved in road construction, engaging in various corruption practices is a normal part of doing business.	c2
		(c) Business firms involved in road construction who do not engage in corruption will be at a competitive disadvantage compared to firms that do.	c3

4.2 SEM Determined Causes of Corruption: Key Findings

The following are the key causes of corruption in public road construction as determined by SEM:

4.2.1 Lack of Accountability

Accountability is central to tackling corruption as it formalizes the "expectations of action or behavior, creating sanctions for failure, enabling trust, and providing the motivation and incentives to use resources efficiently and effectively" (Cavill & Sohail, 2005 as cited in Sohail & Cavill, 2016).

Hence, accountability entails explaining and justifying actions against commonly agreed standards of effectiveness.

For the purpose of this research, the following were considered to assess accountability:

- Abuse of authority in general;
- Abuse of authority in various stages of road construction;
- Awareness of grievance redressal mechanism; and
- Satisfaction with the grievance redressal mechanism.

While the model test established abuse of authority in the stages such as in the opening of bids, letter of intent to award and handing-taking over, this does not mean that abuse of authority does not exist in other stages of road construction. **Table 15** demonstrates this.

Table 15: Percentage of response rating for abuse of authority in various stages of road construction

Process/stage	N=1178					
	Never	Rarely	Sometimes	Most of the time	All of the time	Don't know
• Needs assessment	1.3	5.2	29.6	22.2	33.7	8.1
• Feasibility study	1.4	5.0	28.0	20.7	37.5	7.5
• Clearance (forest, environment, public)	1.3	7.4	26.4	21.2	36.9	6.8
• Design and preparation of bid documents	1.6	4.0	14.4	19.5	53.6	6.9
• Notice inviting tender	2.1	3.1	10.2	13.0	64.8	6.8
• Preparation of bid documents by bidders	1.7	2.4	11.0	14.4	63.9	6.5
• Submission of bids	1.7	2.4	9.3	14.3	66.6	5.7
• Opening of bids	1.8	2.7	9.6	13.0	68.3	4.5
• Bid evaluation	1.7	4.7	16.5	16.7	53.5	6.9
• Award decision	1.6	3.7	12.9	16.7	60.0	5.2
• Letter of intent to award	1.3	2.8	9.9	14.0	66.5	5.5
• Contract award	1.3	3.3	11.7	13.6	64.8	5.4
• Contract implementation	0.8	4.0	17.4	19.5	53.6	4.7
• Contract supervision and monitoring	1.4	5.0	20.8	19.5	48.5	4.8
• Settlement of bills/invoices	1.1	4.4	15.8	20.4	54.2	4.1
• Handing-taking over	1.6	4.4	12.0	16.8	61.2	4.0
• Release of retention money	1.0	3.4	11.7	14.7	63.8	5.4

The existence of the abuse of authority in various stages of road construction was agreed most of the time and all of the time in the stages such as in the opening of bids (81.3%), submission of bids (80.9%), letter of intent to award (80.5%), release of retention money (78.5%) and preparation of bid documents by the bidder (78.3%). Similarly, ACC received 58 complaints related to abuse of authority in road construction.

In assessing accountability, this research also tried to assess whether the respondents were aware of the avenues for filing their grievances. 51.9% of the respondents said that they were aware while 48.1% said that they were unaware of such avenues.

Figure 16: Percentage of respondents indicating awareness of the avenues for filing grievances related to road contract
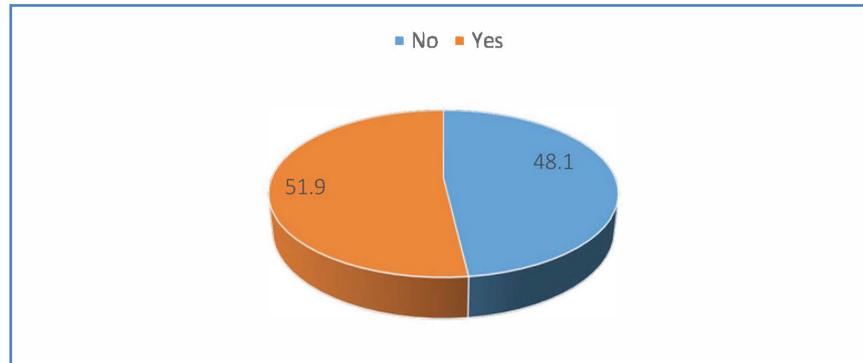
Mere awareness on the avenues of filing grievances may not portray a true picture of the existence of a proper accountability system. Thus, it is equally necessary to assess whether the respondents have used the avenues or not. 26% said that they have filed their grievances.

Figure 17: Percentage of response rating for filing of grievances related to road contract in the last two years (2015 and 2016)
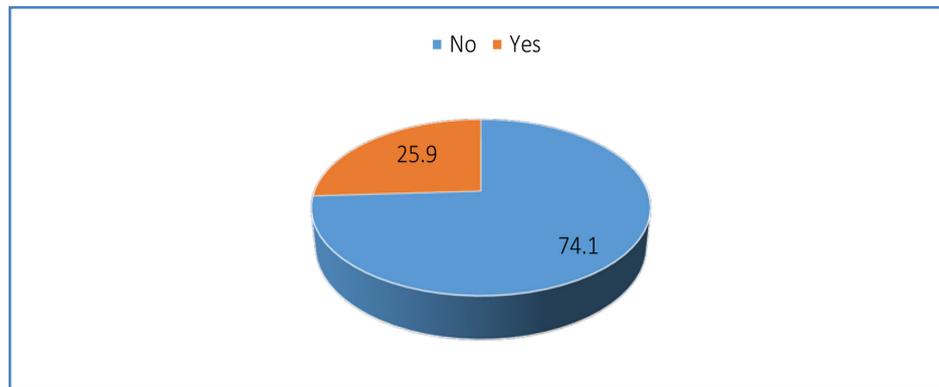
Being able to file grievances do not indicate the effectiveness and efficiency of grievance redressal mechanism. This has to be proportionately matched by delivery of fair and impartial redressal of the grievances.

Figure 18: Percentage of respondents' rating on satisfaction level with the grievance redressal mechanism
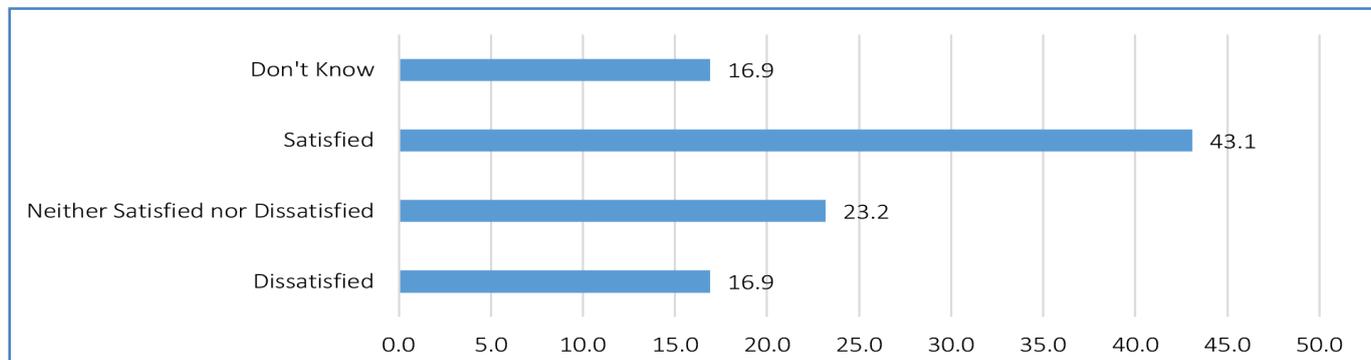
Figure 18 demonstrates the level of satisfaction expressed by those respondents who filed their grievances. 43.1% of those who filed their grievance expressed satisfaction with the grievance redressal while 16.9% expressed dissatisfaction.

4.2.2 Undue Influence

In many countries, road construction projects are faced with the challenge of political influence and pressure (Ware et al, n.d), affecting proper planning of road construction projects. RAA pointed out the implementation of several road construction projects that were not planned as well as the projects that were planned but not implemented.

As demonstrated by **Figure 19**, 1.6% agreed on undue influence by the Ministers, 0.9% by the Head of Divisions/Sections and 0.8% by the *Gewog* officials. Literature on corruption in construction projects reveal that "selection of road project is often heavily influenced by the politicians, who use their approval authority over the annual agency budget to pressure the procuring entity to insert their favoured projects into the budget proposal" (Ware et al, n.d). Also, FGD revealed the challenge of undue influence from highly influential public officials including the elected representatives resulting in the implementation of road projects that were not planned and shelving those that were planned. It was also revealed that even if the planned construction were undertaken, sizeable deviations from the original specification also take place under such influence resulting in cost and time overruns.

Figure 19: Percentage of response rating for undue influence by various position holders
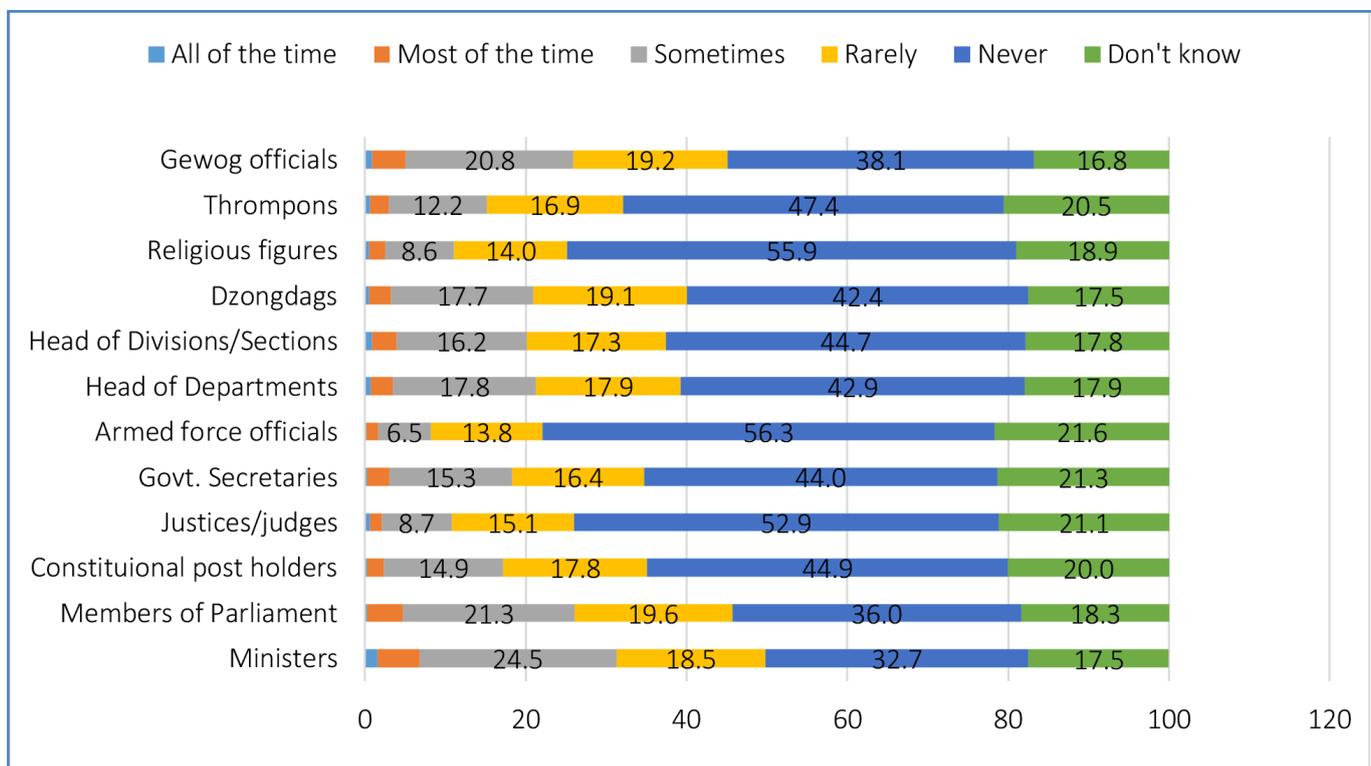
Although **Figure 19** shows undue influence by various post holders, SEM indicated undue influence by the heads of divisions/sections and heads of agencies as key indicators of lack of accountability. The research also explored undue influence in the different stages of road contract. As **Figure 20** demonstrates, undue influence are mostly observed, at low level, in stages such as needs assessment, feasibility study, clearance, design and preparation of bid documents (by government engineers), NIT, preparation of bid documents (by contractors), submission of bids and settlement of bills/invoices.

Figure 20: Percentage of response rating for undue influence in the various stages of contract

Legend: All of the time · Most of the time · Sometimes · Rarely · Never · Don't Know

Stage	All of the time	Most of the time	Sometimes	Rarely	Never	Don't Know
Release of retention money				9.0 · 13.8	52.9	21.1
Handing taking over				10.6 · 14.9	51.0	19.9
Settlement of bills/invoices				13.8 · 16.1	46.0	19.9
Contract supervision and monitoring				14.9 · 15.7	44.8	20.4
Contract implementation				15.9 · 16.5	44.6	19.9
Contract award				9.7 · 12.0	54.6	20.3
Letter of intent to award				9.0 · 12.4	54.7	20.9
Award decision				11.5 · 13.8	50.6	20.5
Bid eveluation				14.9 · 14.0	46.8	20.5
Opening of bids				9.2 · 12.2	54.9	20.7
Submission of bids				8.6 · 13.0	54.7	20.5
Preparation of tender by bidders				10.1 · 12.6	53.1	21.1
Notice inviting tender				9.2 · 12.9	53.9	20.6
Design and preparation of bid documents				13.1 · 14.5	47.1	21.2
Clearance (forest, enviornment, public, etc.)			22.2	18.4	35.5	17.4
Feasbility study			18.8	21.5	34.9	19.4
Needs assessment			21.8	20.2	32.9	18.8

4.2.3 Poor Supervision, Monitoring and Enforcement

Proper supervision, monitoring and enforcement is an essential aspect of undertaking any major contract such as the roads. This helps in realizing required quality and ensuring effective and efficient use of the limited resources.

In the context of supervision, monitoring and enforcement, the research assessed the following statements:

- Contractors acquire materials illegally;
- Contract clauses are not enforced strictly;
- No proper monitoring during contract execution;
- Frequent replacement of site engineers by the contractors hinder work progress;
- BoQ manipulated by misrepresenting the quantity;
- No proper verification of personnel (workers) at the site as per contract agreement;
- No proper verification of materials at the site as per contract agreement; and
- Requirement of technical personnel not followed as per contract agreement.

Figure 21: Percentage of response rating for the items related to supervision, monitoring & enforcement
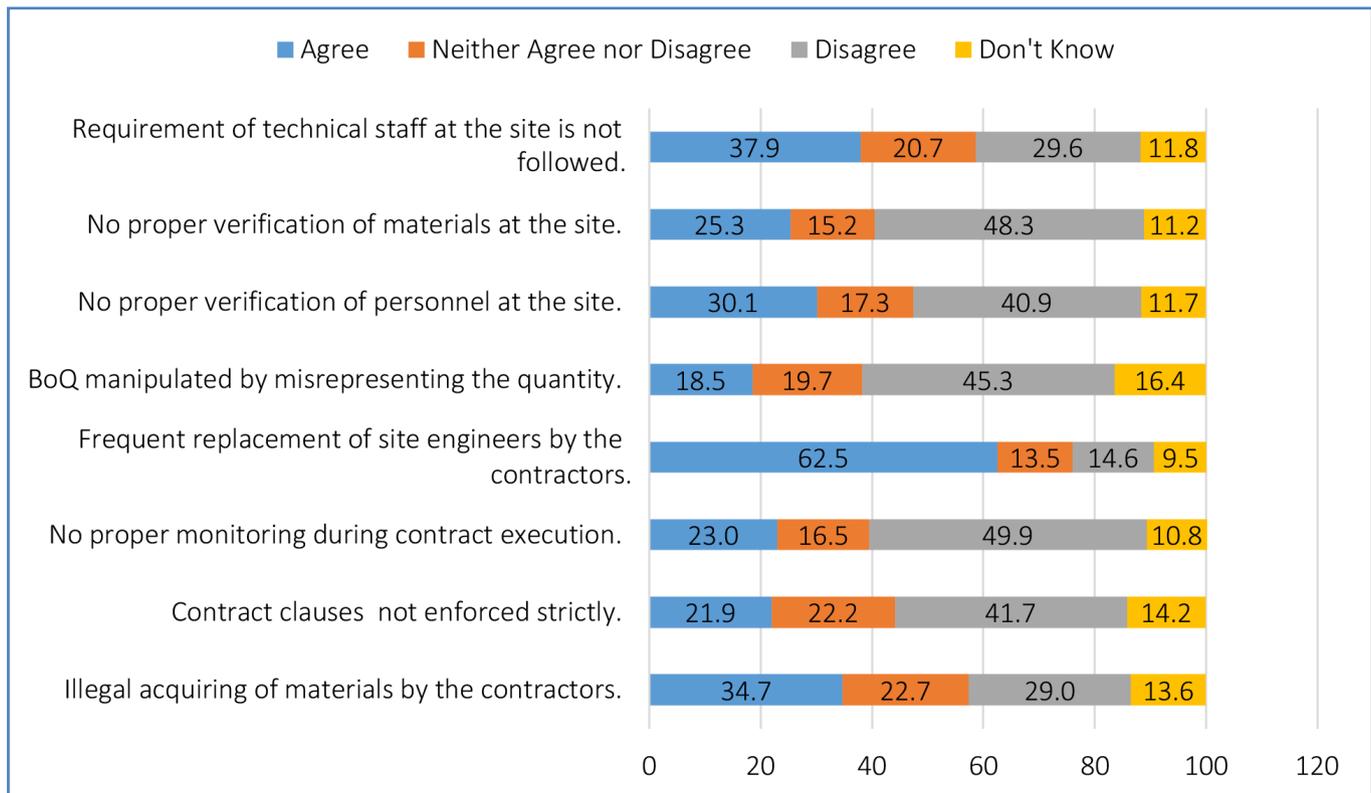
Figure 21 presents the percentage of response ratings for items related to supervision, monitoring and enforcement. It can be inferred from the figure that poor supervision, monitoring and enforcement results in frequent replacement of site engineers by the contractors, technical staff requirement not followed, illegal acquiring of materials by the contractors, no proper verification of personnel (workers), no proper verification of materials and so forth.

