



**AGGREGATION, ANALYSIS, AND SYNTHESIS OF DISCLOSURE
AND ASSURANCE REPORTS OF CONSTRUCTION PROJECTS
COVERED BY CoST-ETHIOPIA**

STUDY REPORT

Addis Ababa, Ethiopia | November 2016

Construction Sector Transparency Initiative - Ethiopia

DISCLOSURE AND ASSURANCE PROCESS OF CoST – ETHIOPIA [2010 - 2016]

STUDY REPORT

AGGREGATION, ANALYSIS, AND SYNTHESIS OF MATERIAL PROJECT INFORMATION/ INFRASTRUCTURE DATA STANDARD

Study Team

Asmerom Taddese

Hagos Abdea

Kasim Seid (ST leader)

Addis Ababa, Ethiopia | November 2016

CONTENTS

CONTENTS	III
LIST OF ANNEXES	V
LIST OF FIGURES	V
LIST OF TABLES	VI
ACRONYMS AND ABBREVIATIONS	VII
EXECUTIVE SUMMARY	VIII
I. INTRODUCTION	1
1. BACKGROUND	1
2. OBJECTIVES OF THE STUDY	1
3. SCOPE OF THE STUDY	1
4. THE STUDY TEAM AND DESCRIPTION OF COST PROJECTS	1
5. APPROACHES AND METHODOLOGY	2
6. IDENTIFIED KEY VARIABLES FOR AGGREGATION, ANALYSIS, AND SYNTHESIS.....	2
II. EXTRACTION, AGGREGATION, AND ANALYSIS	4
1. COMPLETENESS OF PROJECT STUDIES	4
2. TENDER PROCESS	4
2.1 <i>Delivery Strategy</i>	5
2.2 <i>Mode of Procurement</i>	5
2.3 <i>Level of Competition</i>	7
2.4 <i>Share of NCB and ICB by Subsectors</i>	8
2.5 <i>Procurement Efficiency and Sufficiency of Bid Floating Period</i>	9
2.6 <i>Procurement Length and Project Implementation Periods</i>	10
3. CONSTRUCTION COST	13
3.1 <i>Cost Overrun</i>	13
3.2 <i>Reasons of Cost Overrun</i>	15
3.3 <i>Price Escalation</i>	16
4. PROJECT DEVELOPMENT COST ASSESSMENT	17
4.1 <i>Services/Works Cost Ratio</i>	17
5. CONSTRUCTION TIME	18

5.1	<i>Time Overrun</i>	18
5.2	<i>Reasons for Time Overrun</i>	19
6.	CAUSES FOR CONCERN.....	21
III.	KEY FINDINGS.....	23
1.	BUILDING SECTOR.....	23
2.	WATER SECTOR	23
3.	ROAD SECTOR.....	25
	ANNEXES.....	26

LIST OF ANNEXES

Annex 1: Key Variables Considered in the Aggregation Study (ToR)	26
Annex 2: Procurement efficiency for design contract [SCI]; in days.....	28
Annex 3: Procurement efficiency for supervision contract [SCII]; in days	29
Annex 4: Procurement efficiency for Works contract [WC]; in days	29
Annex 5: Minimum, Maximum, and Average procurement length by Subsector.....	30
Annex 6: Project Details and Study Team Assignment	31
Annex 7: Summary of updated cost and time overrun records	34
Annex 8: Summary of Project cost and price escalation payments at disclosure time.....	37
Annex 9: Initial completion period and completion period at the time of disclosure in days for the three sectors.....	38

LIST OF FIGURES

Figure 1: Projects with Feasibility and EIA Studies	4
Figure 2: Project Delivery Strategy by Subsector	5
Figure 3: Mode of Procurement and Bidding Methods (Services & Works Contracts) - Building Subsector. 6	
Figure 4: Mode of Procurement and Bidding Methods (Services & Works Contracts) - Road Subsector	6
Figure 5: Mode of Procurement and Bidding Methods (Services & Works Contracts) - Water Subsector	7
Figure 6: Level of competition in the procurement process - building sector.....	7
Figure 7: Level of competition in the procurement process - road sector	8
Figure 8: Level of competition in the procurement process - water sector	8
Figure 9: Share of NCB and ICB contracts in birr and number	9
Figure 10: Project implementation durations (days) - building subsector.....	11
Figure 11: Project implementation durations (days) - road subsector.....	11
Figure 12: Project implementation durations (days) - water subsector	11
Figure 13: Project implementation durations (days) at industry level.....	12
Figure 14: Design period and total implementation period ratio.....	13
Figure 15: Updated average cost overrun.....	14
Figure 16: Minimum, Average, and Maximum cost overrun in birr	15
Figure 17: Reasons of cost overrun	16
Figure 18: Average price escalation payment as compared to their respective total project cost by sector... 17	
Figure 19: Services, Works, and Project cost ratios	18
Figure 20: Minimum, Maximum, and Average time overrun	19
Figure 21: Updated average time overrun	19
Figure 22: Reasons for time overrun	21
Figure 24: Summarized causes for concern.....	22

Figure 25: Parallel construction and design phases; project implementation based on feasibility studies and preliminary designs	24
Figure 26: Construction phase following design phase; project implementation based on detailed design ..	25

LIST OF TABLES

Table 1: Number of CoST Projects by disclosure phase and subsector	2
Table 2: CoST Projects by Total Initial Contract Prices	2
Table 3: Key variables for the study	3
Table 4: Cost overrun summary	14
Table 5: Summary of consultancy service cost and project cost ratio.....	18

ACRONYMS AND ABBREVIATIONS

AT	Assurance Team
CoST	Construction Sector Transparency Initiative
DB	Design-Build
DBB	Design-Bid-Build
EIA	Environmental Impact Assessment
ERA	Ethiopian Roads Authority
ICB	International Competitive Bidding
ICP	Initial Contract Price
IDS	Infrastructure Data Standard
MOE	Ministry of Education
MPI	Material Project Information
MoWR/MoWIE	Ministry of Water Resources / Water Irrigation and Energy
OB - ICB	Open Bidding under International Competitive Bidding Procedure
OB - NCB	Open Bidding under National Competitive Bidding Procedure
NCB	National Competitive Bidding
PE	Procuring Entity
PM	Project Management
RB - ICB	Restricted Bidding under International Competitive Bidding Procedure
RB - NCB	Restricted Bidding under National Competitive Bidding Procedure
RIB	Restricted International Bidding
RFP	Request for Proposals
RFP - ICB	Request for Proposal under International Competitive Bidding Procedure
RFP - NCB	Request for Proposal under National Competitive Bidding Procedure
RNB	Restricted National Bidding
SCI	Service Contract I – Design Consultancy Service Contract
SCII	Service Contract II – Supervision and Contract Administration Consultancy Service Contract
SSS	Single Source Selection
ST	Study Team
TOR	Terms of Reference
TPC	Total Project Cost
TSB - ICB	Two stage Bidding under International Competitive Bidding Procedure
TSB - NCB	Two stage Bidding under National Competitive Bidding Procedure
USD	United States Dollar
WC	Works Contract
WWCE	Water Works Construction Enterprise

EXECUTIVE SUMMARY

The Construction Sector Transparency Initiative (CoST) is a country centered initiative to improve the value for money spent on public infrastructures by increasing transparency in the delivery of Government financed construction projects.

Disclosure of Material Project Information (MPI) or Infrastructure Data Standard (IDS) by its latest name is one of the three essentials of CoST. Assurance of the disclosed information and demand for accountability based on the disclosed information are the other basics of the Initiative.

In its course, CoST-Ethiopia has disclosed 52 construction projects from the three sectors, namely building, road, and water. All the projects covered by the disclosure have their own specific reports and to get better and more complete picture of the sectors and the industry at large; a study on aggregation, analyzing and synthesizing of the findings of the reports is essential. The results of such a study could be used as input by the Procuring Entities, the Government and other interested group.

The contents of key variables selected for the purpose of the Aggregation Study include tender process, construction cost, construction time, causes for concern, and other issues with other sub categories and the results of extraction, aggregation, and synthesis reveal the following major findings within the scope of the Aggregation Study:

1. Projects by Volume of Work

The Aggregation Study covers 52 projects from the building, water, and road sectors with a total initial project cost of Birr¹ 36,475,343,121.60 (USD 3,268,239,130.51). Ten projects with total project cost of Birr 2,061,405,198.89 (USD 158,474,490.35) are from the building sector; ten projects with total project cost of Birr 8,274,042,506.69 (USD 848,082,310.83) are from the water sector; and the remaining 32 projects with total project cost of Birr 26,139,895,416.02 (USD 2,261,682,329.33) are from the road sector.

2. Completeness of Project Studies

In relation to the process of project identification studies, water and road sector projects are implemented after feasibility, environmental, and other related studies are conducted followed by detailed engineering designs. However, building sector projects do not conduct feasibility and environmental impact assessment studies as part of project identification process except for one university project.

3. Tender Process

In the building sector, the majority of the projects in the building sector adopted a procurement delivery strategy of Design Bid Build (DBB) with separate consultancy services (SCI and SCII) and more that 75 per cent of the design and supervision contracts are outsourced to a single consultant by direct award. For Works contract, the majority of building contracts are procured

¹ Ethiopian currency

through open bidding under National Competitive Bidding (NCB) procedure and the level of competition can be taken as fair competition² for 70 per cent of the projects.

In the road sector, the level of competition in the Works contract is less than 50 per cent and is regarded as low for more than 76 per cent of the projects while for a relatively higher number of projects, the level of competition for both consultancy service contracts is regarded as fair, i.e. 63 per cent of the design contracts and 77 per cent of the supervision contracts procured in this sector can be taken as fair procurement with more than 50 per cent level of competition.

In the water sector, single source procurement is applied for the majority of projects as a preferred mode of procurement; i.e. direct award was applied for 70 per cent of the design contracts and 87.5 per cent of the supervision and Works contracts. The remaining contracts were procured through International Competitive Bidding (ICB) due to a mandatory requirement of the financier, the World Bank. In this sector, only 11 per cent of the design contracts and 12.5 per cent of the Works contracts is regarded as fair competition indicating a much lower level of Competition in the sector.

Furthermore, the majority of the projects in the building and water sectors were procured through National Competitive Bidding (NCB) with 83 and 95 per cent shares respectively. In the road sector, however, a slight majority of projects (53 per cent) were procured through International Competitive Bidding procedure. At industry level, 60 per cent of the projects covered by CoST-Ethiopia were procured through National Competitive Bidding while the remaining 40 per cent were procured through International Competitive Bidding procedure.

For Works contracts, it is revealed that all of the projects of the ICB contracts and 93 per cent of the projects of the NCB contracts have got sufficient bid preparation periods. The efficiency of bid evaluation and contract signing activities on these contracts is 73 and 20 per cent respectively indicating that there is a delay in contract signing for most of the Works contracts.

4. Construction Cost

4.1 Cost Overrun

The aggregate cost overrun at the time of disclosure of projects at industry level is 17.09 per cent that doesn't include the price escalation payment. At the time of disclosures, there is 65.18 per cent cost overrun in the water sector, 6.81 per cent in the building sector, and 3.18 per cent in the road sector.

The projects sampled for disclosure by CoST-Ethiopia assumed a different progress status, varying from near commencement to completion status and in order to show the actual cost overrun at the completion period of the projects, the cost overrun results have been updated for a selected number of projects from the three sectors. The update was performed by selecting six Works contracts from the building sector; thirteen from the road sector; and six from the water sector that were considered by CoST-Ethiopia.

² Level of competition is taken as fair when greater than 50 per cent of the bidders who purchased bid document or shortlisted consulting firms participated in the technical and financial competing

The updated summary of cost overrun reveals that the aggregate cost overrun at industry level is 76 per cent and the average cost overrun in the building sector is 16.43 per cent; 41.61 per cent in the road sector; and 170.57 per cent in the water sector.

4.2 Reasons of Cost Overrun

Design change, incomplete designs, and changes in quantity are major reasons of cost overrun that share nearly 92 percent of the reasons for cost overrun in the building sector. In the road sector; the reasons of cost overrun are evenly distributed among six categories where design change is the major reason of cost overrun in the sector and incomplete design is not reported as a reason of cost overrun.

In the water sector; design change, scope change, and changes in quantity each share 26 per cent as a major reason for cost overrun with total share of 78 per cent followed by incomplete design.

4.3 Price Escalation

Price escalation payments made in the building sector is 6.3 per cent of the total project cost as summarized from two out of ten building projects covered by CoST-Ethiopia. The price escalation payments in the water and road sector projects are, respectively, 9.03 and 12.35 per cent of the total initial project costs considering price escalation payments disclosed by the Procuring Entities. On average, around 12 per cent of the aggregate project cost has been paid by the Public Bodies as price escalation on construction projects that are covered by CoST-Ethiopia.

5. Construction Time

5.1 Time Overrun

The maximum time overrun is recorded in the water sector by 288 per cent of the completion period (1901 days) and the minimum time overrun is recorded in building sector. However, since most projects were undergoing and not completed during the Assurance process, the time overrun presented in this study cover only for the period of time that the disclosure was made and does not show the actual overrun at the completion of these projects. For this reason, the results have been updated for selected projects as performed for cost overrun by updating some of the projects covered by CoST-Ethiopia whose status of completion was above eighty per cent.

The updated summary of time overrun shows that the industry level time overrun is 124.43 per cent and the time overrun for the building, road, and water sectors is 160.70 per cent, 63.34 per cent, and 149.25 per cent respectively.

5.2 Reasons of Time Overrun

In the building sector; design change and change in quantity being reasons of time overrun with 25 and 17 per cent shares respectively, the major reason of time overrun with 42 per cent share include delay causes related to the contractual obligations of the parties including land issue, energy crisis, power and water supply, shortage of finance and budget planning, unavailability of foreign currency, scarcity of construction materials on local market, poor provisions of equipment and skilled manpower, etc.

Design change and force majeure (including inclement weather condition) each share 22 per cent of the reason of time overrun in the road sector while other reasons such as Contractor's low

capacity, land acquisition related problems (Employer's contractual obligation), etc constitute the major reasons of time overrun with 26 per cent share in this sector.

In the water sector; incomplete design (20 per cent), scope change and changes in quantity (17 per cent each), and design change (16 per cent) are reasons of time overrun that delay project completion in the sector. The other reason of time overrun in the sector with 20 per cent share is a combination of reasons related to the capacity and efficiency of the contracting parties.

6. Causes for Concern

Project delay is the major causes for concern followed by procurement problems and cost overrun in the building sector. Project identification issues is the least causes for concern in the building sector even if feasibility and environmental impact assessment studies were not conducted for the majority of projects in the sector.

In the road sector, procurement issues are the major causes for concern with 33 per cent share followed by project delay (21.4 per cent), contract administration issues (17.1), and cost overrun (15.7 per cent).

In the water sector, different causes for concern were obtained from the analysis where procurement regulation and capacity building issues, contract administration practices, time and cost overrun are all reported to be causes for concern in the sector.

The aggregate summary of the causes for concern at industry level shows that procurement problems, project delay (nonperformance to the initial contract period), cost overrun, and contract administration problems are the major causes for concern with 26.4, 22.2, 16.7, 16.7 per cent shares respectively.

7. Key Findings

In the building sector, the design and supervision contracts for the majority of the projects are procured through direct award and there is no competition for these services. Also, the average updated cost overrun in this sector is 16.43 per cent and the price escalation payment that was paid for two projects out of the sampled ten projects is 6.03 per cent. The majority of Works contracts in the building sector do not have price escalation provisions owing to the requirements that price adjustment is allowed for projects whose initial completion period is above 18 months.

