



**ADDIS ABABA UNIVERSITY  
ETHIOPIAN INSTITUTE OF ARCHITECTURE BUILDING CONSTRUCTION  
AND CITY DEVELOPMENT (EiABC)**

**An Assessment on the Competitiveness of Indigenous Contractor's in Road  
Construction Projects (The Case of Federal Roads)**

By

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A thesis submitted to the school of graduate studies of Addis Ababa University, Ethiopian Institute of Architecture, Building Construction and City Development, submitted to the chair of Construction Management in partial fulfillment of the requirements for the degree of Master of Science in Construction Management

December, 2020

Addis Ababa, Ethiopia

# An Assessment on the Competitiveness of Indigenous Contractor's in Road Construction Projects (The Case of Federal Roads)

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Chair of Construction management  
Construction Management Program

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By

**Zemenu Mersha Mihret**

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**STATEMENT OF DECLARATION**

I, the undersigned, declare that, the work contained in this thesis has not been previously submitted to meet requirements for an award at this or any higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

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December, 2020

AAU/EiABC, Chair of Construction Management

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Addis Ababa,

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### ABSTRACT

*A competitive contractor is the guarantee of a project's success with enough capacity and performance on the industry. Therefore, how to choose a competitive contractor is crucial for the clients in the sector. The Federal Democratic Republic of Ethiopia has given an emphasis on improving the quality and size of the road network and infrastructure. Concerning this, the Ethiopian Roads Authority (ERA) is one of the assigned institutions by the FDRE as an implementing agency to award and follow up the implementation of the federal road construction projects to be timely and cost-effective as well as to improve the road sector through competent indigenous contractors. However, different literatures and reports shows that the indigenous contractors are not competitive enough in ERA projects. Thus, the road sector of Ethiopia is being dependent on foreign contractors. Consequently, the country faced lack of foreign currency, lack of local job opportunities, lack of competitive local contractors, and the increment of construction cost & time and quality decrement. Therefore, the study assessed the extent of competitiveness and identified critical affecting factors. Finally, it indicates the improvement mechanisms of competitiveness for indigenous contractors which participate in ERA projects. To achieve this, the research used survey and case study research strategy with mixed approach analysis method. The source of data used for the analysis were collected from respondent documents through questionnaire survey and document review from G-1 contractor's and ERA. Thus, 97 ICB during tender and 104 projects during actual implementation were used for analyzing the competitiveness extent of indigenous contractors. Therefore, the average competitiveness extent of indigenous contractors was 46.07% in terms of value of projects awarded whereas in terms of actual performance were 52.4%. To select the most critical indigenous contractor competitiveness affecting factors, 37 factors were identified. Among these, the identified and prioritized 12 factors are cash flow management, experience, annual turnover, shortage of finance, time planning & management, capacity of human resource, plant and equipment, price increment, crew productivity, project scope, inappropriate price offer and material availability. And also, to find competitiveness improvement mechanisms, 21 factors were identified. From these, the identified 9 improvement mechanisms are continuous capacity building, suitable government policy, efficient use of advance payment, adequate funding, utilizing foreign contractors' best practice, competent project manager, well-defined work plan, utilizing latest technology and utilizing joint venture approach. The research further provides recommendations under what circumstances the competitiveness of indigenous contractor's will be sustainably to Federal road construction projects.*

**Keyword: Competitiveness, Indigenous Contractor's, ERA, Road Construction**

## **LIST OF ACRONYMS**

AFDB: African Development Bank  
ASCE: American Society of Civil Engineers  
CSA: Central Statistics Agency  
CWRA: Construction Works Regulatory Authority  
DCC: Domestic Construction Contractors  
ECA: Economic Commission for Africa  
EiABC: Ethiopian Institute of Architecture, Building Construction and City Development  
EIC: Ethiopian Investment Commission  
EOT: Extension of Time  
EQA: Ethiopian Quality Agency  
ERA: Ethiopian Roads Authority  
FDRE: Federal Democratic Republic of Ethiopia  
GDP: Gross National product  
GNP: Gross National Product  
HR: Human Resource  
ICB: Internationally Competitive Bidding  
JV: Joint Venture  
MoFED: Ministry of Finance and Economic Development  
MoWUD: Ministry of Works and Urban Development  
MUDC: Ministry of Urban Development and Construction  
NCB: National Competitive Bidding  
PPA: Public Procurement Authority  
RFP: Request for Proposal  
RII: Relative Importance Index  
RoW: Right of Way  
RSDP: Road Sector Development Program

## DEFINITION OF BASIC TERMS

**Competitiveness:** The ability to bid, win, and successfully implement a project as per the design requirement and finally ascertain project performance.

**Contractor:** Independent entity that agrees to furnish a certain number of materials, equipment, personnel, or services that meet stated requirements or specifications, at a mutually agreed-upon price and within a specified timeframe.

**Indigenous Contractors:** Contractors that are established and naturally existing in Ethiopia rather than arriving from another place to handle different responsibility in the industry and they are native.

**Stakeholders:** Those individuals or organizations (contractual parties) who claim a stake in the projects considered and could be, either positively or negatively affected by the projects.

The words and expressions, ***This Research, This Study, and This Thesis*** are mutually complementary in this research writing to connote the independent work I have conducted. In the same manner, ***Contractor Company and Contractor organization*** are also mutually complemented expressions. In addition, terms **Local Contractor and Indigenous Contractor** were used interchangeably and they are complemented to each other.

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## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the study

The construction sector is a significant element of the national economy. It provides a substantial support for social and economic development because the sector contains relatively a large number of skilled, semi-skilled and unskilled labors (ECA, 2016). Infrastructures produced by the construction sector and its key allies affect the countries overall economic growth (Myers D, 2013). Among different infrastructures in the construction sector, road transportation is a main component of the economic and social development process often consuming a high proportion of the countries national budget (Filip, N. and Catalin, C. 2014). It plays a pillar role in supporting the political, economic, and socio-cultural development of a country (Eva Ivanova & Jana Masarova. 2013).

Hence, improving the road network is regarded as one of the fundamental objectives towards the pursuit of a campaign against poverty reduction. Certainly, ensuring the quality and density of the road network is the dynamic component of the government strategy considering its effects on every sector of the economy.

Thus, the government of Ethiopia has given due an emphasis on the improvement of the quality and extent of road infrastructure in the country (Construction industry Policy, 2012). Besides, the Ethiopian construction industry is being highly challenged by several problems instead of assuring its aim. Accordingly, making an effort in developing the construction industry is very difficult and complex. For example, under the (African Development Bank's Infrastructure Index) recent improved performances, Ethiopia's infrastructure is among the lowest compared to Sub-Saharan Africa. In this regard, for comparison purposes, based on a 2018 data, the African Development Bank's Infrastructure Index puts Ethiopia at 48 out of the 54 African countries (AfDB, 2020) would be 10.49. Therefore, given the infrastructure accumulation and the geo-demographic situation of the country, Ethiopia's need to meet its infrastructure demands is still considerable (CSA, 2018).

The causal problem of Ethiopia's construction sector can be sub-divided in to two major classifications (Wubshet, J. 2004). The first is the result of the fact that the industry is not viewed and planned in a cohesive manner, besides it operates with in a disjointed, unrelated, unreliable and often conflicting elements. The second problem is related to shortages and market price fluctuation of the inputs required for the construction. Depend on his statement, the shortages and market price fluctuation of the project inputs also highly obstruct the performance, change and competency of the local construction industry. Consequently, measuring its ability of delivering projects successfully, sustainably shaping the construction environment, properly managing with various challenges it faces, improving the capacities of its key stakeholders, satisfying the customer's and community's interests, the competitiveness of the local construction industry as a whole is inadequate (MoWUD, 2001).

To abate this problem, the domestic construction sector shall have well planned, systemized and experienced construction contractors. In this context, the performance and success of projects in the sector is depends on the technical and managerial capacity of the contractors' (Mohammed, A. 2011). He also argues that the contractors should have compatible experience and strong confidence to take responsibilities and to stand by decisions while handling a project to be successful and satisfy project requirement. However, Ethiopian indigenous contractors have been suffered to ensure project performance because of inadequate competitiveness in the industry. This in turn has a negative contribution to the sectors economic damage (Ofori, 2018). As a result, the competitiveness of Ethiopian indigenous contractor's is still under question regarding satisfying contract requirements such as quality work, construction time, construction cost, client and environmental needs and safety issues (ERA, 2016). The report also shows the performance of indigenous contractor at the mean time is measured by the progress of the project at hand that was awarded before. The report further explained that, if one contractor fails to fulfill the required progress during the performance evaluation of that project, ERA will not allow the firm to participate in another tender. As of factors affecting contractor competitiveness, poor work quality, increased amount of rework and defect, low productivity, time delay, cost overrun, inadequate health and safety performance are mentioned (Flanagan, 2005, Mohammed, A. 2011, Rahel, K. 2016, ERA, 2014).

To improve the competitiveness of contractors, factors such as productivity, resources, clients, technology and environment, concerning adding value in the construction process shall be considered (Flanagan, 2005). As a result, the country gains advantages such as the increment of the GNP, foreign exchange, industry performance and overall country development. Therefore, the contractor should give emphasis and control of these factors to minimize the impact and to increase the degree of competence.

### **1.2 Statement of the problem**

For the past few years, the local construction industry has developed in size and high infrastructure demand by the client causing construction project more difficult for the project objective of time, and cost to be achieved (Rahel, K. 2016). On the other hand, the construction market of Ethiopia in terms of local contractor competency and trust in general in the sector, problems are occurred in a substantial quantity due to indications such as poor performance issue of projects, clients and users dis-satisfaction (Ofori, 2018 and Rahel, K. 2016). For example, most of the road projects administered by ERA that are implemented by local contractors are claimed by clients and users.

Furthermore, the Ethiopian contractors, more specifically local contractor competency those participate in ERA is under question. In this context, the contractors are question the government regarding the industry's enhancement. The industry is challenged by several problems that tend to provoke the sector and thus making efforts at developing the industry is very difficult and complex (Wubshet, J. 2003).

Contractors who were available in the sector were constrained by a shortage of technology, lack of experience in managing huge projects, lack of well-skilled manpower, shortage of capital, and physical resources. Because of this, their involvement in RSDP equally with foreign contractors was not satisfactory, (MoUDC, 2012 and ERA, 2014)

The total amount of cost of the contract awarded to foreign contractors is greater than the local contractors (ERA, 2016). Of the contracts awarded over the last nineteen years of the RSDP (July 1997 to 2016) 46% were awarded to local contractors whereas 54% were awarded to foreign contractors. In addition, the participation of local contractors (January, 2016-June, 2018) was 44.33%, whereas for foreign contractor were 55.67% in terms of value.

Furthermore, Solomon, S. (2015), also states that, almost all road projects funded by international financiers were awarded to foreign contractors because, the Ethiopian indigenous contractors lack the capacity to satisfy the qualification criteria set by the financiers. Hence, on due course of their operation, they are the ones to first face the problems and challenges encountered within the industry (Asteway, y. 2008). Therefore, we can understand that, there is a high dependency (especially in huge and difficult terrain projects) of the Ethiopian federal road sector on foreign contractors.

Therefore, the study assessed the indigenous contractor's extent of competitiveness, affecting factors, and finding out mechanisms to improve the competitiveness of indigenous contractor.

### **1.3 Aim and objective of the study**

#### **1.3.1 General objective**

The general objective of this study is to assess the competitiveness of indigenous contractor's in federal road projects administered by Ethiopian Roads Authority.

#### **1.3.2 Specific objectives**

In pursuant of this objective using the ERA projects as a case study, the general research objective embraced the following specific objectives:

1. To assess the competitiveness extent of indigenous contractor's
2. To identify the factors that affect the competitiveness of indigenous contractor's
3. To find out mechanisms that helps to improve the competitiveness of indigenous contractors

### **1.4 Research questions**

1. To what extent does indigenous contractor competitive in terms of winning tender?
2. What are the factors that affect the competitiveness of indigenous contractors?
3. What are the mechanisms that helps to improve the competitiveness of indigenous contractors?

### **1.5. Motivation of the research**

The motivation for this study is mainly due to the inadequate competency of indigenous contractors that happened in the road construction sector of Ethiopia. Reports (MUDC, 2012 and ERA, 2016) on indigenous contractor competitiveness served the major motivation for this study because they forced me to look into problems associated with it. My first impressions when I

start to look into these problems were the existing of inadequate competitiveness of indigenous contractors on road infrastructure and high-rise building projects.

As a result, I am ignited in such an initiative. These were my first explanations of why this huge task was started and provided a direction to my empirical assessment. Consequently, its center of attention is focused on the need to assess the competitiveness of indigenous contractors on federal road projects and over time, it became the problem statement of this study.

### **1.7 Scope and limitation of the research**

The research was focused on grade-1 indigenous contractors that are participated in road construction projects administered by ERA. Concerning this, the study assessed competitiveness of contractors in both tendering and implementation phases. Data are expected from indigenous contractors, ERA project documents as well as different relevant stakeholders (client and consultants) concerning with federal road projects.

Conducting a scientific research has substantial challenges and limitations while collecting and analyzing data. The research was aimed to conduct a questionnaire survey, document review and focus group discussion with key informants. It's well known that the international pandemic (COVID-19) was the major challenge for conducting focus groups discussion and getting enough data. As a result, the focus group discussion with key informants was not held. On the other hand, different archival data was aimed to be collected from ERA for document review purpose. Besides, due to the unavailability of some ERA staff because of COVID-19, the research was limited to get enough data as planned. In addition, unwillingness of some staffs due to confidentiality to access enough data was another challenge during the research period. Therefore, due to the above reasons, the research was limited and challenged to ascertain it as per the expected definitely.

### **1.8 Significance of the research**

The main objective of the study was to assess the competitiveness of indigenous contractor in federal road projects. Contractors are one of the key actors who are designing (not always) and implementing to the tangible one for the society. However, the competitiveness performance of indigenous contractors found to be inadequate (refer section 1.2).

The specific focused attention has enabled to determine which contractor the study should include. Besides, it helped to identify the target study, how data can be collected and how the case study can be designed and conducted. In addition, the following question-answer approach was considered helpful to assist these operations to formulate the significance.

Table 1. 1: The Question-Answer Approach exploring the significance of the study

| Question                            | Answer                                                                                                      |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Why the study has been established? | Different reports show that most local contractor firm suffers competitiveness challenge in the road sector |

## An Assessment on the Competitiveness of Indigenous Contractor's in Road Construction Projects (The Case of Federal Roads)

|                                     |                                                                                                                                                                                                                            |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| What does the study try to achieve? | Assess the competitiveness extent, identify affecting factors and find out mechanisms to improve indigenous contractor's                                                                                                   |
| Who are considered in the study?    | Indigenous contractors participated in ERA projects are considered                                                                                                                                                         |
| How can the research be done?       | By using survey and case study as a research strategy (questionnaire, and document review) was conducted                                                                                                                   |
| Who will benefit from the research? | Indigenous Contractors, Clients (in this case ERA), Consultants, Policymakers, Financers, Beneficiaries (the society), Regulatory Bodies and AAU/EiABC (Academic Achievement), the researcher itself (for academic career) |

Therefore, by providing a critical assessment of the research objective, the study will be significant for the following;

- Contribute towards to indigenous contractors to gain the way to improve themselves in the sector
- Contribute towards ERA can increase the number of locally competitive contractors
- Contribute to the industry, if indigenous contractor become competent as a result, the industry will also internationally competent.
- Contributes towards the country development as a whole by maximizing high foreign exchange, job opportunity, and GNP increment.
- Finally, the research output also serves as an input for researchers to conduct further academic study.

### 1.9 Organization of the thesis

The research has organized in chapters as briefly described below. The major processes of the research, and how each process links with these chapters, are presented;

#### Chapter -1 – Background of the study

This introductory chapter presents a general outline of the research, statement of the problem, the research objectives, research questions, scope & limitation, significance, and research ethics.

#### Chapter -2 – Literature Review

This chapter provides detailed reviews on the construction landscape of competitiveness and factors affecting indigenous contractors in the sector. It also reviews the main criterions considered, the way to evaluate factors of competitiveness on indigenous contractor mechanisms to improve competitiveness as well as advantages to improve competitiveness in the sector.

#### Chapter -3 - Research Methodology

This chapter further elaborates the methodology applied in carrying out the research which is a crucial component in achieving the research objectives. It presents the different methodological approaches employed with its justification, the processes involved and the types of instruments used in the research. The major activities include; how to determine research population, how to

select data sources, data collection instruments and procedures adopted and the way how to analyze & discuss collected data. Finally, the way to conclude the result were discussed in detail.

#### Chapter -4 - Data collection, Analysis, and Discussion

This chapter firstly presents the extent of competitiveness of indigenous contractors by 97ICB projects bid evaluation documents and contractors performance rating documents. Then, using questionnaire survey from respondents' and project completion and progress reports, the factors affecting competitiveness were identified. Furthermore, survey from respondent's and document review helps to determine mechanisms that helps to improve competitiveness of contractors. Questionnaire survey and archival documents analysis were the instruments employed during the research data collection period. Finally, the research provides detailed discussion of the research findings as well as the major outcomes of the study. The research also considers the extent to which the objectives have been achieved.