Frequent replacement of site engineers by the contractors is a serious issue raised by the procuring agencies. 62.5% of the respondents agreed that this is happening and is an issue of serious concern. Besides this research, FGD, the semi-structured interviews and consultative workshops also revealed that while the contract terms lay down specific requirements of site engineers for the contractors, it is not honoured by the contractors. Instead, they frequently replace the site engineers as they also had to cover other sites. Hence, a designated site engineer does not exist in the current scenario. As a result, the site engineers of the procuring agencies have to step in to fill the gap and in most cases, they land up working for the contractor leading to corruption and wrongdoings.

As shown in **Figure 21**, the research also confirmed that majority of the respondents (37.9%) agreed that the requirement of technical staff at the contract site were not followed by the contractors despite the contract terms. While government site engineers are bogged down with multiple sites for supervision and monitoring, the contractors may be exploiting this to their advantage to extract maximum profit at the expense of the quality of the contract.

The contractors acquiring materials illegally was also an issue. 34.7% agreed with the statement. This issue was also raised both at FGD and the consultative workshop. Although the contractors are to procure materials from the established commercial firms, yet they were found to be illegally using subsidized rural materials.

Poor supervision, monitoring and enforcement, as raised at FGD, semi-structured interviews and consultative workshops, was because of the shortage of engineers and this was further exacerbated, as raised by the engineers, by the heavy workload of the engineers. A recent study by CDB concluded that without strict and systematic monitoring of the construction sites by the procuring agencies, the issue of poor supervision, monitoring and enforcement would not be addressed. In the current scenario, there is no set number of works an engineer should handle. In the absence of this, engineers cited that they handle a minimum of 20 works which does not allow them to undertake proper supervision, monitoring and enforcement. This results in delivery of poor quality of works as they have to commit their time equally to the 20 works at hand. Similarly, the semi-structured interviews with the contractors confirmed that even if they repeatedly remind the engineers, it is difficult for them to be present at the site to monitor the execution of the works. The contractors also stated that at times when the inspection team from the headquarters are to come for inspection, the engineers inform them of their coming in advance and request the contractors to be present and appease the team.

ACC has also noted the issue of poor supervision and monitoring in road construction and communicated it to relevant agencies. The former Chairperson communicated the following to the Minister of MoWHS on 10th August 2006:

> ... One of the inherent problems at the construction site is poor supervision. While, the reason is always quoted as shortage of manpower, on the other hand, site supervision is not given due importance and adequate attention. Large projects worth millions are very often left in the hands of fresh and inexperienced site engineers, who besides the technical incapability cannot confront powerful and influential contractors. Unless we change this practice of keeping experienced engineers in the office and sending fresh engineers in the field, we will continue to have roads with potholes and buildings with leakages and crumbling walls.

However, even after more than a decade, this issue still persists.

4.2.4 Unfair Practices

Unfair practices are deeply embedded in the public road construction sector. It is mostly based on personal relationships and undue influence by higher authorities. The occurrences of such practices defeats the purpose of fair and competitive bidding that public procurement envisions to encourage and realize.

The research assessed the following unfair practices:
- Contract not awarded even after proper publicity and open competition;
- Adoption of pre-qualification of contractors restrictive, benefitting only few contractors;
- The selection of contractors not done by appropriate committee;
- Terms of contract relaxed to favour a particular contractor;
- Confidential information of bidding disclosed to a particular bidder;
- Large project split into several small projects and contracted without bidding; and
- Number of small projects bundled to favour a particular contractor.

Figure 22: Percentage of response rating for items related to unfair practices
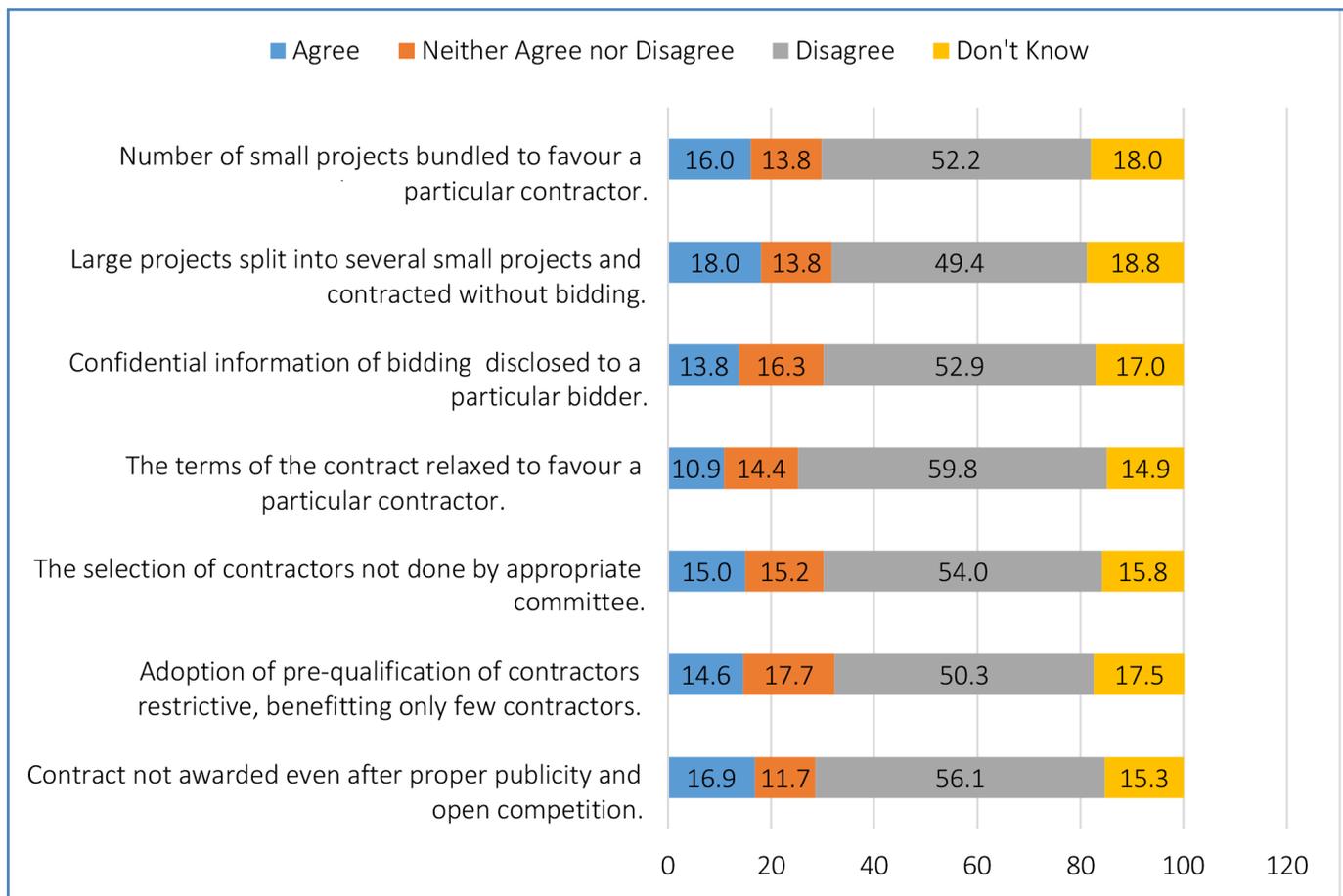
As demonstrated in **Figure 22**, unfair practices that exist in road construction, as agreed by the respondents, comprise of large projects split into several small projects and contracted without bidding (18%), contract not awarded even after proper publicity and open competition (16.9%), number of small projects bundled to favour a particular contractor (16%) and selection of contractors not done by appropriate committee (15%).

Similarly, unfair practices such as restrictive adoption of pre-qualification of contractors (14.6%), disclosure of confidential information (13.8%) and contract terms relaxed to favour a particular contractor (10.9%) were also agreed to be existing in road construction.

While the research acknowledges that the existence of such practices is relatively low, it also concludes that the agencies concerned should address such practices as these distort fair and competitive bidding. This finding is further complemented by the complaints about unfair practices that ACC received.

4.2.5 Dishonesty

"Corruption is dishonest behavior that violates the trust placed in a public official. It involves the use of a public position for private gain" (Ackerman, 2001). Dishonest acts distort fair and competitive bidding.

In the context of dishonesty, the research initially assessed the following:

- Fear of repercussion in reporting corrupt practices;
- Government engineers work for private consultancy firms;
- Abnormally high rated and high valued items not properly monitored and verified;
- False documentation by the contractors;
- Substitution of substandard materials;
- Site supervisor neglect duties after taking bribe;
- Site engineers demand output beyond the agreed standards to solicit bribes;
- Suppliers and public officials collude to inflate invoices;
- Tender committee members collude to favour a particular contractor/supplier/consultant;
- Tender evaluation criteria designed to suit a particular contractor/supplier/consultant;
- Contractors provide cash/kind/services to public officials to cover up the short-comings;
- Borrowing money/materials/vehicle by public officials from the contractors common;
- Exchanging favours by way of hiring vehicles/machineries owned by public officials and their relatives by contractors common; and
- Usual to exchange favours through 'unofficial payments'.

In the course of the modelling, SEM established the acts of dishonesty as false representation (documents), theft or substitution of materials and fictitious vendors as demonstrated in **Figure 23**.

Figure 23: Percentage of response rating for items related to dishonesty
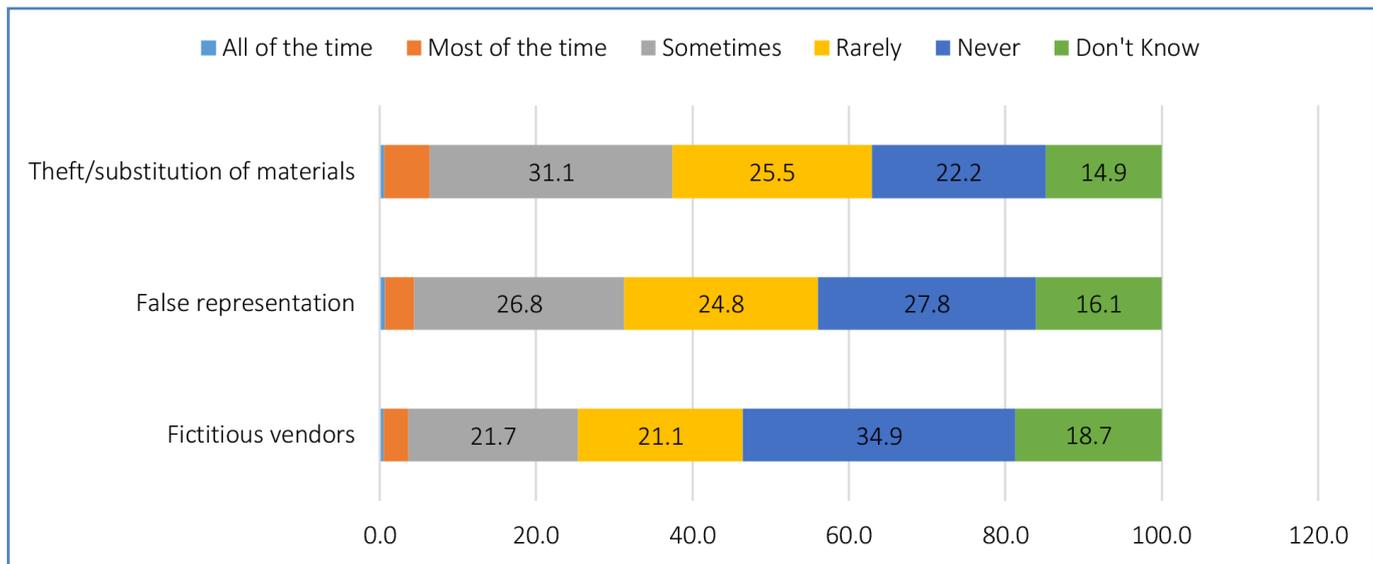
Substitution of materials was also an issue as agreed by 31% of the respondents. This was followed by false representation of documents (both by public officials and contractors) and fictitious vendors (both by public officials and contractors).

However, the acts of dishonesty, as initially assessed, are also issues of serious concern as presented in **Figure 24**.

Figure 24: Percentage of response rating for issues related to dishonesty
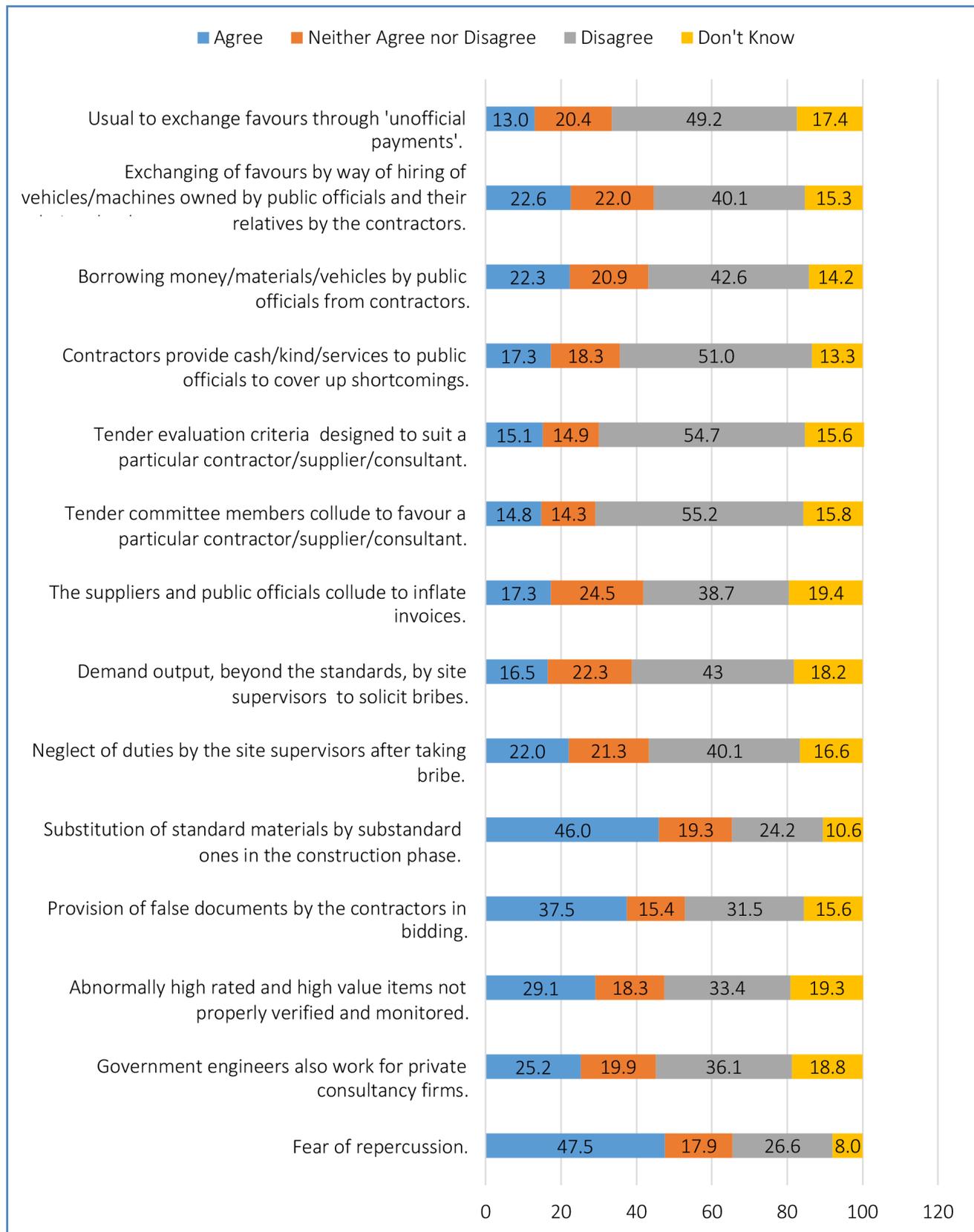
As presented in **Figure 24**, fear of repercussion for reporting corrupt practices tops the response (47.5%). FGD, semi-structured interviews and consultative workshop also confirmed this. This is followed by agreement on substitution by substandard materials (46%), contractors providing false documents in bidding (37.5%), changes in high value items not properly verified and monitored (29.1%), government engineers working for private consultancy firms (25.2%) and exchanging of favours by way of hiring vehicles/machines owned by the public officials and their relatives by the contractors (22.6%). Similarly, the existence of other acts such as public officials borrowing money/vehicles/materials from the contractors (22.3%), neglect of duties by the site supervisors after taking bribe (22%), inflation of invoices through collusion between the suppliers and the public officials (17.3%), provision of cash/in-kind/services by the contractors to the public officials (17.3%) and demand of output beyond the standards by the site engineers to solicit bribes (16.5%) were also agreed by the respondents.