In the water sector, direct award procurement is applied for the majority of projects except the World Bank financed projects (#2) with a main objective of reducing the time required for the procurement of the design, supervision, and Works Contracts so that projects could commence immediately after the go ahead for project implementation was obtained from the concerned authority. The consultant and contractor appointed in this arrangement are Government owned firms engaged in the water sector for a longer period of time with institutional links to the project implementing Ministry office.

Contract document preparation problem was observed on most water sector projects even for consulting service contracts as to the main requirements such as staff requirement and submission deadlines that was recorded as a point of dispute and a barrier for proper contract administration. In summary, contract document preparation problem; construction without having detailed engineering design; revision without limit (excessive number of variations); setting short period of time for completion; and late commencement by the consultant and contractor engaged in the

sector are some of the observed problems in the water sector that could hide performance problems by the consultant and contractor.

In the road sector, design build (DB) project delivery method is applied for 17 per cent of the and the level of competition for the Works contracts is less than 50 per cent for the majority of projects, i.e. the level of competition can be regarded as low for more than 76 per cent of the projects. Only 26 per cent of the projects score a level of Competition of 50 per cent and above indicating that Works contracts are procured with lower competition in the road sector.

The analysis of sufficiency of bid floating period and efficiency of bid evaluation process in the road sector revealed that all of the projects under the ICB and 93 per cent of the projects under NCB procedures have got sufficient bid preparation periods and efficiency of bid evaluation and contract signing processes is 73 and 20 per cent respectively.

I. INTRODUCTION

1. Background

The Construction Sector Transparency Initiative (CoST) is a country centered initiative to improve the value for money spent on public infrastructures by increasing transparency in the delivery of Government financed construction projects.

Disclosure of Material Project Information (MPI) or Infrastructure Data Standard (IDS) by its latest name is one of the three essentials of CoST. Assurance of the disclosed information and demand for accountability based on the disclosed information are the other basics of the Initiative.

In its course, CoST-Ethiopia has disclosed 52 construction projects from the three sectors, namely building, road, and water. All the projects covered by the disclosure have their own specific reports and to get better and more complete picture of the sectors and the industry at large; a study on aggregation, analyzing and synthesizing of the findings of the reports is essential. The results of such a study could be used as input by the Procuring Entities, the Government and other interested group.

This Aggregation Study was conducted with the objective of having summaries of the reports that could enable Procuring Entities, Government, and other stakeholders get full and more complete pictures of the reports at sector and industry level.

2. Objectives of the Study

The objectives of the study are to:

- a) have summaries of the reports that enable Procuring Entities, Government, and other stakeholders get full and more complete pictures of the reports at sector and industry level;
- b) increase the viability of findings of the reports;
- c) show the causes of deficiencies and reasons of successes identified in the study that could indicate future directions; and
- d) look into the improvements made in due course.

3. Scope of the Study

The Scope of the study includes the following:

- Extraction, aggregation, analyzing, and synthesizing of the project information of the 52 projects covered by the disclosure and assurance process of CoST-Ethiopia in understandable way by employing appropriate statistical methods or parameters;
- Assessment of improvements made by comparing variables used for the baseline study with the current situation; and presentation of the results employing appropriate techniques (computer aided tables, charts, graphs, and statements);
- Pinpointing the root causes for the observed deficiencies and successes.

4. The Study Team and Description of CoST Projects

The Study Team (ST) comprises three senior construction management professionals (namely Ato Asmerom Taddese, Ato Hagos Abdie, and Ato Kasiem Seid) who have been working with CoST-Ethiopia and Ato Kasiem Seid has been assigned as a Study Team leader by the team for the assignment.

As shown in table 1 below, a total of 52 construction projects were considered of which 10 projects are from the building sector; 10 projects from the water sector; and the remaining 32 projects from the road sector.

Table 1: Number of CoST Projects by disclosure phase and subsector

Phase/Program	No. of Projects by subsector			
	Building	Water	Road	Total
Pilot	5	5	15	25
Full-fledged	5	5	17	27
Total	10	10	32	52

The projects covered by this study amount to more than 2 billion birr in the building sector, 26 billion birr in the road sector, and 8 billion birr in the water sector as shown in Table 2. The total volume of projects covered by this study is, therefore, Birr 36,475,343,121 (USD 3,268,239,130.51).

Table 2: CoST Projects by Total Initial Contract Prices

Sector	Amount (Birr)	Amount (USD)	Remark
Building	2,061,405,198.89	158,474,490.35	The figures are the Initial Contract Price (ICP) recorded in the Assurance Reports.
Road	26,139,895,416.02	2,261,682,329.33	
Water	8,274,042,506.69	848,082,310.83	
Industry Level	36,475,343,121.60	3,268,239,130.51	

5. Approaches and Methodology

The following are the broader activities that the Study Team covered in the course of executing the assignment as its study approaches and methodology:

- Initial Review Work;
- Extraction of Projects and Contracts Data;
- Aggregation of MPIs (IDS);
- Analysis of the aggregated MPIs (IDS);
- Synthesis and interpretation of the analyzed MPIs(IDS); and
- Finalization of report write-up and presentation.

6. Identified Key Variables for Aggregation, Analysis, and Synthesis

The list of key variables identified for aggregation, analysis, and synthesis include completeness of project identification phase; tender process such as project delivery strategy, mode of procurement, scope of competition; construction cost; construction time; causes for concern; and other related issues. Table 3 summarizes the list of key variables identified for aggregation, analysis, and synthesis works.

Table 3: Key variables for the study

#	Content
1	Completeness of Project Identification Phase
2	Tender Process
2.1	Project Delivery Strategy
2.2	Mode of Procurement
2.3	Scope of competition
2.4	Length of Procurement; Sufficiency to prepare responsive EOI/Bids; Compliance with the principles of Procurement and Efficiency
3	Construction Cost
3.1	Project cost
3.2	Minimum, Maximum, and Average cost overruns at sector and industry levels
3.3	Price escalation at sector and industry levels
3.4	Reasons for cost overrun
4	Construction Time
4.1	Completion time
4.2	Time overrun (Minimum, Maximum, and Average at sector and industry levels)
4.3	Reasons for time overrun
5	Issues of Concern
5.1	Causes for concern at project, sector, and industry level
5.2	Root causes on the observed problems at project, sector, and industry level
5.3	Proposed solutions to the problems
6	Assessment of Project Development Contracts
6.1	Cost and time overrun in design consultancy service contract
6.2	Cost ratio - Consultancy services to Works
6.3	Time taken for procurement process (services and Works)

II. EXTRACTION, AGGREGATION, AND ANALYSIS

1. Completeness of Project Studies

Completeness of project studies is concerned with project identification studies such as Feasibility and Environmental Impact Assessment (EIA) studies. The study compiled and summarized whether the respective Procuring Entities (PEs) conducted these studies for their projects by looking at the availability of these studies in the disclosure of the project information during the assurance process. It deals with the availability of Feasibility and EIA studies and analyzed the number and per cent of projects with Feasibility study, EIA study, and both studies for each of the projects from the building, water, and road sectors.

The analysis of the Assurance reports from the total of 52 projects revealed that water and road sector projects are implemented after feasibility, environmental, and other similar studies are conducted. In these projects, detailed engineering design follows the completion of project identification studies.

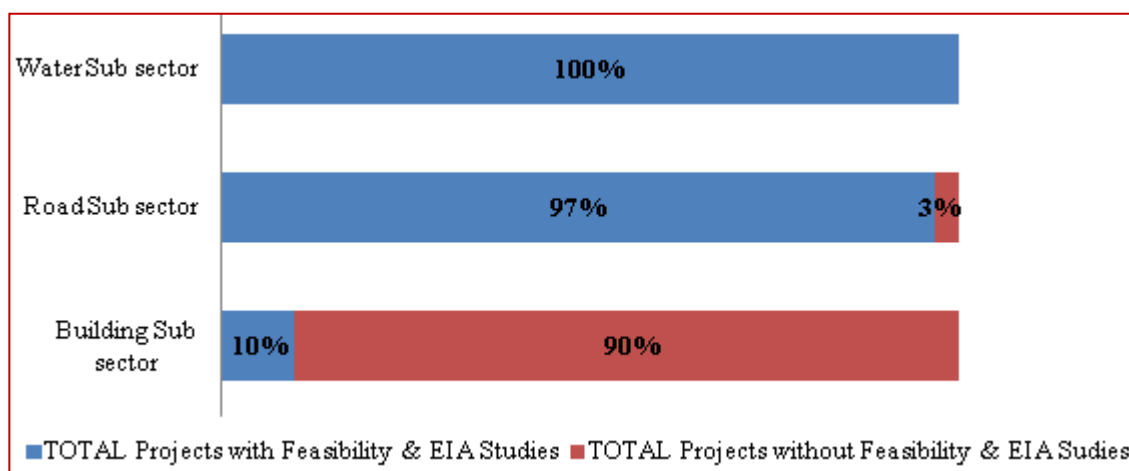


Figure 1: Projects with Feasibility and EIA Studies

As shown in Figure 1 above, however, building sector projects did not conduct feasibility and environmental impact assessment studies except one university project and these projects have been implemented without studying the feasibility and environmental impact assessments.

2. Tender Process

Tender process deals with the following issues in relation to the procurement of consultancy services and Works contracts:

- Delivery Strategy, Mode of Procurement and Level of Competition;
- Share of NCB and ICB in the Public Works;
- Procurement Efficiency and Sufficiency of Bidding Period;
- Procurement Length and Project Implementation Periods.

The procurement information is summarized for Design Consultancy Service Contract, hereinafter called “Design Contract or Service Contract I, SCI”, Supervision and Contract Administration Consultancy Service Contract, hereinafter called “Supervision Contract or Service Contract II, SCII”, and Works Contract (WC) separately.

2.1 Delivery Strategy

The majority of projects in the building sector adopted a procurement delivery strategy of Design Bid Build (DBB) with separate Consultancy Services and the remaining 30 per cent is DBB with either Combined Consultancy Service Contracts or Project Management Contract.

In the road sector, a similar trend of project delivery strategy to the building sector is observed except that Design Build (DB) shares 17 per cent of the road projects among the projects covered in the Aggregation Study and Project Management Contract is not applied in the road sector.

The project delivery method applied for the majority of projects (60 per cent) in the water sector is DBB with combined consultancy service contracts. Figure 2 summarizes the strategy adopted in the delivery of CoST Projects.

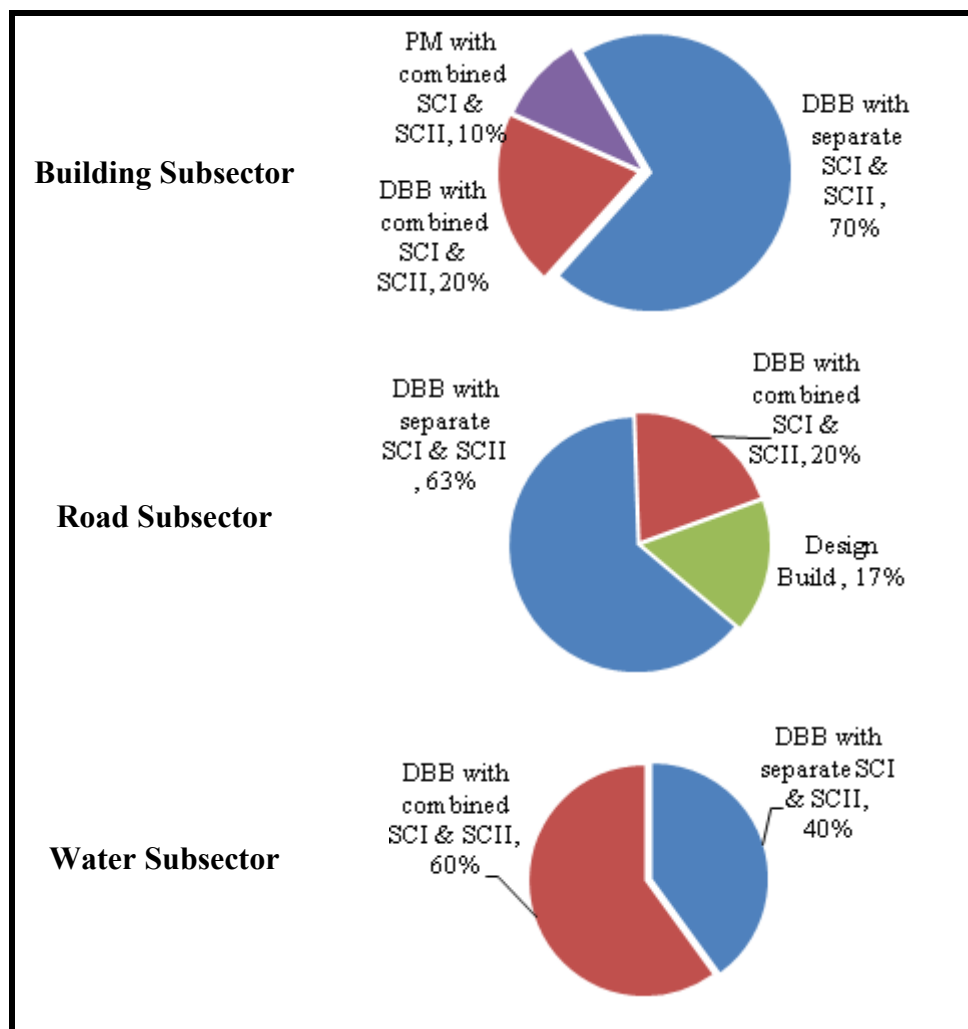


Figure 2: Project Delivery Strategy by Subsector

2.2 Mode of Procurement

From Figure 3, it can be seen that more than 75 per cent of the design and supervision contracts is outsourced to a single consultant by direct award and for Works contract, the majority of building contracts are procured through open bidding under National Competitive Bidding procedure.

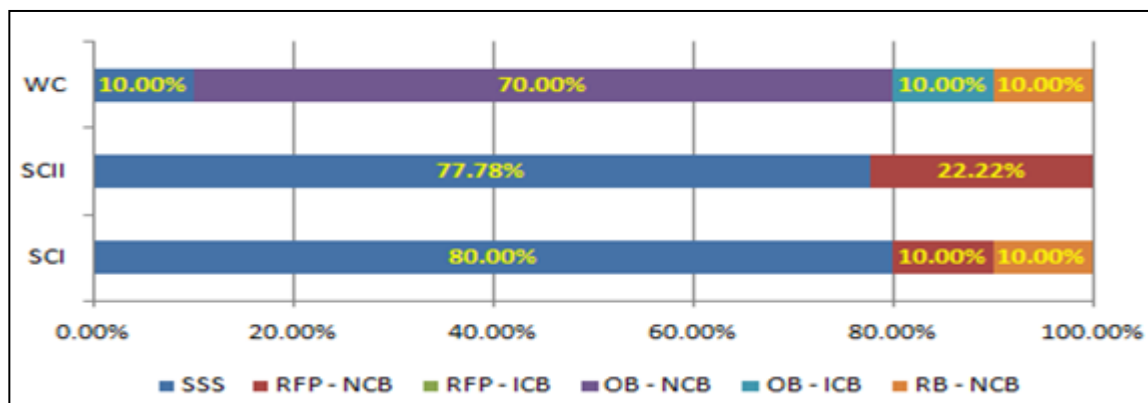


Figure 3: Mode of Procurement and Bidding Methods (Services & Works Contracts) - Building Subsector

National and International Competitive Bidding procedures are applied almost equally in the Works contracts with nearly 45 and 37 per cent shares respectively.

Supervision contracts in this sector are procured through NCB and ICB for 70 and 25 per cent of the projects respectively while design contracts are procured through NCB and ICB for 58 and 26 per cent of the projects respectively.