#### Chapter -5 - Conclusions and Recommendations

This chapter presents the conclusions and recommendations depending on the research findings. The chapter also highlights further research area's for future study.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

To establish a better understanding of the research objective, a critical literature review was conducted. Hence, discussing competitiveness concepts, the competitiveness extent of indigenous contractors, identifying the factors that affect the competitiveness & their degree & extent of impact on contractors and the degree and extent of their impact in road construction perspective that administered by ERA is the major concern. Additionally, the chapter also discusses mechanisms to improve competitiveness and expected benefits from improvement. A comprehensive literature review was conducted to address the objectives of the research. The Chapter also concludes with a summary.

#### 2.2 Competitiveness Concepts

*“It is not the strongest species that survive, nor the most intelligent, but the ones who are most responsive to change” - Charles Darwin*

Competitiveness is the ability of contractors to stay competitive which in turn reflects their ability to improve their position about competitors that are active in the same market (Momaya, 2004). Kantha, (2015) also defined competitiveness as a multi-stage economic concept that covers national, sectorial, company and project level capabilities. Basically, it relates to productivity (ability of using available resources to increase output) and doing more with less input with proven quality of work. He also argues that competitiveness at each level of operation is interlinked & an industry cannot be competitive unless its companies are not competitive. Furthermore, companies can be optimally productive only if given the right macro and industry ecosystem. The following table further presents the definitions of competitiveness by different authors;

Table 2. 1: The relevant definitions of competitiveness

| Definition                                                                                   | Author                           |
|----------------------------------------------------------------------------------------------|----------------------------------|
| A consequence of proved productivity and profitability                                       | Lu, 2006                         |
| It is a cause, a process, and an output                                                      | Waheeduzzan and Ryans, 1996      |
| A process of achieving an objective                                                          | Flanagan <i>et al.</i> , 2005    |
| It is relative to competitors                                                                | Buckley <i>et al.</i> , 1988     |
| A tool of doing tasks in different ways for different customers without compromising quality | Flanagan <i>et al.</i> , 2007    |
| Not only replicates previous performance, but also allows the perception of potential        | Buckley <i>et al.</i> , 1988     |
| Fulfilling the client requirements                                                           | Momaya and Selby, 1998           |
| Satisfying the requirements of the personnel                                                 | Invancevich <i>et al.</i> , 1994 |

|                                                |                                   |
|------------------------------------------------|-----------------------------------|
| It is associated with superior quality         | Momaya and Selby, 1998            |
| Winning ability of a bid (tender)              | Orozco, F. and Serpell, A. (2011) |
| Reliable productivity and profitability        | Flanagan <i>et al.</i> , (2005)   |
| Means of innovation and value for shareholders | Momaya and Selby, (1998)          |

Accordingly, by merging the above definition in to one, contextual meaning of competitiveness is ability of a contractor to win with good tendering strategy, successfully execute with improved productivity by latest operating technology and finally increase value of work share & long-term profitability by satisfying client and contractual requirements without compromising quality.

The ultimate objective of competitiveness is to improve and achieve a better long-term performance for contractors (Flanagan *et al.* 2007). This is in terms of quality production, productivity, profit and overall technical and managerial capacity. In line with this, Flanagan *et al.*, (2005), noted that it is a concept of achieving and satisfying the wish of a client. Furthermore, Orozco, F. and Serpell, A. (2011), defined that a condition of contractor companies characterized by globalization and the need to survive.

A possibility to which construction firm can produce products that meet the standard of international markets under free and fair market conditions, with simultaneously expanding the real incomes of its employees. Flanagan *et al.* (2007) also defined as the ability to win bids successfully, provide superior quality construction services with minimum cost and minimizing rework than its domestic and international competitors. Furthermore, he concludes that, in the end the ability to consistently achieve appreciated organizational performance. It is a compass of contractor's successful performance when it achieves client, design, environmental, and health & safety requirements, (Nurisra et al, 2018). Therefore, contractors must have a strategy that focuses on dynamic processes for sustainable competitiveness.

### 2.2.1 The need of competitiveness

A nation's standard of living is increasingly reliant on the competitiveness of its contractors. Competitiveness is vital, if the nations and contractors are to take advantage of the opportunities presented by the international economy. World trade and foreign investment have grown faster in the last several decades than world output. Competitiveness in industries subject to international trade and foreign direct investment can provide substantial advantage for economic growth. This is especially true for small nations, where competitiveness can allow contractors to overcome the limitations of their small home markets to achieve their maximum potential. It is also vital if a contractor is to guard against the threats posed by the international economy. International competition has become fiercer than ever before. Lower costs for transportation and communication, reduced trade barriers, and the spread of technology have combined to sharpen international competition. This competition has put unprecedented pressure on all contractors, economic actors, including management and labor. In an environment in which the construction contractor must continually improve to meet the threat from an ever-wider array of competitors,

the failure of management and labor to meet the challenge can spell disaster for the contractors (Bakar, A. 2012).

There is a growing realization that contractors cannot avoid the rigors of international competition. Every firm is not stand alone. Contractors are linked to the international business through trade in goods and services, capital flows and commodity prices. The experience of developing contractors in the 1980s has indicated that attempts to isolate an economy can have lasting detrimental effects. In the modern world, contractors can try to run from the world economy, but they cannot hide. This is particularly true for small contractors, in which the costs generated by economic isolation and losses in efficiency can be substantial and for developing contractors in which any loss of efficiency often means higher levels of poverty.

Therefore, it can allow a company to produce good or service of equal value at a lower price in a more desirable fashion and quality. These conditions need a productive entity to generate more sales compared to its market rivals.

### **2.2.2 Characteristics of Competitiveness**

Many experts and researchers in the construction sector have engaged in a debate about competitiveness and contributed to a wider understanding of the subject. However, competitiveness has characteristics with a common understanding. Therefore, it is essential to point out some characteristics of the concept that competitiveness is;

- A) Multi-defined: There is no specific and particular definition of competitiveness because of the term is subject to misinterpretation and consequent confusion, (Porter, M. E.,1990). It has a substantial definition depending on the circumstance or the area.
- B) Multi-measured: There is no single tool to measure competitiveness in contractors, because the evaluation and measurement of competitiveness depend on the definition, (Buckley, P. J.,1988)
- C) Multi-level: Competitiveness is applied at national, industrial, company and project level (Momaya, K., 2004)

### **2.2.3 Elements of competitiveness**

The constituent elements of firm competitiveness are inseparable from the nations represented by the three mainstream schools: contractor capability, contractor resources, and contractor competitive environment, (Lin Y. and Wang J, 2015). The contractor ability includes: (a) management ability (b) bidding strategy and (c) technical skill. The contractor resource includes: (a) financial resource, (b) human resource, (c) technology, and (d) plant & equipment. Whereas the contractor competitive environment includes: (a) relationship, (b) marketing ability, and (c) corporate image and (d) environmental factors. The criteria's have also their index under them. The complete form of a contractor's competitiveness is displayed in the following figure.

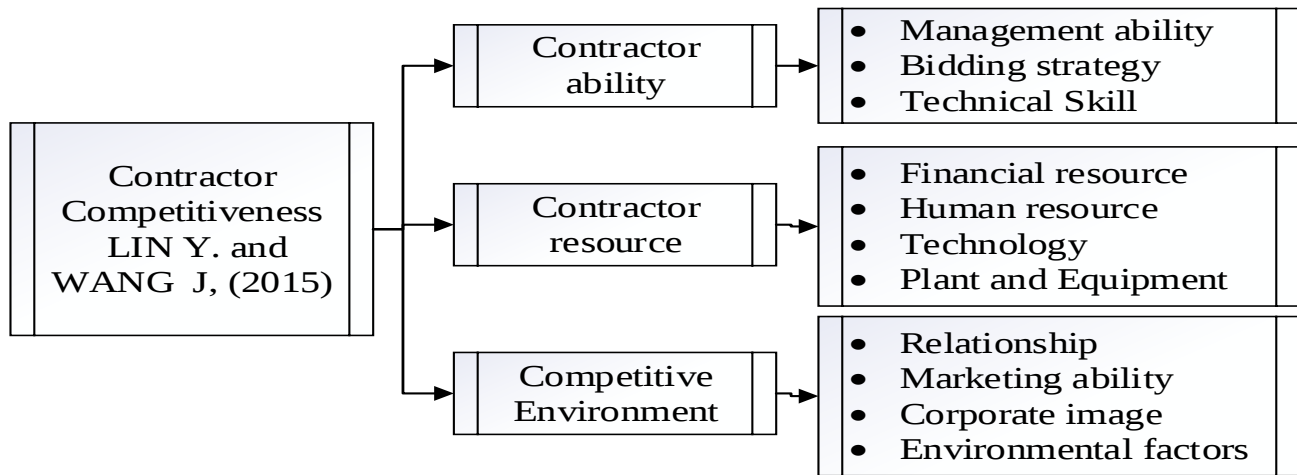


Figure 2. 1: The elements of competitiveness  
(Source; Lin y. and Wang J, 2015)

Contractor need to increase their knowledge and understanding of competitiveness in the construction industry, (Flanagan *et al.*, 2005). To articulate strategies for competitiveness, contractors should know the variables that affect the expected results, and their internal relationship of these factors. Literature presents two kinds of variables on competitiveness; on the one hand, there are factors, sources or determinants of competitiveness; on the other hand, there are indexes used to measure the competitive performance of the construction companies at a specific point in time.

#### 2.2.4 Competitiveness hierarchy

Levels of competitiveness can be in the Nation level, Sectorial level, Firm level, and Project level. Different literatures (Flanagan et al, 2006), (Orozco and Serpell, 2011), (Yong-Tao et al, 2007), and (Hoang N (2010), presented several levels of competitiveness. The following figure further illustrates the level of competitiveness in construction.

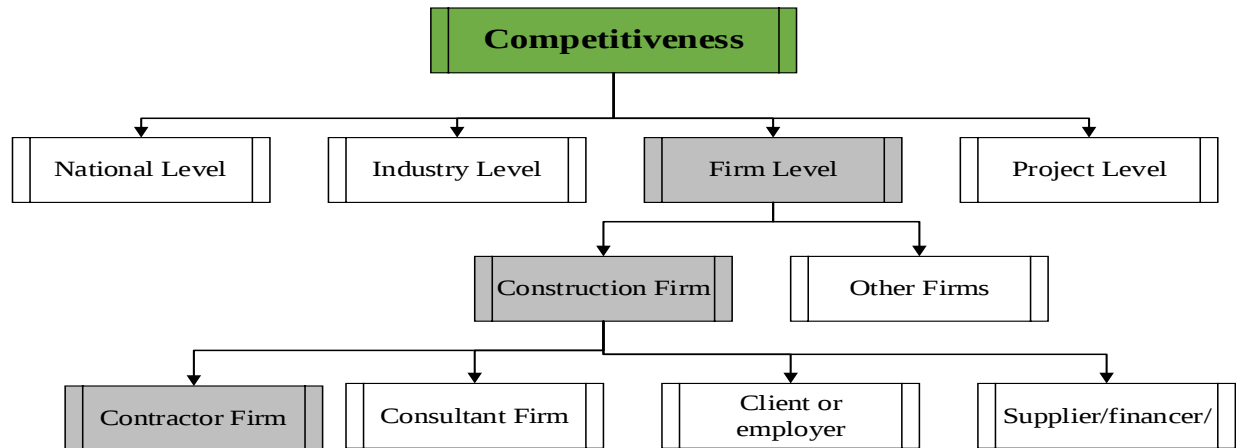


Figure 2. 2: *The level of competitiveness hierarchy*  
(Source: Author conceptualization)

The above figure further illustrates the hierarchy of competitiveness levels for different levels including construction and other sectors. Basically, the level classification major focus is to differentiate each level regarding in construction concept. The following figure also presents the level of competitiveness.



Figure 2. 3: *Competitiveness in three levels*

Table 2. 2: Illustration of the three levels of competitiveness in the construction context

|                                 |                                                                                                                       |                       |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------|
| <b>National competitiveness</b> | It is the ability of a country to create, produce and distribute products to international market and earning returns | Scott and Lodge, 1985 |
|                                 | Ensuring an increased welfare of its citizens in productivity & growing.                                              | Attila Chikán, 2008   |

An Assessment on the Competitiveness of Indigenous Contractor's in Road Construction Projects (The Case of Federal Roads)

|                          |                                                                                                                                                                                                 |                                      |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
|                          | The ability of a nation to innovate and achieve an advantage over other nations in several key industrial sectors.                                                                              | Porter, 1990                         |
|                          | The ability of nations economy to attract and maintain contractors with stable market activities, while improving living standards of all those living in the region                            | Cooke, 2004                          |
|                          | The ability of nations economy to provide its residents with a high living standard and employment level                                                                                        | Porter and Ketels, 2003              |
|                          | The collection of parameters which determine the level of productivity of a country and that determine the level of prosperity that can be attained by an economy                               | World Competitiveness Yearbook, 2007 |
| Industry competitiveness | The degree to which an industry satisfies the pleasure of its customers in terms of price, quality, and innovation.                                                                             | Momaya, 1998                         |
|                          | The extent of a sector to offer potential growth and attractive return on investment                                                                                                            | World Competitiveness Yearbook, 2006 |
|                          | The productivity increment of a country is highly dependent on sectors capability                                                                                                               | Porter, 1980                         |
| Firm competitiveness     | The level in which, under free and fair occasions, a firm can produce goods and products that can meet the international standards and simultaneously proving the real income of its employees. | Invancevich, et al. 1997             |
|                          | The ability of a firm to sustainably satisfy the requirements of customers (clients)                                                                                                            | Attila Chikán, 2008                  |

(Source: Tunj-Olayeni, 2015),

### 2.3 Indigenous Contractor in Ethiopia

Indigenous contractor is a company that established under the enterprise promotion and has no other home base but Ethiopia. Their entire capital and any other proprietary interests in the enterprise are owned and controlled by Ethiopians and most or all of their technical and managerial undertakings are managed by Ethiopians.

Tunj-Olayeni. (2015) also defined that, an indigenous construction contractor as one that registered under the companies and having not less than 51% shareholding in the country. Improved participation in work opportunities is a cry of every local contractor. Weak participation of local contractors is a consequence of stiff competition from foreigners and inadequate supportive environment (unsuitable government policy). Inadequate capacity of indigenous contractors is a result of factors that include lack of skills and experience, inadequate capital, inadequate technology, unfavorable donor conditions, and utilization of inappropriate delivery practices, (ERA, 2016).

In this regard, indigenous construction contractors in Ethiopia has certain peculiarities. For instance, many indigenous contractors fall within the Small and Medium Enterprise category. Moreover, a greater percentage of indigenous construction contractors in Ethiopia engage more in building construction than other areas of construction, (roads, bridges, dams, irrigation and energy). As a result, foreign construction contractors are implementing most of the civil engineering projects. Furthermore, most indigenous contractors have weak financial, technical, managerial and administrative skills, (Rahel 2016).

#### **2.4 Contractor registration system in Ethiopia**

A valid license is the first indication that the contractor might be qualified to do the job by fulfilling basic requirements. Another good reason to use a licensed contractor is to take advantage of getting any available state funds to help resolve. To participate in a full advantage of such a program, the contractor should have a current license for all the work he proposes to do. All contractors in Ethiopia must be registered before undertaking any construction work in the country. Contractors who desire to carry out any construction activity are required to first register with the construction works regulatory authority following the Guidelines as a construction contractor. Accordingly, every contractor has to submit a photocopy and original documents of such a required legal certificate to the CWRA before being licensed as a contractor.

Every contractor has the option of applying for registration as a contractor in any one of the following categories, (CWRA, 2018);

- a) General Contractors: These contractors are qualified to undertake a variety of construction works such as buildings, roads, railways, bridges, dams, irrigation & energy and other construction works.
- b) Building Contractors: These contractors are qualified to undertake building and related construction works.
- c) Road Contractors: These contractors are qualified to undertake the construction of roads and other related civil infrastructure construction works.
- d) Specialized Contractors: These are contractors who are qualified to undertake construction activities in specialized trades such as foundation works, electro-mechanical works, painting and decorations, sanitary works, wood and metal works, landscaping, and other activities.

The criteria and requirements for registration of a contractor in any of the categories listed above is different from grade to grade to which the contractor is applying. Once, a contractor is registered, the registration shall be valid for one calendar year beginning from the year of registration. In the end, each contractor is expected to renew every calendar year thereafter.

#### **2.5 The competitiveness of indigenous contractor firm's**

In a specific context, contractor competitiveness is a means of sustainably fulfill client requirements with profit without compromising quality, (Attila Chikán, 2008). This ability of a

contractor is realized through offering market products that have higher customer's value rather than offered by other competitors. Company-level competitiveness focuses mainly on individual contractors in terms of different competitiveness factors such as quality service and sustainable products with reasonable price.