4.3   Financial Implications of Corruption in Public Road Construction

Given the sensitive and hidden nature of corruption, it is difficult to calculate the financial implications of corruption despite several attempts by many scholars and anti-corruption experts. Those who attempted it used various parameters such as economic wealth, quality of governance and quality of institution (Rose-Ackerman, 1999) to derive the financial implications of corruption. Without the availability of reliable data, calculation of actual financial implications of corruption is difficult. Confronted with this challenge, this research attempted to estimate the financial implications of corruption rather than measuring the actual financial implications of corruption. In doing so, the financial implications of corruption were derived and extrapolated using the experience of corruption from the field survey (giving of bribes by the contractors and acceptance of bribes by the public officials,) RAA reports and GDP.

Experience of Corruption from the Field Survey

As stated above, there are two kinds of methods used to assess the experience of corruption from the field survey: supply and demand side of corruption. Generally, corruption exhibits in the form of supply and demand. These two concepts of corruption are further defined as: active bribery (supply side of corruption) which is focused on the person who pays bribe and passive bribery (demand side of corruption) focused on the person who receives bribe (Low, Lamoree and London, 2015). These two concepts of corruption are applicable to this research and also examines corruption from the point of view of the bribe payer and the receiver. However, this research further extends the concept of corruption to providing payment in-kind or services.

Supply Side of Corruption

Most of the scholars use field survey to estimate the frequency and value of cash payments and others such as in-kind or services to speed up service delivery (Mauro, 1995; Aidt, 2009). This research asked the contractors whether they have made payment in cash or in-kind or services to public officials to speed up the contract processes or to get the contract.

In turn, public officials such as engineers, committee members and others were asked whether they have received cash or payment in-kind or services from the contractors. These two concepts were used in gauging the experience of corruption.

As shown in **Table 16**, out of 297 contractors, only 10 admitted to having made payment in cash or in-kind and 11 revealed that they provided services to the public officials involved in public road construction. In terms of percentage, 3.4% and 3.7% of the contractors made payment in cash/in-kind or services respectively in the last five years in road construction. When asked on the experience of corruption, the respondents had to reveal whether they made payment in cash or in-kind or services. Many of the respondents opted to respond "No". This could be either due to the fear of repercussion for revealing the truth or that they did not want to report their experience.

Table 16: Number of contractors who made payments in cash or kind or services to public officials

Items	Frequency
Yes	10
No	287
Total	**297**

On an average, each contractor made payment in cash two times, in-kind once and in services, six times. An average amount of payment in cash and in-kind was calculated at Nu. 50,000 and Nu. 6,500 respectively and Nu. 56,818.18 for services provided by the contractors (**Table 17**). This matches with what the semi-structured interview with the contractors gathered where one respondent remarked, "*Sang tang go bay. Sang ma tang ba chin, la thob ba lakha dug*" (It is necessary to offer incense. Without making such an offer, it is difficult to get work). It is not only in getting the work that incense offering had to be made but also at the stage of handing-taking over where offering incense plays an even bigger role in accepting substandard, defective works. FGD with the contractors also raised that it was difficult to avail contract opportunities without providing payment in cash or kind or services. In fact, it appears that making payment in cash or kind or providing services is an accepted norm in availing contract opportunities.

Table 17: Frequency and value of cash, kind and services provided by the contractors

Items	"Yes" Respondent	Minimum	Maximum	Mean
• Frequency of cash payment	10	0	4	2.3
• Value of cash payment	10	0	250,000	50,000
• Frequency of in-kind provided	10	0	3	1.3
• Value of in-kind provided	10	0	35,000	6,500
• Frequency of services provided	11	1	20	5.64
• Value of services provided	11	500	500,000	56,818.18

Demand Side of Corruption

Public officials were asked whether they have accepted or received payment in cash or in-kind or services from the contractors. There were only 17 respondents (N=881) who admitted to having received payment in cash or in-kind or services (**Table 18**). Those who agreed comprised of engineers, committee members and AFD personnel while a majority of them avoided answering this question.

Table 18: Number of respondents who received cash or kind or services from the contractors

Response	Number of Respondent
Yes	17
No	864
Total	**881**

Thus, the research established strong linkage between the givers and receivers of payment in cash or in-kind or services. In general, the frequency and value received remain high as it was provided by the contractors. In terms of the frequency and value, cash is the most prevalent transaction (**Table 19**).

Table 19: Frequency and value of cash, kind and services received from the contractors

Items	"Yes" Respondent	Minimum	Maximum	Mean
• Frequency of cash received	17	0	4	1
• Value of cash received	17	0	150,000	20,117.65
• Frequency of in-kind received	17	0	10	1.35
• Value of in-kind received	17	0	40,000	4,447.65
• Frequency of service received	17	0	30	3.76
• Value of service received	17	0	30000	6294.71

4.4   Financial Implications of Corruption and Wrongdoings in the Public Road Construction Sector from RAA Reports

Given that it is hard to detect corruption, calculating the financial implications of corruption is difficult. To evaluate the financial cost of corruption or wrongdoings in public road construction, RAA annual reports were analyzed to calculate the average amount lost per year from 2010 to 2015.

As presented in **Table 20**, 32 types of wrongdoings, of varying amount totaling to Nu. 467.67 million with an average loss of Nu. 77.95 million, were detected in the public road construction over the last six years (2010 – 2015).

The average cost of corruption or wrongdoings, derived from RAA reports, were then extrapolated to calculate the cost of corruption or wrongdoings in road construction as a percentage of average GDP from 2010 to 2015. The average GDP contribution by the road sector for the period 2010-2015 was Nu. 11,325.40 million as shown in **Table 21**. The estimated loss to GDP as a result of corruption or wrongdoings was then derived by calculating the percentage of average amount lost per year from the average GDP of Nu.11.325.40 million.

Table 20: Amount lost to wrongdoings in the public road construction (in Nu. million)

Types of wrongdoings (2010 - 2015)	Amount lost (in Nu.)	Amount lost (in Nu. million)	Average lost (in Nu. million) per year	Estimated amount loss to GDP (in Nu. million)
• Acceptance of defective works and release of withheld money.	18,376,297.68	18.38	3.06	0.03
• Acceptance of substandard materials and inadmissible payment.	579,659.67	0.58	0.1	0
• Claim of new rates instead of old rates.	282,941.84	0.28	0.05	0
• Defects in bitumen sealing.	317,969.00	0.32	0.05	0
• Deficient planning and lack of coordination.	146,040,000.00	146.04	24.34	0.21
• Excess payment.	2,485,688.00	2.49	0.41	0
• Failure of execution of Gabion wall.	558,590.76	0.56	0.09	0
• Improper preparation of estimates.	36,609,000.00	36.61	6.1	0.05
• Inadmissible payment.	2,103,913.74	2.1	0.35	0
• Inclusion of general items of works as a separate item in BoQ.	16,595,602.00	16.6	2.77	0.02
• Irregularities in construction of base course and L-drain.	10,207,616.10	10.21	1.7	0.02
• Irregularities in execution.	95,932.24	0.1	0.02	0
• Irregularities in granting of time extension despite reduction of work scope.	4,966,898.00	4.97	0.83	0.01
• Lack of routine or timely maintenance.	138,737,928.14	138.74	23.12	0.2
• Manipulation of measurement for excess payment.	772,282.52	0.77	0.13	0
• Mismatch of quantity claimed and site measurement.	172,584.17	0.17	0.03	0
• No public benefit (One or two beneficiaries).	2,812,425.43	2.81	0.47	0
• No record of departmental execution.	50,298,288.49	50.3	8.38	0.07
• Non-application of rates.	180,315.84	0.18	0.03	0
• Non-execution of works as per technical estimate.	4,289,025.26	4.29	0.71	0.01
• Nonfulfillment of contractual obligations.	12,920,000.00	12.92	2.15	0.02
• Non-rectification of defective granular sub-base course (GSB).	1,011,189.96	1.01	0.17	0
• Non-rectification of defective works.	494,209.00	0.49	0.08	0
• Overpayment.	1,348,042.61	1.35	0.22	0
• Payments to project management and supervision consultancy resulting in wasteful expenditure.	3,738,000.00	3.74	0.62	0.01
• Refund on humanitarian grounds.	1,377,600.00	1.38	0.23	0
• Supply of wrong specification.	240,614.15	0.24	0.04	0
• Unjustifiable claim.	1,342,866.50	1.34	0.22	0
• Unjustified payment for hire of tripper truck.	549,448.00	0.55	0.09	0
• Unjustified payment for hourly hire charges of excavator.	3,536,753.41	3.54	0.59	0.01
• Unspecified and defective materials.	1,412,866.74	1.41	0.24	0
• Wasteful expenditure on reinstatement and restoration of public services.	3,217,966.00	3.22	0.54	0
Total	**467,672,515.25**	**467.67**	**77.95**	**0.69**

Source: RAA reports (2009-2015).

The average loss over the six years was summed up to get the total estimated loss which is the actual amount of financial implications of corruption or wrongdoings. Applying this method to the public road construction, GDP gain was estimated at Nu. 0.69 million as shown in **Table 20**. This means that had there been no wrongdoings in public road construction, an estimated Nu. 0.69 million would have been added to GDP over the past six years.

Table 21: Total estimated loss extrapolated over the six year period (2010 – 2015) (in Nu. million)

Year	Average GDP (2010-15)	2010	2011	2012	2013	2014	2015	Total estimated average loss by 2015	Total Estimated loss by 2015
• GDP contribution from road sector.	11325.4	6538.68	9973.51	11281.70	11886.86	13467.30	14804.10		
• Estimated loss in million.		45.12	68.82	77.84	82.02	92.92	102.15	78.14	468.87

Source: Authors' calculation based on GDP from NSB.

Based on GDP contributed by the road sector, total estimated amount lost to corruption or wrongdoings, over the six year period (2010 – 2015,) comes to Nu.468.87 million with an average estimated loss of Nu. 78.14 million per year as shown in **Table 21.** The efficiency and quality of road construction would have been affected due to these wrongdoings. If this amount had been monitored and utilized properly, 156 KM of farm roads would have been built to provide rural connectivity at the current Nu. 3 million estimated for one KM of farm road or 17 KM of highway estimated at the existing Nu. 28 million for one KM of highway.

4.5   General Assessment of Road Conditions

DoR has assessed the condition of roads in the country. As demonstrated in **Figure 25**, Bhutan has 104.39 KM of roads categorized in Condition A and 544.5 KM in Condition B. However, the majority of roads fall in Condition C and below.

Figure 25: Classification of roads by conditions

Condition E - Many large potholes, large cracks, wavy and undulations (201.53 KM)

Condition A - Perfectly smooth, no undulations (104.39 KM)

Condition D - Small potholes, rutting, wavy roads (231.35 KM)

Condition B - Good condition with small cracks and thin raveling, small undulations (544.5 KM)

Condition C - Significant cracks such as aligator cracks, longitudinal cracks, transversal cracks (847.25 KM)

Source: www.mowhs.gov.bt

In contrast to the existing poor perception of the condition of the roads, **Figure 26** shows that 56.3% of the respondents expressed satisfaction with the condition of the roads while 21.6% expressed dissatisfaction.

Figure 26: Satisfaction level of respondents with the general condition of roads in the country (%)
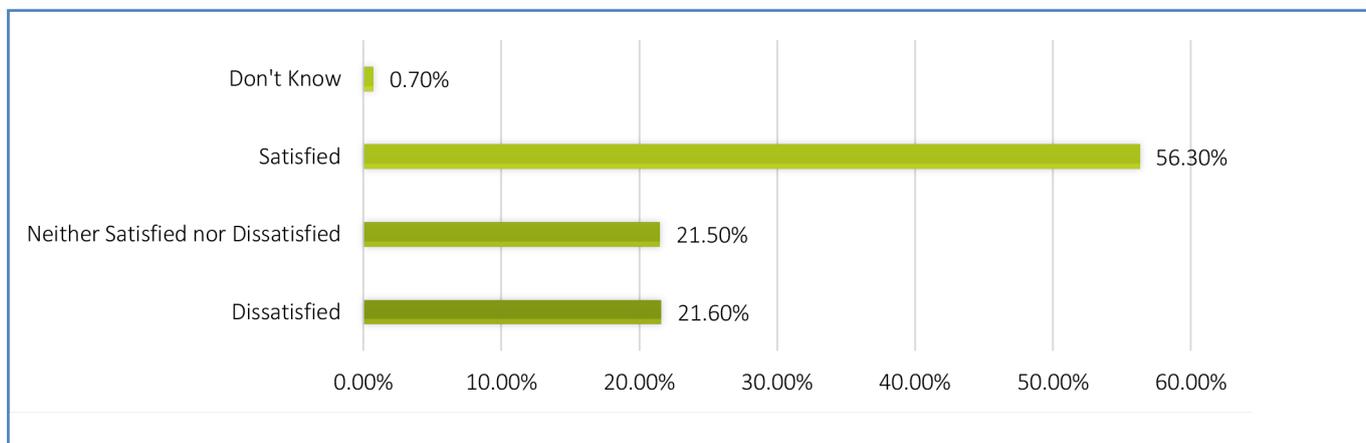
Rating the condition of the types of roads, 37.5% of the respondents rated the condition of farm roads as bad followed by *Dzongkhag*, *Thromde* roads and national highways (**Figure 27**)**.**

Figure 27: Satisfaction level of the respondents with the general condition of different types of roads (%)
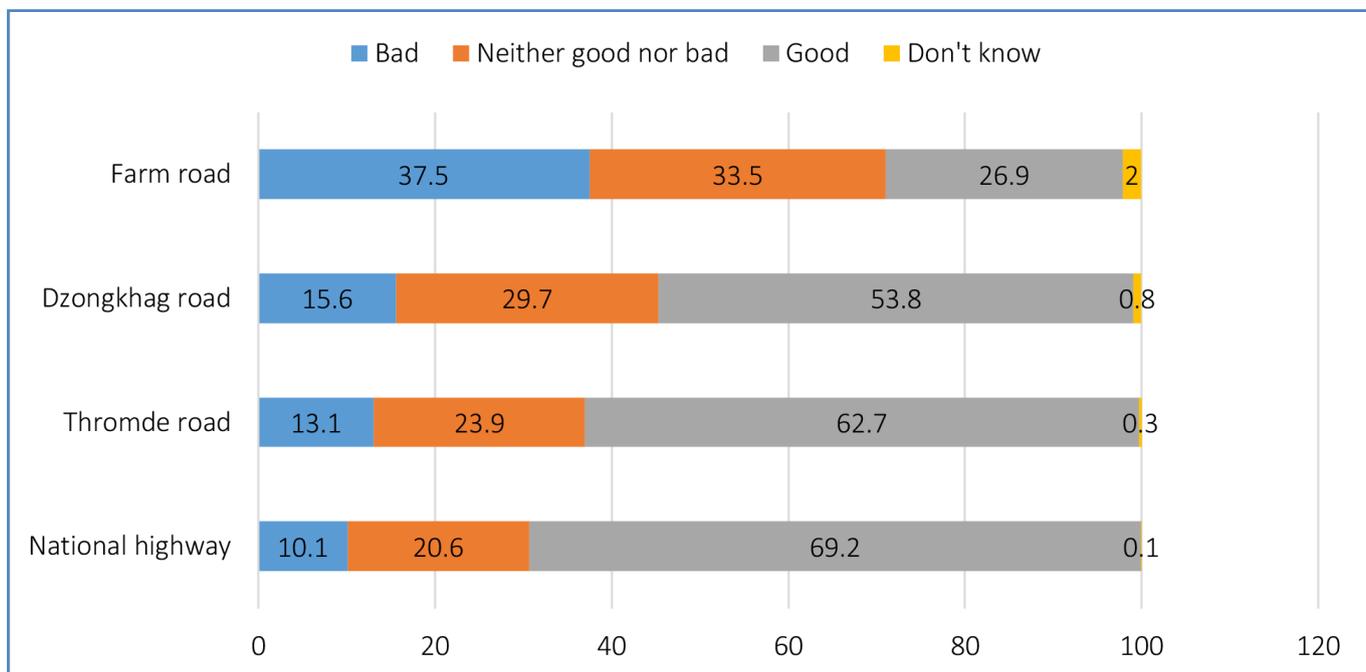
Extending the assessment of the road condition by *Dzongkhags* **(Figure 28)**, while dissatisfaction with the roads had been reported in all *Dzongkhags,* majority of the respondents from Thimphu, Chukha, Mongar, Pema Gatshel, Lhuentse and Sarpang reported dissatisfaction. Most of the respondents stated that they have to make do with what roads they were provided even if what they were provided does not serve the purpose. Unfortunately, potholed roads continue to define the condition of our roads whether *Thromde* or *Dzongkhag* roads or National Highways but by far the worst are GC and farm roads.