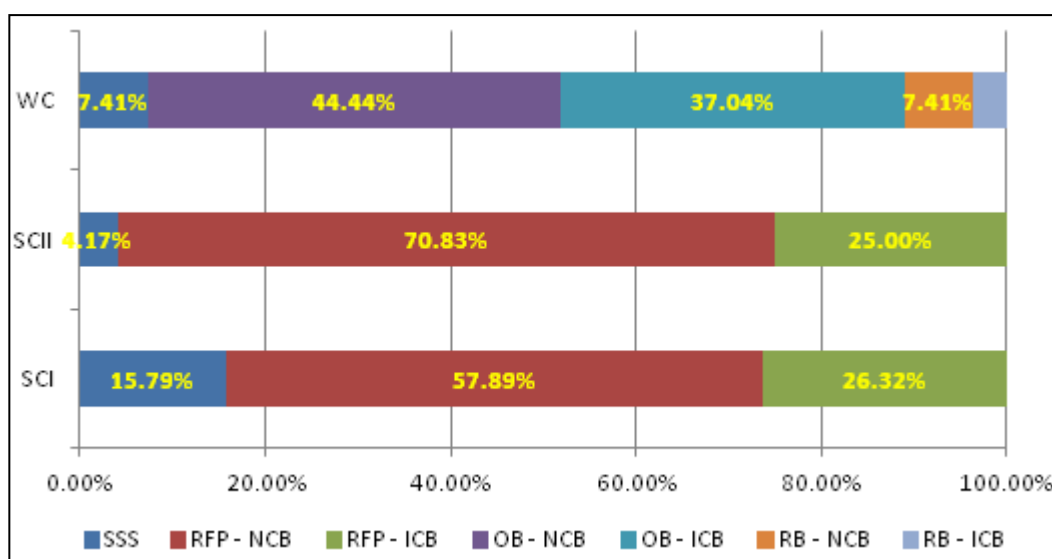


Figure 4: Mode of Procurement and Bidding Methods (Services & Works Contracts) - Road Subsector

For the three contracts, single source procurement (direct award) is applied for the majority of projects as a preferred mode of procurement in the water sector; i.e. it was applied for 70 per cent of design contracts and 87.5 per cent in supervision and Works contracts. The other contracts were procured through open bidding under ICB procedure as a mandatory requirement of the financier, the World Bank.

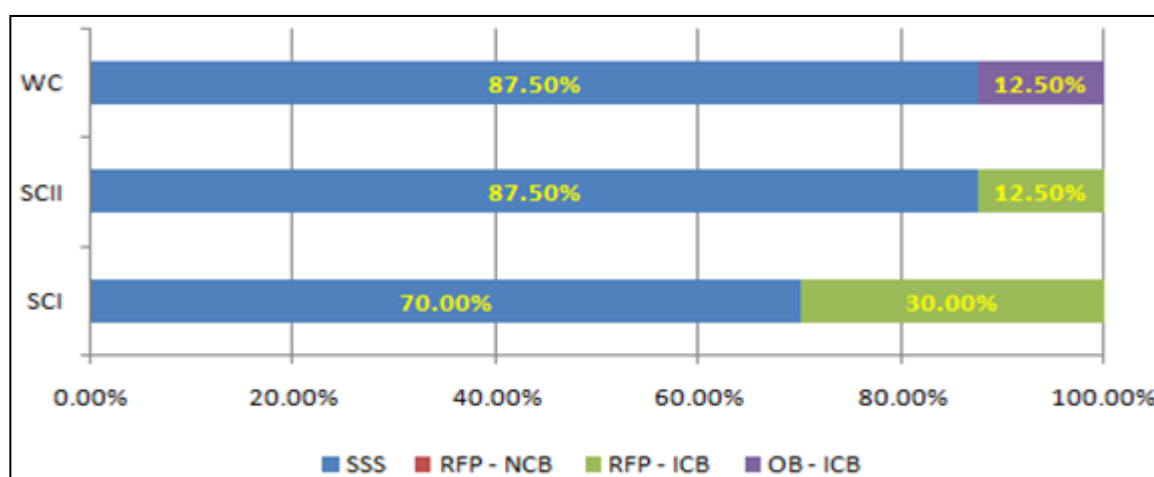


Figure 5: Mode of Procurement and Bidding Methods (Services & Works Contracts) - Water Subsector

2.3 Level of Competition

For the purpose of this study, level of competition is evaluated as a percentage of the number of applicants to the number of bidders submitting their proposals or bids and it is taken as fair competition if at least half (more than 50 per cent) of the applicants submitted their proposals or bids and is taken as low competition otherwise.

For building subsector (Figure 6), the study reveals that there is no competition for the majority of design and supervision contracts while for Works contract, the level of competition can be taken as fair competition for 70 per cent of the projects while there is low or no competition for the remaining 30 per cent of the projects.

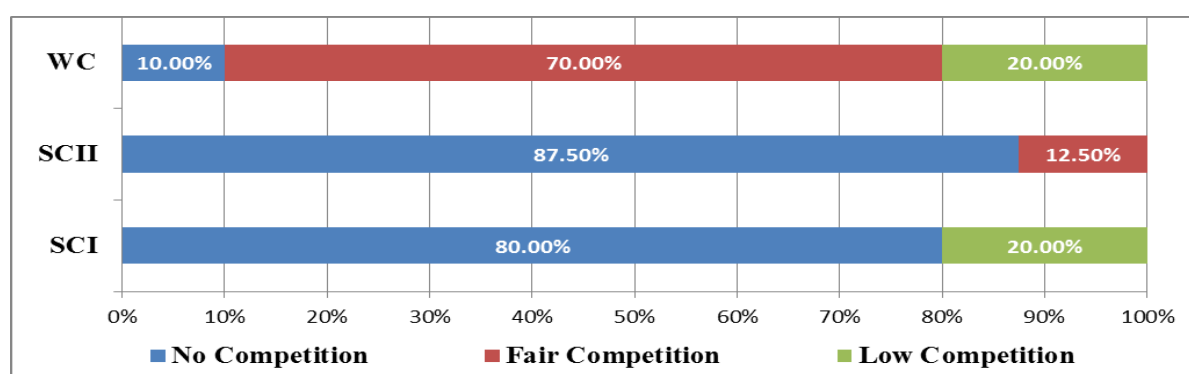


Figure 6: Level of competition in the procurement process - building sector

The level of competition in the Works contract of the road sector is less than 50 per cent for the majority of projects; that is, the level of competition can be regarded as low for more than 76 per cent of the projects. For a relatively higher number of projects, however, the level of competition for both consultancy service contracts is regarded as fair, i.e. 63 per cent of the design contracts and 77 per cent of the supervision contracts procured in the road sector can be taken as fair procurement with more than 50 per cent level of competition.

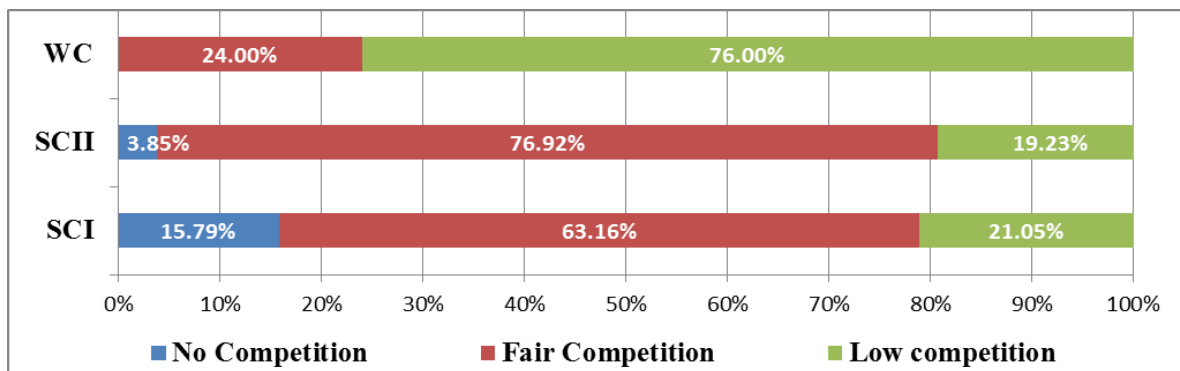


Figure 7: Level of competition in the procurement process - road sector

As far as water subsector is concerned, only 11 per cent of the design contracts and 12.5 per cent of the Works contracts is regarded as fair competition indicating a much lower level of Competition.

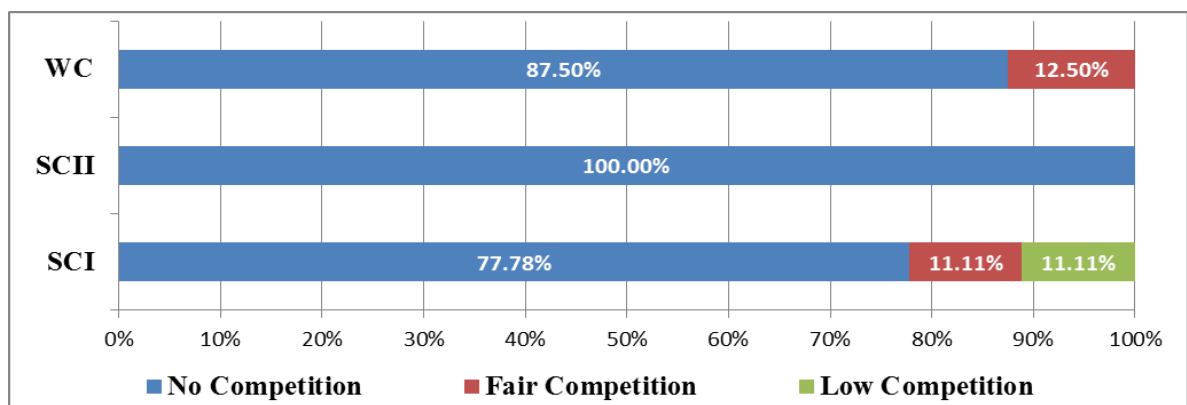


Figure 8: Level of competition in the procurement process - water sector

2.4 Share of NCB and ICB by Subsectors

As shown in Figure 9 below, the majority of the projects in the building and water sectors were procured through National Competitive Bidding with 83 and 95 per cent shares respectively. In the road sector, however, a slight majority of projects were procured through international competitive bidding with 53 per cent shares from the road sector projects.

At industry level, 60 per cent of the projects covered by CoST-Ethiopia were procured through National Competitive Bidding while the remaining 40 per cent were procured through International Competitive Bidding procedure.

In summary, the study revealed that the majority of projects at industry level were procured through DBB either with separate or combined consultancy service contract and some trends of DB and PM Contracts were also observed in the road and building sectors respectively.

Also at industry level, the mode of procurement for the majority of design consultancy service contracts was single source procurement followed by open bidding under national and international competitive bidding procedures.

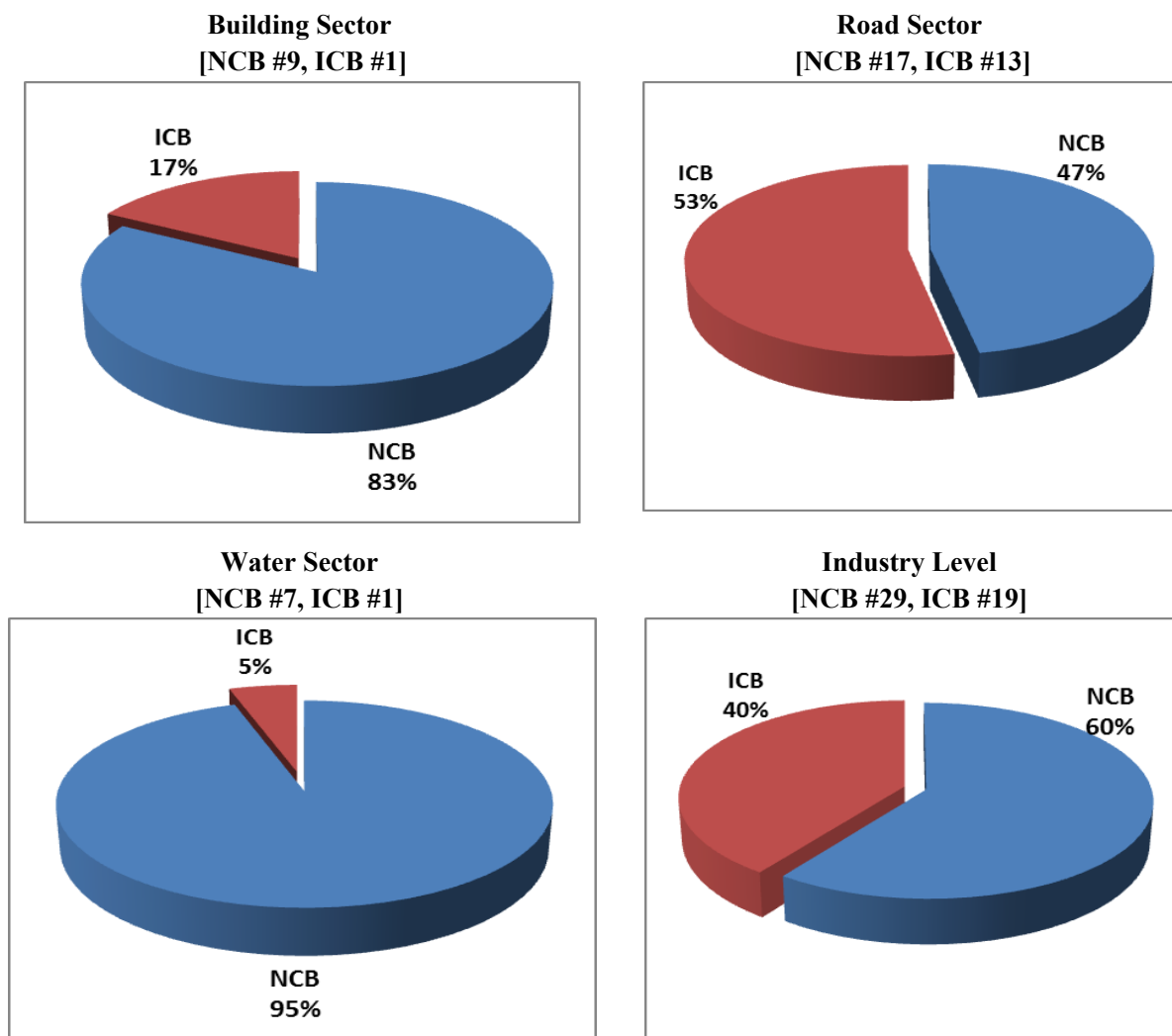


Figure 9: Share³ of NCB and ICB contracts in birr and number

2.5 Procurement Efficiency and Sufficiency of Bid Floating Period

The bid preparation (floating) period, bid evaluation period, duration between contract award and signing have also been summarized for the design, supervision, and Works contracts under the building, road, and water sector projects. The result has then been compared to the requirements of procurement directives, guidelines, and general principles. Under the rules of procurement, the minimum bid preparation period is 30 and 45 days for the national and international competitive bidding procedures respectively.

The sufficiency of bid preparation (floating) period is then evaluated according to this requirement and a percentage of sufficiency of floating period for the contracts is summarized for the three sectors and at industry level. Furthermore, efficiency of the Procuring Entities' bid evaluation is summarized by comparing the time taken for bid evaluation against the commonly applied bid validity period of 90 days. Similarly, the time taken between contract award and contract signing

³ The per cent share is computed financially and the number of projects are indicated in the same figure

has been compared to the procurement rules that states contracts have to be signed between 7 to 15 days of the contract award date.