According to MoFED, (2016), price is still popular criteria to award contracts. Regarding this, the lowest-price is necessarily the client's principal selection criterion and suggested that cost has to be considered in the selection process alongside an evaluation of the contractor's ability to fulfill the multiple objectives inherent in the project. After the technical evaluation result, the first and foremost contract-awarding factor is the price offered by a contractor for the aimed project. To easily win the contract local contractors mostly offer unreasonable price. This causes weak performance during execution because of inadequate finance. However, contractors must get an approval from ERA to participate in different bids regarding the progress performance.

According to ERA (2016), the project performance (performance rating) of contractors is measured by the progress of the project. If one contractor fails to fulfill the progress requirement that the contractor would achieve within a specified time, then, the contractor cannot participate in the bidding process to get a new award. Concerning this, according to ERA bidding requirement criteria, annual construction turnover, general and specific experience, proposed equipment, required type & the number of key personnel are some of the major requirements used for qualifications.

Such a contractor has different extent and degree of experience concerning competitiveness in different projects. It is important for contractors to realize the competitive advantage and can develop competitive strategies. Materu (1997), argues that indigenous contractor in Tanzania, like many of their counterparts in other developing countries, suffered with several challenges that affect their growth. He further identified ten issues that affect their competitiveness. Amongst, the following five were considered critical: (a) small volume of work opportunities, (b) poor quality products, (c) shortage of suitable policy for contractors, (d) poor commitment, (e) shortage of finance and funding sources. Other issues identified include lack of training opportunities, shortage of competent professionals, lack of plant & machineries, corruption and high taxes.

Despite of the issues mentioned above, the situation today remains unchanged and the same to the Ethiopian local contractors. The volume of work (contracts) awarded to indigenous contractors in Ethiopian infrastructure projects especially in the road sector continues to be unchanged. The ability to win bids and good productivity remains a serious problem for the majority of contractors. This was mainly due to obstacles such as unsuitable government policy, cashflow management, equipment and labor capacity. The performance of indigenous contractors in the sector was highly influenced by these factors.

In a related context, as different reports argue that, Ethiopian contractor's experience, public influence, the public policy, inadequate commitment by stakeholders and currency devaluation

also makes their competitiveness inadequate. As a result, the capacity and performance of indigenous contractors become affected and leads to award contracts to foreign contractors. It is obvious that, except for specially funded projects (China aid), most of the huge (big scope) projects found on the hands of foreign contractors. This practice influences the development and experience of local contractors both technically and financially. Generally, the Ethiopian local contractor firm's competitiveness extent as compared to the foreign contractors is under question and weak as measured by several parameters such as (cashflow, quality, time, cost, resource, planning and management) issues.

## **2.6 ERA's contractor performance evaluation approach**

Providing quality products and services that anticipate and meet customers' requirement offers a competitive advantage for construction organizations. Continuous evaluation and assessment of contractors are the key to success and go forward. For evaluating the performance of the contractor in different countries (such as Singapore, UK, and Hong Kong) uses CONQUAS system. CONQUAS is a system which is used to evaluate the quality performance of contractors during implementation period. For Ethiopian local contractor's context, ERA used a performance rating system (monthly, quarterly, and yearly bases) by applying different performance evaluation criteria such as expected progress with elapsed time, cost performance, overall project progress percentage of execution and safety records. The performance assessment is made to know the ability of contractors concerning on the progress of active projects (mainly on time and cost) and to award other new contracts.

In the works contract of government-financed projects, one of the initial qualification criteria is performance assessment results of bidders on ongoing projects. For bidders having ongoing projects with ERA, the performance assessment is carried out following the indicated procedure (formula). If bidders do not have projects with ERA, the performance assessment is carried out following a qualitative assessment of bidder's performance based on written feedback from their employers. The performance assessment is carried out every calendar month. Under each evaluation, the performance of the bidder in the immediate previous month (from the date/month of deadline for submission of the tender in reference) is used for evaluation.

For local contractors, while the performance assessment is conducted, first the total contract duration is divided into three equal periods such as one-third, second one-third, and last one-third or end of the contract period. Finally, after the assessment, contractors, who fail to complete projects after elapse of one-fourth period of the contract duration, will be disqualified to participate in a new tender.

It is clear that as the number of projects that a given contractor can handle at a time increases, it does have an impact on the technical and managerial efficiency of the contractor unless and otherwise the contractor takes some positive measures to reduce the negative impact resulted from the increase in number of new projects.

On the other hand, employers would take risks in giving a greater number of new projects to the contractor; in so doing contributes to the contractor's inefficiency. Hence, to manage the risk of inefficiency due to an increase in the number of projects, it is suggested to raise the expected performance of a given contractor by a certain percentage if he has three or more contracts at his hand. Generally, according to ERA's performance assessment, if the number of projects at hand increased, the expected percentage should also increase to reduce risk and inefficiency. Furthermore, the expected progress output is increased as the number of projects also increased at a time.

## **2.7 ERA's bid evaluation approach**

A time taking and sound decision is required from the client in the construction industry to select a best-fit contractor for the proposed project (Abinet Dametachew, 2015). Every construction project faces a diversity of uncertainty. Hence, inappropriate contractor increases the chances of delays, cost overruns, poor quality work, disputes, or even bankruptcy" (Hatush *et al*, 1997) as cited in (Abinet Dametachew, 2015). His finding reveals that qualification criteria used in federal road projects are not following the standard and did not consider the size of projects in the subject and found that the qualification criteria wide open to be manipulated by the employer.

According to revised PPA (2011) qualification criteria and ERA (2016), performance rating, annual construction turn-over, cash flow requirement, experience, contract non-performing records, legal status, major equipment, key personnel, proposal for sub-contracting, work method & programs, pending litigation, financial performance, current contract commitments and declaration of a site visit and understanding of the work are the main criteria to evaluate contractors bid.

Contractors are needed to present their required labor and equipment to award the requested category and grade. Grade one General Contractor must present stated labor and equipment in MUDC Amended Directive 19/2013 and for any particular project, again the contractor must present his available labor and equipment. On the other hand, the contractor may be requested to present historical contract non-performing and pending litigation to evaluate further legal capability to be awarded. The major criterions considered and used by ERA during evaluation of contractors bid are presented below.

### **2.7.1 Annual construction turnover**

Annual construction turnover of the company is the total amount of money the company collects in the budget year without considering advance payment. In the practice of world bank annual construction turnover can be calculated by dividing the engineering estimation by the contract period in years and the multiplying factor is 2. In line with this, sometimes if the project is very large (>200USS), the multiplying factor is reduced but not less than 1.5. For the practice of ERA and PPA, the way of calculating annual construction turnover for local contractors is dividing the engineering estimation by the contract period in years and the multiplying factor is 1, whereas for foreign contractors is dividing the engineering estimation by the contract period in years and

the multiplying factor is 2. In case a joint venture formed by local and foreign bidders, the multiplying factor is 1.5 and the required annual turnover will be average of the last five years. If bidders submit their offer in Joint Venture (JV) consortium, the construction turnover requirement for each partner (members of the JV) shall not be less than 25%, while the lead partner of the JV shall not be less than 40%. The value of total certified payments received in each year shall be adjusted for inflation of birr value through multiplying by Cn/Co factor, where Cn is the value of 1 Dollar in Birr on the 28 days before the bid submission date. Co is the value of one dollar in Birr computed using the exchange rate prevailing on the last date of the respective fiscal year. The basis of computing dollar value of birr shall be the selling exchange rate issued by the national bank of Ethiopia.

### **2.7.2 Experience**

#### **A) General experience**

Both World Bank and ERA requires a minimum of two years' experience under a construction contract in the role of contractor, Joint Venture partner or sub-contractor is required. All categories of contractors from grade 6 to grade 10 are exempted from this requirement. In the case of foreign contractors, only grade one contractors are allowed to participate in road construction projects.

#### **B) Specific experience**

Construction experiences in a specific manner indicate the contractor's ability only for the proposed project similar to work experience, (Abinet D., 2015). According to PPA revised in 2016, the number, value, nature, complexity, and similarity of projects are points to be considered under the evaluation of local contractors.

Concerning the number of projects, ERA requires, successfully and substantially completed at least one similar contract within the last 10 years as a contractor, Joint Venture partner or sub-contractor. On the other hand, regarding the value, with a value of at least 70% of the estimated value of the subject contract, when the estimated value of the subject project is below 1 billion-birr bidders can present two projects to meet the requirement. Each with a value of at least half of the requirement and also when the estimated value of the subject project is equal or above 1 billion-birr bidders can present three projects to meet the requirement, each with a value of at least one-third of the requirement.

In addition to general and specific construction experience, the contractor is evaluated in current contract commitments (using performance rating system) on hand and not completed in six months or completion less than seventy percent in the financial progress. Current contract commitments indicate the current performance of the bidder.

### **2.7.3 Performance**

According to ERA's local contractor performance evaluation, the performance of a firm can be measured based on the performance of the project at hand. The total contract duration is divided into three equal periods. At the end of the first one-third period, the minimum expected progress

is should be 9%, at the end of the second one-third period, the minimum expected progress is should be 38% and at the end of the last one-third period or the end of the contract period, the minimum expected progress is should be 70%.

Beyond the contract period but only up to a period of one-fourth of the contract period, the project is expected to be completed 100%. Therefore, the bidder can be competing in the tender if he fulfills performance qualification requirements unless and otherwise the contractor will be rejected from competing in a new tender. It is not to be forgotten that, the percent of execution expected from foreign contractors is different from the local contractors.

#### **2.7.4 Equipment and machineries**

In the tender document "Evaluation and Qualification Criteria" section, there are types and number of equipment's that the bidders are expected to propose as owned, hire or lease (in some case to be purchased also acceptable) for a particular project in the subject. Where tender documents prepared fairly and precisely there will be points for provisions of each equipment. Sometimes it is good to provide more than required to assure the employer/evaluator, the company has enough equipment and not to worry in missing of required attached data.

#### **2.7.5 Key Professionals**

When the client issued a tender document (request for proposal) to the bidders, each required key professionals are presented in the ToR with their required general and specific experience to the assignment. As a result, the contractor will demonstrate the qualification and competence of the persons proposed for the entitled project. The contractor should also show every required position, education level, general experience, and experience in similar works.

#### **2.7.6 Work program and methodology**

The bidder will clearly demonstrate technique capability, full knowledge of how each activity shall be executed, the time required for each activity, how crew formed and managed, site condition, and safety measure to be taken in the contract execution period. These ideas can be demonstrated in two forms;

- ☞ First, work program that indicated timeline to project execution, start and finish date of the project, relation between each activity, project closer, items delivery time and critical activates.
- ☞ Secondly, construction methodology includes crew formation, camp and site organization, detailed description of activates, every required labor and equipment for activates. Both demonstrate bidder technical knowledge towards the project, assures understanding of the site and scope work.

Generally, while ERA evaluate the qualification of the bidders, the above major parameters are used mainly but not limited too. If one bidder does not fulfill the above requirements, then ERA considered the bidder non-responsive.

## 2.8 Indigenous contractor firm's competitiveness extent

One of the measures of construction industry capacity is the number and level of locally matured national contractors. According to (CWRA, 2019), there are 19507 contractors of which 5176 were renewed in 2019, of which road contractors, general contractors, building contractors, and specialist contractors are 39, 3478, 1655 and 4 respectively. From this, the number of indigenous contractors who were actively participated at a time in federal roads were 32, (ERA, 2019). There are also 26 foreign contractors currently working in projects administered by ERA. Even if the number of local contractor's is greater in number, their ability of winning difficult contract's (huge in scope and difficult terrain classification e.g., Express way's) as well as quality work and cost-time performance is still inadequate as compared to foreign contractors.

An indigenous contractor firm's competitiveness underpins the sustainability of the construction industry. Based on this fact, a question arises: "what makes competitive contractors efficient?". According to Jing Li *et al*, (2013), in case of enhancing the construction performance structural changes are mainly futile. The competitiveness improvement of contractors should instead include "initiatives at the level of operation". The value added by contractors lies in the effective and efficient management of their entire value chain system.

The government of Ethiopia was tried substantial support and cooperation's for indigenous contractors to increase their participation in the road sector (especially in huge and difficult terrain infrastructures), (ERA, 2004). Even though, the participation of indigenous contractors has become better than the previous, their competency is still under question. ERA, (2004) annual report revealed that various challenges happened on the side of contractors which are influencing their capacity and competitiveness such as management related problems, shortage of well-educated professionals, shortage of finance and shortage of well-defined and really applied work plan.

In other ways, as presented in the report, the bidding requirement (qualification criteria's) of the road projects set by ERA is not technically compatible with the capacity of local contractors. Furthermore, the procurement law was not really applied and it was abused by the procurement entity (client) and also no fair information was distributed to all bidders equally. According to ERA, (2005), annual report, from 15 contractors were participated at a time, ERA was planned to increase 15 to 100 contractors within 5 years. From this, contractors become increased to 61 and this was 61% out of the planned.

Moreover, the total amount of cost of the contract awarded to foreign contractors is greater than the local contractors since complex and huge projects are awarded to foreign contractors such as expressways and difficult terrain infrastructures, (ERA, 2016). Additionally, from 1358 contracts (both consulting & construction) awarded over the last nineteen years of the RSDP (from July 1997 to 2016), 46% for road construction works are awarded to local contractors whereas 54% were awarded to foreign contractors. The value of civil work contracts awarded to local contractors was ETB 82.7 billion to June 2016.

Furthermore, (ERA, 2018), an appraisal report (January 2016-June, 2018), out of 182 civil work contracts awarded to contractors, the participation of local contractors was 44.33% whereas for

foreign contractors was 55.67% in terms of value. The value of civil works contract awarded to local contractors was ETB 80.75 billion, whereas for foreign contractors was ETB 101.4 billion. This shows the competitiveness extent of Ethiopian local contractors is not enough and under question.

EEA, (2008), report noted that the capacity of the local construction industry is weak, unsatisfactory and technologically backward. But the global construction activities are becoming technologically advanced and very complex which demands higher and more sophisticated capacity. The report also emphasized that the existing indigenous contractors doesn't satisfy the required key professionals, machinery and financial resources. Moreover, the number of local contractors involved in huge construction works such as roads, high-rise building structures, bridges and dams are very low as compared to the number of such projects the country is undertaking. Thus, enhancing local contractor capacity would be critical and an important element to ensure the sustainability of the local construction market.

Furthermore, (EEA, 2008), presented other limitations that constrained the local contractors such as lack of the practice of outsourcing part of the construction works for specialized sub-contractors. This might have helped to improve the volume and quality of construction works. Moreover, the inability to create mergers among construction contractors due to the legal barriers has hampered the huge capacity that could have been created in the country.

The level of growth and performance of many indigenous construction contractors is still weak and substantially affect their competitiveness in the construction market (ERA, 2014). Their status cannot offer them a good opportunity to compete and equally manage the associated risk on a global scale. The local construction sector itself is still experiencing constraints that have continued to limit its growth. If this persists for a long time, Ethiopia may fail to have in place a sustainable civil works contracting capacity to construct and maintain all infrastructures but to continue relying on foreign companies. A sustainable contracting industry involves having a cadre of contractors with the ability to participate competitively. They should be able to undertake works effectively with continuous growth and improvement on performance to meet the current and future needs of the contracting industry.

With the increasing difficulty and complication of construction projects, there is a need to improve organization and management structure to overcome the technical complexity and unprecedented scope of works. The radical development of globalization has made competitiveness a fundamental factor in the existing competitive world. Internationally improved competitiveness is not the final achievement of local contractors significantly, rather, can no longer be avoided as far as becoming competitive is concerned.

However, many of the indigenous construction contractor have been in the construction business for over a long business year, but have remained unmaturred and weak competitive because of the dynamics of global competitiveness, (Rahel, 2016). She also argues that several indigenous

construction contractors have been investigated as a non-contract performing capability. Their performances had been questioned by various stakeholders in the search for value of money for contracts awarded to them. Moreover, as it was discussed in (section 2.2) competitiveness can be understood as the ability of winning a tender and accomplishing it as per the contract agreement. In the case of ERA, indigenous contractors are challenged by both problems (tendering and implementation) as compared to foreign contractors. Largely, many of them fail to provide technical and financial proposals that pass the litmus test for the award of contracts. Not only this, even if some contractors can win the contract, they cannot complete the contract as per the contract agreement (time, cost, quality, and health & safety) issues.

### **2.8.1 Tendering phase**

According to the ERA Terms of Reference (ToR) document, contractors are requested to propose the required labor, equipment & machinery, similar experience & satisfactory execution testimonies and financial standings. While ERA floated tenders for works contract, so many local contractors are participated in the tender to prepare an offer. Concerning this, most of the contractors are failed to give technical and financial offers.

Again, even though some contractors were trying to give an offer, they will be failed during the bid evaluation phase due to the non-conformity of technical and financial requirements. This is due to the inability of local contractors to fulfill must meet requirements e.g. similar satisfactory execution, required resources and annual turnover. Consequently, some contractors are forming a joint-venture consortium to alleviate this issue.