Figure 28: Satisfaction level of respondents with the condition of roads in their locality by Dzongkhags
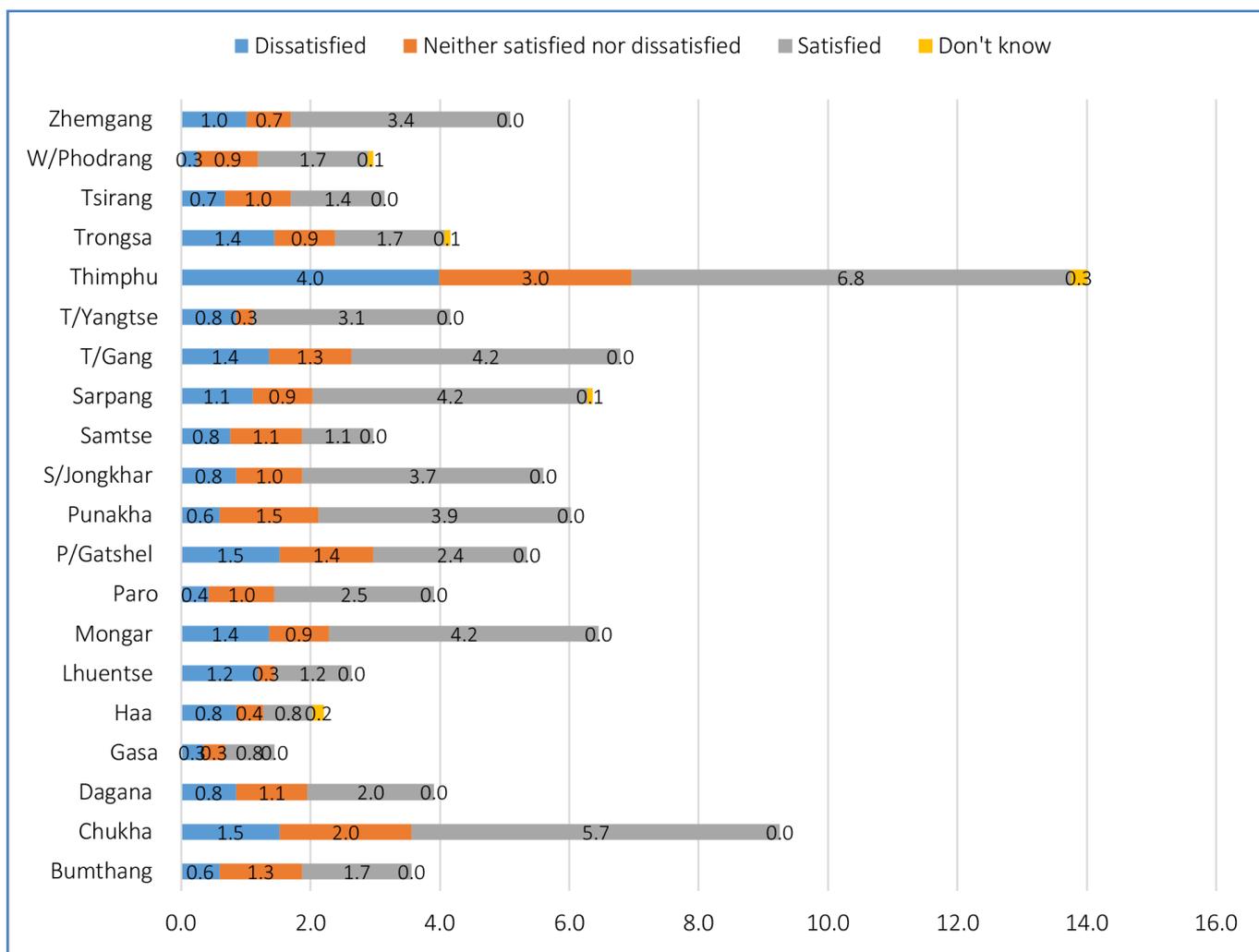
4.6   General Issues in Public Road Construction

4.6.1   Lack of Transparency

Studies on corruption state that the risks and opportunities are especially high when huge amounts of money, coupled with multiple transaction chains, is involved. Hence, transparency, as noted by Khun and Sherman (2014), has to pervade in all processes of the procurement cycle and include sharing of information on "laws, regulations, institutions, processes, plans and decisions to all the potential bidders and the public at large" by the government.

Higher levels of transparency is associated with lower levels of corruption (Peisakhin, 2012). Dirienzo etal (2007), in their study of corruption and the role of information, indicated that "the greater the access to information, the lower the corruption levels". Similarly, Bac (2001) states that "a higher level of transparency in decision making increases the probability that corruption or wrongdoing is detected".

Hence, promoting transparency is a key feature of public procurement which should, in the words of Ware et al (2006), "imbue the public with confidence that the government is providing legitimate services for citizens rather than increasing private wealth of government officials and narrow private interests". Hence, instituting proper transparency mechanisms and promoting it is indispensable for realization of value for money.

Thus, the research, in the context of transparency, undertook to assess the following:

- Freeness of information accessibility;
- Sources of information; and
- Simplicity of administrative procedures involved in the different stages of construction.

Figure 29: Percentage of response rating for freeness of information accessibility on road contract
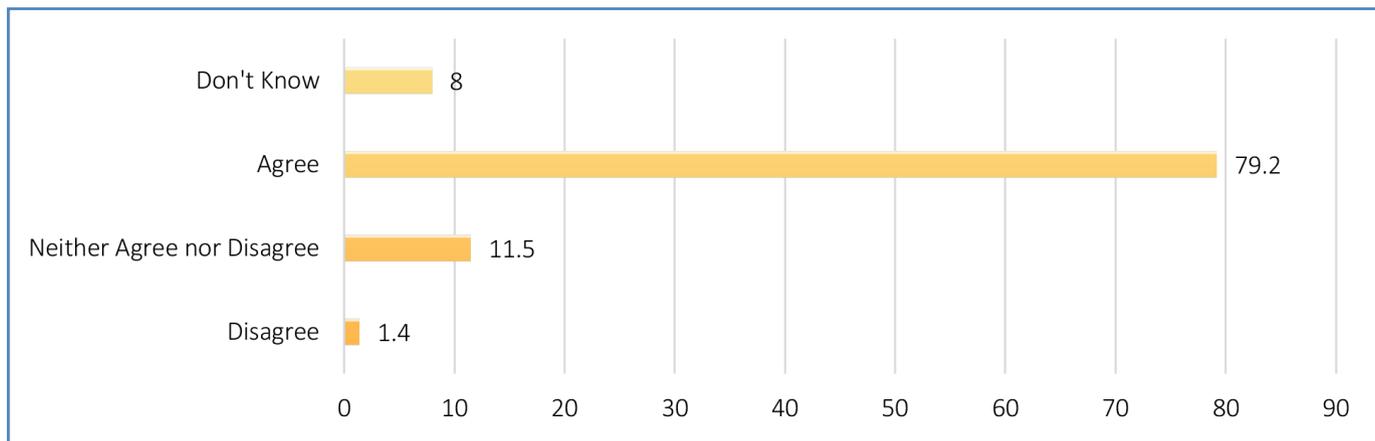
The research confirmed that freeness of information accessibility is not much of an issue as depicted in **Figure 29** as access to information is made available on all available medium of dissemination. This is further supported by **Figure 30**. However, when freeness of information accessibility was assessed by the annual income of the contractors, 2.1% of the respondents, with an annual income of Nu. One million and below, disagreed while those above Nu. One million agreed that the freeness of information was not an issue in accessing road contract opportunities.

In assessing the sources of information to access road contract opportunities, the respondents mostly relied on websites, TV, print media and radio. Given the close knit society, word of mouth was also a vital source of information that the contractors use to access road tender opportunities as shown in **Figure 30**.

Figure 30: Percentage of response rating for various source of road contract information
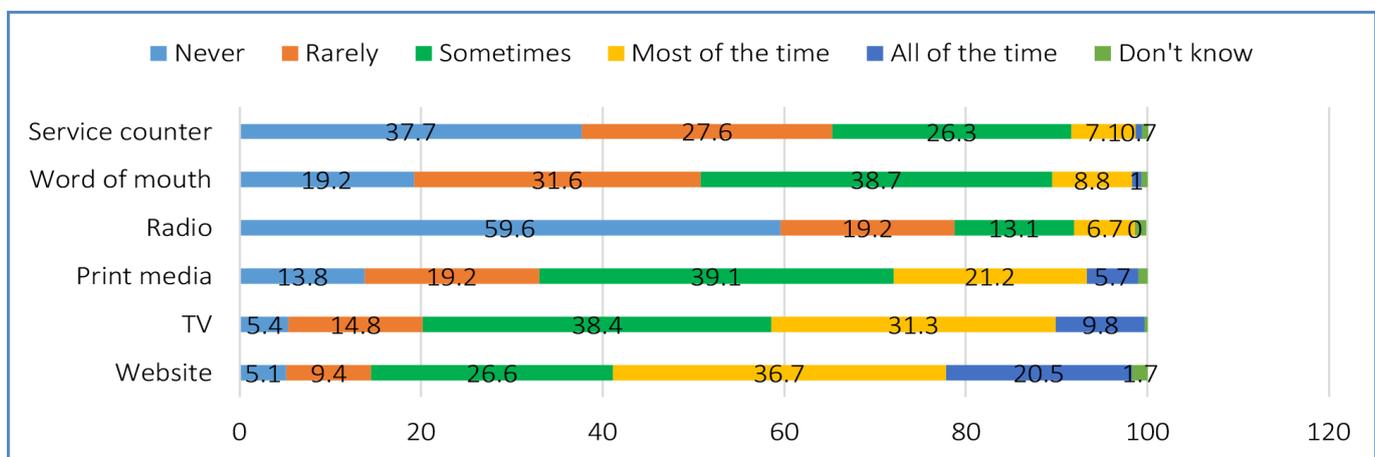
The simplicity of administrative procedures is one of the most important ways of assessing transparency. It is normally expected that the procedures be simple and easy to understand irrespective of the education level. The research gathered the views of those involved in road construction to get a synoptic assessment of transparency in the current systems and procedures in the different stages in road construction.

Figure 31: Percentage of response rating for simplicity of administrative procedures in the different stages of road construction
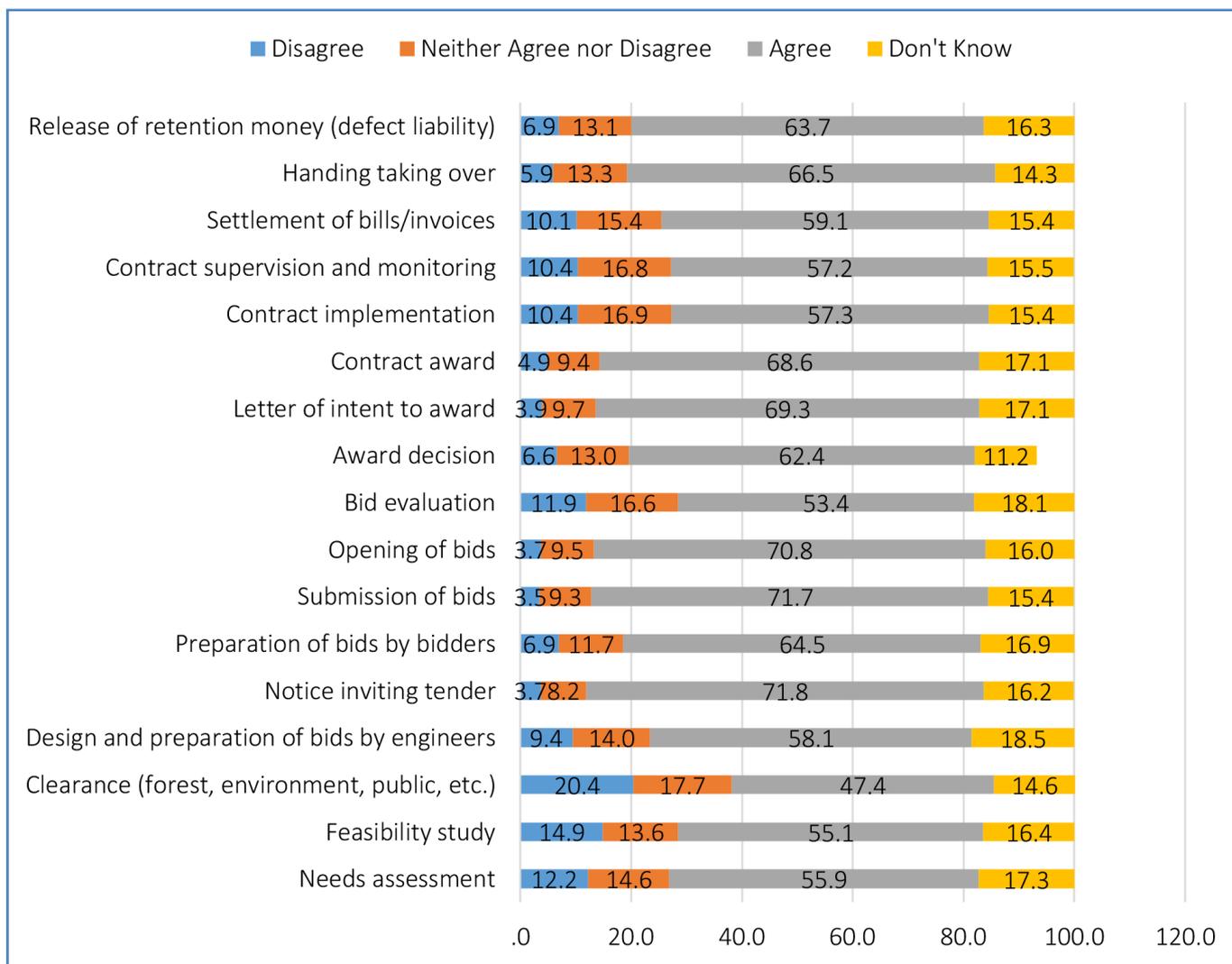
In general, it appears that the administrative procedures are simple and easy to understand. However, there were respondents who disagreed that the procedures are simple and easy for them to understand in the stages of clearance (20.4%), feasibility study (14.9%), needs assessment (12.2%), contract implementation and contract supervision and monitoring (10.4% each). Hence, it is important that the procedures in these four stages are made simple so that it provides a fair and level playing field for all involved while further maintaining and improving the procedures in the other stages; as complicated and difficult to understand procedures might deprive some contractors from taking part in the tender opportunities. Besides the risks and opportunities for corruption and wrongdoings associated with complicated procedures, promotion of competitive bidding and value for money cannot be achieved.

The research also used the following statements which are a mix of negative and positive ones, to seek the level of agreement or disagreement of the respondents as they experienced or saw the procedures while taking a part in contract opportunities. Although most respondents agreed on existence of transparency, there were also some respondents reporting either lack of or insufficient levels of transparency as **Figure 32** shows. This calls for further improvement so as to make it as transparent as possible.

Figure 32: Percentage of response rating on issues related to transparency
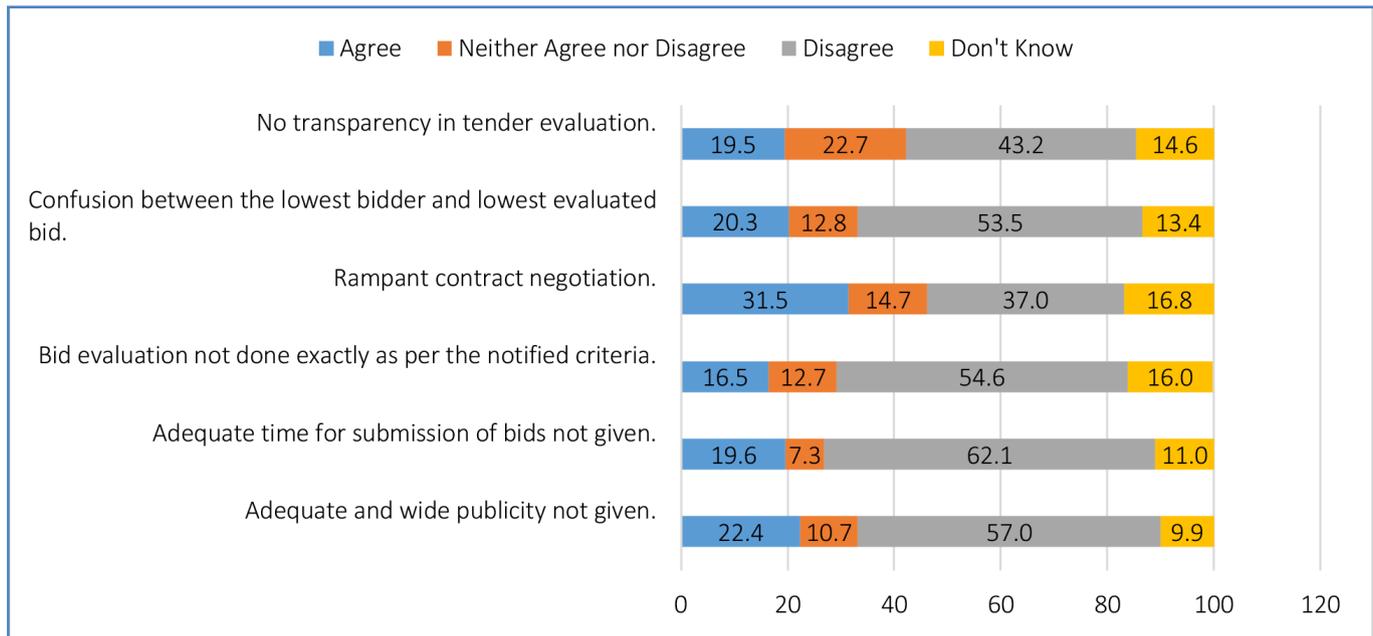
As shown in **Figure 32**, what comes out strikingly is that contract negotiation was rampant as agreed by 31.5% of the respondents. This is followed by adequate and wide publicity not given to the tender (22.4%), confusion between the lowest bid and the lowest evaluated bid (20.3%), inadequate time for submission of bids (19.6%) and no transparency in tender evaluation (19.5%). Other issues such as bid evaluation not done as per the notified criteria was also agreed by 16.5% of the respondents.