Annex 2 provides information and analysis on summarization and evaluation of the sufficiency of bid preparation (floating) period as compared to the minimum durations together with the efficiency of bid evaluation and contract signing processes. For design contracts at industry level, the projects with available data indicate that sufficient bid preparation period was given for all projects of ICB contracts and for 75 per cent of the projects of NCB contracts. While there is a delay of contract signing of this service contract at industry level, the efficiency of bid evaluation is 80 per cent indicating that Procuring Entities bid evaluation period is less than 90 days for the majority of design contracts.

Similarly, Annex 3 reveals that sufficient information was obtained for supervision consultancy service contracts only in the road sector and nearly 75 per cent of the projects with available data indicate that sufficient bid preparation (floating) period was given to supervision consultancy service contracts for both NCB and ICB contracts. The efficiency of bid evaluation and contract signing activities is, however, 56 and 42 per cent for NCB and ICB contracts respectively.

For Works contract; sufficient bid information is obtained in the road sector, only some information was obtained in the building sector, and no information was obtained in the water sector as the procurement strategy applied for most of the projects in this sector is direct procurement. From Annex 4, it is revealed that all of the projects under the ICB and 93 per cent of the projects under NCB procedures have got sufficient bid preparation periods and the efficiency of bid evaluation and contract signing processes is 73 and 20 per cent respectively.

Generally, there is a delay in contract signing where the period between contract award and contract signing ranges from a minimum of 28 days to a maximum of 91 days in design consultancy service contracts; from a minimum of 7 days to a maximum of 248 days in supervision consultancy service contracts; and from a minimum of 8 days to a maximum of 207 days in Works contracts.

2.6 Procurement Length and Project Implementation Periods

Procurement length and project implementation periods together with comparison of design period to construction completion period are also part of the themes under this Aggregation Study. With the assumption that projects could be implemented successively after engineering design and contract document preparation is completed, the following figures (Figures 10 to 12)⁴ indicate construction project implementation durations adding design contract procurement duration, design period, Works contract procurement duration, and construction completion periods at sector and industry level.

⁴ The minimum, average, and maximum periods are derived from the selected projects (not a single project)

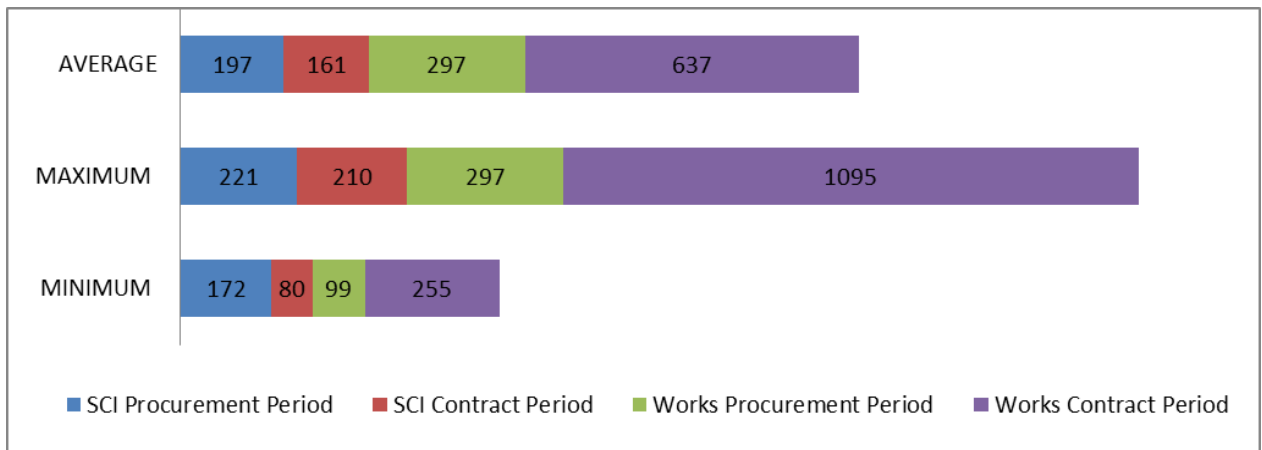


Figure 10: Project implementation durations (days) - building subsector

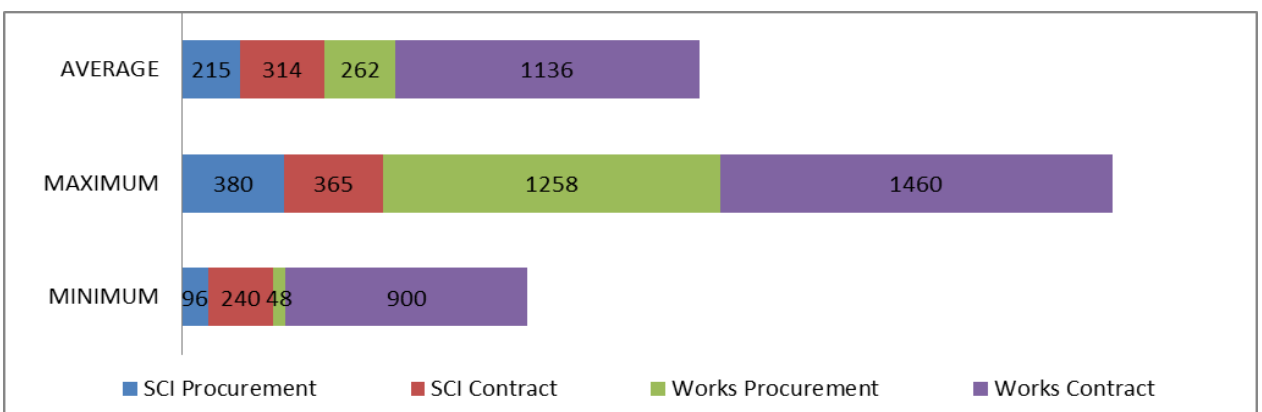


Figure 11: Project implementation durations (days) - road subsector

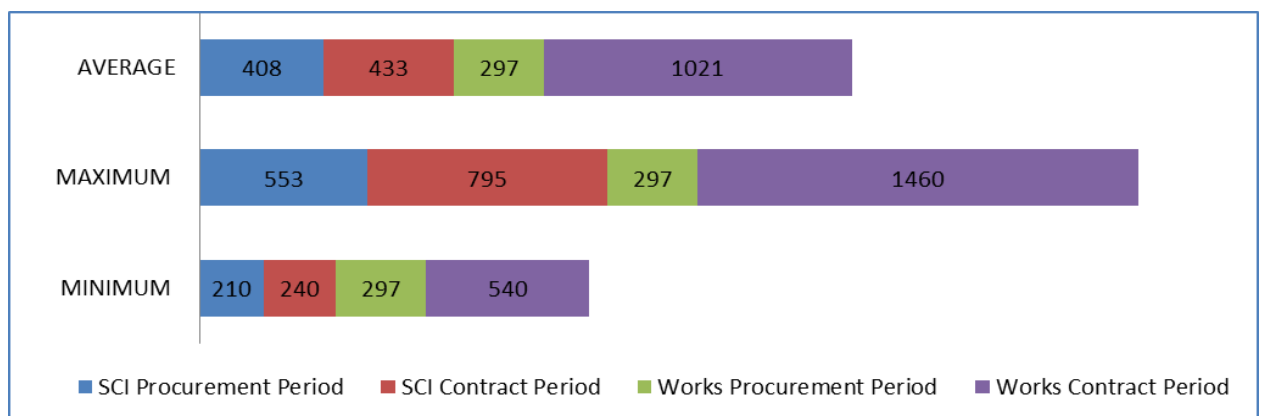


Figure 12: Project implementation durations (days) - water subsector

For design consultancy service contract, the average time for procurement and design period is respectively 245 and 311 days and for Works contract, the average time for procurement and completion period is respectively 307 and 990 days. If projects are successively implemented in this manner, the total implementation period of construction projects could be 1787 calendar days (nearly five years) without considering delays in design service and construction works.

With this approach, the minimum and maximum time period a construction project could be implemented is respectively 479 and 4,066 days. Figure 13 provides a comparison of selected project implementation periods with the minimum, maximum, and average time period from the

building, road, and water sector projects. The majority of projects indicated in this figure have more time period than the average total implementation period summarized in this study.

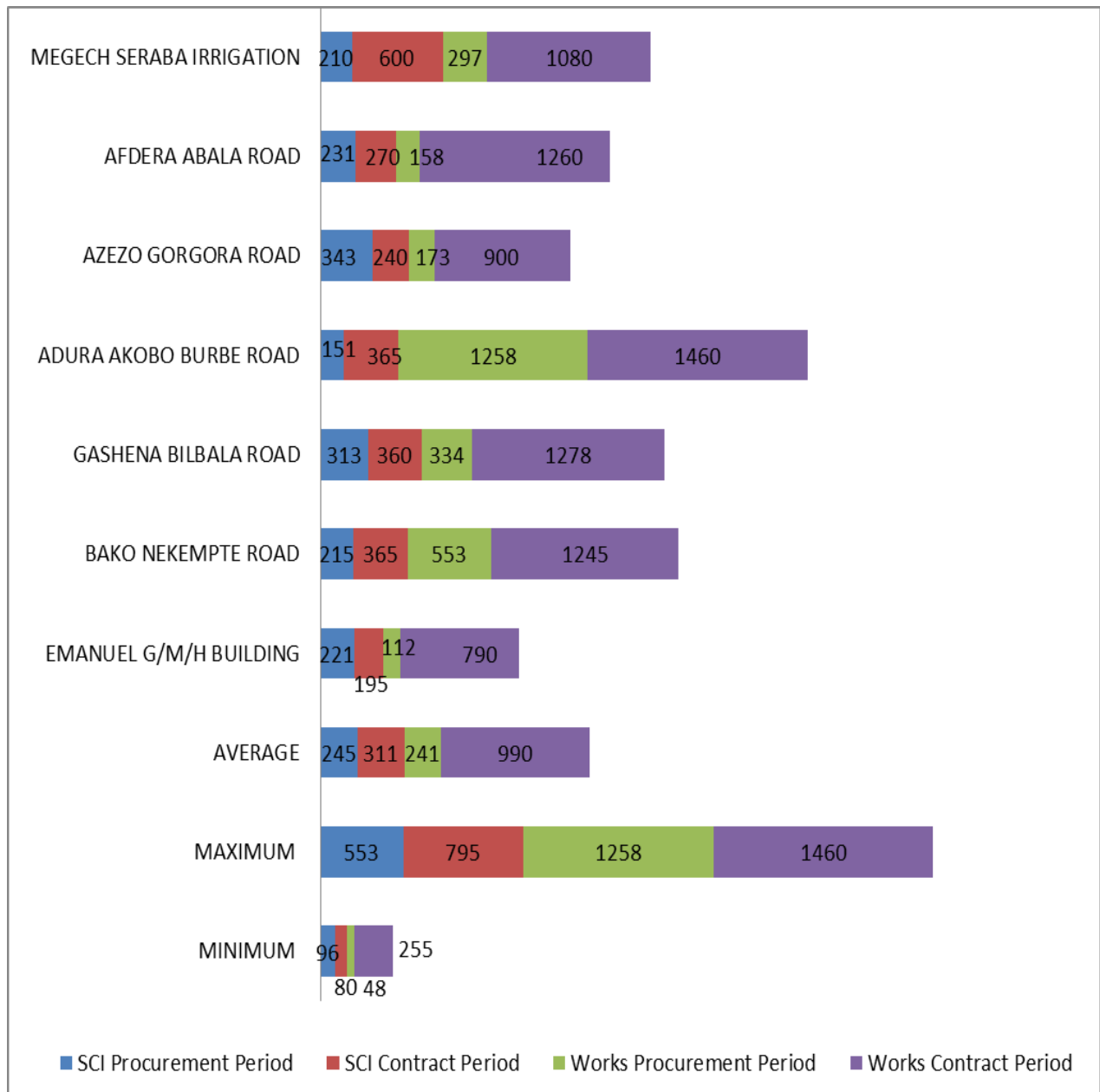


Figure 13: Project implementation durations (days) at industry level

The minimum, maximum, and average procurement for design consultancy service, supervision consultancy service, and Works contracts for the three sectors have been summarized in Annex 5 below.

In the building sector, the procurement length for Works contract is less than the procurement length of both service contracts with a maximum procurement period of 221 days to recruit of a consultant with combined design and supervision contracts. In the road sector; a shorter procurement length is observed to recruit design consultant and the procurement length for supervision and Works contracts runs from a minimum of 48 days to a maximum of 1,258 days.

Even though the number of available data obtained from the water sector projects is small for concluding remarks owing to the direct procurement strategy of the sector, the procurement length

of both services and Works contract took more time period than the other sectors; i.e. from 210 to 553 days.

As part of the last analysis of the collected information under this heading, the design period is compared to the total implementation (design and construction) periods to analyze the time allotment for design of construction projects, i.e. to analyze the sufficiency of design periods as compared to the sum of design and construction periods.

Figure 14 shows that the average design period is nearly 23 per cent of the total implementation period at industry level where the building and road sector projects design period are slightly lower than the industry average while for the water sector projects, it is above the average industry level.

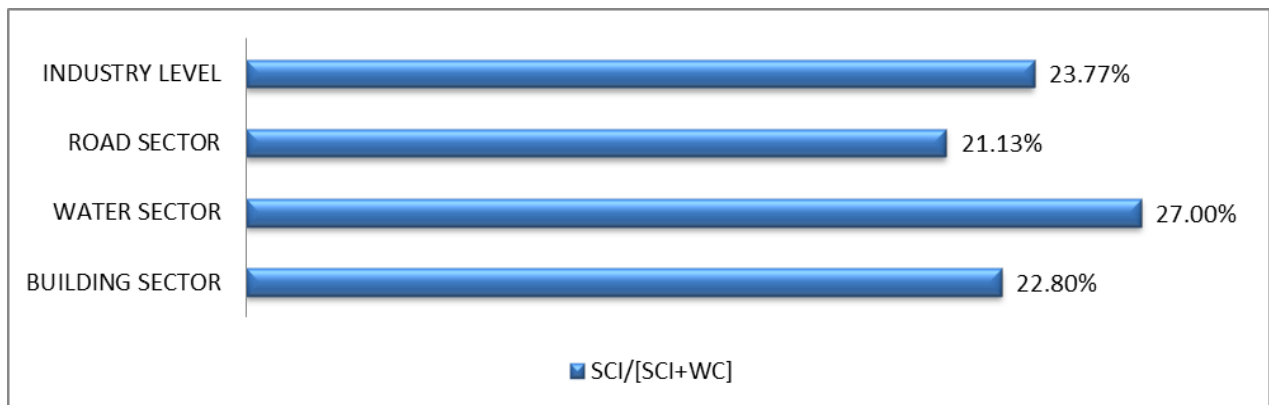


Figure 14: Design period and total implementation period ratio

3. Construction Cost

3.1 Cost Overrun

During the pilot and full-fledged program of CoST-Ethiopia, most (if not all) of the projects covered in the Assurance report preparation were ongoing at different stages. The Aggregation Study summarized the project costs at the start and at the time of Assurance studies considering cost variations during the construction phase for all of the projects.

In effect, cost overrun of the projects at the time of Assurance report preparation has been compiled and analysis of the minimum, maximum, and average cost overrun at sector and industry level has been performed. Together with summarizing these variables, the reasons of cost overrun as provided in the Assurance Reports were also analyzed and discussed under this part of the Aggregation Study.