The previous years of ERA bid evaluation reports shows that the number of local contractors participated in the tender is more than foreign contractors. However, during the bid-offer, the percentage becomes vice-versa. Hence, the ability and competitiveness extent of local contractors is weak during tendering phase.

### **2.8.2 Implementation phase**

According to different project completion report of ERA despite any other problems experienced with the indigenous contractors in terms of ability and strategy in tendering, the works were never held up through the weak implementation performance, cooperation, lack of supply of principal construction materials (needs foreign currency) attributable to contractor's inefficiency. Additionally, adherence to procedure, workmanship, staffing and equipment are also other challenges while implementing the contract.

Almost all indigenous contractors in each project on their hand were militated time performance problems, quality problems, price escalation and financial problems (Rahel, K. 2016). She also concludes that, for some of the projects the additional time extension and cost required to be even more than 40% of the original contract period and the contract amount for local contractors.

On the other hand, most of the reports documented by ERA have agreed that local contractors have weak performance ratings in the perspective of time, cost, and quality as compared to foreign contractors during the implementation phase. Concerning this, (Rahel, K. 2016), has identified nine main causing factors for low performance of local contractors. Accordingly, weak financial management method, financial difficulties faced by the contractors, variation order, frequent design change, inadequate planning and scheduling, poor project management system, lack of equipment efficiency, insufficient number of resources, poor site and resource management, errors in design and un-realistic contract requirements by the consultant, are the major problems in order of their influence.

ERA, (2018), report shows most of the projects awarded to local contractors have substantially challenged by time and cost claims. This is due to inadequate management methods of both technical and managerial of project related issues during implementation period. In addition, most contractors plan the proposed program almost with no risk consideration; this is why most often different constraints and problems were occurred.

Such a performance has a great impact on the construction industry in such a way that their weak performance will disappoint investment on road construction projects by government, wear down mutual trust & respect among the parties, and it creates a negative attitude towards public.

In general, the growth level of indigenous construction contractors in Ethiopia in the road sector is still weak especially in implementation. This has on many occasions given the foreign contractors enormous opportunity in the local construction industry by scooping nearly all the big construction contracts. This leads to a high challenge to the construction industry as well as to the country development due to the reason that local contractors involved in the road construction industry has significance in the economic development of the country.

## **2.9 Competitiveness parameters for indigenous contractor firm's**

Tunji-Olayeni, (2015), has identified two fundamental approaches to find contractors competitiveness parameters. The first approach is to identify critical success factors (CSFs) while the second one is to identify key performance indicators (KPIs). The selection of a suitable approach will depend on the capacity and performance of the user. Furthermore, according to Shen, Lu, and Li (2003), there are two important tasks for assessing contractor firm's competitiveness; (a) identifying a set of competitiveness parameters and (b) exploring the calculation procedures for deriving competitiveness index from the multiple parameters.

### **2.9.1 Critical success factors (CSFs)**

As noted by Tunji-Olayeni, (2015), the idea of CSFs was developed by Ronald Daniel in 1961. He described CSFs as the three to six factors that determine the success, key jobs that must be done exceedingly well for a firm to be successful. Lu, *et al.* (2008), described two main conditions where CSFs approach is used (a) when there is a need to reduce numerous factors into

limited ones to make a complex system manageable (b) when there is a need to identify vital factors among a list of several factors competing for a limited resource.

A large number of competitiveness parameters have been identified for construction contractors in the sector. For instance, Shen, Lu, and Li (2003), identified 98 parameters for assessing the competitiveness of construction contractors. Tan *et al.* (2007), also identified 88 parameters for assessing the competitiveness of contractors. Hence, the CSFs approach is adopted to reduce a large number of parameters to some manageable few but critical ones.

Additionally, there is no a particular procedure to identify CSFs. Lu *et al.*, (2008), highlighted the following steps for identifying CSFs. These are, (1) specify a full set of selected success factors, (2) conduct a survey to investigate each factor's significance by referring the research goal, (3) calculate each factor's importance index value based on the survey data, (4) extract and prioritize CSFs by RII value, and (5) interpret the extracted CSFs. In this light, major parameters used for assessing the competitiveness of contractors have identified, (refer section 2.10).

### 2.9.2 Key performance indicators (KPIs)

Key performance indicators are the measures of the performance process that are critical to the success of a construction contractor firm, Takim and Akintoye, (2002) cited in Tunji-Olayeni, (2015). Some KPIs identified in the literature are given in the following table.

Table 2. 3: key performance indicators

| KPI                                                                                                                                             | Author                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| With specifications, on-time, under budget, efficiency, effectiveness, safety, defect remedy, stakeholder's cooperation, dispute resolution     | Toor and Ogunlana (2010)                      |
| Proper plan, staff experience, communication, budget, safety, claims, client satisfaction and profitability                                     | Jastaniah (1997)                              |
| Time, cost, productivity, safety, defects, client satisfaction                                                                                  | Egan (1998)                                   |
| Customer commitment, stakeholders, benefit, cost-effectiveness, production, project management, project status, risk and decision effectiveness | Pillai, Joshi and Rao (2002)                  |
| People, environment, communication, cost, time, quality, safety and client satisfaction                                                         | Cheung, Sun and Cheung (2004)                 |
| Resources, staff experience, site management, safety, contractor experience, time, cost and quality                                             | Wong (2004)                                   |
| Cost, time, quality, safety, scope, innovation, sustainability and client satisfaction                                                          | Rankin, Fayek, Meade, Haas and Manseau (2008) |
| construction time, construction cost, predictability of cost and time, defects and client satisfaction                                          | Skibniewski and Ghosh (2009)                  |

(Source: Ali, Ai-Sulaihi and Al-Gahtani, 2013)

## 2.10 Factor classification and categorization

The research was challenged to select and classify the major factors affecting indigenous contractor firm's competitiveness from different authors such as (Nurisra, *et al.* (2018), Weishing, *et al.* (2008), Yong Tao, *et al.* (2007), Flanagan, (2005), Ocen, *et al.* (2001), Orozco, F. and Serpell, A. (2011), Hoang, N. (2010), Adams, O. (1997), and Laryea, S. (2010). Depending on the factors identified above, the research has classified these factors as of; Management related, Human resources related, financial resources related, relationship related, bidding strategy related, technology & innovation related, corporate image & reputation related, marketing related, technical experience related and environmental factors. The research mainly focuses and emphasizes on the factors found in each category. Accordingly, the major affecting metrics are categorized in the following figure below as follows.

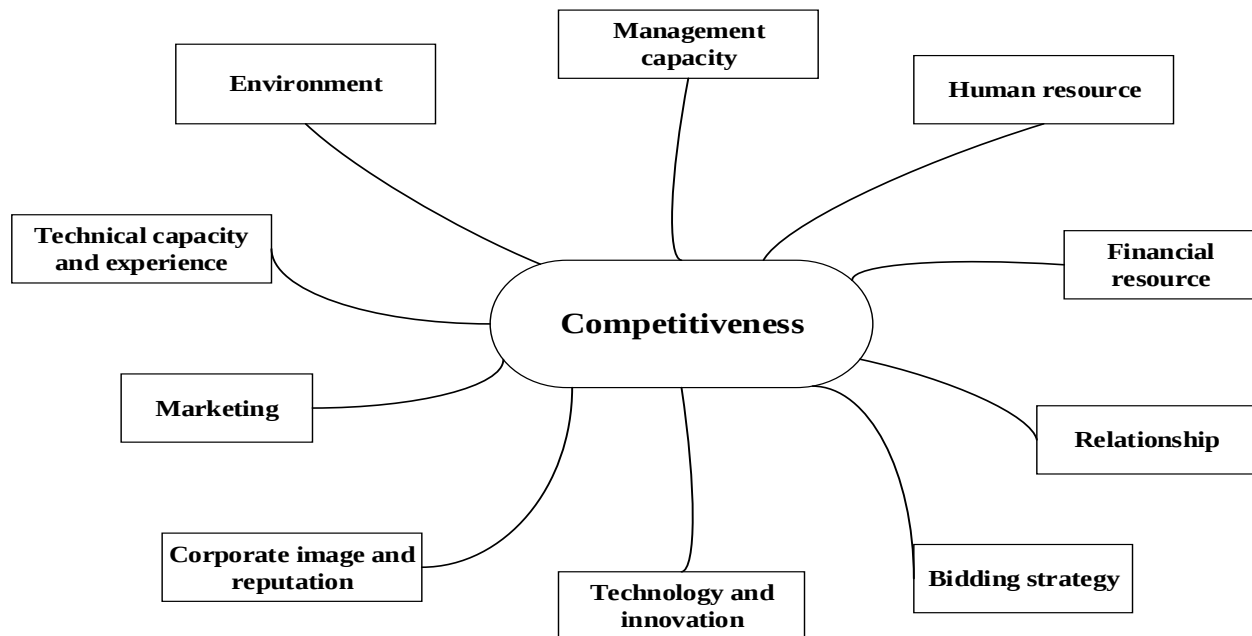


Figure 2. 4: Mapping of metrics affecting the competitiveness of indigenous contractors  
(Source: Author conceptualization)

### 2.10.1 Management ability

The contractor's ability of successful project delivery highly depends on the management skill of the contractors itself such as finance, human resource, project, environment, risk, claim and stakeholders (Inuwa Ibrahim, 2014). He also argues that, management skill reflects the contractor's ability to provide high-quality products to clients by efficiently managing the resource and overall project. Roger, A. (2001), also states that management ability indicates the more advanced technical management systems are developed to make the company more

competitive to operate on the world market easily. Reliable management ability is helpful to the contractors to improve their operational effectiveness and form the competitive advantages.

Moreover, the construction sector is a project-based sector because the contractors are matured and grow based on the success they achieve in their projects. Each construction project is unique in nature but the managerial process and procedure is normally uniform across projects in a company. Since, the project is at the core of the construction business, project management competencies cannot be dissociated from contractor performance. Furthermore, project success is closely linked and highly related to management ability, skills, experience and know-how of managers in the firm. The following table below presents the major management related factors.

Table 2. 4: Major management factors that affect competitiveness

| Category                  | Factors                        | Author                        |
|---------------------------|--------------------------------|-------------------------------|
| <b>Management ability</b> | ♣ Cash flow management         | Yongtao, (2008)               |
|                           | ♣ Time management              | Nurisra <i>et al.</i> (2018), |
|                           | ♣ Risk management              | Hoang N, (2010),              |
|                           | ♣ Health and safety management | Flanagan, (2005),             |

### 2.10.2 Human resources

Construction is a labor-based industry especially during the implementation phase of the project, (Commission of European Communities, 1997). Practically, the industry has immersed large numbers of poorly qualified labor from the lowest strata of educational achievement. This profile is in stark contrast to the future needs of a modernized sector which is to develop a sustainable and well-qualified workforce with capable of delivering improved quality, increased productivity, and better value for money. To bring about the latter scenario, the strategic objectives of the construction industry should be to improve employment conditions, job satisfaction, and education & training at all levels of professionals. Additionally, there is also a need to changing technology which will reduce the hard and unpleasant tasks in road construction, · promote employment, recruitment, and job security. Consequently, construction contractors can raise the level of skills and competence.

The raising problems of the contractors as well as to the road sector is its inability to recruit and retain people of sufficient technical and managerial professionals especially for site operations. Because of this several contractors have poor image. Therefore, the firm should establish appropriate organized structure that enables the company to make optimum use of resources and improve the quality and frequency of communication by effective training program. As different authors, (Weisheng, L. 2008, Yong-Tao, *et al.* 2007, Roger, A. 2001, Nurisra, *et al.* 2018, Hoang, N. 2010) argues that a well-established training program will certainly have a merit in attracting professionals.

Roger, A. (2001), argues that human resources are the basic resources for project success in contractor. According to Porter theory of competitiveness model, human resources is key to

supporting any operations of a contractor firm. The majority of competitive theories consider the knowledge base of the personnel is an important competitiveness asset, since, employees form the basic backbone of the contractor success. When the key professionals are productive and creative, the firm can achieve short- and long-term success. Professionals and their sectorial experience are considered a critical factor for contractors' competitiveness, (Porter, 1990). The following table below presents the major human resource factors.

Table 2. 5: Major human resource factors that affect competitiveness

| Category              | Factors                           | Author                         |
|-----------------------|-----------------------------------|--------------------------------|
| <b>Human Resource</b> | ♥ Capacity of human resource      | Ocean, <i>et al.</i> (2001),   |
|                       | ♥ Job satisfaction of workers     | Nurisma <i>et al.</i> (2018),  |
|                       | ♥ Availability of skilled workers | Yong Tao <i>et al.</i> (2007), |
|                       | ♥ Employee productivity           | Flanagan, (2005),              |

### 2.10.3 Financial resource

When a firm have large financial resource, the firm have a greater financial strength that enables the company to enter in to complex and huge projects, (Abinet, D. 2015). Adequate project financing in today's world is an important issue in the international construction business. If the contractor can utilize or provide a finance for himself, then, the company is less dependent on financing and funding institutions in the market such as banks.

Financial resource is a critical resource for any contractor organization and can be seen in different forms such as enterprise cash flow, ability to raise equity, cash equivalent, and the firm's borrowing capacity (Porter, 2008) as cited in Ahmed, B. (2018). A company's degree of profit reveals its business efficiency in the international market, (i.e. a firm with higher income, lower debt and higher profits is considered as strong competitor). The following table below presents the major financial factors.

Table 2. 6: Major financial resource factors that affect competitiveness

| Category                  | Factors                         | Author                         |
|---------------------------|---------------------------------|--------------------------------|
| <b>Financial Resource</b> | ♣ Annual construction turn-over | Nurisma, <i>et al.</i> (2018), |
|                           | ♣ Cash flow status              | Bekele J. (2015)               |
|                           | ♣ Financial capital             | Abinet D., (2015)              |

### 2.10.4 Relationship

In construction business particularly in road sector several stakeholders and experts are involved in all phases of the construction process. Project participants as an organization or a private expert who have a negative or positive influence on the success of the project. Winch (2002) also categorize project stakeholders in to internal stakeholders (clients, contractors, sub-contractors,

material suppliers and financiers) and external stakeholders (landowners, local residents, and public actors such as the local and national government).

Each stakeholder should establish smooth relationship with each other to minimize negative influence, to maximize productivity and project success. In line with this (Lu, 2006) argues that, if there will be hard relationship among stakeholders, the success of the project will be highly affected, finally there will be loss of profit on the contractor side. Consequently, due to unprofitable performance relationship a contractor becomes weak in equally competing to foreign contractors in the international business perspective. The following table below presents the major relationship factors.

Table 2. 7: Major relationship factors that affect competitiveness

| Category            | Factors                             | Remark                          |
|---------------------|-------------------------------------|---------------------------------|
| <b>Relationship</b> | ♥ Relationship with clients         | Weishing, <i>et al.</i> (2008), |
|                     | ♥ Relationship with sub-contractors | Yong Tao, <i>et al.</i> (2007), |
|                     | ♥ Relationship with creditors       | Flanagan, (2005),               |
|                     | ♥ Relationship with suppliers       | Ocen, <i>et al.</i> (2001),     |
|                     | ♥ Relationship with consultant      | Hoang N, (2010),                |

### 2.10.5 Bidding strategy

Tendering is an established mechanism by which contractors signify their expression of interest in a construction project, (Tunji-Olayeni, 2015). It requires a construction firm ability to make strategic analysis in terms of selection of contracts, (Drew, *et al.* 2001). They also argue that, thoroughly prepared and strategical tendering system have a good influence to the bidder to enter in to a contract.

Contractor's bidding strategy is concerned with setting the mark-up level to a value that is likely to provide the best pay-off. The contractor must choose a price high enough to provide sufficient contribution to overheads and profits, yet low enough to ensure that a sufficient volume of work is obtained in an environment of considerable uncertainty about the behavior of the competitors' (Douglas, E.J. 1989). Moreover, the bidding technique involves bidding strategy, bidding resource, bidding decision and methods to win the tender.

On the other hand, there are factors that affect bidding strategies. Flanagan, R. and Norman, G. (1982a), identified these factors as job characteristics, economic environment, competition condition, market conditions, number and identity of competitors, type, and scope of construction work, client and location. The empirical research work by Drew and Skitmore, (1997), shows that bidding competitiveness of the contractors towards project type effect is partially influenced by the degree of project type standardization. One of their findings emphasizes that contractors are more competitive when they bid for contracts that are highly standardized in terms of type and value. Flanagan and Norman, (1982a) have also identified five major factors influencing contractors' bidding strategy such as (1) market conditions, (2) projected workload, (3) scope & complexity of project, (4) type clients, and (5) project type.

Contractors can enhance their bidding competitiveness by critically analyzing the effect of the above factors and through learning from their experience over time. The following table below presents the major bidding factors.