Figure 33: Percentage of response rating for items related to code of ethics and information availability
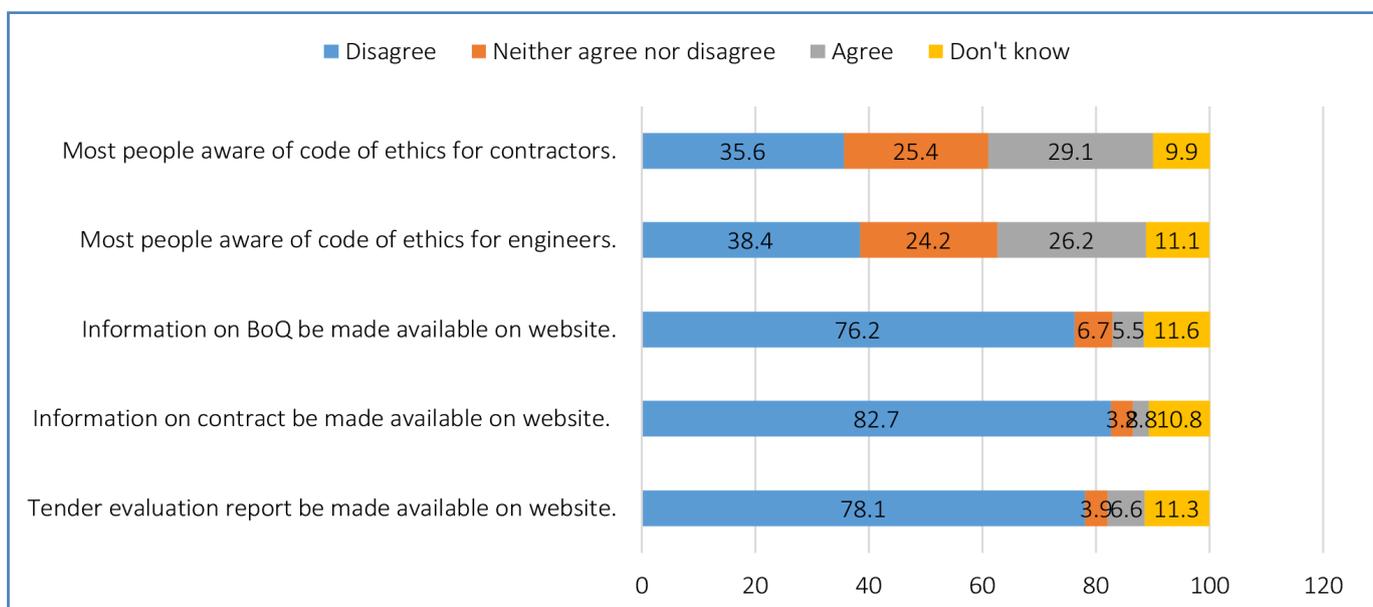
Figure 33 presents the percentage of respondents who agreed to the positive statements. In the figure, 29.1% of the respondents agreed that most people were aware of the code of ethics for the contractors. This is followed by 26.2% who agreed that most people were aware of the code of ethics for engineers. Although, the code of ethics exist for both the contractors and government engineers the unawareness expressed by the respondents, the bulk of which comprised of the contractors and government engineers, is worrisome. It singularly indicates that proper awareness and advocacy have not been carried out. Further, given the frequent physical interface between the engineers and the contractors, it is even more important that the code of ethics be advocated among them so that the risks and opportunities for corruption and wrongdoings are prevented.

4.6.2 Inefficiency

Efficiency is much talked about and is the key expectation in the use of public resources and the delivery of public services.

In the context of efficiency, the research considered the following:

- Unnecessary delays in the various stages of road construction;
- Duration taken to address grievances;
- Satisfaction with the grievance redressal mechanism; and
- Professional competence of the engineers/designers/consultants.

As shown in **Figure 34**, one can see mixed responses. However, it can be inferred that while unnecessary delay is not much in the way current processes are assessed by the respondents, there are also others expressing unnecessary delays in clearance, needs assessment, feasibility study, settlement of bills/invoices and contract implementation. While the National Environment Commission issues the environment clearance with some delays, respondents said that obtaining the clearance is an expensive affair altogether.

Figure 34: Percentage of response rating for unnecessary delay in various stages of road construction
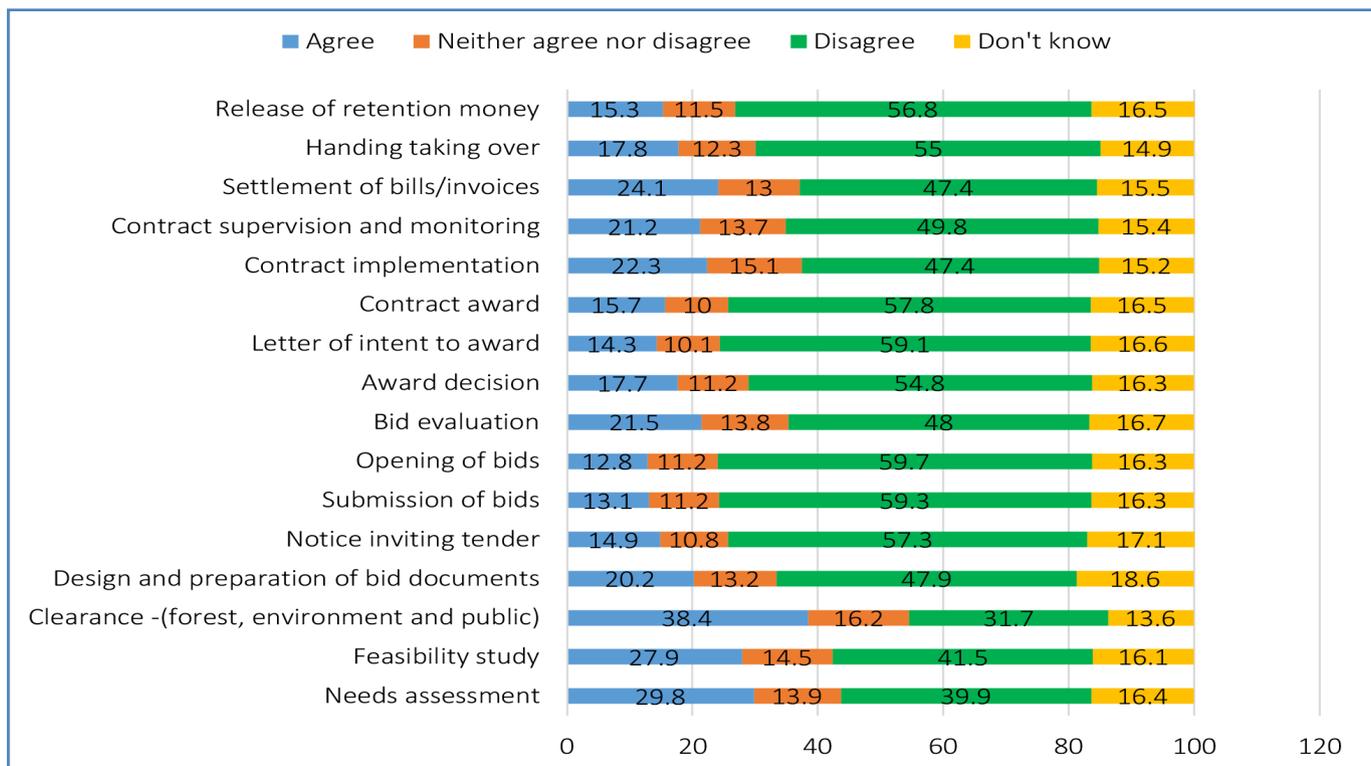
The time taken to settle the bills is another issue that was raised by the contractors during FGD. While the research confirmed that majority of the respondents (78.8%) agreed that the bill had been settled within 30 days as mandated by the rule, a few of them (8.1%) disagreed.

Figure 35: Percentage of respondents for time taken to settle bills
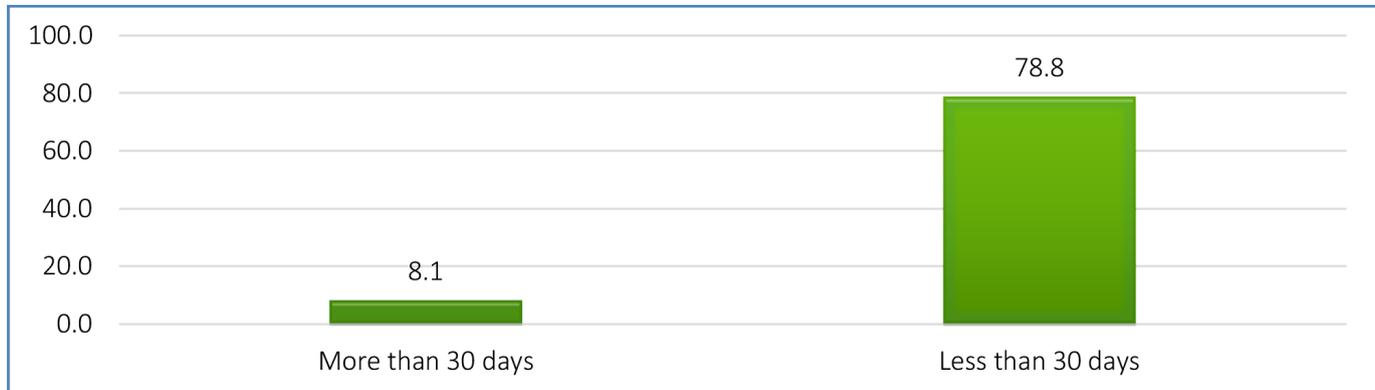
Assessing the duration taken to clear a bill by *Dzongkhags*, the delay in bill payment was reported in all *Dzongkhags*. However, a majority of the respondents from Thimphu and Chukha indicated that it had taken more than 30 days.

Figure 36: Percentage of respondents for time taken to settle bills by Dzongkhags
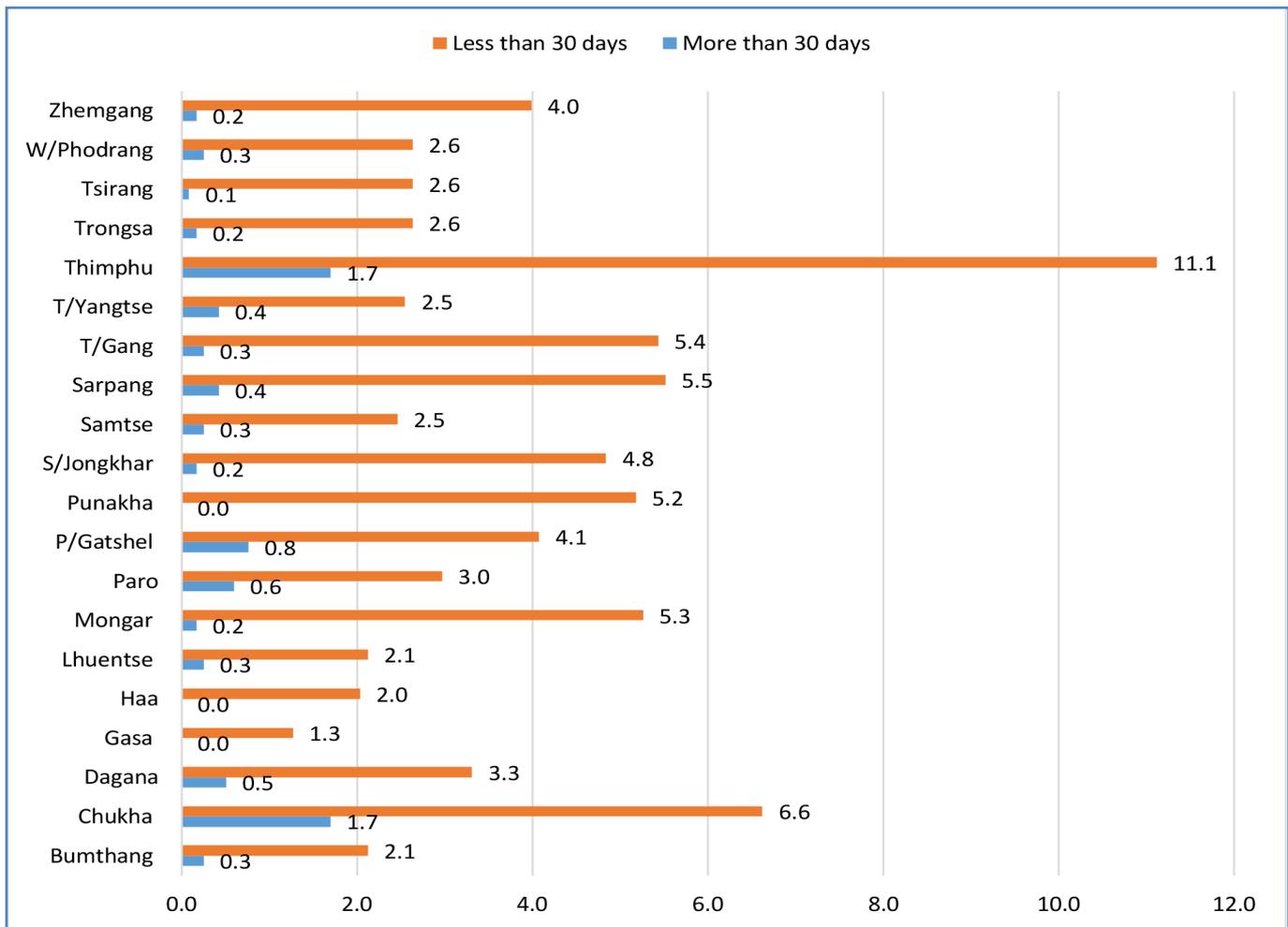
As shown in **Figure 37**, 45.8% of the respondents said that the procuring agencies informed them of the reasons for the delay while 49% said that they were not informed.

Figure 37: Percentage of respondents on whether they are given reasons or not for delay in settlement of bills
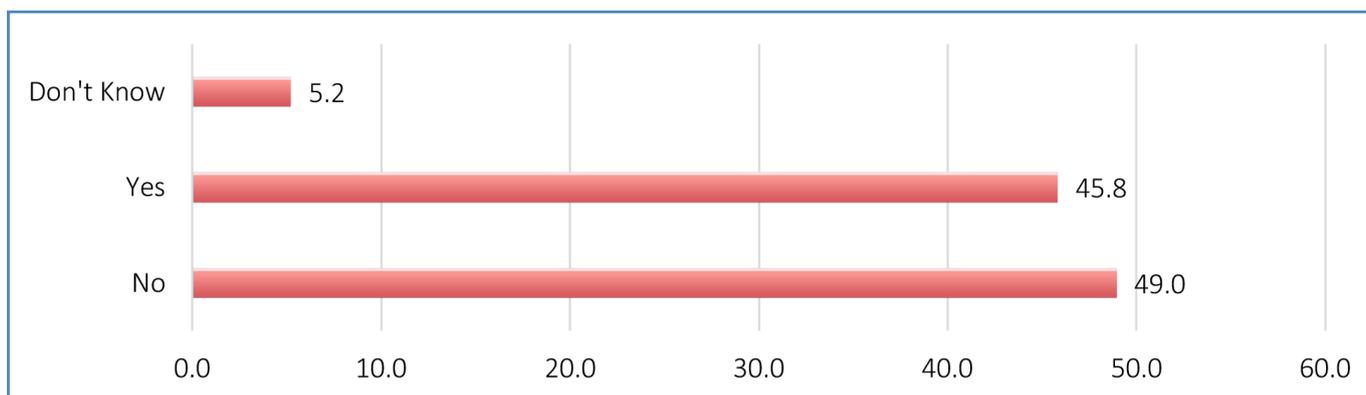
As part of assessing (in)efficiency, the research also considered the views of the respondents on whether the engineers/designers/consultants prepare designs that meet the specifications of the road. At FGD, it came out very clearly that the engineers/designers/consultants do not prepare designs that meet the specifications of the road. Semi-structured interviews with the engineers established that the shortage of manpower coupled with heavy workload and at times, lack of due diligence (copy paste) by the engineers result in designs that did not meet the specifications of the road. This issue is more pronounced in the Gewog Centre and farm roads which are poorly designed with steep gradients.