From the analysis results, it can be seen that the aggregate cost overrun at the time of disclosure of both pilot and full-fledged projects at industry level is 17.09 per cent. This percentage of cost overrun is in addition to price escalation payment that is summarized in the next section of this Aggregation Study. The summary of cost overrun is compared to the initial contract price of projects that mostly arise from variation orders, quantity re-measurement during construction, and other cost varying events except price escalation payments. At sector level, there is 65.18 per cent cost overrun in the water sector, 6.81 per cent in the building sector, and 3.18 per cent in the road sector.

A possible explanation for the cost overrun in the water sector could be that the initial contract price is determined before detailed engineering design is carried out and construction of most water sector projects are procured through single source procurement. Also, the majority of the water sector projects commence based on feasibility study and preliminary designs (if any) while detailed engineering design was carried out in parallel to the construction of these projects.

Table 4: Cost overrun summary

SUBSECTOR	PILOT (%)	FULL-FLEDGED (%)	TOTAL (%)
Building	1.49	8.18	6.81
Road	2.40	3.54	3.18
Water	63.56	66.91	65.18

It has to be noted, however, that the cost overrun summarized in this study is for a period of time the Assurance studies were carried out and these figures may vary at the completion of the projects. That is, the estimated or actual project cost at completion of these projects was not obtained from the Assurance Reports and cost overrun summarized under this Aggregation Study only considers up to the time of the disclosure of the respective projects.

For this reason, the cost overrun data have been updated for a selected number of projects from the three sectors considering some of the projects covered by CoST-Ethiopia whose status of completion was above eighty per cent. Among the fifty two construction projects covered by CoST-Ethiopia; six projects were selected from the building sector; thirteen from the road sector; and six from the water sector.

As depicted in Figure 15, the updated summary of cost overrun shows that there is 76 per cent cost overrun at industry level and the average cost overrun in the building, road, and water sectors is respectively 16.43; 41.61; and 170.57 per cent.

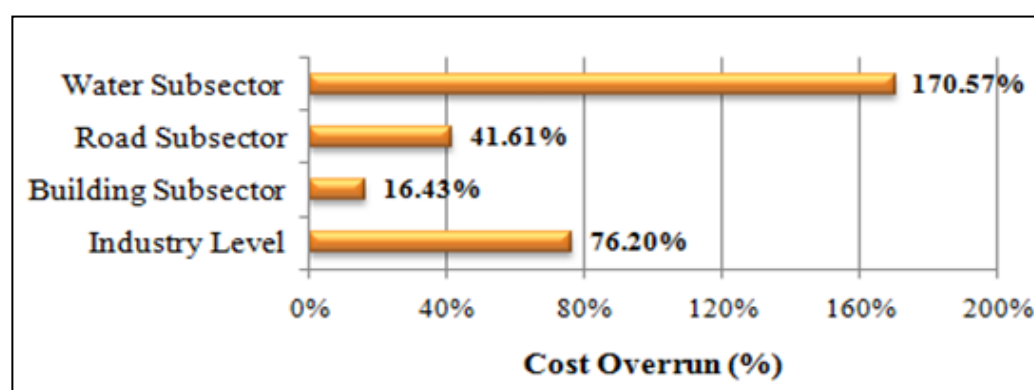


Figure 15: Updated average cost overrun

Most of the building, road, and water sector projects experience cost overrun to a certain degree depending on the reasons of cost overrun on each sector. Figure 16 indicates that the minimum cost overrun in the building, road, and water sector projects are respectively 1.69 million birr (0.74 per cent of the initial contract price, ICP), saving of 21.67 million birr (negative 3.40 per cent of the ICP), and 3.34 million birr (0.79 per cent of the ICP) respectively. At industry level, the maximum cost overrun is recorded in the water sector with 1.76 billion birr, 208.9 per cent of the initial contract price.

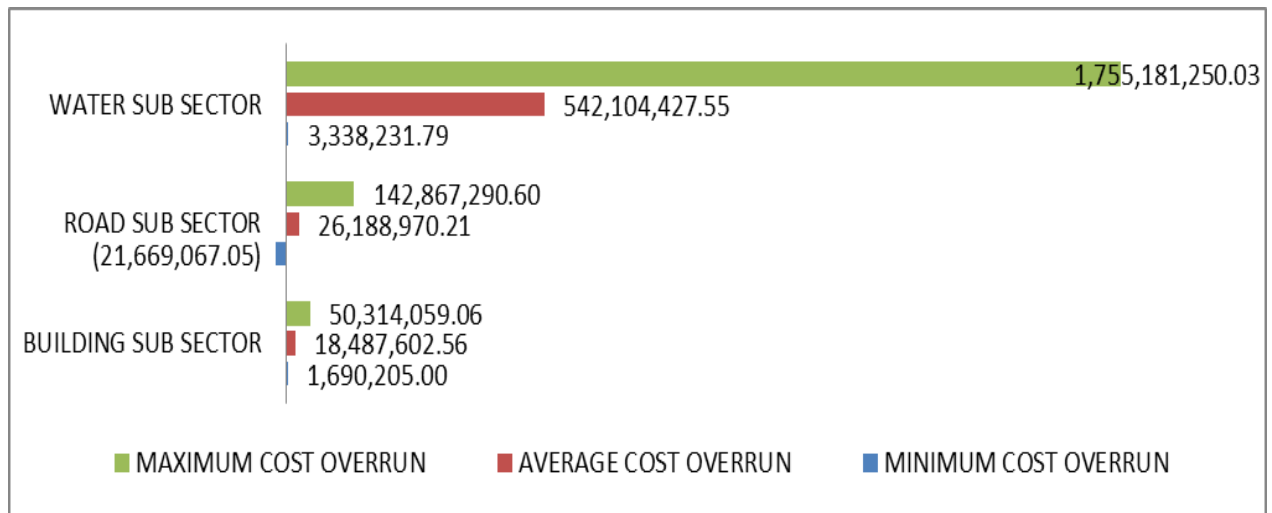


Figure 16: Minimum, Average, and Maximum cost overrun in birr

3.2 Reasons of Cost Overrun

For the purpose of this analysis, the reasons of cost overrun have been summarized for the three sectors and aggregated into seven categories of:

- incomplete design;
- design change (though variation);
- project scope change;
- changes in quantity (up on re-measurement);
- force majeure (events not caused by contracting parties);
- price hike/inflation;
- other reasons such as construction difficulty, Employer’s inactions, shortage of materials, etc that increased the cost of the project.

As can be seen from Figure 17, design change, incomplete designs, and change in quantity are major reasons of cost overrun that share nearly 92 percent of the reasons for cost overrun in the building sector. In the road sector, the reasons of cost overrun are evenly distributed among six reasons where incomplete design as a reason of cost overrun was not reported and design change is the major reason of cost overrun.

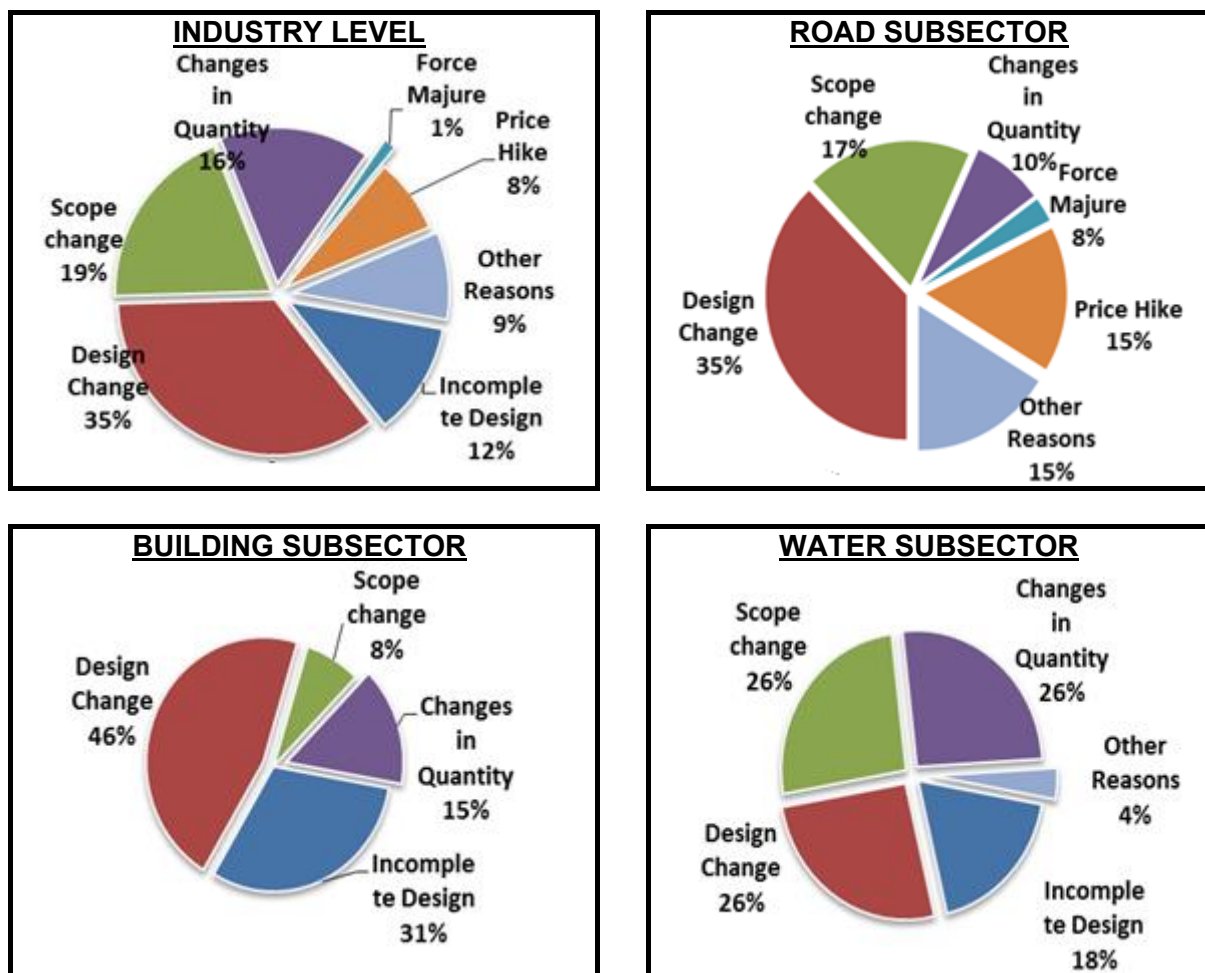


Figure 17: Reasons of cost overrun

In the water sector; design change, scope change, and changes in quantity each share 26 per cent as a reason for cost overrun with a total of 78 per cent followed by incomplete design. The aggregated summary at industry level shows that design change is the major reason of cost overrun (35 per cent) and force majeure is the least ranked reason of cost overrun (only 1 per cent).

3.3 Price Escalation

For most projects, price escalation payments are paid to the Contractor by Procuring Entities pursuant to their respective contract agreement provisions. Figure 18 and Annex 8 reveal around 12 per cent of the aggregate project cost has been paid by the Procuring Entities on construction projects. This average figure was summarized from projects at the stage of the construction projects when the pilot and full-fledged Assurance Reports were prepared and amounts to 2.5 billion birr out of the total 21.7 billion birr construction project.

For water and building sector projects, the coverage of price escalation payments is limited to cement, reinforcement bar, and fuel for which sufficient information was not disclosed by the Procuring Entities and respective project participants. For these reasons, a higher amount of price escalation payment is presumed to be paid at the time of disclosure.

Price escalation payments made in the building sector is nearly 6.3 per cent of the total project cost as summarized from two out of ten building projects covered by CoST-Ethiopia. Moreover, most building projects whose completion period is less than 18 months do not provide price escalation payment clauses in their contract agreement.

The price escalation payments in the water and road sector projects are respectively 9.03 and 12.35 per cent of the total initial project costs considering price escalation payments disclosed by the Procuring Entities.

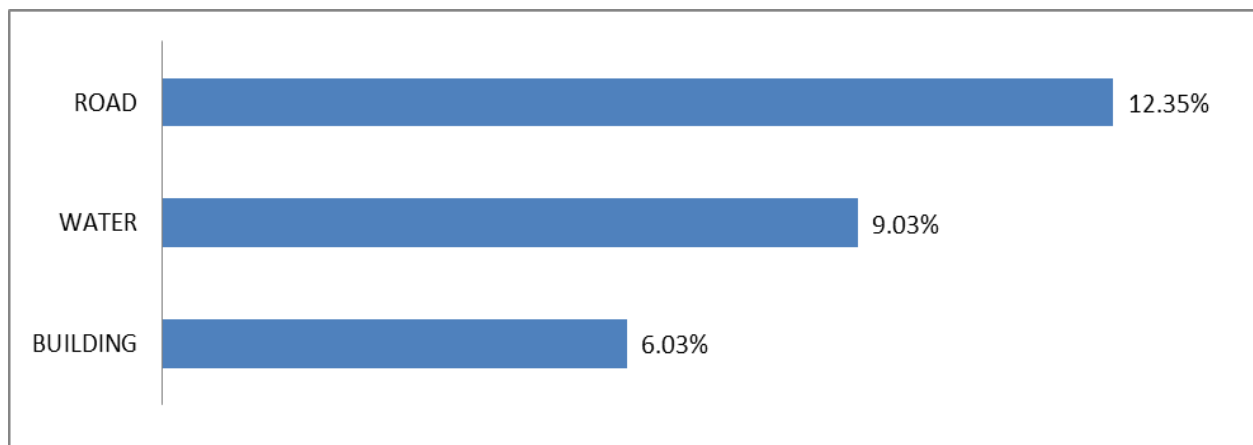


Figure 18: Average price escalation payment as compared to their respective total project cost by sector

It has to be noted that as the project progresses and when completion dates are extended for these projects, price escalation payments would rise than indicated in this study. Hence, the summarized price escalation payments do not indicate the actual price escalation payments of the projects at the time the projects are completed.

4. Project Development Cost Assessment

4.1 Services/Works Cost Ratio

The costs of design contract (SCI) and the supervision contract (SCII) has been summarized as a percentage of project costs to indicate the practical share of the costs for design and supervision services from the total project cost (TPC)⁵.

Table 5 indicates that at industry level, the average cost share of the design consultancy service contract is 1.23 per cent of the construction cost and the supervision consultancy service contract is 3.01 per cent of the construction cost. The average share of both service costs is 3.80 per cent of the construction cost and the share of these service costs is minimum in the building sector and maximum in the water sector.

Similarly, Figure 19 indicates that at industry level, the average cost share of the design consultancy service contract is 1.15 per cent of the Total Project Cost (TPC) and the supervision

⁵ Total project Cost (TPC) is the sum of costs of design consultancy service, supervision consultancy service, and Works contracts

consultancy service contract is 2.68 per cent of the Total Project Cost. The average share of both service costs is 3.45 per cent of the total project cost and the share of these service costs is minimum in the building sector and maximum in the water sector.