Table 2. 8: Major bidding strategy factors that affect competitiveness

| Category                | Factors                       | Author                                        |
|-------------------------|-------------------------------|-----------------------------------------------|
| <b>Bidding Strategy</b> | ♣ Company bidding experience  | Douglas, E.J. (1989)                          |
|                         | ♣ Client bidding requirements | Drew and Skitmore, (1997)                     |
|                         | ♣ Bidding price               | Laryea S., (2010)<br>Ghafur and Nawi, (2016), |

### 2.10.6 Marketing

Because of sophisticated competition in the market construction companies must combine a series of projects to increase revenue. Concerning this, a sustainable marketing system provides a key role in the strategic management of construction contractors when trying to achieve a competitive advantage. Ahmed B. (2018) noted that professional engineers and skilled work force must be treated as an important asset to develop a feasible competition market strategy. Because of the behavior that, marketing in construction has different implications from that of other industries as construction clients are not “uniform” organizations. The following table below presents the major marketing factors.

Table 2. 9: Major marketing factors that affect competitiveness

| Category         | Factors                                 | Author                         |
|------------------|-----------------------------------------|--------------------------------|
| <b>Marketing</b> | ♥ Market price fluctuation              | Ahmed B. (2018)                |
|                  | ♥ Costing experience                    | Yong Tao, <i>et al.</i> (2007) |
|                  | ♥ Ability to collect market information | Flanagan, (2005)               |
|                  | ♥ Availability of product information   | Hoang N, (2010)                |

### 2.10.7 Technology and innovation

Expanded production potential, variety of product rang and increased outward expansion opportunities are a result of advanced technology. It helps to minimize price and risk levels, thus lowering the manufacturing capital requirements, (Rao and Soumya, 2010). The larger utilization of advanced technology and innovation implementation is considered as an important source of competitiveness enhancement. In addition, for the sake of effectively manage complex projects, special expertise and application of new products and processes are required. For example, energy-efficient design and construction is one of the challenges that the construction industry has been facing recently.

Moreover, advanced technologies and creativities are required to the contractors in order to increase productivity, providing reliable works and service, thus producing reliable product to clients, and to minimize risk and uncertainty. Because of this, there is a need to integrate

technology and innovation by contractors as a part of their business and invest more in research and development. The following table below presents the major technology and innovation factors.

Table 2. 10: Major technology and innovation factors that affect competitiveness

| Category                           | Factors                              | Author                  |
|------------------------------------|--------------------------------------|-------------------------|
| <b>Technology &amp; Innovation</b> | ♣ Utilizing construction software's  | Ocean, et al, (2001),   |
|                                    | ♣ Availability of latest machineries | Rao and Soumya, (2010), |
|                                    | ♣ Attitude of the firm to technology | Laryea S., (2010)       |

Many contractors agreed that, advanced technology and productive creativity is a critical success factor for their competitiveness. Additionally, it's a key to long-term benefits of conserving and protecting the environment. The table below shows several initiatives that indicate the potential and commercial merits of environmentally responsible technology.

Table 2. 11: Potential characteristics of sustainable technologies

| Merits                         | Description                                                            |
|--------------------------------|------------------------------------------------------------------------|
| Resource efficiency            | ▪ Efficient usage of material resources, often using recycled material |
|                                | ▪ Minimal use of non-renewable resources                               |
|                                | ▪ Efficient consumption of energy in production                        |
|                                | ▪ Use of locally friendly materials                                    |
| Decreased environmental impact | ▪ Very low emissions to the environment during production              |
|                                | ▪ Very low toxic release even zero                                     |
| Economic pro's                 | ▪ Economically cost-effective compared to conventional service         |
|                                | ▪ Increase productivity and quality in the sector                      |
| Social pro's                   | ▪ Maintain living standards or quality of life                         |

### 2.10.8 Technical skill & experience

In Ethiopia, it is well-known that a wide gap exists in technical ability and specific construction experience between local and foreign contractors, (ERA, 2011). Walker, (1995) also argues that only a few local contractors can compete with the technically and financially superior foreign contractors in many developing countries. For example, in the Hong Kong construction industry localized foreign contractors have made success especially in the civil engineering sector. Their success illustrates the important role of experience in gaining the competitive advantages of international contractors.

Technical skill and specific construction experience have a great influence on bidders' competency in tendering, (Fu and Drew, 2003). Concerning this, their finding also concludes that contractors who have experience in tendering are more competitive than less experienced contractors. Tunji-Olayeni, (2015), also noted that, regarding specific experience, the

productivity of the firm is another great issue. He argued that low productivity causes technical inefficiency of the firm. Additionally, their particular experience in the sector helps how they manage and execute the works as per client and contractual requirements. The following table below presents the major technical capacity and experience factors.

Table 2. 12: Major technical skill & experience factors that affect competitiveness

| Category                              | Factors                                                        | Author                                       |
|---------------------------------------|----------------------------------------------------------------|----------------------------------------------|
| <b>Technical skill and experience</b> | ♥ Project type                                                 | Walker, (1995),                              |
|                                       | ♥ General and Specific experience                              | ERA, (2011),                                 |
|                                       | ♥ Availability of materials confirming contract specifications | Ocen, et al, (2001),<br>Fu and Drew, (2003), |
|                                       | ♥ Ability of estimation of quantities                          | Bekele J., (2013)                            |

#### 2.10.9 Environmental factors

The construction environment in general and construction contractor in particular have a substantial impact on the environment both in local and global scale. On the other hand, the environment by itself have also a barrier to the construction companies such as policy, regulation and principles of the government and the public. According to Abinet Dametachew, (2015), argument, the policy and regulations of the government is not suitable to the contractors. For example, one study concluded that, rules, regulations and bidding systems of the Ethiopian government is not appropriate and suitable to local contractors. Even the procurement law set by PPA was not effectively applicable by all clients (i.e., it is abused and no fair and full information is distributed to all bidders equally). Additionally, political cases are also another issue (they are highly affected by unstable politics even the foreign contractors too). Even though, there are experienced contractors in Ethiopia, most of them are influenced by local construction laws and standards. Consequently, substantial controversy is being occurred in between stakeholders (especially between client and contractor). The following table below presents the major identified environmental factors.

Table 2. 13: Major environmental factors that affect competitiveness

| Category             | Factors                                | Author                     |
|----------------------|----------------------------------------|----------------------------|
| <b>Environmental</b> | ♥ Regulatory and legal restriction     | Yong Tao et al, (2007),    |
|                      | ♥ Knowledge of local construction laws | Abinet Dametachew, (2015), |
|                      | ♥ Political stability                  | Hoang N, (2010),           |

### 2.10.10 Image & Reputation

A company's reputation is established by the opinion of customers towards company products and services. Consequently, reputation management is increasingly becoming a key element of business success in a contractor organization. It is also a tool used to evaluate or analyze a firm's ability by stakeholders by the expressed reactions of customers, investors, employees and the public. Furthermore, a firm's reputation stems from the satisfaction of end users derive from consuming a particular good or engaging a service. Additionally, good reputation logically leads to positive financial and social performance that ultimately enables the firm to achieve competitiveness (Lu, 2008). Therefore, the contractors should care about their image to the society to build itself sustainably. The following table below presents the major environmental factors.

Table 2. 14: Major image and reputation factors that affect competitiveness

| Category                      | Factors                                     | Remark                                          |
|-------------------------------|---------------------------------------------|-------------------------------------------------|
| <b>Image &amp; Reputation</b> | ♥ Company history                           | Ghafur and Nawi, (2016),                        |
|                               | ♥ Previous performance on Projects          | Nurisra et al, (2018),                          |
|                               | ♥ Type and number of environmental services | Yong Tao et al, (2007),<br>Ocen, et al, (2001), |

Generally, different authors argue that there are also another critical factors that affect the contractor competitiveness ability such as discriminated quality, increased amount of rework and defect, low productivity, delay of execution, cost overrun, low client satisfaction, poor health & safety performance, poor site condition (due to poor implementation) and contractor attitude. Therefore, the contractor should give emphasis and control to minimize the impact and increase the degree of competence both national and international market.

### 2.11 Impact of weak indigenous contractor firm's competitiveness

Many of the Ethiopian local contractors suffered competitiveness challenges because of weak competency. This results to award projects to foreign contractors for timely and cost-effective performance. According to ERA, (2016) report the status of indigenous contractors is low while they are evaluated in terms of the progress of the project projected on their hand. This weak competitiveness causes indigenous contractors facing to win and accomplish projects as per the requirement of ERA. This is the reason behind in most cases huge contracts were awarded to foreign contractors. Therefore, contractors should assess and measure their competency.

Flanagan, *et al.* (2007), argues that the ultimate purpose of assessing and measuring competency is to improve and achieve a better long-term performance for contractors. Moreover, Ethiopian contractors are facing substantial challenges by different parameters. According to the MUDC, (2012), the bidding requirement and method of bidding also another factor of limiting indigenous contractors' competitiveness.

## 2.12 Indigenous contractor firm's competitiveness strategy

Wilson (2014), defined strategy as the system of forecasting and determination of the basic long-term goals and objectives of a company and the adoption of courses of action and allocation of resources necessary for carrying out these goals. Any active firm needs a strategy because of the reason to increase profit, revenues, market share and most importantly-acceptance, (Salim, *et al* 2018). He also argues that, standalone strategies are not enough for sustainable achievement.

Contractors competitive strategy is mainly concerned with how a firm competes in a particular business and earns a competitive advantage through a distinctive way of competing. Any business firm need to consider the overall strategy if a company diversifies. It is concerned with the mix of businesses the company should compete in and how strategies of individual units should be coordinated and integrated. Competition is a key tool for the success or failure of construction contractors in construction business. It determines the appropriateness of a firm's activities that can contribute to its performance, such as innovations and good implementation. As of Salim, *et al.* (2018) argument, competitive strategy helps to search for a favorable competitive position in an industry, aims to establish a profitable and sustainable position against the forces that determine industry competition. The ability of a company to capture the opportunity that an industry gives depends on its core competency.

The construction contractor companies nowadays are very dynamic and there should be forcing the contractors to use right strategic decisions in doing the business. Furthermore, their existence is depending on the contractor's capability to grab opportunities, they need to create mechanisms to increase their involvement in huge and complex projects.

The mechanism that helps the local contractors is set in such a way that they local contractors should have to expose themselves to foreign developers' activities. Concerning this, Salim, *et al.* (2018), states that these contractors' technologies imitate their way of operations and management practices that increase local construction productivity. They also argue that contractors must create domestic linkages because when companies create linkages, knowledge from these contractors can be transmitted to the suppliers and distributors and ultimately to domestic contractors using the same suppliers and distributors.

In other perspectives, the increase in competition that accompanies foreign contractor entry can force domestic contractors to increase their productivity by updating manufacturing technologies and adopting advanced management practices to meet these competitive challenges over foreign contractors both nationally and internationally. This is one of the strategies that, can be adapted to increase the involvement of local companies in huge infrastructure projects. The project participants realized that sharing of knowledge and information is one of the key elements of a successful contractual relationship, (Salim, *et al.* 2018). There appears to be no clear guide on the process of collaboration between the main contractor and subcontractor. Therefore, it makes it difficult to effectively interact and achieve common project goals within the bounds of cost, quality and time.

### 2.13 Foreign construction contractors' best practice

According to (EIC, 2019), there are foreign contractors registered in Ethiopia for civil infrastructure works on federal road projects administered by ERA. During their operation, international contractors have their own best way of working methods and practice as compared to Ethiopian indigenous contractors depend on different parameters such as health and safety issues, timely and quality-based management issues, and reliable technology, knowledge and good working attitude. The following table below presents the best practice of foreign contractors in the sector.

Table 2. 15: Foreign contractors' best practice of in the sector

| Sn. | Elements                              | Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Attractive customer services attitude | <ul style="list-style-type: none"> <li>☞ International contractors have an attractive customer service attitude and reputation that covers the whole process of the design and construction and from tendering to after sells service.</li> <li>☞ When foreign contractors start their business, they care their customers and think “a customer as a key to success” in the competition.</li> <li>☞ Attractive customer service attitude will add credit to foreign contractors when they bid for construction projects by creating sustainably smooth relationship with clients.</li> </ul> |
| 2   | Strong financial back-up              | ☞ Construction is a risky business. As a result, international contractors have adequate financial contingency to alleviate risks.                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 3   | Strong design-and-build capacity      | ☞ In most international contractors, substantial numbers of public and private sector projects are based on design and build delivery which covers areas such as road infrastructures, housing, industrial, retail, leisure, health, offices and utilities. In many nations DB delivery system had been more accepted by the public and private sector for innovation, improved quality and cost-effective solutions.                                                                                                                                                                         |
| 4   | Strong & widespread trade connection  | ☞ Many of the international customers prefer foreign contractors because of the contractor excellent working attitude honest for the work.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5   | State-of-the-art technology           | ☞ Foreign contractors' state-of-the-art technologies such as the design and construct of nuclear power stations, intelligent buildings, and tunnels differentiate them from their local competitors. Additionally, foreign contractors respect applies                                                                                                                                                                                                                                                                                                                                        |

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the wish and need of their customers in any cases.

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(Source: Xu, T J, Bower, D and Smith, N J (2005))

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## 2.14 Improving indigenous contractor competitiveness

The headache issue for African countries is to expand the participation of local construction sector in to major construction projects (ECA, 2016). The report also argues that local contractors in most of African countries have complications competing equally even in their local markets with the larger contractors that operate internationally by offering wide range of outshined engineering and management services and advanced technology.

Having a competitive advantage over other construction contractor is a key factor to improve the company's productivity, source of additional profits, and confirmation of the company's cohesive and effective long-term strategy of growth, (Porter, M.E. 1998). As a result, most of companies in developing countries now a days are striving to build their lasting competitive advantage in the market. Additionally, from his argument the lasting competitive advantage is a source of additional value for both company and the consumer.

Improving its competitiveness becomes a key strategy for any contractor to sustain its business development, (Nasser, 2011). Due to the presence of large number of factors that determine the competitiveness of a contractor, it is difficult to satisfy all these factors at the same time because the firm's management practice always have limited resources such as money, labor, time, and efficient management efforts. Therefore, by using limited resources, identifying a list of critical success factors is valuable for helping contractors to be more focused to develop their competitiveness (Lu, *et al.* 2008).

In line with critical success factors, Laryea, S. (2010), argues that as an opportunity of improving their competitiveness indigenous contractors can team up to buy equipment. Besides, there is a gap in Ethiopian contractors with the history of partnerships to share a resource. The main problem is people cannot be trusted and do not approach partnerships in a business sense.

Some of the contractors especially in developing countries, (Laryea, S. 2010), the contracting environment and construction business is stifled and not growing. However, some of them said it provided contractors with an opportunity to diversify into other areas where they can make higher profits.

Different professionals in the sector said that, indigenous contractors who want to increase and build their capacity should approach foreign contractors who might like to sublet some of their work. This would help the local contractor in developing capacity and learning and transferring knowledge. Different contractor experts explained that "international contractors don't give work to local contractors in developing countries because these contractors work 24hours and they are committed to deliver as per contractual agreement. Consequently, this creates a great gap from local and international contractors.

It is obvious that, today's powerful international contractors were developed within strong, protected markets and their international status was often achieved with the help of export credits supplied and supported by their governments. Because of their well improved competency, the

international market is dominated by foreign contractors from the US, Japan, China, UK, France, Germany, Italy, and Korea. The first proposed solution to the problems of contractors from small developing countries, therefore, is to provide donor and government support to regional contractors to enable them to develop and mature.

Ways that help to improve the competitiveness of contractors are grouped as macro level, meso level, and micro level factors, (Borowiecki & Siuta-Tokarska. 2017). The following figure below further presents the classification of competitiveness improvement parameters.

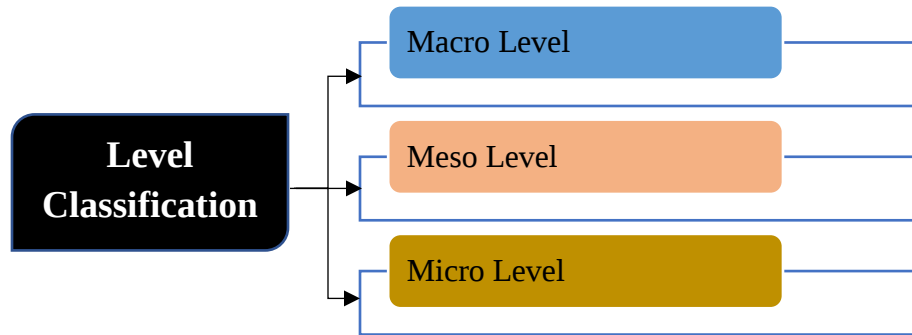


Figure 2. 5: The classification hierarchy of improving factors  
(Source: Borowiecki & Siuta-Tokarska. 2017)

### A) Macro-level factors

Under this category, different improving factors are found that helps to increase the competitiveness of indigenous contractors. The following table shows the identified parameters in macro-level.