Figure 38: Percentage of response rating for the statement "engineers/designers/consultants prepare designs that meet specifications for the road"
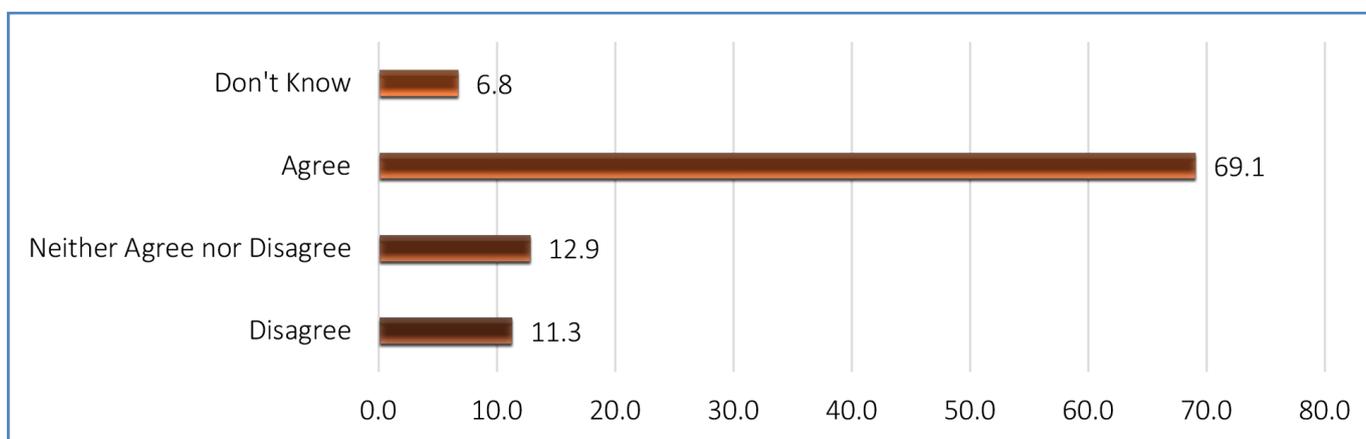
There is no denying the fact that contractors play an important role in road construction. It is the responsibility of the contractors to ensure that roads are constructed according to the specifications laid down by the procuring agencies. The research confirmed that while the respondents agreed that the contractors ensure construction of roads such as National Highway, *Thromde* and *Dzongkhag* roads as per the specifications prescribed by the procuring agencies, farm roads did not obtain a good rating. Instead, the disagreement rating for the farm roads was almost double than that of other types of roads revealing the poor image of farm roads and the consequent frustrations.

4.6.3 Flaws in Laws, Policies and Rules

Sound and well-designed laws, policies and rules are the vital requirements for any society and therefore should ingrain minimizing their vulnerability to corruption. In the context of the policies, laws and rules that govern procurement of road construction, it is even more important given the huge amount of investment coupled with the complex nature of work, involvement of complex bureaucratic procedures and multiple transaction chains.

The research considered the following to assess the flaws in the policies, laws and rules and regulations that govern public road construction:

- PRR;
- SBD;
- National wage rate;
- Material price index; and
- Bhutan Schedule of Rates.

What comes out strikingly and goes well with the established practice is that, as shown in **Figure 40**, there is an agreement that awarding the work to the lowest rate compromises the quality, hinders completion within the stipulated duration, escalates the cost and gives rise to unethical practices including corruption. CDB had noted that, for financial year 2016 – 17, 81.39% of construction works witnessed cost overruns and 64.53% went into time overrun. In fact, these are the two biggest challenges that the procuring agencies face (Rai, 2009).

This is closely followed by impractical national wage rate. FGD, semi-structured interviews and consultative workshops with the stakeholders, pointed out that at the existing national wage rate, it is very difficult to find and employ national labourers in road construction as it is much lower than the market rate. DoR also stated that it is difficult to find national labourers especially when undertaking departmental execution of road construction projects and when they do find a few, the national labourers are unwilling to work at the current prescribed wage rate. Thus, DoR has had to resort to practices such as manipulating the number of labourers so as to be able to pay them more.

Figure 40: Percentage of response rating on items related to issues in public road construction

Legend: ■ Agree ■ Neither Agree nor Disagree ■ Disagree ■ Don't Know

Item	Agree	Neither Agree nor Disagree	Disagree	Don't Know
Sub-contracting a major issue .	60.0	15.4	14.00	10.6
Escalation not applied correctly for payment.	31.1	24.0	24.2	20.7
Impractical BSR (2015).	39.4	19.4	20.1	21.1
Lack of material price index.	49.4	15.9	16.4	18.3
Mismatch between technical criteria and requirement.	42.8	21.0	20.7	15.5
Deviation provision improves quality and output.	24.2	19.9	41.6	14.3
Deviation provision provides risks of corruption.	44.7	18.00	23.9	13.4
Work to lowest rate leads to unethical practices.	62.5	13.8	13.5	9.0
Work to lowest rate leads to cost overrun.	65.5	12.1	14.6	7.8
Award to lowest rate leads to time overrun.	68.7	11.3	12.1	7.9
Award to lowest rate compromises quality.	75.6	7.8	8.9	7.7
20% creditline not used for said purpose.	27.3	23.9	23.8	25.0
The defaulting contractor penalty inadequate.	30.3	16.2	42.1	11.4
Historical documents definition not clear.	33.8	20.8	21.5	23.9
National wage rate impractical.	76.5	6.6	8.7	8.1
Technical score be weighted in award.	8.6	10.5	60.9	20.00
Loopholes in rules promote corruption.	32.7	21.6	27.0	18.7
PRR (2015) simple and easy.	13.3	17.2	42.6	26.8
SBD (2015) simple and easy.	14.6	16.5	43.6	25.4
Flaws in the SBD.	26.4	14.3	34.7	24.6

Sub-contracting is a major issue dominating road construction and has been validated by the research. As **Figure 40** shows, 60% of the respondents agreed that it is a major issue. Section 6.3.5.1 of PRR allows for sub-contracting of 20% of the total value of contract but this provision seems to have been exploited. It was shared by the respondents that despite this ceiling, there have been times when the contractors sub-contract the whole contract. While it is prevalent in all parts of the country, it is severe in the bordering regions where it is sub-contracted to non-Bhutanese. Although, PRR does not define the requirement of nationality in sub-contracting, the procuring agencies are required to define nationality in sub-contracting in the bidding documents and contract terms. However, incidences of sub-contracting the whole contract to foreign nationality in the bordering towns are raised by the respondents. The 8th Engineering Conference recommended that sub-contracting be permitted given the need to promote specialized trades. MoWHS and MoF said that the issue of sub-contracting will be resolved with the adoption of specialized trades which is currently being worked on.

The other issue that came to the fore was the system of awarding contracts. FGD, semi-structured interviews and consultative workshop raised the need to include technical score in determining the award although this did not match with the survey results. The respondents said that the current award assessment, that is based on lowest evaluated bid (90% financial and 10% technical), is no better than the lowest rate bid. They also felt that the current system of bid evaluation in e-tool, although designed with the best intentions, has issues of selecting the wrong contractors in terms of technical expertise.

Further, as indicated by 27.3% of the respondents, the current credit line facility is not serving its intended purpose. Given that the need and timeline for advances are clearly specified in PRR, the credit line is still given 20% weightage in the final award. Moreover, access to credit is not a problem given the easy access granted by the financial institutions. On the other hand, the procuring agencies raised the fact that the contractors do not make use of the credit line at all but instead go after the engineers and accounts personnel to pass their bills. Further, given the entitlement in the rule of 10% mobilization advance and 75% material advances of the total value of materials brought at site, instances of contractors not coming to the site for months after availing such advances were also raised.

The bulkiness of SBD was also raised. FGD, semi-structured interviews and the consultative workshop pointed out that the bulkiness of SBD does not allow for ease of understanding even for the serious practitioners. Hence, the need for revisiting SBD and incorporating relevant requirements were suggested so that it promotes genuineness and seriousness on the part of the engineers as well as the contractors.

Lack of a material price index was another important issue pointed out by the respondents. In its absence, Bhutan follows the Indian Wholesale Material Price Index which, the respondents said, was inapplicable given the different geographical terrain. While NSB was to develop a material price index, to date it has been unable to do so due to lack of relevant expertise.

The rules provide for deviation to the maximum of 20%. However, despite the best intentions, this provision seems to be misused and exploited by both the officials of the procuring agencies and the contractors. Instances of deviation going beyond the prescribed amount were also indicated by the respondents. Literature on construction states that the provision for deviation provides risks and opportunities for corruption and wrongdoings.

4.6.4   Flawed Procedures

A well-established procedure is an important requirement in any organization and serves to provide systems of check and balance.

For the purpose of this research, the following processes were considered:

- Convenience of signing of IP in person;
- Reasonable technical requirements;
- Availability of standard operating procedures;
- Effectiveness of ensuring checks and balance in decision making;
- Consistency of tendering process across the agencies; and
- Relevance and competency of tender evaluation committee.
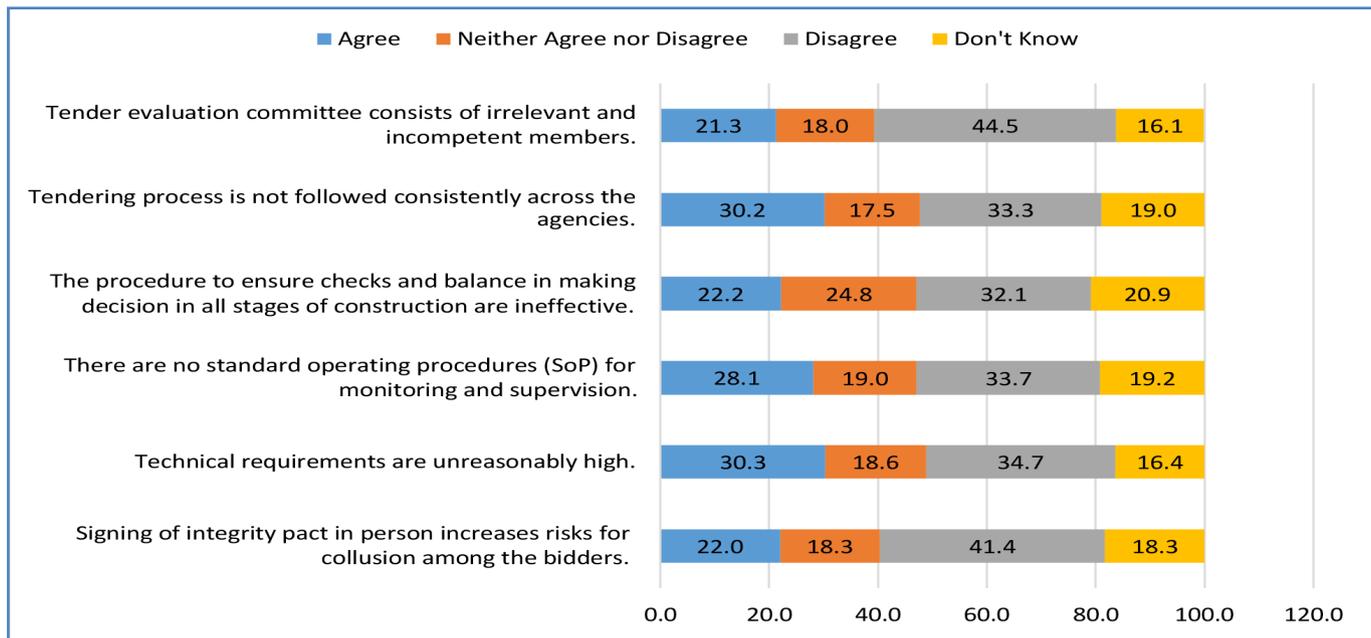
A general glance at **Figure 41** reveals that while most of the respondents disagreed with the statements on procedural flaws, there were others who agreed that there are procedural flaws in road construction.

Signing of IP in person is an important requirement in availing any contract opportunity and is included with a noble intent. However, it has its own share of risk such as collusion which was pointed out at FGD and semi-structured interviews. 22% of the respondents agreed that it provides opportunities for collusion while 41.4% disagreed. For instance, a bidder from Trashigang can send a taxi driver or someone very close to the bidder to sign the IP and then submit it to the procuring agency based in Thimphu. This wrong-doing breaches and defies the fundamental intent of integrity because the signed pact does not represent the truthfulness of the bidder given that it was signed on his or her behalf by a taxi driver. Even if the bidders themselves come in person, possibilities are very high that, at the time of submitting the signed IP, the bidders come to know who are bidding and would collude among themselves.

Research on construction point out that setting of unnecessary technical requirements is not only unwarranted but also obstructs fair competition and increases risk of collusion. Thus, setting technical requirements that is not too taxing on the contractors but as genuinely required by the nature of the contract is of utmost importance. Procuring agencies setting unreasonable technical requirements, irrespective of the contract requirement, was raised at an FGD with the contractors. However, in the survey, only 30.3% of the respondents agreed while 34.7% disagreed that technical requirements are unreasonably high.

Human resource constraints is the most cited reason for having a member sit on two or more related committees especially in the *Dzongkhags* and DoR regional offices. While the institution of the committees is intended to provide checks and balances in the system, having the same person sit in two or all such committees may lead to biased tender decisions. As stated in the demographic profile section, 2.6% of the respondents were members of opening and evaluation committees, 2.8% of opening, evaluation and award committees, 1.7% of opening and award committees and 0.4% of evaluation and award committees.

Moreover, it appears that engineers may not be needed in the opening committee as it does not require their technical competencies if a checklist of documents required for bid submission had already been prepared. However, their skills and competencies are required in the evaluation and award committees and hence justifies their presence. The research found that 12% of the engineers sit on the opening committee.

Evaluation serves as the basis for award of the contract. It is crucial for sound decision making for the award of the contract. Thus, it is necessary that the members for this committee be appointed from a pool of relevant and competent personnel.

The process for monitoring and supervision by the government site engineers should be guided by standard operating procedures (SOP). Without a SOP, the site engineers undertake their responsibilities in an unplanned manner which may cause inconveniences to both the procuring agencies and the contractors. The government engineers (12.9%) also acknowledged that there is no SOP for monitoring and supervising the contract works. Further, the current SOP for DoR engineers is not comprehensive. It only lays down the number of engineers that are required for given lengths of road construction.

Mere institution of checks and balance in the procedures for decision making do not serve the purpose. It has to be effectively implemented. The ineffectiveness of the checks and balance in the procedures in decision making was raised by both the engineers and the contractors. However, in the survey, only 22.2% agreed while 32.1% disagreed that it was ineffective. Given the huge investment and complex nature of road construction, it is necessary that effective checks and balance for decision making be instituted which otherwise will provide for opportunities and risks for unethical practices to creep in.

At the consultative discussions with the relevant stakeholders, it was raised that different procuring agencies adopt different tendering processes which is not in line with the rule. However, in the survey, only 30.2% agreed while 33.3% disagreed that this was the case. Uniform tendering processes will not only minimize wastage of limited resources but also minimize the risks and opportunities of corruption and wrongdoings.

4.6.5   Lack of Proper Coordination among Agencies Concerned

Given the involvement of multiple agencies in road construction, effective coordination is important for the success of road projects. It helps to mitigate the fragmentation dilemma (Alaloul, Liew, & Zawawi, 2016; Lavikka, Smeds, & Jaatinen, 2015) and improve the performance of the ministries, departments/division, regional offices and contractors through proper sharing of information. It determines the success of the projects in terms of quality, cost and time.

A study conducted by Andy NY and Price (2010) revealed that poor communication leads to unclear job duties and fails the coordination process. Therefore, it is essential to coordinate information sharing to integrate inter-organizational knowledge throughout the construction processes (Lavikka, Smeds, & Jaatinen, 2015).

In the context of coordination, the research considered and assessed the following:
- Interpretation of PRR by different procuring agencies;
- Interpretation of SBD by different procuring agencies;
- Budget release;
- Acknowledgement of lowest evaluated bid by RAA and ACC;
- Sharing of information;
- Coordination among the relevant departments/divisions of MoWHS;
- Coordination among relevant government agencies; and
- Communication by the procuring agencies to the contractors.

Figure 42: Percentage of response rating on items related to coordination
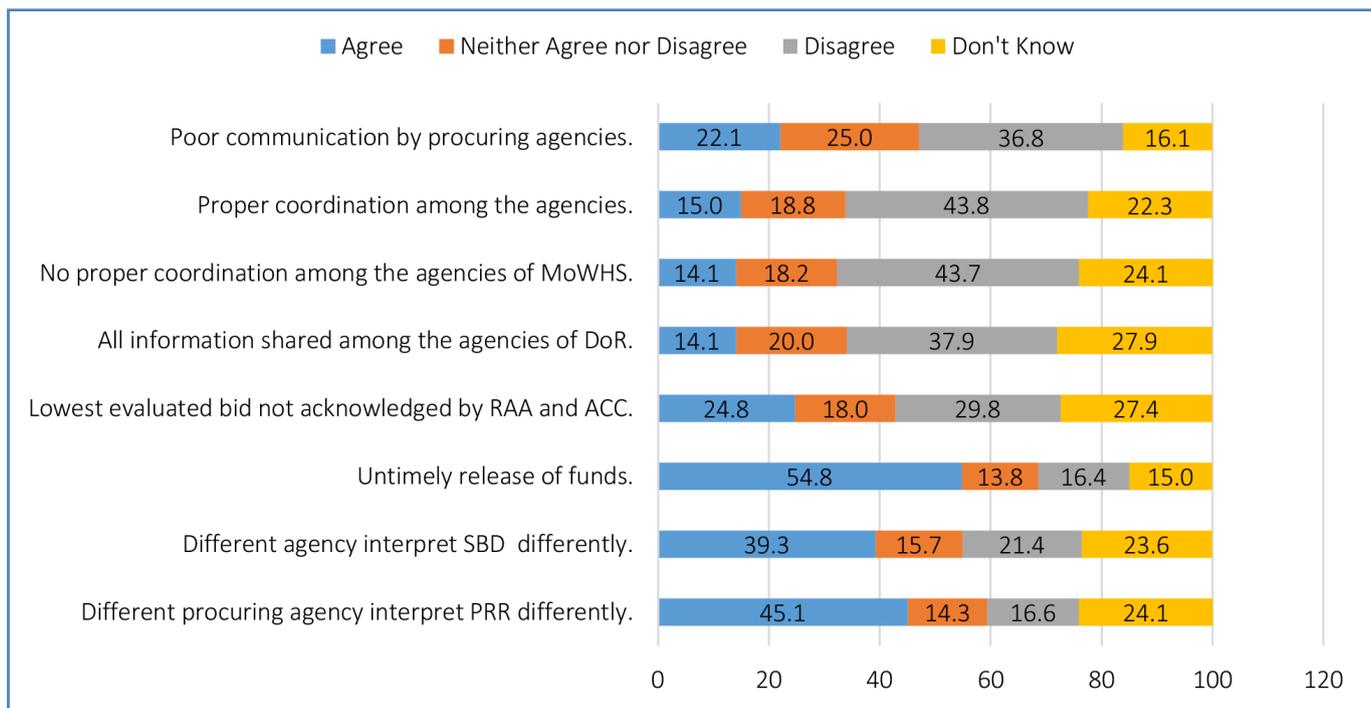
As shown in **Figure 42**, most of the respondents agreed that the untimely release of funds is an issue (54.8%). Upon consultation with MoF, it was clarified that there is no issue with the release of budget for road constructions that were financed by RGOB so long as the procuring agencies had submitted their procurement of works plan to the Ministry. However, it was pointed out that the procuring agencies often ask for budget release even for those projects that were not included in the procurement plan and this could be the reason why untimely release of budget had been reported as an issue. According to MoF, this issue mostly pertained to donor funded road construction projects and now that donor agencies have agreed to the timely release of funds, this issue would be addressed to a large extent.