Table 5: Summary of consultancy service cost and project cost ratio

	Service Cost to Project Cost			Service Cost to Total Project Cost		
	SCI/WC	SCII/WC	[SCI+SCII] / WC	SCI / [SCI+SCII+WC]	SCII / [SCI+SCII+WC]	[SCI+SCII] / [SCI+SCII+WC]
No of Projects with sufficient data	30	35	42	30	35	42
Building Sector	0.40%	1.73%	2.52%	0.39%	1.65%	2.40%
Water Sector	2.03%	7.35%	8.90%	1.69%	6.05%	7.56%
Road Sector	1.21%	1.97%	2.67%	1.14%	1.88%	2.54%
Industry Level	1.23%	3.01%	3.80%	1.15%	2.67%	3.45%
SCI – DESIGN CONTRACT; SCII – SUPERVISION CONTRACT; WC – WORKS CONTRACT						

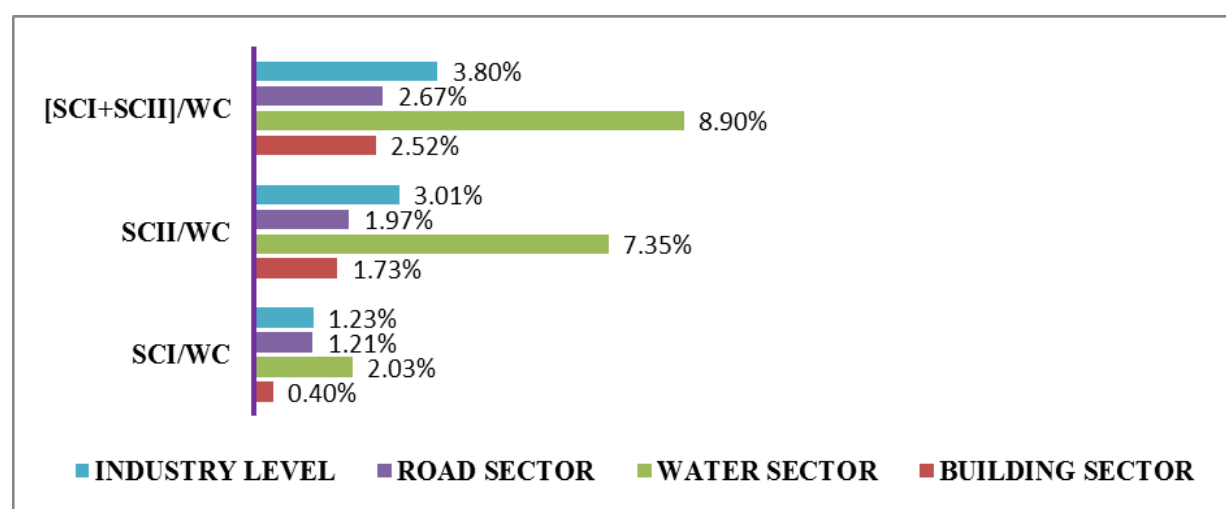


Figure 19: Services, Works, and Project cost ratios

5. Construction Time

5.1 Time Overrun

As with cost overrun, the maximum time overrun is recorded in the water sector by 288 per cent of the completion period (1901 days) and the minimum time overrun is recorded in the building sector. Annex 9 shows the minimum, maximum, and average time overrun of projects from the three sectors. Also, Figure 20 shows completion period with time overrun for all projects considered by CoST-Ethiopia.

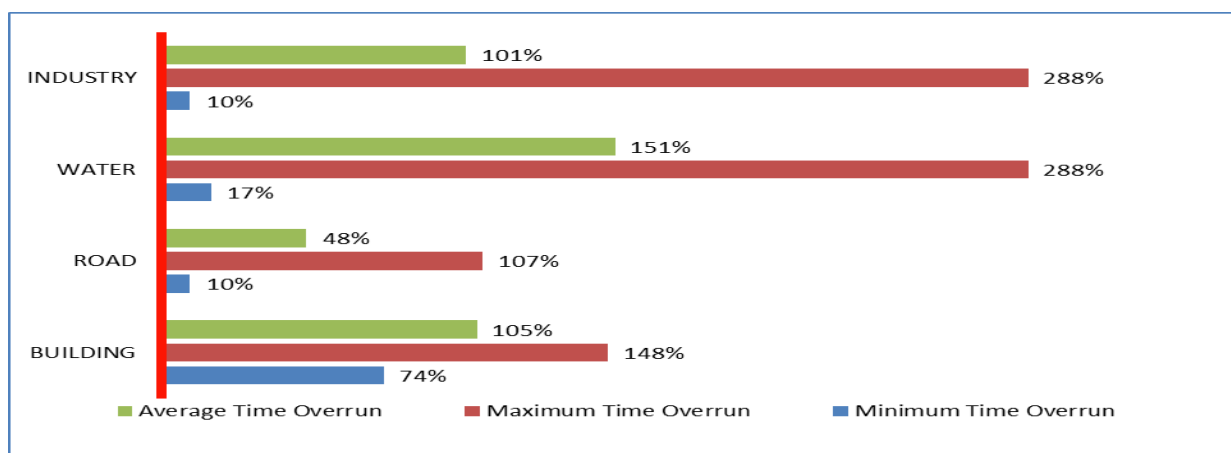


Figure 20: Minimum, Maximum, and Average time overrun

As most projects were undergoing and not completed during the Assurance process, the time overrun presented in this study cover only for the period of time the disclosure was made and the time overrun does not show the actual time overrun at the completion of these projects.

For this reason, the results have been updated for selected projects as performed for cost overrun. The update was considering some of the projects covered by CoST-Ethiopia whose status of completion was above eighty per cent for most of the selected projects.

As shown in Figure 21, the updated summary of time overrun shows that the industry level time overrun is 124.43 per cent and the time overrun for the building, road, and water sectors is 160.70 per cent, 63.34 per cent, and 149.25 per cent respectively.

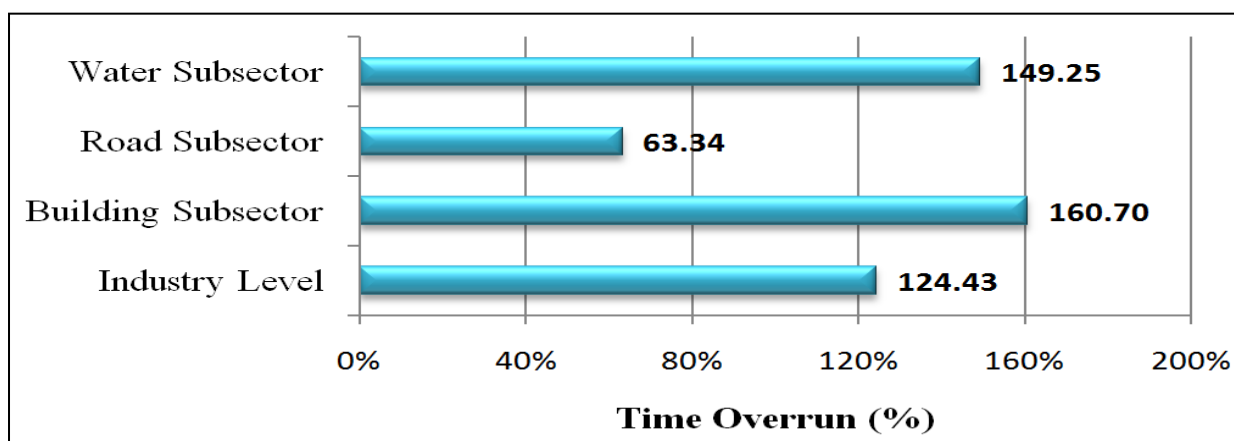


Figure 21: Updated average time overrun

5.2 Reasons for Time Overrun

Similar to the reasons for cost overrun, the reasons of time overrun have been summarized for the three sectors and aggregated into seven categories of:

- incomplete design;
- design changes;
- scope change;
- changes in quantity;

- force majeure and adverse weather conditions
- poor completion time estimation, and
- other reasons such as contractor's low capacity, Employer's inactions, shortage of materials, and construction difficulty.

In the building sector; design change and change in quantity being reasons of time overrun with 25 and 17 per cent shares respectively, the major reason of time overrun in this sector with 42 per cent share include other reasons such as land acquisition issues, energy crisis, power and water supply, shortage of finance and budget planning, unavailability of foreign currency, scarcity of construction materials on local market, poor provision of equipment and skilled manpower, etc.

In the road sector, design change and force majeure (including inclement weather condition) each share 22 per cent of the reason of time overrun while other reasons such as Contractor's low capacity, land acquisition related problems (Employer's contractual obligation), etc constitute the major reasons of time overrun with 26 per cent share.

In the water sector; incomplete design (20 per cent), scope change and change in quantity (17 per cent each), and design change (16 per cent) are reasons of time overrun that delay project completion. The other reason of time overrun in the sector with 20 per cent share is a combination of other reasons related to the capacity and efficiency of project participants such as Contractor, Consultant, and Employer.

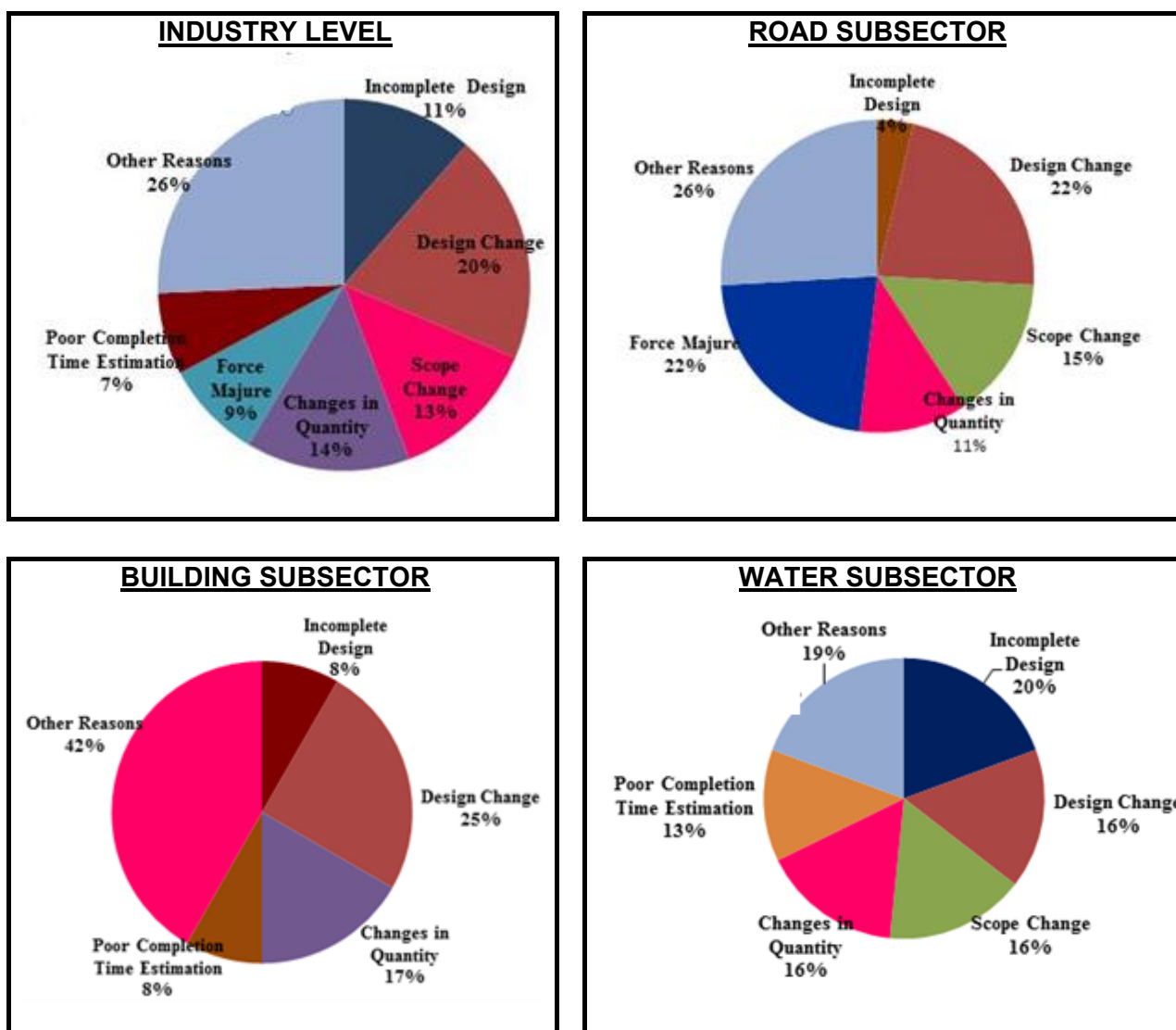


Figure 22: Reasons for time overrun

6. Causes for Concern

The causes for concern that was provided in the Assurance Reports have been grouped into seven categories in a similar way to the reasons of cost and time overrun. The categories of causes for concern that call for intervention in each of the projects are aggregated into the following:

- cost overrun;
- time overrun;
- project identification issues;
- procurement issues;
- contract administration issues;
- capacity building issues;
- procurement regulation issues.

The categories listed above were grouped according to the causes for concern provided in the Assurance Reports and analysis was made based on the frequency of the causes for concern provided for each of the projects covered by CoST-Ethiopia.

Figure 23 depicts that, project delay is the major causes for concern followed by procurement problems and cost overrun in the building sector. A project identification issue is the least causes for concern in this sector even if feasibility and environmental impact assessment studies were not conducted for the majority of projects in the sector.

In the road sector, procurement issues are the major causes for concern with 33 per cent share followed by project delays (21.4 per cent), contract administration issues (17.1 per cent), and cost overrun (15.7 per cent).

In the water sector, different causes for concern were obtained from the analysis where procurement regulation and capacity building issues, contract administration practices, time and cost overrun are all reported to be the causes for concern in the sector.

The aggregate summary of the causes for concern at industry level shows that procurement problems, project delays, cost overrun, and contract administration problems are the major causes for concern.

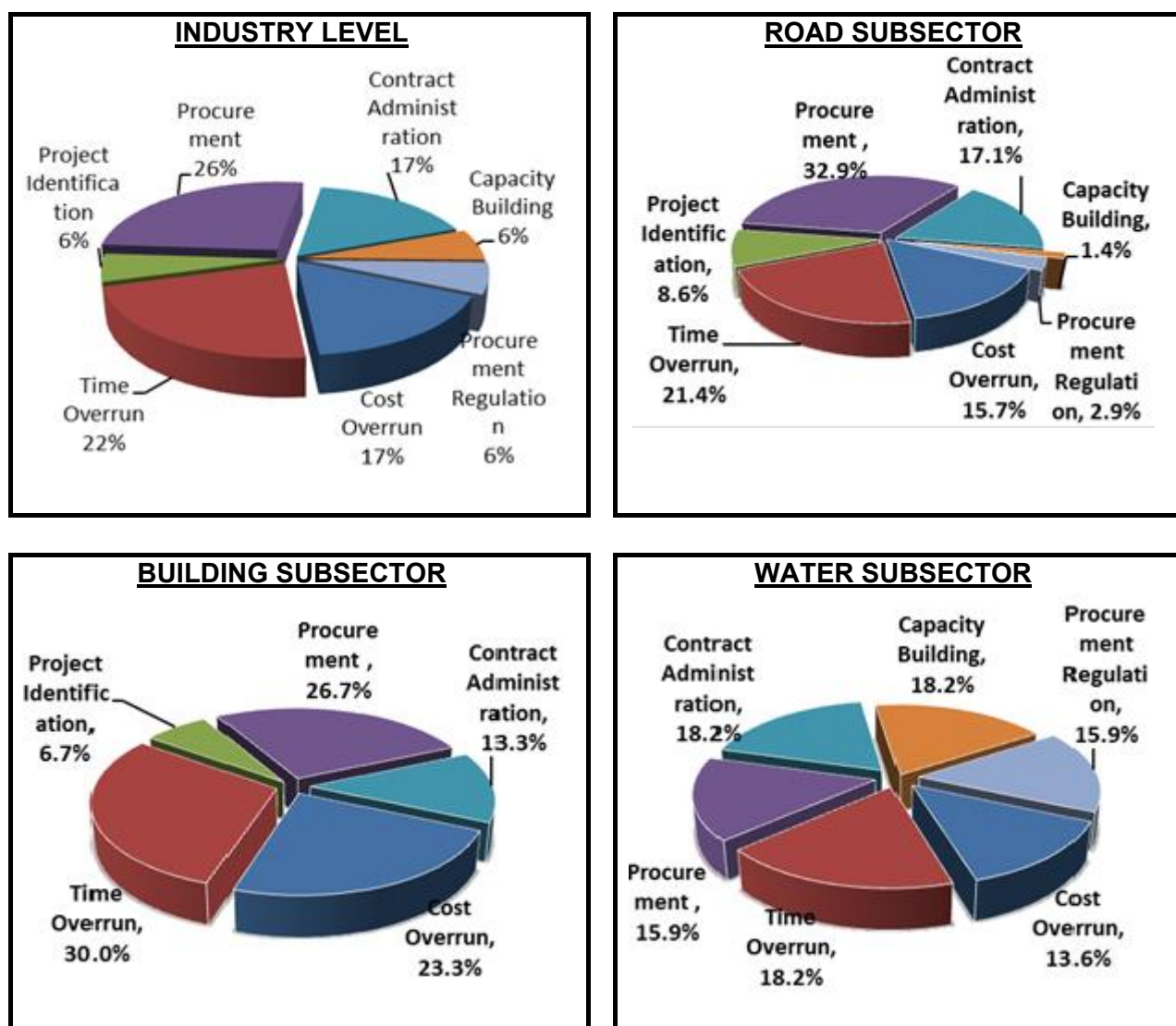


Figure 23: Summarized causes for concern

III. KEY FINDINGS

The projects covered by CoST-Ethiopia from the building, water, and road sectors could be taken as representative sample both in number and volume of projects and therefore, the findings of this Aggregation Study are believed to be indicative of the sectors' and industry's project implementation practices. And, for the purpose of this study; the building sector include ten projects, the water sector includes ten projects, the road sector includes thirty two projects.