Table 2. 16: Macro level competitiveness improvement factors

| Factors                                  | Source                                         |
|------------------------------------------|------------------------------------------------|
| Continuous capacity building             | ERA, 2005                                      |
| Suitable government policy               | Ethiopian National Construction Gazzetta, 2018 |
| Quality management system                | Shaari, 2017                                   |
| Suitable organization structure          | Yam, M. C. 200                                 |
| Well-established communication chain     | Salim, <i>et al.</i> 2018                      |
| Strong marketing strategy                | Łopacińska, 2014                               |
| Workers freedom of decision              | Ethiopian National construction Gazzetta, 2018 |
| Investing in construction-based research | Łopacińska, 2014                               |

### B) Meso-level factors

Table 2. 17: Meso level competitiveness improvement factors

| Factors          | Source                |
|------------------|-----------------------|
| Adequate funding | Lu, Shen, & Yam, 2008 |

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|                                                  |                                        |
|--------------------------------------------------|----------------------------------------|
| Utilizing foreign contractors' best practice     | Porter M.E. 1998                       |
| Utilizing latest technology                      | Salim, <i>et al.</i> 2018              |
| Utilizing joint venture approach                 | Murray and Appiah, 2010                |
| Cooperation in decisions and problem-solving     | Cheong Yong, Y., & Emma Mustaffa, 2012 |
| Price information on labor, materials and plants | Lu, W., Shen, L., and Yam, M. C. 2008  |
| Subdividing contracts in small value packages    | Murray and Appiah, 2010                |
| Clear communication among stakeholders           | Lu, Shen, & Yam, 2008,                 |
| Identify customer needs and expectations         | Łopacińska, 2014                       |

### C) Micro level factors

Table 2. 18: Micro level competitiveness improvement factors

| Factors                            | Source                                         |
|------------------------------------|------------------------------------------------|
| Efficient use of advance payment   | Ethiopian National Construction Gazzetta, 2018 |
| Competent project manager          | Nguyen, Ogunlana, & Lan, 2004,                 |
| Well-defined work plan             | Lu <i>et al.</i> 2008                          |
| Ontime payment to sub-contractors' | Ethiopian National Construction Gazzetta, 2018 |

### 2.15 Benefits of improving indigenous contractor competitiveness

According to ECA, (2016), efforts to increase the ability of local contractors to compete for construction have substantial advantages to the nation. Ofori G. (2018), also discussed the substantial advantages while improving the competitiveness of indigenous contractors; (a) Creation of local job opportunity, (b) GNP increase, (c) high foreign exchange, (d) high industry performance and (e) overall country development due to the enhanced and long-term performance of indigenous contractors inside the country. But in the previous practice so far, the construction sector as well as the nation lost the above advantages.

Rahel, K. (2016) and Getachew, G. (2020), argues the participation of local contractors' in the road sector has the following significance but not limited to;

- ♣ Generating job opportunity for professional, skilled and unskilled manpower
- ♣ It helps the employer to get a sound offer
- ♣ Solve foreign exchange problem
- ♣ Produces a competent local contractor in the sector
- ♣ Increase in gross domestic product (GDP) and contributes to the overall development of the country that has a multiplier effect on the economy of the country.
- ♣ To ensure self-sustained development of the country.

Government support to build the competitiveness of local contractors for either construction or public-private partnership activities can be both supply-side assistance (e.g., capacity-building for companies and employees), as well as demand-side assistance (e.g., giving special consideration to project bidders that are local contractors, or that include local contractors as partners or subcontractors).

## 2.16 Conceptual framework

The conceptual framework gives a depiction of how the variable relates to each other. The variable distinct here is the independent, dependent, and moderating variable. Independent variable affects and determines the effect of another variable. The independent variables in this study are the variables categorized in management ability, human resource, financial resource, relationship, bidding strategy, technology and innovation, corporate image and reputation, marketing, technical ability & experience, and environmental factors. The dependent variable is the contractor firm's competitiveness in the road Sector particularly ERA projects. The moderating variable is measured and manipulated to discover whether or not it modifies the relationship between the independent variable and the dependent variable. Government policies, construction laws, and environmental factors are identified as moderating variables. Competitiveness of indigenous of contractors could be researched and examined using many parameters articulated by factors such as finance, human resource, technology, environmental factors, technical and managerial factors, company image and marketing. The following figure below further presents the conceptual framework of this study.

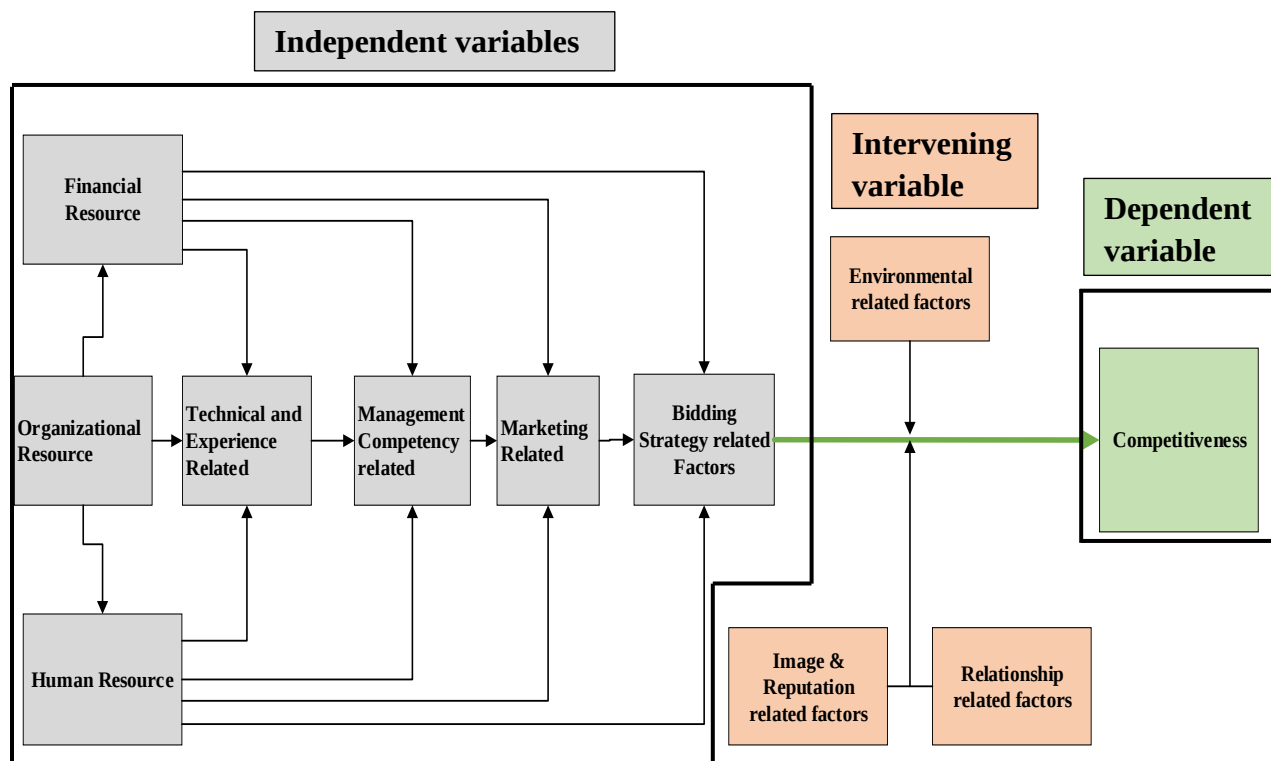


Figure 2. 6: The conceptual framework of the research

(Source: Author conceptualization)

The above figure (2.5), further illustrated that, the interrelationship between contractors' specific resources like management and technical competencies as in the case of construction contractors, financial and human resources, marketing system, relationships with stakeholders and the bidding technique adopted by a firm. All the resources identified in the framework are perceived to be significant for competitiveness and the availability of these resources is believed would greatly enhance the competitiveness of indigenous contractors.

Any company resource including construction contractor company's is made up of financial and human resources, (Tunji-Olayeni, 2015). Financial resources are key resources for construction contractors because most of the resources and competencies identified in the conceptual framework as determinants of competitiveness can be acquired with financial resources. The human resource is also another vital resource for contractors particularly for labor-intensive contractors. Human resources facilitate the translation of organizational goals into reality.

A company resource determines a firm's market because a firm can be described in terms of the size of financial measures such as profit, return on investments, and turnover. A firm can also be described in terms of type, quality and number of human resources. Moreover, the financial capability of a firm determines the number and quality of human resources that a firm can employ. This helps the firm to easily process the marketing system.

A company's resource can be also determining the technical and managerial capabilities of the firm because of the communication track can inspire employees towards achieving contractors' goals with project management competencies. Contractor resource and project management capabilities have also a relationship. Firm's financial resource highly indicates the human resource competencies' in the perspective of type and number of competent workers that can be employed. Consequently, the firm can get a technically qualified workforce and the contractor becomes technically and managerially competent.

A firm bidding strategy and extent of winning is also highly dependent on the contractors technical and managerial competencies' and overall image and relationship of the firm. Moreover, a firm's success in bidding can also be determined by the available financial resources to cover for bidding expenses and available financial resources to employ experienced bidding professionals.

All these variables are internal factors (firm-specific resources and competencies) that are perceived to have an impact on the competitiveness of the firm. Furthermore, a firm's relationship with clients or other stakeholders in a contract, environmental parameters, and the firm's history can greatly enhance the firm's chances of winning a job.

There is a constant interaction between construction contractors and stakeholders because of the demand and supply of construction services. Hence, a healthy relationship between construction contractors and stakeholders would likely influence the competitiveness of construction

contractors positively. This could be irrespective of the contractor's resources, structure, project management competencies, or bidding strategy.

### **2.17 Summary of literature review**

The purpose of this chapter was to present the Ethiopian indigenous contractors' competitiveness extent and identifying major affecting factors. The chapter also presented the ways to improve the competitiveness of indigenous contractors. In an attempt to do so, the chapter first established the nature of the Ethiopian construction industry and road infrastructure approaches, practices, and trends. In addition, then the chapter went to present and discuss in detail about the Ethiopian indigenous contractors' extent of competitiveness and company success criteria's (factors). Here, the competitiveness extent of local contractors was tried to investigate by mainly assessing ERA's bid evaluation documents and additional project progress and completion reports were used. Based on this, the competitiveness extent of indigenous contractors is not satisfactory and considerable. This is generally due to the difficulty of qualification criteria set by the employer (ERA).

Following, the chapter also identified the major factors with in ten categories that affect the competitiveness of indigenous contractors. The major categories of factors were management factors, human resource factors, financial factors, bidding strategy factors, relationship factors, technical skill and experience factors, marketing ability factors, technology & innovation factors, image & reputation factors and environmental factors.

The chapter also critically reviewed the major competitiveness improvement mechanisms of indigenous contractors in three main category, macro level, meso level and micro level mechanisms. As a result, due the enhancement of competitiveness, the sector as well as the nation can be benefited in such a way that, creating job opportunity for professionals, helps the client to get reasonable bid offer, solve hard currency problem, knowledge transfer and improve gross domestic product of the country.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3. General**

Conducting a research is a way of investigating the truth that are embarked to get answers for a problem in a scientific way, (Tayie, 2005). It is also a means investigation through careful and systematized way towards increasing the sum of knowledge, (Richard Fellows & Anita Liu, 2008) therefore, a research methodology refers to the overall system used in the research process. A scientific research involves a critical investigation of the various aspects of the problem under consideration of understanding and developing mechanisms and strategies that administer the research process. The main purpose of the research has a significant bearing on the methodology that needs to be adopted. This section aims to define and justify the methodology used for data collection and analysis and the data needs to be address the research aims and objectives. Therefore, the main focus of this research was assessing the competitiveness extent of indigenous contractors, identifying major affecting factors, and finding mechanisms to improve the competitiveness of indigenous contractors.

#### **3.1 Research Type and Approach**

The mechanism followed in conducting this research was started with problem identification that has been done through review of critical literature and archival document review. Then, the research design was developed and structured. Following this, the research data and information's were identified based on the developed research design structure. Based on the data and information sources identified, the research strategy and instruments were decided.

Yin (2009), evidenced that descriptive goals that pose what, who, where, how many questions would generally be best addressed by surveys and archival studies. Michael & Miles, Matthew, B. (2002), also indicate case study research's case studies naturally combine data collection methods such archival documents, interviews, questionnaire and observations. Therefore, in

combination with the above two justifications, the research used survey and case study as a research strategy for investigation together with mixed approach to its data collection and analyses. Accordingly, survey in the form of structured questions and archival document review had been conducted to cover the wide variety of samples within the study population and to investigate the case in detail respectively.

Since the first objectives of this research was to assess the competitiveness extent of indigenous contractors, a document review was conducted to assess critically by referring 97ICB bid evaluation report and 104 performance evaluation documents in ERA. Regarding the second and third objective, questionnaire survey and document review (contractor documents, progress and completion reports) were used to identify affecting factors and improvement mechanisms.

A scientific research can be categorized as a theory-based (deductive) research, a problem initiated (inductive) research, and a mixed approach. Accordingly, this research was used inductive types of research approach, since the research has initiated based on problems and research questions to be addressed and answered. The research questions set by the researcher are problem-oriented and required to investigate the factors affecting competitiveness and mechanisms to improve the competitiveness of indigenous contractors.

In different types of research, objectives such as exploratory, explanatory and descriptive are employed, (Yin, 2009). Similarly, the study has research questions like; to what extent, what factors affecting competitiveness and how to improve indigenous contractors. As a result, for the first questions descriptive type were used where as for the second and for the third questions, descriptive vs explanatory approach was used to describe characteristics of affecting factors and to identify the nature of cause-and-effect relationships. Therefore, the research used both descriptive and explanatory research types to address the specified objectives.

In the time of conducting a research, the strategy of the research can be classified as either qualitative, quantitative or mixed approach, (Tayie, S. 2005). A quantitative research is one of an objective approach which usually requires to record the opinion, belief and attitude of the respondents in different degree that can be measured with numbers. On the other hand, qualitative research is a subjective approach of discussing and observing peoples in their language and environment respectively (Naoum, 2007). Therefore, the methodological approach used in undertaking this research was a mixed approach.

Interviews and archival studies are the major types of qualitative study, (Creswell, 2009). The quantitative method also focuses more on numbers and frequencies rather than meaning and experience. Concerning this, due to the presence of quantitative data collected by a questionnaire survey from respondents, this approach was also used to analyze and prioritize numerically regarding the factors affecting competitiveness. Whereas for the qualitative aspect, document review was used to collect qualitative data from bid evaluation reports, project progress and completion reports. All helps to the research to provide reliable data to address the objective of the research by following the research design procedure.

### 3.2 Research Design

The main focus of the research design is the way the research objectives could be achieved through realistic methodology, data collection, data analysis, and conclusion that determine the finding of the study. Moreover, it is used as a tool to make the research problem that becomes researchable and to develop answers to the research queries, (Oppenheim, A. 1992). Richard Fellows & Anita Liu (2008) also states that research design is a strategy that governs the researcher in the period of collecting analyzing and interpreting observations. It is a logical framework of proof that makes the investigator to draw inference concerning causal relations among the variables under investigation. Furthermore, (Kumar, 2005) defined a research design as a procedural plan that is employed by the investigator to solve questions objectively, accurately, validly, reliably and economically.

Generally, a research design involves a critical review and development of the research queries that are tailored to the problem statement, the critical design of the research instrument, collection of the data needed and critical analysis of the data to achieve to an informed conclusion, (Kothari 2004). The selection of a proper research design on the outset of research project is the key step and have a fundamental effect on the execution of the research, (Creswell, J W. 2003). Therefore, understanding the research design procedures that are appropriate for this study and that would provide evidence and allow the researcher to identify past experiences in the topic

area are the key sources to select the appropriate method.

All scientific researches from simple survey to international studies addressing complex issue requires a design of some type. All steps, including variables, samples and measurement instruments should be selected based on their appropriateness to the research question, (Tayie, S. 2005).

By using the nature of the assessment in to consideration, (Yin, 2003), suggests three conditions has advised in deciding the research design. These conditions are; the types of research questions, the investigator ability of control over the actual occasions and the degree of focus employed on contemporary events. He also indicated that the type of data to be collected, their availability & time & cost constraints of the study are important conditions in choosing the research strategy. This research employed the research design process presented below. The following figure presents the overall research design process from data collection to conclusion and recommendation.