The issue of different procuring agencies interpreting PRR differently was raised at the stakeholder consultative meeting and is further validated by the survey findings where 45.1% of the respondents agreed. The semi-structured interviews also confirmed this as well. When procuring agencies requested GPPMD on its interpretation, they were told that it should be the Procurement Officers, who were appointed in their agencies after the training, to interpret PRR. However, upon consultation with GPPMD, it was learnt that the procuring agencies tape their conversation or make notes of their interpretation and use their interpretation to justify their wrongdoings to the auditors. Similarly, the issue of SBD being interpreted differently by different procuring agencies was also raised. This was agreed by 39.3% of the respondents.

Another issue that was raised pertained to the lowest evaluated bid not being acknowledged by RAA and ACC as agreed by 24.8% of the respondents. It was pointed out at FGD, semi-structured interviews and consultative workshop that even if the contract decisions were based on the lowest evaluated bid, as the rule mandates, RAA and ACC, with a focus on cost savings, always question the procuring agencies as to whether the contract had been awarded to the lowest rate. As a result, the procuring agencies said that the officials involved in decision making do not take the risk of awarding the contract based on the lowest evaluated bid so as to avoid audit memos in their name which deprives them of availing career enhancement and progression opportunities.

Similarly, issues such as poor communication by the procuring agencies (22.1%), lack of proper coordination among the agencies (15%), information not shared among the agencies of DoR and no proper coordination among the agencies of MoWHS (14.1% each) were also indicated.

A case in point arising out of poor coordination is the necessity to re-construct roads each time underground cables are laid by different agencies such as BPC, Bhutan Telecom, *Thromde,* etc.

4.6.6   Improper Planning

Roads in Bhutan do not carry a good image due to their poor quality, potholes, and un-usability especially during monsoon. The poor quality was also discussed in Parliament and reported in the newspapers as well. Of the many factors that can be attributed to this, planning or lack thereof plays an important role. The complaint records of ACC show that 14% of the complaints were related to flaws in the planning process of road construction. Similarly, the Annual Performance Audit Report of the Department of Roads 2008, also observed poor planning in the construction and maintenance of roads and bridges. The report further made the following observations:

- Inadequate time allocated for planning;
- Non-completion of planned activities;
- Non-implementation of planned activities;
- Implementation of unplanned activities; and
- Inefficient planning of maintenance works.

It is generally agreed that infrastructure planning is poor in Bhutan. In practice, planning is undertaken along-side the implementation and has been the cause of all issues in the construction industry. In international construction practices, adequate time is devoted for detailed planning that does not compromise on quality, cost and time unlike the practice in Bhutan where quality, cost and time overruns are a defining norm in any construction undertaking. The upcoming initiative by MoF, where emphasis on the requirement of procurement planning is laid out, is expected to ingrain and establish the practice of proper procurement planning so as to realize value for money, efficiency and transparency.

Proper planning is a prerequisite and key to the success of any project as it is "critical in setting the tone for subsequent phases" (Ware etal, 2006).

The issues related to planning are presented in **Figure 43**. There are many factors that influence planning in road construction and the principal ones are touched upon below:

Proper planning must take into consideration the weather factor which plays an important role in road construction. This issue was strongly raised by the contractors at FGD. This is also confirmed by the survey findings where 58.8% of the respondents agreed that weather factor was not considered. Upon clarification, the MoF stated that the procuring agencies should consider weather in determining the contract duration. However, in the current practice, most of the procuring agencies do not take the weather into consideration in determining the contract duration.

Similarly, good planning should also foresee risks and proper risk management system be put in place. This issue was raised at FGD both by the procuring agencies and the contractors. The research also confirmed this issue as agreed by 54.4% of the respondents. As required by the contract terms, ensuring proper risk management that covers the period of the contract, the defect liability period and the maintenance period of three years is a must. However, at FGD, it was raised that while insurance is mandatory, the insurance

companies do not agree to insure small road construction works. As a matter of practice, the terms of the contract need to stipulate that the contractor must obtain insurance cover by defining a minimum duration.

Proper planning of the contract will also not see major changes in material specifications in the course of the contract execution. However, the issue of changes in material specifications during the execution was raised by the contractors and the engineers at FGD and was further confirmed by the research (45.3%). Such changes result in time and cost overruns.

Similarly, issues such as lack of research based planning, cost of project not based on project life cycle and lack of systematic needs assessment were reported.

Figure 43: Percentage of response rating for items related to planning
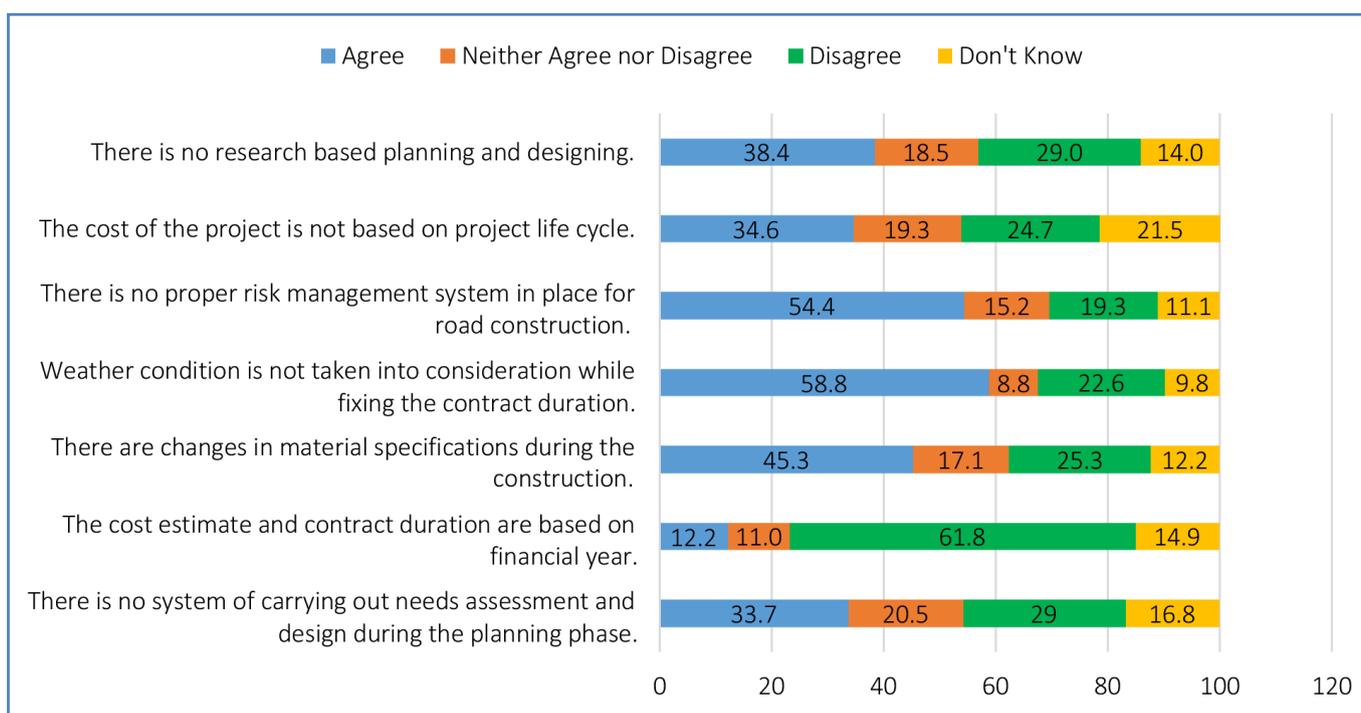
4.6.7 Human Resource Constraints

The caliber of human resource is an important aspect for the success of any organization. The cadre must project professionalism and a high level of diligence and ethical standards in the conduct of the professional responsibilities.

The research assessed the following in the context of human resource related issues:

- Capacity building for the contractors;
- Adequacy of experienced engineers in the construction firms;
- Linkages between regional and international construction forum;
- Availability of experts – geotechnical, etc.;
- Availability of competent technicians to conduct quality tests;
- Availability of compensation schemes;
- Provision of training opportunities;
- Distribution of workload;
- Availability of adequate tools; and
- Provision of life insurance specific to the construction sites.

Figure 44 and **45**, present ratings on negative and positive items by the respondents to assess human resource constraints. The issue of non-availability of geotechnical expertise had been raised at FGD and is further confirmed by the research (71.4%).

Figure 44: Percentage of response rating for negative items related to HR

Legend: ■ Agree   ■ Neither agree nor disagree   ■ Disagree   ■ Don't Know

Item	Agree	Neither agree nor disagree	Disagree	Don't Know
ToC for task allocation ineffective.	15.8	20.8	43.2	21.2
Government engineers inadequately compensated.	28.9	17.7	37.4	16.1
Lack of competent technicians for QAP.	58.7	14.0	12.9	14.3
Non-availability of experts.	71.4	8.8	7.8	12.0
Poor linkage and participation of engineers.	54.5	15.2	10.6	19.7
Inadequate experienced govt. engineers .	38.3	23.5	29.3	8.9
No experienced contractor engineers .	51.7	25.0	15.6	7.6
No capacity building for contractors.	50.6	17.3	23.0	9.1

Currently, MoWHS has two engineers in the Geo-Tech Section who are civil engineers and not professionally trained geo-technical experts. The frequent road blocks in the country during the monsoons could also be a result of undertaking construction without carrying out a thorough study of the soil conditions due to the absence of geotechnical expertise.

Capacity building of contractors is equally important so as to keep them abreast with the changes in technology and skills in the construction sectors. The contractors and the engineers raised this issue very strongly at FGD. The survey findings also confirmed that 50.6% of the respondents agreed on the need for capacity building. Of these, the majority of the respondents comprised of government engineers (18.4%), followed by contractors (13.7%), community contractors (7.7%) and administration (5.5%). On the other hand, semi-structured interviews revealed that even if the government conducted capacity building workshops, the contractors usually send their front desk staff who have no involvement in the contract work. Hence, there is a need to convince the contractors that the government is serious about capacity building and that the contractors should equally play their part in enhancing the skills of their field staff to cope with the changing demands of the construction industry.

Having experienced engineers is a prerequisite for any contract to be executed and more so for road contracts where the nature of the contract is complex. While discussions in different mediums point out that the engineers are inexperienced, this research tried to assess the validity of this prevailing notion. The research confirmed that 51.7% of the respondents agreed that the contractors do not have experienced engineers.

As part of the capacity building initiatives, it is necessary that institutional networks both at the regional and international levels are forged so as to allow for expanding the knowledge and skills of the engineers. This was validated by 54.5% of the respondents. In most countries, Civil Engineers Societies/Councils

are established to promote sharing of knowledge and best practices through innovative research and development. Similarly, in Bhutan an Engineering Council is proposed to be set up under MoWHS but this does not appear to be any time soon. Moreover, there are no properly identified linkages at the regional and international construction forums and the short-term, out-country conferences and workshops are availed on an ad hoc basis.

Figure 45: Percentage of response rating on positive statements related to HR
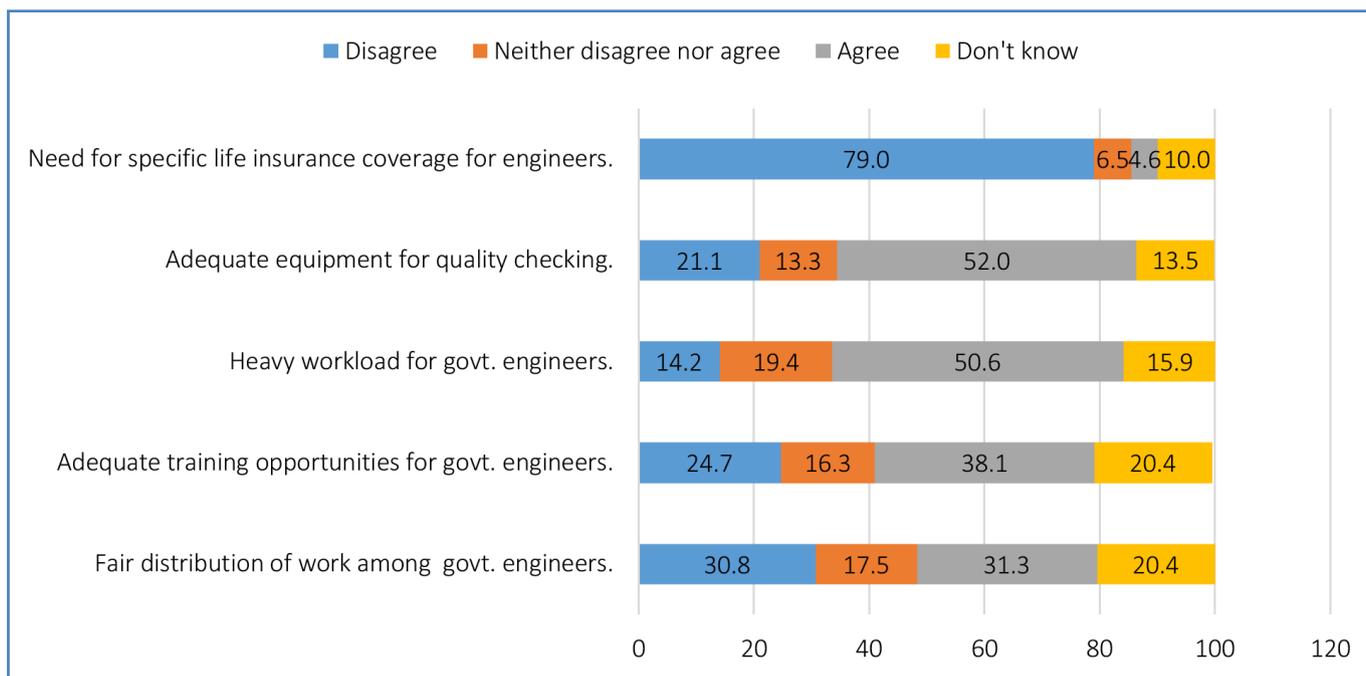
4.6.8 Social Ties

Bhutan is known to possess strong social ties which is a national asset. While its benefits, as noted by Weisel and Shalvi, are "clear, little is known about its possible negative aspects" (2015: 10651).

The research has considered the following statements:

- Personal relationship with the head of the agency;
- Personal relationship with the engineers;
- Political affiliation;
- Family/personal relationship;
- Favouritism;
- Public officials receive financial incentives; and
- Public officials receive gifts.

Figure 46: Percentage of response ratings on items related to social ties
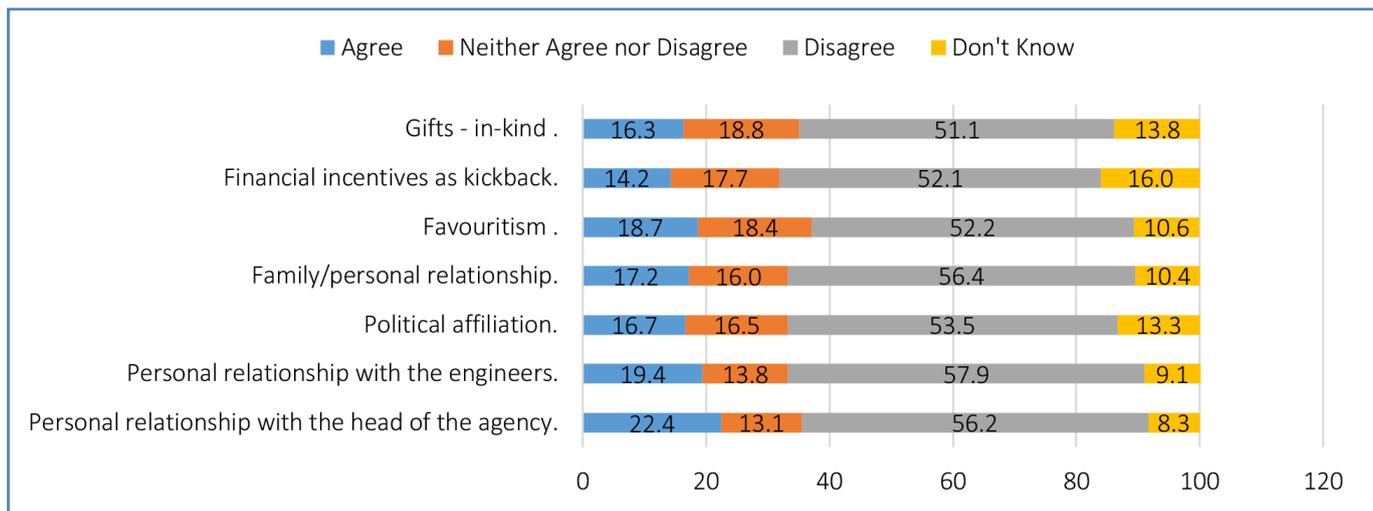
Similar to the findings of ACC (2016b), this research also concluded that the influence of various relationships play an important role in influencing any decision. Besides this issue being raised at FGD, the research confirmed 22.4% of the respondents who agreed that the personal relationship with the head of the agency helps in getting the contract followed by personal relationship with the engineers (19.4%), favouritism (18.7%), family/personal relationship (17.2%) and political affiliation (16.7%). The semi-structured interviews with the contractors also confirmed that if one does not know the engineers well, it becomes difficult to avail of the contract opportunities. The complaints lodged with ACC also allege that road contracts are being given to the relatives and friends of the engineers or of those in positions of influence, power and decision making.