The main objective of the study is to summarize the facts provided in each of the Assurance Reports that could indicate common behaviors of a construction project implementation practices.

1. Building Sector

In the building sector, 90 per cent of the projects did not conduct feasibility and environmental impact assessment studies and these projects have been implemented without studying the feasibility and environmental impact assessments. Also, the design and supervision contracts for the majority of these projects are procured through direct award and there is no competition for these services.

The average cost overrun in the building sector is 6.81 per cent and the price escalation payment that was paid for two projects out of the sampled ten projects is 6.03 per cent of the initial contract price. The majority of the building projects do not have price escalation provisions owing to the requirements that price adjustment is allowed for projects whose initial completion period is above 18 months.

The average design fee for building sector projects is 0.4 per cent of the construction cost and the supervision and contract administration service fee for building and road sector projects is almost similar. The minimum, average, and maximum time overrun in the building sector projects is respectively 74, 105, 148 per cent and the average time overrun in the building sector is more than twice the average time overrun in the road sector.

2. Water Sector

Direct award procurement is applied for the majority of projects in the water sector except the World Bank financed projects (#2) with a main objective of reducing the time required for the procurement of the design, supervision, and Works Contracts so that projects could commence immediately after the go ahead for project implementation was obtained from the concerned authority. The consultant and contractor appointed in this arrangement are Government owned firms engaged in the water sector for a longer period of time with institutional links to the project implementing ministry office.

The Procuring Entity initiate implementation phase (construction) before detailed design is completed and projects in this sector are planned to start construction based on feasibility studies and preliminary designs while detailed engineering designs are being performed in parallel to the construction. For this main reason, there is no complete engineering design prior to construction and contract document is deficient at the time of contract signing or at the time of commencement for most of these projects.

All these projects suffer cost overrun and delay in completion due to the procedural arrangements that could be indicative of the fact that the approach did not result the objective of reduced project implementation periods, i.e. projects delayed and their costs increased substantially and reasons for these problems emanate from the absence of detailed engineering design and complete contract documents.

Contract document preparation problem was observed on most water sector projects even for consulting service contracts as to the main requirements such as staff requirement and submission deadlines that was recorded as a point of dispute and a barrier for proper contract administration. That is, when contract documents do not clearly indicate the contract requirement on both consultant and contractor agreements, it hinders proper contractual actions because of absence of clear provisions.

In summary, contract document preparation problem; construction without having detailed engineering design; revision without limit (excessive number of variations); setting short period of time for completion; and late commencement by the consultant and contractor engaged in the sector are some of the observed problems in the water sector projects that could hide performance problems by the consultant and contractor.

Also, one of the problems with incomplete contract document is on contract quantity estimation that even affects including subcontract agreements made by the main contractor and subcontractors. Water Works Construction Enterprise (WWCE) is the Contractor that is directly appointed for the construction of most of the water sector projects and this firm applied open tendering procedures to subcontract parts of the Works. This contractor made subcontract agreements with foreign contractors by open tendering procedure for which one the subcontract with 28 million Birr increased to 100 million birr (by 357 per cent) and another subcontract with 1.42 million USD has increased to 2.36 million USD (by 166 per cent) due to the quantity estimation problem in the contract document.

Furthermore, a sample of the performance of an international design consultant, a design service period for one of the projects was 20 months and the consultant has got a further eight months extension of time. However, there was a delay in submission of the final designs and related studies by more than 16 months indicating that even in the case of ICB contracts, design submission could take nearly three years in the sector.

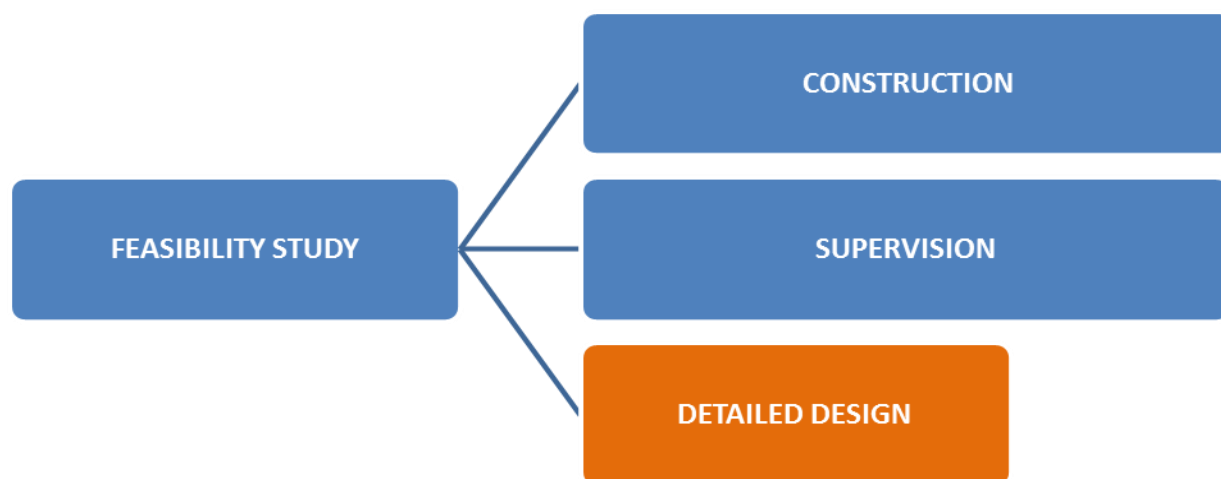


Figure 24: Parallel construction and design phases; project implementation based on feasibility studies and preliminary designs

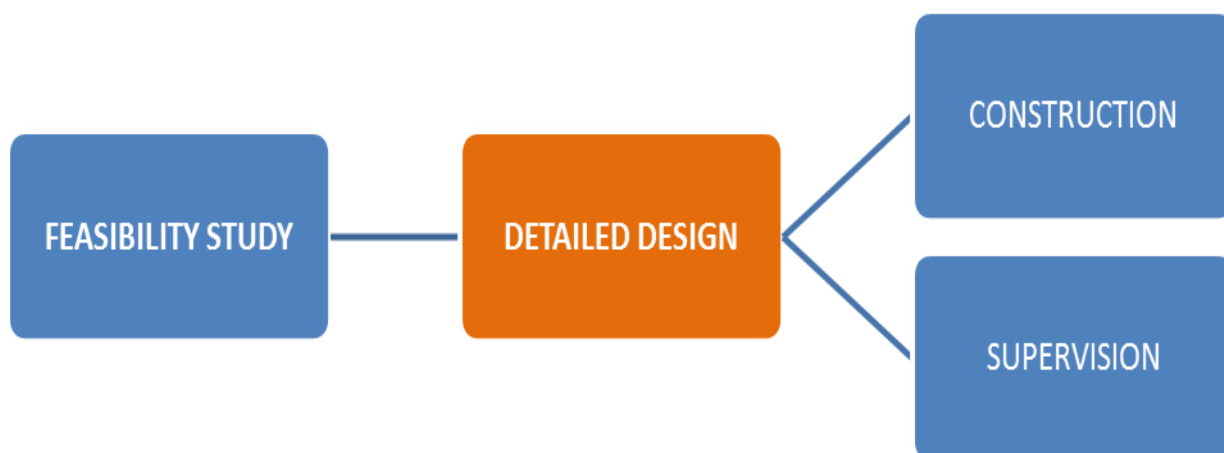


Figure 25: Construction phase following design phase; project implementation based on detailed design

3. Road Sector

Design build (DB) project delivery method is applied in the road sector for 17 per cent of the total 32 projects as a suitable delivery method in solving part of the construction problems that could arise from other delivery strategies.

The level of competition in the Works contract of the road sector is less than 50 per cent for the majority of projects, i.e. the level of competition can be regarded as low for more than 76 per cent of the projects. In other words, only 26 per cent of the projects score a level of Competition of 50 per cent and above indicating that Works contracts are procured with lower competition in the road sector.

The analysis of sufficiency of bid floating period and efficiency of bid evaluation process in the road sector revealed that all of the projects under the ICB and 93 per cent of the projects under NCB procedures have got sufficient bid preparation periods and efficiency of bid evaluation and contract signing processes is 73 and 20 per cent respectively.

In the road sector; a shorter procurement length is observed to recruit design consultant and the procurement length for supervision and Works contracts runs from a minimum of 48 days to a maximum of 1,258 days.

ANNEXES

Annex 1: Key Variables Considered in the Aggregation Study (ToR)

#	Major Variables	Details
1	Project Cost	Cost of specific projects
		Project cost at Sector Level
		Project cost at Industry Level
2	Completeness of Project Studies	Feasibility study (Available/Not Available)
		Environmental Impact Assessment (Available/Not Available)
		Attention by the Projects for the two studies
		Number (and percent) of projects with feasibility study
		Number (and percent) of projects with EIA study
3	Bid Statistics	
a	Length of Procurement (with segments for bid floating, evaluation, award, project commencement) at Project Sector and Industry Level. Average values are used for sector and industry levels.	Minimum length of procurement (by segment and in total)
		Minimum length of procurement (by segment and in total)
		Minimum length of procurement (by segment and in total)
b	Level of competition at Project, Sector and Industry levels. Average values are used for sector and industry levels.	Number of firms who purchased Bid Document
		Number of firms who submitted Bid Document
		Number of firms who qualified
4	Construction Cost	
a	Cost overrun of projects	
		Project cost at the start
		Project cost at the time of study
	Aggregation at Sector and Industry level (in percent and in absolute figures) of cost overrun	Estimated/actual project cost at completion
		Minimum cost overrun
		Maximum cost overrun
		Average cost overrun
b	Reasons for Cost overrun of projects (explain as to how the following became reasons for cost overrun)	Design - incompleteness
		Design - change of design
		Scope change
		Change in quantity
		Price hike
		Force majeure
		Others, specify
5	Price Escalation	Price escalation at Project Level (in percent and in absolute figure)
		Price escalation at Sector Level (in percent and in absolute figure)
		Price escalation at Industry Level (in percent and in absolute figure)

		absolute figure)
6	Construction Time	
a	Time overrun at project level (in percent and in absolute figures)	Estimated project completion time at the start
		Estimated project completion time at the time of study
		Estimated/actual project completion time at completion
	Aggregation at Sector and Industry level (in percent and in absolute figures) of time overrun	Minimum time overrun
		Maximum time overrun
		Average time overrun
		Estimated time overrun for ongoing projects
	b Reasons for Time overrun of projects (explain as to how the following became reasons for cost overrun)	Design - incompleteness
		Design - change of design
		Scope change
		Change in quantity/volume of work
		Force majeure
		Poor initial estimation of completion time
		Others, specify
7	Issues of Concern	Issues of concern of specific projects Implications of the causes of concern Root causes for the issues of concern with remedial points Cross cutting issues of concern at Sector Level with remedial points Cross cutting issues of concern at Industry Level with remedial points

Annex 2: Procurement efficiency for design contract [SCI]; in days

Criteria for Comparison	Bid Preparation / Floating Period		Bid Evaluation Period	Contract Signing Period	Combined Bid Evaluation & Contract Signing
	Min=30 NCB	Min=45 ICB	Max = 90	Max = 15	Max = 105
Industry Level					
No. of Projects with sufficient data	12	5	10	4	4
No. of Projects fulfilling the Criteria	9	5	8	0	0
Sufficiency of Floating Period / Efficiency of Evaluation (%)	75.00	100.00	80.00	0.00	0.00
Building Sector					
No. of Projects with sufficient data	1	-	1	-	-
No. of Projects fulfilling the Criteria	0	-	0	-	-
Sufficiency of Floating Period / Efficiency of Evaluation (%)	0.00	-	0.00	-	-
Road Sector					
No. of Projects with sufficient data	11	3	9	4	2
No. of Projects fulfilling the Criteria	9	3	8	0	0
Sufficiency of Floating Period / Efficiency of Evaluation (%)	81.82	100.00	88.89	0.00	0.00
Water Sector					
No. of Projects with sufficient data	-	2	-	-	2
No. of Projects fulfilling the Criteria	-	2	--	-	0
Sufficiency of Floating Period / Efficiency of Evaluation (%)	-	100.00	-	-	0.00

Annex 3: Procurement efficiency for supervision contract [SCII]; in days

Criteria for Comparison	Bid Preparation / Floating Period		Bid Evaluation Period	Contract Signing Period	Combined Bid Evaluation & Contract Signing
	Min=30 NCB	Min=45 ICB	Max = 90	Max = 15	Max = 105
Road Sector					
No. of Projects with sufficient data	19	4	9	12	1
No. of Projects fulfilling the Criteria	14	3	5	5	0
Sufficiency of Floating Period / Efficiency of Evaluation (%)	73.68	75.00	55.56	41.67	0.00

Annex 4: Procurement efficiency for Works contract [WC]; in days

Criteria for Comparison	Bid Preparation / Floating Period		Bid Evaluation Period	Contract Signing Period	Combined Bid Evaluation & Contract Signing
	Min=30 NCB	Min=45 ICB	Max=90	Max=15	Max=105
Industry Level					
No. of Projects with sufficient data	15	9	22	15	-
No. of Projects fulfilling the Criteria	14	9	16	3	-
Sufficiency of Floating Period / Efficiency of Evaluation (%)	93.33	100.00	72.73	20.00	-
Building Sector					
No. of Projects with sufficient data	2	1	3	-	-
No. of Projects fulfilling the Criteria	2	1	1	-	-
Sufficiency of Floating Period / Efficiency of Evaluation (%)	100.00	100.00	33.33	-	-
Road Sector					
No. of Projects with sufficient data	13	8	19	15	-
No. of Projects fulfilling the Criteria	12	8	15	3	-
Sufficiency of Floating Period / Efficiency of Evaluation (%)	92.31	100.00	78.95	20.00	-