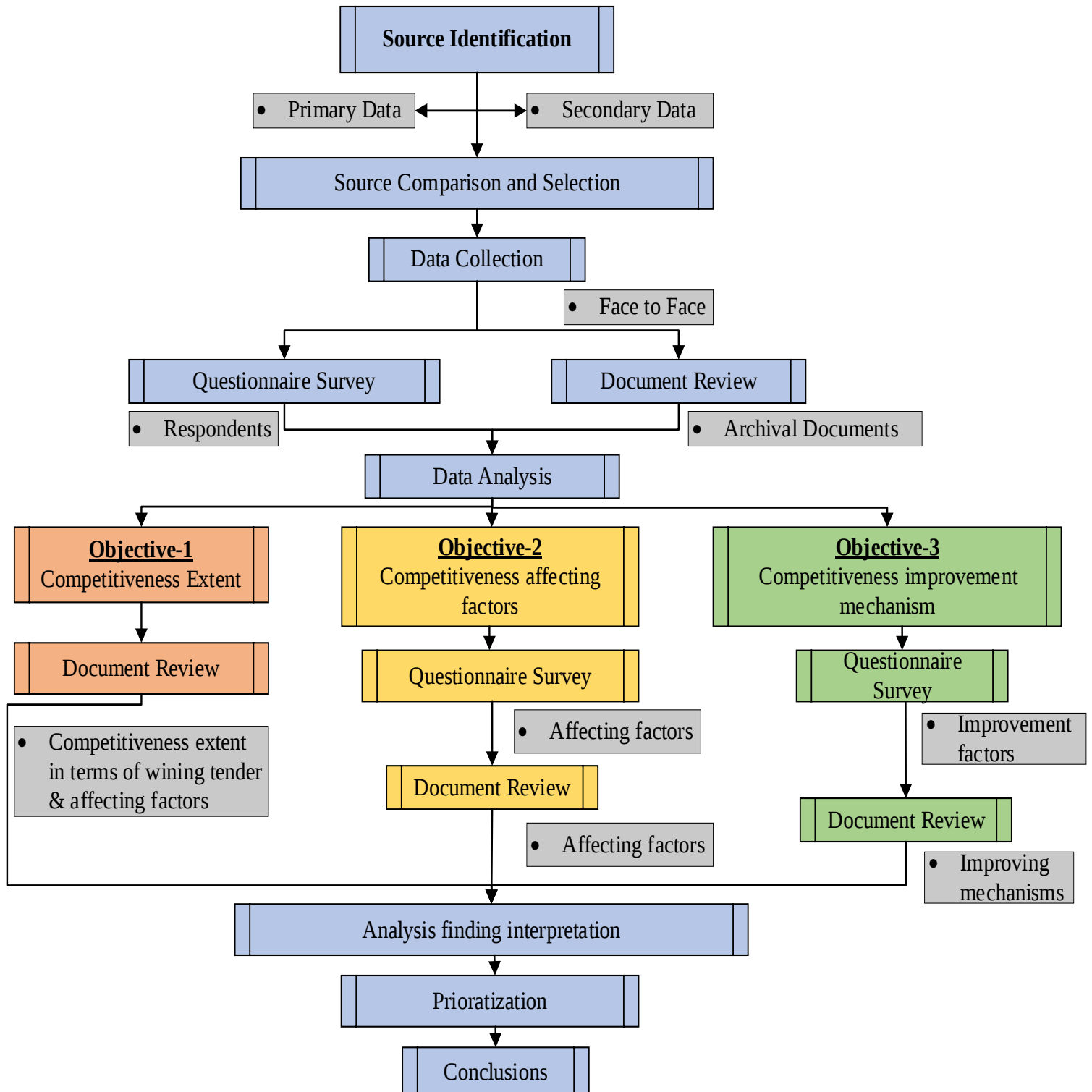


Figure 3. 1: The research design framework  
(Source: Author Conceptualization)

Therefore, with the research problem established in chapter one, the critical literature review developed and variable identified in chapter two, this chapter as part of the research design presents the research methodologies used. The chapter presents the particular method used for this study and justifies why it was chosen. This is followed by discussions of data collection and analysis techniques used. Finally, the chapter discusses the rigors applied to assure the quality of the research process and its output to achieve the ultimate goal of the research to draw up findings in a way to make conclusions and to forward relevant recommendations.

### 3.3 Research population

To determine the research population referring to contract agreement of ERA, Grade-one contractors actively participating in ERA projects fall under large categories. Due to this reason, the research uses grade one(G-1) contractors as a population. There are reasons why the research used on Grade-one contractors;

- ♥ Mainly the competitiveness assessment was made in comparison with foreign contractor's participated in road projects administered by ERA. Concerning to this, only G-1 foreign contractors are allowed to participate in construction works in Ethiopia (no other category of contractors allowed to participate). As a result, the research used G-1 local contractors as a research population.
- ♥ Additionally, Grade-1 contractors perform the most fundamental role in the road sector, and thus represent a typical business model in terms of management, sector experience, human and equipment resource, bidding experience, financial status. Furthermore, they have more physical and human resources, involved in large ERA projects and accordingly have wide exposure to different types of road construction projects. Thus, the research believed that these contractors have experience in good resource utilization and management issues may require managerial effort to increase their competitiveness.

There are 32 grade one contractors participated in ERA projects in different parts of the country. Therefore, the research used these contractors as a research population.

### 3.4 Research data source

In this research, the data sources were two basic documents. These were; respondents' documents (primary data) and archival documents (secondary data). Respondents' documents were collected from respondents by using questionnaire survey. The questionnaire survey was structured and it was used to identify major competitiveness affecting factors. Archival records included documents vital for knowing major challenges and affecting factors of contractor's competitiveness and used to show mechanisms to enhance competitiveness of indigenous contractors. Therefore, documents and archives are used as the major data source to fill gaps identified from the documents and to triangulate the data gathered. The following table presents the major data sources used.

Table 3. 1: The major documents taken as data source and the type of data the document presents

An Assessment on the Competitiveness of Indigenous Contractor's in Road Construction Projects (The Case of Federal Roads)

| Item                                                | Data source                  | Description of document                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Extent of competitiveness of contractors            | ERA's bid evaluation reports | This document generally presents the winning ability of indigenous contractors during the bidding stage. From this document, questions like how much contractors access the RFP, how much contractors submit an offer, and how much of the contractors win the bid are presented. Additionally, the document presents ERA's qualification criteria's and requirements. |
| Factors affecting contractor firm's competitiveness | Project completion report    | This document presents the overall performance of contractors during the project implementation phase. It also helps to identify major factors that affects the project overall performance                                                                                                                                                                            |
|                                                     | ERA's bid evaluation report  | This document presents ERA's bid evaluation criteria jointly with factors that affect the contractors to win the bid                                                                                                                                                                                                                                                   |
|                                                     | Questionnaire survey         | This document helps to identify the factors that affect firm's competitiveness from the respondents. It also helps to analyze the result numerically.                                                                                                                                                                                                                  |
|                                                     | ERA's ToR document           | The ERA ToR document presents the institution requirements and standards fulfilled by the contractors before and during implementation                                                                                                                                                                                                                                 |
| Mechanisms of Competitiveness improvement           | Questionnaire survey         | This document helps to present major mechanisms that helps to improve the competitiveness of indigenous contractors.                                                                                                                                                                                                                                                   |
|                                                     | Project completion reports   | From project completion report documents, critical suggestions and recommendations given by supervision consultants and client to the contractor were taken. Thus, suggestions were continuously recorded during implementation phase of a particular case                                                                                                             |
|                                                     | Contractors documents        | This document presents the way of contractor's self-management in terms of technical, managerial and environment issues regarding to be competent to projects                                                                                                                                                                                                          |

### 3.5 The Research Instruments

The research used a questionnaire survey and document review for inquiry together with a mixed approach to its data collection and analyses. Surveys in the form of structured questionnaires were conducted (refer to section 3.5.1) within the study population. The competitiveness extent of indigenous contractors in terms of tender winning was reviewed through bid evaluation reports of 97ICB projects where as for implementation phase 104 projects are reviewed. The major affecting factors and improvement mechanisms of competitiveness were identified through the two instruments (questionnaire survey and archival document review). In this light, the reason why the two instruments were used sequentially is for data triangulation purposes.

By using survey and case study as a research strategy, the research used research instruments by considering the aim of what the research was going to address as well as their purposes. Detail justification why each instrument was selected is presented below in the following table as follows;

Table 3. 2: The data collection instruments adopted

| Sn. | Research Instruments            | Purpose (aim)                                                                                                                                    | Justification why                                                                                |
|-----|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| 1   | Questionnaires (structured)     | <ul style="list-style-type: none"><li>• Include samples over wide geographical locations and</li><li>• Get access to many participants</li></ul> | <ul style="list-style-type: none"><li>• Cheap and appropriate to include large samples</li></ul> |
| 2   | Documentations: (Archival Data) | <ul style="list-style-type: none"><li>• Assess existing practices, trends over time and</li><li>• Suggesting the way forward</li></ul>           | <ul style="list-style-type: none"><li>• Real, targeted &amp; contextual coverage.</li></ul>      |

#### 3.5.1 Questionnaire survey

A questionnaire survey is one of the cheap and appropriate data collection instruments used widely in different fields of science for a long time, (Saunders, et al. 2009). He also evidenced that a questionnaire is a good instrument to collect information from a large number of people and/or people who may not have the time to attend an interview. Questionnaires normally come in the form of structured or semi-structured question formats. For example, the style of the structured questionnaire is restricted to answering the given options and participants forced to select among those options (e.g., multiple choice, and Likert scale questions) whereas semi-structured questionnaire enables participants to give greater voice to their thoughts and opinions. For this research, structured questionnaire was used to address the research questions and objectives. Mainly, the affecting factors of contractors in both tendering and implementation phases are identified directly from the respondents using a questionnaire survey.

The reason why the research was used questionnaire is that, it is relatively inexpensive and not time-consuming as compared to other instruments of data collection especially if administered in person or by e-mail. Participants are free to express their views privately without any stress and

frustration as well as giving more accurate, clear, and honest responses because of anonymity. On the other hand, the main common problems associated with using a questionnaire is that of low response rate if not administered face-to-face method. The participants sometimes miss some questions or give inappropriate responses that can cause questionnaires to be discarded. Therefore, to minimize such problems, the researcher was used a directly face-to-face data collection technique to explain unclear questions that need clarification from the researcher to the respondents and as a result to increase the response rate.

#### **A) Questionnaire Design**

After major factors that affect the competitiveness of indigenous contractors are identified the research queries were designed and developed. The questionnaire for the survey was developed by establishing the questions from previous literature conducted regarding contractor firm's competitiveness. The design of a questionnaire is influenced by how it will be administered and in particular, the amount and nature of contact with respondents. The internal validity and reliability of the data to be collected and response rate to be achieved greatly depends on the design of the questionnaire. Consequently, developing easily understandable and interpretable question is a complex process and requires a careful wording system to make the questions easily understand by the respondents.

The research questionnaire was prepared in the form of Likert scale questions and the respondents were asked to answer such questions. The questionnaire was divided into three different parts. The first (Part-I) was general queries about the respondent's information. The second part (Part-II) talks about different factors affecting competitiveness in the sector. This question was asked to collect factors under ten components from the respondents. The last part (Part-III) talks about mechanisms that helps to improve the competitiveness of local contractors. All the above questions were asked to professional experts worked under contractors in the road sector. Finally, the data collected from the survey was analyzed in chapter four (4), in the data analysis section numerically by using Microsoft excel-2016 tool.

#### **3.5.2 Case Study**

According to Yin, (2009), argument case study research can be either single or embedded based. This is simply meaning that, the research may select/choose/ either one case or several cases during the study. Both cases have merits with different scale of measurement of their merit. According to (Yin, 2009) argument the critical pros of multiple case study is evidence can be provided from many sources which is helpful to easily generalize. Whereas, a single case study on the other hand is characteristic /personal/ which is difficult to give reliable generalization. A single case on the other hand, maybe considered idiosyncratic. Accordingly, this research was used an embedded case study (several cases with several units of analysis).

##### **3.5.2.1 Justification; why the research used case study**

The main reason why a case study was used in addition to questionnaire survey were shown through discussing what a research strategy is and how its components were treated in this study. As a result, a research strategy is known to perform the conceptualization of an operational plan

and insuring the validity and reliability of this operational plan to the research queries, (Kumar, 1999). The first function was carried out by detailing all the procedures used for the tasks performed. The second function was then discussed along side by side with the first function to describe how the two important requirements (Reliability and Validity) were made to qualify this research scientific. Additionally, it helps to facilitate an in-depth investigation of a particular instance of a phenomenon. Those instances may be selected in several ways to be representative of general cases, (Richard Fellows & Anita Liu, 2008),

According to (Yin 2009), argument the following are points that are used as an evidence which justify why case study research strategy is used in this research;

- 1) It helps to investigate in-depth a small number of cases,
- 2) Data are analyzed about a large feature
- 3) Cases are studied in their real-life context; understanding how the case influences and is influenced by its context
- 4) Cases are naturally occurring in the sense that they are not manipulated as an experiment
- 5) The use of multiple sources of data including archival documents to allow triangulation of findings

### **3.5.2.2 Case selection**

The primary task of case study research is selection of cases involving what cases and how many cases to be selected for the study, (Gerring, 2004). One of the more controversial issue in selection of cases is whether or not a single case is sufficient. Yin (2009) suggests that there are five reasons for a single case selection, namely; (1) case criticality, (2) if the case is unique /typical/, (3) revelatory (previously inaccessible to researchers), (4) longitudinal, (5) comparing the case at different points in time.

Nevertheless, it needs a wise attention that a single case selection is a risky option and danger of selection bias, (Remenyi, *et al.* 1998). The best alternative is to use multiple cases and as a result the findings from which may be considered more compelling and robust. Moreover, multiple cases can allow a theory to be better grounded in more varied evidence. In this regard, (Eisenhardt, 1989) recommends the use of four to ten cases for better external validity. Following this, the research was used six (6) different cases for document review.

As briefly discussed in chapter one (refer section 1.1) the Ethiopian construction industry has planned to improve the competitiveness of indigenous contractors sustainably especially in infrastructure projects. Therefore, contractors that are participated in road infrastructure projects are the main parts of the study. For this light, projects administered by the Ethiopian road's authority which are fully funded by the government of Ethiopia and world bank (ICB projects) are considered as "a best-case scenario" for clarity and detail review and assessment on the competitiveness of local contractors in both tendering and implementation.

Therefore, depending on criteria stated in this chapter (refer section 3.3), all the 32 contractors were used for the survey to collect adequate data. For the case of document review, projects from

2015 to the end of 2019G.C executed by local contractors was used as a best-case scenario (refer Appendix-C).

### 3.5.2.3 Document Review

Document review is a technical process for reviewing printed and electronic (computer based and internet transmitted) materials, (Bowen Glenn, 2009). This research used different documents from ERA such as contractors bid evaluation reports, contractor progress reports, completion reports and contractor documents itself. The bidding evaluation report was used to assess the winning extent of local contractors, whereas progress reports and completion reports are used to identify the factors affecting the indigenous contractors during the project execution. Furthermore, the document review also helpful to show mechanisms for competitiveness improvement.

The document review was considered only for projects funded without any political consideration. For example, the Chinese government sometimes enforce the Ethiopian government to give the contract to Chinese contractors while the fund is from the Chinese government. Therefore, the review does not consider such projects, (they are excluded from review).

### 3.6 Reliability of the research instrument

Reliability is mainly focused with the quality of research instrument to measure consistently whether the test designer was right in expecting a certain collection of items to yield interpretable statements about individual differences. The consistency was assessed by Cronbach's alpha method that measures the internal consistency of a research instrument by determining the average correlation of items in a survey instrument. Cronbach's alpha coefficient ranges from 0 to 1 with alpha coefficients > 0.70 representing a satisfactory reliability (Nunally, 1978). However, the Cronbach alpha will generate a lower coefficient or value if there is no correlation between test items or if the research used few numbers of test items or variables.

Accordingly, Cronbach (1951), refers to the internal consistency as the proportion of the test variance that can be attributed to a group of items which measures the reliability coefficient alpha;

$$\alpha = \left(\frac{K}{K-1}\right) \left(\frac{S_y^2 - \sum S_i^2}{S_y^2}\right) \dots\dots\dots \text{EQ. 3.1}$$

Where;

K=the number of items

S<sup>2</sup>y=the variance associated with the observed score

$\sum S^2_i$ = The sum of all the variance of each item

A high value of the Cronbach's alpha implies a higher internal consistency of the construct  $S^2_y$ . The higher the coefficient the stronger the linear relationship of the tested variables and resulted the higher the internal consistency (Gao and Low, 2014) quoted in (Mekdim, 2017). Thus, Cronbach's alpha coefficient is the most widely used objective measure of reliability and the internal consistency of the scale of data (data collected through questionnaire) were checked using this coefficient before the analysis in this research. If the number of variables to be tested is increased, then, the result of the Cronbach alpha will also increase. On the other hand, a small number of items result small value of alpha.

### 3.7 Data Analysis

The study used questionnaires and document review as the main data source. In the case of this research, since the research has both qualitative (archived documents) and quantitative data (questionnaire), mixed approach was adopted as a data analysis technique with nominal and ordinal scales of measurement.

Moreover, from the factors that are collected by questionnaire from respondents in the Ethiopian context, most critical factors were identified. For this purpose, the relative importance index (RII) method was used to determine the relative importance of the major affecting factors and mechanisms of improvement of indigenous contractors. The five-point testing scale of 1 (strongly disagree), 2 (disagree), 3(neutral), 4(agree) and 5(strongly agree) were employed and transformed to relative importance indices (RII) for each integration factor as follows, (Sambasivan & Soon, 2007).

$$RII = \sum W / A * N \dots\dots\dots (EQ.3.2)$$

Where;

RII: relative importance index

W: the weights given to each contractor competitiveness affecting factors by the respondents (Ranging from 1 to 5),

A: The highest weight (i.e., 5 in this case), and

N: the total number of respondents.