In a society where the culture of gift giving is prevalent, public officials receiving gifts was also agreed by 16.3% of the respondents. It is unclear whether the provisions of The Gift Rules 2009 were strictly adhered to at the time of accepting the gifts.

Chapter 5: Recommendations

The recommendations proposed here emanate from the findings of this research and are also drawn from international best practices. They are made with a view to improving efficiency, accountability and transparency in public road construction.

5.1 Develop SOP/Guidelines for Effective Contract Implementation, Supervision and Monitoring

Poor supervision, monitoring and enforcement has been identified as one of the causes of corruption in public road construction in Bhutan. It has been established that this is due to lack of due diligence on the part of both the government engineers and contractors. It was pointed out that it is the responsibility of the contractors to use their own engineers to monitor, supervise and implement the contract and undertake road construction contracts diligently without round the clock supervision by the government. Ideally, the responsibility of the government engineers should be confined to verifying specifications of the materials as set out in the BOQ and undertaking quality checking.

However, it has been found that government engineers were mostly involved in supervision, monitoring and enforcing contract terms and at times, even fully involved to get the contract completed.

There is a lack of SOP/guidelines for contract implementation, supervision and monitoring. Such SOP/ guidelines must be developed. The Construction Development Corporation Limited (CDCL) has developed an SOP which is being effectively implemented and is worthy of emulation and incorporation by DoR, *Thromdes* and *Dzongkhags*.

5.2 Review Technical Score System

Concern on the current practice of including technical score as a qualifying criteria had been raised by all the stakeholders and further validated by the research finding. The current system of evaluation of bids in e-tool, although designed with best intentions, has issues of selecting the wrong contractors in terms of technical expertise. This is mainly due to the fact that once a contractor meets the minimum qualifying criteria or percentage there is no differentiation made in the technical expertise as it is not considered in the final score.

Thus, it is recommended that the need to include the technical score for the final award of the contract be reviewed.

5.3 Develop and Enforce Quality Assurance Plan (QAP)

As a result of poor implementation, supervision and monitoring, quality suffers at the end. It may be due to such laxity that the quality of construction in Bhutan is not well reputed. The poor quality of public roads is a consistent topic of discussion in every forum. While it is the responsibility of the contractors to come up with QAP, it was found that the plan is neither being implemented by the contractors nor enforced effectively by the procuring agencies. Thus, the contractors do not take the QAP seriously. The QAP needs to be implemented diligently by the contractors and should be strictly monitored by the procuring agencies.

5.4. Adopt and Implement Integrity Initiatives

Dishonesty is a cause of many issues in public road construction including corruption and wrongdoings. Acts of dishonesty, as elaborated in the section on causes of corruption, constitute false representation, theft/ substitution of materials, and representation of fictitious vendors.

It is symptomatic of the lack of ethics and integrity. Hence, promoting and upholding ethics and integrity is necessary so as to embed and uphold proper conduct of ethics and integrity.

While it is the mandate of ACC to lead Bhutan's fight against corruption, the focus so far has been on public agencies. Realizing this, ACC collaborated with TI Malaysia and developed a program, Business Integrity Initiative of Bhutan (BIIB) which will be rolled out soon. It is recommended that large contractors be made a part of this initiative to begin with.

5.5   Implement Model Guideline on Management of Conflicts of Interest in the Public Sector 2017

Failure to declare CoI constitutes a corruption offense. The research established that non-declaration and mismanagement of CoI is a concern in public road construction. Hence, there is a need to strictly implement the model guideline on management of CoI so as to allow for unbiased road contract decisions and promote fair and competitive bidding.

5.6   Implement Gift Rules 2017

The research confirmed that 3.4% and 3.7% of the contractors made payment in cash or in kind and provided services to the public officials respectively. Similarly, 1.9 % of the public officials admitted having received payment in cash or in kind or services. Further, several instances of the Gift Rules not being implemented had been stated by several respondents This calls for effective implementation of the Gift Rules 2017 in both the spirit and letter of the Rules.

5.7   Provide Training on Ethics and Integrity

The research established the existence of various types of corruption and wrongdoings in the public road construction sector such as bribery, failure to declare CoI, abuse of functions and so forth. There can be many reasons as to why such acts exist; however, it is primarily due to weak ethics and integrity on the part of those involved. Hence, it is very important that the engineers and contractors are trained to uphold the highest level of ethics and integrity. ACC can provide the lead in the beginning; however the agencies concerned are expected to take forward the initiative so that it is embedded in the mindset and serves to guide the behavioral culture of the engineers and contractors. Thus, the research recommends the following:

- A module on ethics and integrity be incorporated in the orientation program and attendance be made mandatory for issuing new contract licenses;
- Enhance modules/units on ethics and Integrity in the tertiary institutes and colleges; and
- Provide refresher courses on ethics and integrity for contractors and engineers (government & engineers with construction/consultancy firms).

5.8   Develop Guidelines for Deviation

Literature on construction in general and public road construction in particular point out that deviation, in the form of concealed nature of design, provides risks as well as opportunities for corruption and wrongdoings. While the rule allows for deviation by 20%, the reality of implementation presents a different scenario as captured through focus group discussions, semi-structured interviews and consultative workshops with the road construction procuring agencies, engineers and contractors. Thus, it is proposed that comprehensive guidelines for deviation be developed and strictly enforced and implemented.

5.9   Adopt and Enforce Debarment Rules

The current exclusion clause is not explicit and does not allow for exclusion of defaulting contractors or blacklisting them. Due to this, the blacklisted contract firms reappear under different licenses and take part in contract opportunities. Moreover, the current practice only blacklists the firm and not the proprietor. The PRR needs to be further strengthened to include excluding not only the firm but also the proprietor whose acts constitute corruption and wrongdoings in public road construction. The Debarment Rule has long been overdue. The finalization of draft that is currently with ACC and needs to be prioritized so that it is enforced and implemented by the procuring agencies.

5.10   Develop and Enforce Contractors' Accountability Framework

It has been established that currently it is only the site engineers that are singularly accountable in the road contract implementation even when the contractor fails to deliver either the whole or parts of the road contract. The accountability on the contractors is virtually non-existent. The contractors are expected to execute road contract works without the need for regular supervision and monitoring by the road procuring agencies as the contract terms specify the need for the contractors to recruit a site engineer of their own so as to undertake supervision and monitoring works for the contract. However, in most of the road contract works, the contractors employ only one engineer who has to shoulder the sole supervision and monitoring responsibility at different sites in different *Dzongkhags*. It is because of this failure by the contractors to honour the contract terms that the government site engineers end up working for the contractors in effect as they equally need the project to be completed on time which otherwise could be seen as their failure. The need to fulfill their individual work plan (IWP) is also another factor. Hence, corrupt practices and wrongdoings are bound to crop up. This is further exacerbated by the ineffective current penalty provision for delay of works. The contractors exploit this ineffectiveness as it is easy for any contractor to pay the penalty and further delay the work.

Thus, as proposed by the government engineers, there is a need to emphasize on the institution of audit clearance for the contractors besides laying out a clear cut accountability framework for the government engineers and the contractors in the course of the contractual obligations.

5.11   Capacity Development for Engineers and Contractors

Unlike other types of construction, public road construction is complex and requires a combination of all types of expertise to undertake thorough study of the geotechnical and geological nature of the soil conditions given the mountainous topography.

In the course of the research, it was found that investment in geotechnical field has been lacking despite the critical role it plays in road construction. It is high time that utmost importance be accorded to and consequent investments in this field be made so as to cope with the changing demands of road construction.

Engineers shoulder a complex responsibility and play an important role in the success or failure of road contract projects. Hence, investment in the development of the professional capacity of the engineers is critical. One of the ways to strengthen their professional capacity is to establish linkages and networks with renowned construction forums so as to enable the participation of the engineers for greater exposure and to update them on the changing demands of expertise and technology.

Contractors play an equally important role in the road construction projects and hence the need to impart relevant training to them is as important. It is recommended that trainings be organized for contractors to create awareness on the changing demands of the sector and promote the required level of support and cooperation for smooth and successful implementation of the road construction projects.

5.12   Conduct Awareness on Procurement Rules and Regulations (Procuring Agencies and Law Enforcement Agencies)

PRR and SBD are interpreted differently by different procuring agencies and this has been repeatedly raised by the respondents. Hence, it is important that the interpretation is made as uniform as possible through periodic awareness programmes on PRR and SBD.

5.13   Review and Revise National Wage Rate

The current national minimum wage rate is Nu. 125 per day while the minimum market rate stands at Nu. 500 a day. Construction sector including road construction has the capacity to absorb and provide employment to more than 10,000 people. However, there is a "low demand for construction sector jobs due to low wages and lack of job security" (11th FYP). Currently, it provides employment to 6,241 people constituting 1.8% of the total employment. DoR raised that it is not able to get labourers at the current wage rate which hinders the timely completion of works.

The current wage rate needs to be reviewed and revised so as to make employment in the construction sector more attractive to the workers.

5.14   Develop Material Price Index

Bhutan does not have a material price index of its own; but uses the Indian material price index to a large extent. Given the mountainous topography and the costs associated with it, the context of reference may not hold water. Realizing this and the relevance of the role, NSB was charged with the task to develop the material price index for Bhutan. However, NSB confirmed that it has not been able to do so due to lack of required expertise. Thus, there is a dire need to for relevant agencies to collaborate and pursue the development of a material price index on a priority basis.

5.15   Engage Community in Monitoring and Assessment of Farm and GC roads as part of Social Accountability

Constructive citizen engagement is crucial for improving the quality of infrastructure development and services. It is with this intention that ACC in collaboration with DLG initiated the Social Accountability (SA) tools in the country. Since then, at least four SA tools: Community Score Card, Citizen Report Card, Social Audit and Budget Advocacy and Analysis have been rolled out and are now being institutionalized by DLG.

The research has established that the current condition of the farm roads that were initiated to provide intra-rural connectivity does not help the people who are the ultimate beneficiary. This could be because farm roads are mostly unusable during the summer as a result of its steep gradients which makes it prone to frequent landslides and soil erosion. In auditing the farm roads, RAA had repeatedly pointed out that the guidelines framed by MoAF were not followed both in the letter and spirit of the guidelines.

Thus, it is necessary that the community be engaged in monitoring and assessing the construction of farm roads.

5.16   Develop Data Mining Policy at the Agency Level

The research advocates development of effective data mining policy at the agency level (Ministry, Department, *Dzongkhags*/*Thromdes* and DoR Regional Offices). The researchers observed that there is scope to further strengthen the existing data mining system in the road construction sector. The current system of inventory, sharing of information and data analysis can be improved to contribute to proper planning, supervision and monitoring, and control wrongdoings in the sector.

Conclusion

There is undisputed international recognition of the vital role the road sector plays in national socio-economic development and the consequent derivation of benefits out of this sector. The increasing allocation of budget to the sector in the successive plans by the government itself is an indication of the high priority accorded to the sector and its significance in national connectivity. The sector's contribution to GDP has also been witnessing a gradual increase.

International literature points out that there is corruption in all stages of construction including public road construction. This research also concluded that various forms of corruption exist in public road construction in Bhutan such as abuse of authority, bribery, bid rigging, failure to declare conflict of interest and trading in influence albeit at a low level. It reconfirmed the prevalence of favouritism and abuse of functions over other forms of corruption. Given the government's approach of *'zero tolerance to corruption'*, the existence of such types of corruption and wrongdoings, even at low level, is still a matter of concern as it could get deeply entrenched if corrective measures are not explored and appropriate mechanisms not adopted to address them.

The research established that poor supervision, monitoring and enforcement, undue influence, dishonesty, unfair practices, and lack of accountability are the causes of corruption in public road construction.

Besides those factors that cause corruption, the research also highlighted other issues such as Improper planning, human resource constraints, lack of proper coordination among agencies concerned etc. that do not directly cause corruption but increase the risks and opportunities for corruption.

In terms of financial implications of corruption, this research estimated a loss of Nu. 468.87 million from 2010 to 2015 in road construction. Although the amount does not look alarming as compared to other countries, if monitored and used properly, 156 KM of farm roads would have been built at the current standard estimated cost of Nu. 3 million to build 1 KM of farm road.

The recommendations proposed in this report are expected to address corruption and wrongdoings in the public road construction sector to a large extent.

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Abbreviations

ACAB	Anti-Corruption Act of Bhutan, 2011
ACC	Anti-Corruption Commission
ADB	Asian Development Bank
AFD	Administrative and Finance Division
AIC	Akaike Information Criterion
BoQ	Bill of Quantity
BPC	Bhutan Power Corporation
CAB	Construction Association of Bhutan
CDA	Construction Development Authority
CDB	Construction Development Board
CDCL	Construction Development Corporation Ltd.
CFI	Comparative Fit Index
CoI	Conflicts of Interest
CPS	Corruption Perception Survey
CST	College of Science and Technology
DLG	Department of Local Government
DNB	Department of National Budget
DNP	Department of National Property
DoR	Department of Roads
EC	Environmental Clearance
EFA	Exploratory Factor Analysis
EIA	Environment Impact Assessment
FGD	Focus Group Discussion
FYP	Five Year Plan
GDP	Gross Domestic Product
GNHC	Gross National Happiness Commission
GPPMD	Government Property & Procurement Management Division
ICB	International Competitive Bidding
IP	Integrity Pact
IRB	Independent Review Body
IWP	Individual Work Plan
JV	Joint Venture
KM	Kilometer
KMO	Kaiser-Meyer-Olkin
MoAF	Ministry of Agriculture and Forests

MoF	Ministry of Finance
MoHCA	Ministry of Home and Cultural Affairs
MoWHS	Ministry of Works and Human Settlement
NCB	National Competitive Bidding
NEC	National Environment Commission
NIT	Notice Inviting Tender
NSB	National Statistics Bureau
ODK	Open Data Kit
PPPD	Public Procurement Policy Division
PRR	Procurement Rules and Regulations
QAP	Quality Assurance Plan
RAA	Royal Audit Authority
RGoB	Royal Government of Bhutan
RIM	Royal Institute of Management
RMSEA	Root Mean Square of Approximation
RUB	Royal University of Bhutan
SA	Social Accountability
SBD	Standard Bidding Document
SDC	Swiss Agency for Development and Cooperation
SEM	Structural Equation Modelling
SOP	Standard Operating Procedure
SPSS	Statistical Package for the Social Sciences
SRMR	Standardized Root Mean Residual
TI	Transparency International
WB	World Bank

Glossary

Abuse of Authority: The abuse of authority is the improper use of a position of influence, power or authority by a staff member or non-staff personnel against another staff member or non-staff personnel or a group thereof.

Accountability: Accountability is defined as "proactive process by which public officials inform about and justify their plans of action, their behavior, and results, and are sanctioned accordingly" Ackerman (2014).

Bribery: The act of taking or receiving something with the intention of influencing the recipient in some way favorable to the party providing the bribe.

Bid rigging: When suppliers/contractors in the market collude to fix prices or direct customers to use certain contractors.

Billing Fraud: Purposely overstating the amount of labour, materials and other equipment required to complete a project.

Conflict of Interest: Arises when an individual with a formal responsibility to serve the public participates in an activity that jeopardizes his or her professional judgment, objectivity and independence.

Collusion: Secret agreement or cooperation especially for an illegal or deceitful purpose.

Dzongkhag: District

Dzongdag: Governor of a District

Embezzlement: Fraudulent taking of public property/fund for personal gain.

False Representation: This includes the usage of undocumented workers; falsifying minority content reports, test results or insurance certificates; non-compliance with environmental regulations; and misrepresentation of small business status.

Favoritism: A normal human inclination to prefer acquaintances, friends and family over strangers

Fictitious Vendors: These are created by falsifying payment applications, covering up the purchase of personal items or diverting money to a phantom company. This activity is often controlled by an employee but can also be done by external entities through falsified company documentation.

Gewog: Lowest administrative unit in Bhutan's three tiered governance system. A group of villages make up a Gewog and is translated as a block.

Substitution of Materials: Taking material from the work site for personal use or using lower-grade material than quoted, which might result in subsequent repairing or replacement.

Thrompon: Mayor

Thromde: Municipality