Annex 5: Minimum, Maximum, and Average procurement length by Subsector

Parameters	SCI	SCII	Works
Building Subsector			
No. of Projects with sufficient data	2	1	5
Minimum Procurement Length - Days	172	221	99
Maximum Procurement Length - Days	221		179
Average Procurement Length - Days	197		124
Road Subsector			
No. of Projects with sufficient data	15	26	24
Minimum Procurement Length - Days	96	53	48
Maximum Procurement Length - Days	380	1,018	1,258
Average Procurement Length - Days	215	304	262
Water Subsector			
No. of Projects with sufficient data	3	1	1
Minimum Procurement Length - Days	210	484	297
Maximum Procurement Length - Days	553		
Average Procurement Length - Days	408		
Industry Level			
No. of Projects with sufficient data	20	28	30
Minimum Procurement Length - Days	96	53	48
Maximum Procurement Length - Days	553	1,018	1,258
Average Procurement Length - Days	245	307	241

Annex 6: Project Details and Study Team Assignment

#	Project Name	Contract Date	Initial Contract Price [BIRR]	Initial Contract Price [USD]	Initial Construction Time [Days]
Building Sector Projects					
1	Implementation Process of 10 Universities - Hossana	01 May 2010	18,401,563.94	1,374,173.99	270
2	Implementation Process of 13 Universities - Axum	12 Dec 2010	81,108,790.00	8,345,341.37	540
3	St. Paulos Millennium Medical College	May10	73,705,033.57	5,537,984.34	820
4	Emanuel General Mental Hospital	09 Jun 2010	67,660,053.56	5,068,928.20	790
5	Jimma University Building Projects	02 Jul 2008	309,525,592.83	32,405,322.29	991
6	Jimma University Teaching and Referral Hospital	May 2007	236,703,570.23	27,521,750.83	1095
7	Jimma University Laboratory and Workshop	24 Jan 2011	355,925,389.92	21,719,984.74	730
8	Jimma University Classrooms Phase II	May 2012	340,932,496.71	19,555,273.04	300
9	Jimma University Research and Conference Hall	3 May 2010	227,919,070.43	17,096,922.24	560
10	Jimma University Dormitory Phase II	13 Jun 2012	349,523,637.70	19,848,809.31	300
Road Sector Projects					
1	Tongo Beji Muji, Contract 2 Gidame Mugi	17Apr 2008	372,420,036.56	39,505,637.16	1080
2	Hausewa Abala Irebti	04Jul 2008	746,341,435.30	78,436,262.94	1260
3	Hubmo Arbaminch Upgrading	23Nov 2007	380,204,197.21	42,537,950.01	913
4	Abala Shaigube Design-Build Road Project	Mar 2010	707,955,759.00	53,398,382.79	
5	Gondar Debark Road Project	Dec 2008	690,779,965.26	70,871,033.68	1260
6	Injibara Chagni Pawi Junction	22 Nov 2012	2,283,309,548.60	127,008,585.60	913
7	Dashena Abderaafic Mykedra	26 Nov 2013	1,607,687,055.78	85,198,042.17	1186
8	Lumame Debre Markos	30Aug 2013	1,319,400,000.00	392,463,417.40	644

#	Project Name	Contract Date	Contract Price [Birr]	Contract Price [USD]	Construction Period [Days]
Road Sector Projects (cont'd)					
9	Semera - Ddigsala Road Project	07Feb 2008	328,215,146.17	35,874,428.81	1066
10	Gindeber - Gobensa Road Project	08Jan 2010	755,409,675.00	60,475,348.65	1260
11	Adigoshu - Lugdi Road Project	10Apr 2007	627,709,145.85	73,722,373.11	1280
12	Gedo - Manabegna [Design Service]	Design stage			
13	Bako - Nekempte Road Project	29 Jul 2009	391,047,637.57	34,964,917.52	1245
14	Butajira Gubre Road Upgrading Project	Nov 2007	637,497,172.45	71,338,731.5	1278
15	Aposto-Wondo-Negele; Irba Moda Wadera Road	24Dec 2008	690,779,965.26	6,320,2587.43	1080
16	GashenaLalibela-Sekota: Gashena Bilbala Road Project	15 Jan 2014	1,442,916,047.83	76,139,309.16	1278
17	Adiremet - Dejena - Dansha Road Project	23 Dec 2008	926,292,277.49	95,012,132.02	1096
18	Dedebit - Adiremet Road Project	10 Feb 2010	801,212,552.61	60,720,921.00	1095
19	Bahir Dar - Zema River Road Project	02 Sep 2013	1,236,755,640.33	66,143,739.46	1096
20	Meha lMeda–Alem Ketema Road Project	27 Jun 2011	802,248,892.71	47,417,319.84	1096
21	Adura Akobo–Adura Burbe Road Project	16 Mar 2009	823,697,031.20	74,968,784.69	1460
22	Buahit - Dilyibza Road Project	29 Mar 2011	947,920,000.00	55,662,400.00	1096
23	Ginir-Imi-Gode Road Project: Ginir-Beredimtu	22 May 2008	541,718,515.05	57,263,326.72	1080
24	Ginir-Imi-Gode Road Project Contract 2: Beredimtu-Imi	Jun08	497,108,024.65	52,516,940.13	1095

#	Project Name	Contract Date	Contract Price [Birr]	Contract Price [USD]	Construction Period [Days]
Road Sector Projects (cont'd)					
25	Azezo Gorgora Road Upgrading Project	23 Jan 2013	720,000,000.16	39,697,636.35	900
26	Hawsewa Abala Irebti, Contract I Afdera Abala	04 Jul 2008	746,341,435.30	78,436,262.94	1260
27	Zarema Adiarkai Shire: Zarema Mytsebri	30 Sep 2011	912,631,312.54	53,747,427.12	1096
28	Zarema Adiarkai Shire: Mytsebri Shire	30 Sep 2011	747,452,284.82	44,019,569.19	1096
29	Combolcha-Bati-Mille: Burka Mille	21 May 2013	1,285,666,666.10	69,721,619.64	1080
30	Agulae Shaigube Berahile (DB)	03 Aug 2010	923,916,753.17	68,667,168.57	1095
31	BerahileDalol (DB)	03 Aug 2010	1,245,261,242.05	92,550,073.73	1095
32	Azezo Gorgora	Sep 2014	720,000,000.16		900
Water Sector Projects					
1	Tendaho Dam & Irrigation Project	03 Aug 2014	840,254,274.00	99,944,603.91	660
2	Ethiopian Nile Irrigation and Drainage Project				
3	Lake Tana Surrounding Projects and Ribb Dam	01 Dec 2007	1,336,274,358.08	149,409,568.50	1460
4	Tana Beles Integrated Water Resources Management	Design stage			
5	Kesem dam and Irrigation Project	Aug 2004	829,745,725.00	100,067,020.20	660
6	Megech (Seraba) Pump Irrigation and Drainage Project	06 Jun 2012	420,692,188.27	24,099,457.98	1080
7	Gidabo Dam and Irrigation Project	11 Jan 2010	303,386,292.79	24,216,658.11	720
8	Megech Dam Project	Aug 2008	2,451,953,329.63	254,904,386.10	1290
9	Ribb Dam Construction Project	02 Oct 2007	1,336,274,358.08	149,996,560.40	1460
10	Arjo Dedessa Dam Construction Project	31 Jan 2011	755,461,980.84	45,444,055.63	540

Annex 7: Summary of updated cost and time overrun records

A. Building Sector

#	Project Name	Initial Contract Price		Revised Contract Price		Cost Overrun [%]	Completion Period [Days]	Approved EOT [Days]	Time Elapsed ⁶ [Days]	Time Overrun [%]
		ETB	USD	ETB	USD					
1	Thirteen New Universities - Axum University	81,108,790.00	8,345,341.37	93,519,474.77	4,214,680.00	15.30	540	99	980	81.48
2	Emanuel General Mental Hospital	67,660,053.56	5,068,928.20	85,943,780.51	3,856,380.00	27.00	790	-	1705	115.82
3	Jimma University Additional Facilities	309,525,592.83	32,405,322.29	378,997,541.15	17,080,400.00	22.40	1000	1540	2828	182.80
4	Jimma University Teaching and Referral Hospital	230,785,980.46	27,521,750.83	266,004,564.19	11,988,100.00	15.30	1095	297	3181	190.50
5	Jimma University Laboratory and Workshop	355,925,389.92	21,719,984.74	404,445,400.64	18,227,300.00	13.60	730	201	1990	172.60
6	Jimma University Classrooms Phase II	303,113,137.15	19,555,273.04	340,698,607.41	15,354,400.00	12.40	300	27	930	210.00
Average cost overrun [%]						16.43	Average time overrun [%]			160.70

⁶ Time elapsed is as of July 2016 or at completion for the projects selected from the three sectors

B. Road Sector⁷

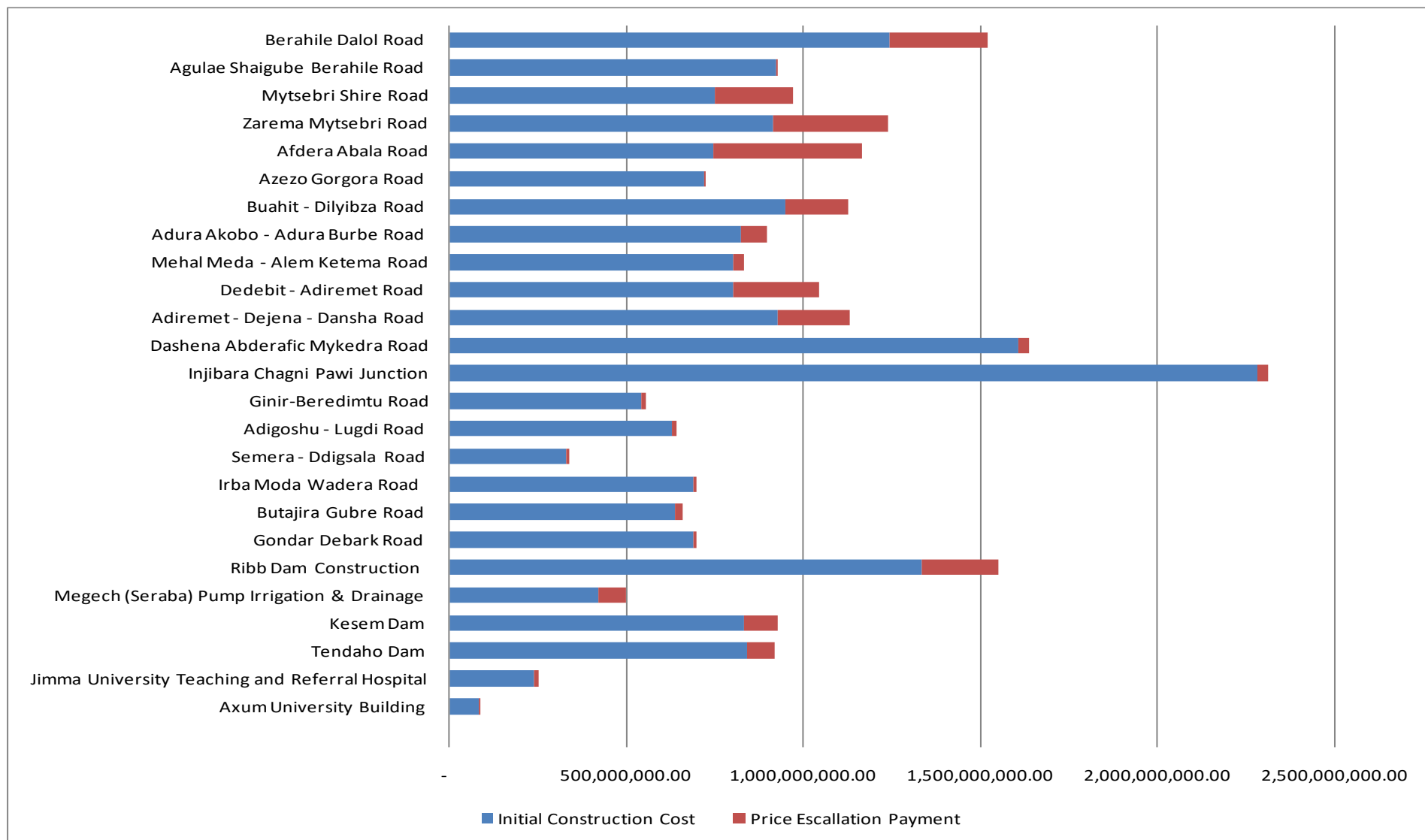
#	Project Name	Initial Contract Price		Revised Contract Price		Cost Overrun [%]	Completion Period [Days]	Approved EOT [Days]	Time Elapsed [Days]	Time Overrun [%]
		ETB	USD	ETB	USD					
1	Hausewa Abala Irebti	746,341,435.30	78,436,262.94	1,534,515,474.36	69,156,600.00	105.60	1260	-	2171	72.30
2	Tongo Beji Muji, Contract 2 Gidane Mugi Road	372,420,036.56	39,505,637.16	447,630,512.74	20,173,500.00	20.20	1080	-	2877	166.40
3	Hubmo Arbaminch Road	380,204,197.21	42,537,950.01	521,783,421.62	23,515,400.00	37.20	913	-	2401	162.90
4	Agulae Shaigube Berahile DB	969,916,753.17	53,398,382.79	1,131,594,917.90	50,998,000.00	16.70	1095	-	1411	28.90
5	Adiremet-Dejena-Dansha	926,292,277.49	95,012,132.02	1,189,047,035.43	53,587,200.00	28.40	1096	-	2000	82.50
6	Dashena Abderafic Mykedra	1,458,501,868.8	85,198,042.17	1,589,039,838.55	71,613,900.00	9.00	1186	-	816	-
7	MehaMeda–AlemKetema	-	-	-	-	-	1096	-	1635	49.20
8	Azezo Gorgora Road	-	-	-	-	-	900	-	1173	30.30
9	Zarema Adiarkai Shire, Contract II : Mytsebri Shire	-	-	-	-	-	1096	-	1770	61.50
10	Berahile Dalol (DB)	-	-	-	-	-	1095	-	1412	29.00
11	Gindeber - Gobensa Road	-	-	-	-	-	1260	-	1586	25.90
12	Aposto-Wondo-Negele; Irba Moda Wadera Road	-	-	-	-	-	1080	-	1924	78.20
13	Buahit - Dilyibza Road	-	-	-	-	-	1096	-	1836	67.50
Average cost overrun [%]						41.60	Average time overrun [%]		70.00	

⁷ The update record was obtained from the PE's disclosure website

C. Water Sector

#	Project Name	Initial Contract Price		Revised Contract Price		Cost Overrun [%]	Completion Period [Days]	Approved EOT [Days]	Time Elapsed [Days]	Time Overrun [%]
		ETB [million]	USD [million]	ETB [million]	USD [million]					
1	Tendaho Dam and Irrigation Project	840.00	99.94	3,040.00	137.01	261.90	1460	-	3650	150.00
2	Ribb Dam Construction	1,336.00	149.99	4,631.00	208.71	246.63	1460	-	3165	116.75
3	Gidabo Irrigation Project	258.00	24.22	707.00	31.86	174.03	730	-	2343	221.00
4	Kessem Dam and Irrigation Project	829.00	100.07	1,939.00	87.39	133.90	1460	-	4289	193.75
5	Megech (Serba) Pump Irrigation and Drainage project	890.00	254.90	964.00	43.45	8.31	1095	-	1613	47.33
6	Arjo Deddesa Dam construction Project	755.50	45.44	2,256.00	101.67	198.63	548	-	1460	166.70
Average cost overrun [%]						170.60	Average time overrun [%]		149.25	

Annex 8: Summary of Project cost and price escalation payments at disclosure time



Annex 9: Initial completion period and completion period at the time of disclosure in days for the three sectors