The relative importance index (RII) value had a range from 0 to 1 (0 not inclusive), the higher the value relative importance index, the more important factor. The RII value also used to rank the factors that affect competitiveness as well as improvement mechanisms. In this light, the RII value is categorized depending on the values. This helps to identify the most important factors.

According to Akadiri Oluwole, P. (2011), the important level of different factors is laid in between the following ranges

Table 3. 3: The importance level and RII value interval for variable rankings

| RII Values | Important Level |
|------------|-----------------|
|------------|-----------------|

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|                         |             |
|-------------------------|-------------|
| $0.8 \leq RII \leq 1$   | High        |
| $0.6 \leq RII \leq 0.8$ | High Medium |
| $0.4 \leq RII \leq 0.6$ | Medium      |
| $0.2 \leq RII \leq 0.4$ | Medium-Low  |
| $0 \leq RII \leq 0.2$   | Low         |

The RII scores were then extrapolated to define their criticality that those are as follows;

| <b>RII values</b>         | <b>Importance level</b> |
|---------------------------|-------------------------|
| $0.90 \leq RII \leq 1$    | Strongly important      |
| $0.75 \leq RII \leq 0.89$ | Very important          |
| $0.60 \leq RII \leq 0.74$ | Important               |
| $0.45 \leq RII \leq 0.59$ | Moderately important    |
| $0.30 \leq RII \leq 0.44$ | Unimportant             |
| $0.15 \leq RII \leq 0.29$ | Very unimportant        |
| $0 \leq RII \leq 0.14$    | Strongly unimportant    |

(Source: Akadiri, 2011)

Generally, to identify and prioritize the factors depending on importance level, “very important and above was used.

### 3.8 Research Validation

In a case study research strategy, the research finding should be validated by different experts in the sector. This helps to make the research finding reliable. The research follows a sequential data analysis system during the research period. By using the questionnaire survey finding as an input, document review was conducted. This was for the purpose of triangulation. After the document review was conducted and finding were justified, the research was validated by different experts in the sector (contractors, ERA engineers, consultants and external stakeholders). After the specified objectives of the research were achieved, the findings were commented and suggested. An emphasis was given on the research findings for the validation purpose. In line with this, if experts have extra suggestions and opinion, the researcher were clearly presented it.

According to Burke Johnson, (2015), descriptive, interpretive and theoretical validity are used. Among these methods, the interpretive validation method was applied because of clearly understanding the participants viewpoints, thoughts, feelings, intentions and experiences. Additionally, to assure the research validation trustworthy, the following strategy were adopted in the following table below.

Table 3.4: Strategies used for research validation

| Strategy                 | Description                                                                                                                                                                                                                                                                           |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Researcher as a detector | The researcher qualitatively searches for evidence about causes and effects. Additionally, the researcher develops an understanding of the data through careful consideration of potential causes and effects and systematically eliminating rival explanations until the final case. |
| Triangulations           | Crosschecking of information's and conclusions through the use of multiple procedure of source.                                                                                                                                                                                       |
| Participant feedback     | The feedback and discussion of the researcher interpretations and conclusions with the experts                                                                                                                                                                                        |
| Reflexivity              | This involves self-awareness and critical self-reflection by the researcher on his or her potential biases as these may affect the research conclusion                                                                                                                                |

(Source: Burke Johnson, 2015)

Generally, their idea and suggestions as well as their comment on the findings were clearly presented jointly with the research findings.

### 3.9 Measures to assure research quality

Other than the common day to day observation, the research has been claimed to be more reliable and believable. Indeed, one of the major characteristics of science itself is the notion that science is derived from facts. The major quality assurance criteria used in providing a defensible knowledge is validity (with variations of construct, internal and external validity), and reliability, (Cook and Campbell, 1979).

As indicated above, four tests were applied to establish the quality of this research.

- A) *Construct validity*: In this research construct validity was ascertained by multiple sources of evidence from different sources. Data was collected by questionnaire survey from respondents and from different documents (bid evaluation reports, Completion reports, ToR Document and contractor documents). This data was checked and triangulated against one another during data collection process. The questionnaire and document review were interlinked to each other. Additionally, during data collection, the research was given an emphasis to collect quality data from both techniques (survey and document review). Correct operational measures were established for concepts while studied. This is concerned with exposing and reducing subjectivity by linking data collection questions and measures to research questions and propositions.
- B) *Internal Validity*: Different archival documents from ERA, contractors and relevant source were reviewed. Then after, the research was ascertained by using sequential data analysis techniques during data analysis. Consequently, external validity of the research was ascertained.

- C) *External validity*: The generalization used were statistical and analytical by particular theory, since the research used case study and survey. After the analysis was conducted different experts from contractors, clients and consultants were participated as a focus group but interviewed as personally due to the international pandemic COVID-19.
- D) *Reliability*: Another researcher should be able to go in and repeat the case study and come up with the same findings. As a result, to assure the reliability, clear documentation process and appropriate record keeping was used with quality document selection system during the research period.

### 3.10 Means of Achieving Research Objectives

To say one research is completed, all the research objectives must be addressed and answered correctly. Table (3.4) indicates how the research objectives were achieved. Objective one was achieved by reviewing documents and critical literature review. Objective two was achieved by the mean score weighted summation of factor and critical literature review. Whereas, objective three was achieved through critical literature review, weighted summation and document review.

Table 3. 5: Means of achievement of research objectives

| Sn. | Objective                               | Means of achievement                                 |
|-----|-----------------------------------------|------------------------------------------------------|
| 1   | Extent of competitiveness               | Literature and Document review                       |
| 2   | Factors affecting competitiveness       | Literature, questionnaire survey and document review |
| 3   | Mechanisms of improving competitiveness | Literature, questionnaire survey and document review |

### 3.11 Research Ethics

Ethical considerations are a critical issue while researchers publish their findings to avoid any unethical practice (David, B. & Resnik, J.D. 2015). Belmont Report (1979) also adopts three basic ethical principles; (a) respect for persons, (b) beneficence, and (c) justice. Respect for persons requires that individuals are regarded and treated as autonomous agents able to exercise free self-will in making decisions. Beneficence concerns respecting a person's decisions, protecting them from harm and endeavoring to ensure their well-being. Whereas Justice concerns the distribution of benefits and burdens commonly examined under five primary formulations; (a) an equal share of person-to-person, (b) individual need; (c) individual effort, (d) societal contribution; (e) merit.

In this context, while the researcher conducts the research, the researcher only used any sort of data and information for academic purposes only. Each type of information and data collected from different sources are used as confidential. There were no data and personal information were used besides the purpose of the investigation.

## CHAPTER FOUR

### ANALYSIS AND DISCUSSION OF THE RESULTS

#### 4.1 General Description

##### 4.1.1 Background

This chapter presents the nature of the sample used, data analysis, and discussion on the findings of the study. Finally, a conclusion and recommendation were given based on the findings. Descriptive statistics, and inferential statistics procedures were used for analyzing the data. The descriptive statistics was used for analyzing the data include bar charts, tables, and ranking analysis while the inferential statistics used include correlation. The chapter also presents the result of document review. Finally, relevant conclusion and recommendation was provided.

##### 4.1.2 Reliability test

As it is stated in chapter three in section (3.6), the reliability test helps to know the internal consistency of the variables in the survey (Cronbach, 1951). This research was used the Cronbach alpha reliability test method to know the internal consistency of the variables identified.

According to Cronbach alpha reliability test rule of thumb, for a Likert-scale question, if " $\hat{a} \geq 0.9$ " then the internal consistency will be excellent, if " $0.9 > \hat{a} \geq 0.8$ ", then the internal consistency will be good, if " $0.8 > \hat{a} \geq 0.7$ ", then the internal consistency will be acceptable, if " $0.7 > \hat{a} \geq 0.6$ ", then the internal consistency will be questionable, if " $0.6 > \hat{a} \geq 0.5$ ", then the internal consistency will be poor and if, " $0.5 > \hat{a}$ ", then, the internal consistency will be unacceptable. Additionally, according to Cronbach's rule, the value of " $\hat{a}$ " should be acceptable and above (i.e. " $\hat{a}$ " should be  $\geq 0.7$ ). He also concludes that the maximum score of " $\hat{a}$ " should be between 0.9 and 0.95. Based on his rule, the internal consistency of indigenous contractor competitiveness affecting and improving factors was analyzed below in the following table.

#### A) Reliability test for affecting factors

Table 4. 1: The reliability test of the affecting factors

ANOVA

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| Source of Variation   | SS    | df   | MS          | F     | P-value  | F crit |
|-----------------------|-------|------|-------------|-------|----------|--------|
| Rows                  | 288.4 | 35   | 8.2394      | 15    | 7.45E-71 | 1.434  |
| Columns               | 273.2 | 32   | 8.539       | 15.55 | 1.43E-68 | 1.454  |
| Error                 | 615.2 | 1120 | 0.5493      |       |          |        |
| Total                 | 1177  | 1187 |             |       |          |        |
| <b>Cronbach alpha</b> |       |      | <b>0.93</b> |       |          |        |

Therefore, according to the above table (4.1), the test value of 37 affecting factors of “a” shows 0.935, which is between 0.9 and 0.95. So, the relationship between the factors that affect the competitiveness of indigenous contractor's is excellent and reliable.

#### B) Reliability test for competitiveness improvement factors

Table 4. 2: The reliability test of the improvement factors

| ANOVA                 |       |     |             |       |          |        |
|-----------------------|-------|-----|-------------|-------|----------|--------|
| Source of Variation   | SS    | df  | MS          | F     | P-value  | F crit |
| Rows                  | 104.8 | 22  | 4.7656      | 8.196 | 1.81E-23 | 1.557  |
| Columns               | 222.8 | 32  | 6.9622      | 11.97 | 1.09E-47 | 1.46   |
| Error                 | 409.3 | 704 | 0.5814      |       |          |        |
| Total                 | 737   | 758 |             |       |          |        |
| <b>Cronbach alpha</b> |       |     | <b>0.87</b> |       |          |        |

According to the above table (4.2), the test value of “a” shows 0.878, which is between 0.8 and 0.9. Therefore, depend on the Cronbach alpha thumb rule discussed above, the relationship between the factors that helps to improve the competitiveness of indigenous contractors is good and reliable.

#### 4.2 Competitiveness extent of indigenous contractors

It is a common feature that indigenous contractors in road construction projects are facing difficulties to win bids and accomplish as planned and designed due to financial, technical and managerial constraints (Rahel K, 2016). Thus, the probability of competitiveness is inadequate. The higher inadequate competitiveness of indigenous contractors is a basic challenge to the stakeholders (particularly for consultant and client) in the industry.

By using the countries budget and abroad financiers, ERA awards many contracts per year. This contract passes through different bidding procedures (technical and financial evaluations) from invitation to bid up to signing contract. Concerning this, ERA has set out different bidding

requirements and qualification criteria for both local and foreign to participate in bid and to win the bid.

#### **4.2.1 ERA bidding requirements and evaluation criteria**

Choosing a contractor for one proposed project is one of the chief decisions that can influence the success of any road construction project. Concerning this, contractor pre-qualification is a universally applied process to identify a qualified, responsible, competent, and reliable contractor.

In ERA, the qualification of contractors is generally measured the technical ability of the bidder to execute proposed project through established minimal capacities. The significant criterions include experience (general and specific to the project), financial capacity (annual turnover and historical financial performance) and performance (performance rating) on ongoing projects and resource capacity (availability of equipment and key personnel required for the project). Additionally, the proposed work schedule and method statement for the project is jointly evaluated.

Qualification of the firm (i.e., previous experience, financial strength, work methodology, quality and experience of labor) and project characteristics (work schedule, type, value, duration, complexity, location of a project, and contract type) are the fundamental factors that affect contractor failure. Time overrun and cost overrun are closely related to specifications on the qualifications of contractors.

Contractor prequalification decision-making involves a wide range of criteria that often consists of both qualitative and subjective information (Russell, *et al.* 1990). The procedure remains principally an art where subjective judgment based on the evaluator's experience becomes a crucial part of the process.

The first and foremost criterion is experience. Fu and Drew, (2003), noted that experienced contractors in tendering for construction work contracts are potentially more competitive and capable than inexperienced contractors. He also argues that the effect of construction experience also affects contractors in such a way that ways of preparing an offer, way of costing and planning. Since it has been used for regular use for pre-qualification purposes, most of the local contractors are suffered. Therefore, ERA procedurally processes evaluating the candidate contractor's project records to determine whether or not the firm has handled jobs of similar scope and complexity in the previous. As a result, according to ERA's bid evaluation report, many contractors were failed due to the espouse reason that their weak previous specific experience highly affect their technical and financial offer competency as equal as foreign contractors do.

Possessing experience in projects similar to the proposed in terms of type, scope, and complexity should be a fundamental evaluation criterion (Birrell, 1985). This can be determined from

satisfaction expressed by previous clients. This includes assessing the performance history of the firm in terms of timely completion, within budget, success of quality and cost control.

According to ERA's bid evaluation report, most of the contractors can't comply the specific experience while the client evaluates their offer. Their experience in terms of value of projects, similarity, nature and complexity is not comply with the proposed project. As a result, the evaluation committee disqualifies many contractor's offer during technical evaluation stage.

The other basic criterion is financial stability that involves evaluating the financial condition of each bidder. Russell *et al* (1990) noted the importance of contractor's credit rating, banking arrangements, and financial statements to measure the liquidity, efficiency and profitability of a contractor in investigating his financial capability. The financial stability and profitability are also a big challenge for contractors to continuously handling of their workers. Concerning this, improper use of advance payment is also another additional factor. Most of Ethiopian contractors are weak in their cash flow management system. Therefore, due to their weak financial management system, their financial capability will be unsatisfactory.

Labor qualification (experience of key personnel) also another key criterion used. It is concerned with the qualification, skill, and experience of technical staffs. Clough and Sears (1994) argues that the financial achievement of a contractor mainly depends on the quality of its key professionals. In addition, (Russell, 1991) found that out of randomly selected 14 projects, 8 were failed when studied due to the inadequate experience of the management and technical staff of the contractor. This factor is a highly limiting factor to ensure quality offers during the bid and quality products/services after the contract.

Equipment and machinery resources are the other critical criteria used by ERA for bid evaluation qualification. The availability of equipment and machinery is a major factor affecting contractor success to win a bid. In this criterion, the available resources in terms of personnel, plant, and machineries are evaluated. Plants and machineries can be either rented or owned bases.

Most of the time the main problem of local contractors in using rental equipment is not just practiced enough in the sector, even if there are no enough machinery renting standardized company's in the market. On the other hand, the requirement set by ERA also difficult especially for huge in scope and difficult terrain projects. Even the equipment and plant found in local contractors are not properly managed. Russell *et al* (1990) argues that, equipment maintenance, repair and replacement is an important element of contractor's success. Beside this, contractor's loss their equipment resources due to improper management.

Performance ratings (Current workload) is also other criteria sometimes called current projects on hand. It involves the evaluation of the candidate contractor's project performance on ongoing work projects. ERA has performance rating calculation criteria (refer section 2.7.3) for both local and foreign contractors. His commitment may qualify or disqualified the contractor to

participate in a new tender. As a result, if one contractor fails to score the expected rating, the contractor will not be allowed to participate in a new bid.

Accidents at construction sites may not only result in a loss of life but also results an increased insurance premium rates on the subsequent projects by the same contractor. This is why ERA assesses the safety record of the bidders from previous projects certified by the safety engineer. It also results in a loss of kindness. Al-Gobali (1994), ranks this criterion as number 8 out of 14 factors affecting project performance. The selection of a contractor with a good safety record can minimize construction accidents and thereby save construction costs

Litigation is another measure of trust in the relationship between the client and the contractor. Coordination between the stakeholders will lead to reduced interface problems, delays and consequently cost increment. Concerning this, ERA is being practiced the tendency of contractor's litigation from their experience. Hence, as part of the criteria ERA includes the litigation history of the contractor.

In addition to the above criteria, previous interaction and smooth relationship of the bidder with ERA plays a vital role to be selected by the client (ERA) as prefers to work again with a contractor that has produced the earlier project at the required cost, time, safety and quality requirements.

ERA sets requirements and qualification criteria for the project financed by the Government of Ethiopia based on the framework set by its board. The framework states the factor for each required criterion by dividing it into local and foreign bidders as well as international and national competitive bidding, (PPA qualification criteria, 2016)

#### 4.2.2 Extent of winning tender

Concerning the tendering phase, the research was tried to critically review bid evaluation reports for indigenous contractors by taking projects that were funded by world bank and the government of Ethiopia. The research was randomly selected 97 ICB federal road projects in terms of value of projects to assess local contractors tender winning extent. The following table presents the participation of local contractors in both number and value of projects for three years (2017-2019G.C) of operation.

Table 4. 3: The number and value of projects offered by local and foreign contractors

| Sn. | year | No. of projects | Contractors | No. of Participant | No. of bid offered | Pass | Fail | Win | Amount in Billion Birr | % of Share |
|-----|------|-----------------|-------------|--------------------|--------------------|------|------|-----|------------------------|------------|
| 1   | 2017 | 47              | Local       | 551                | 184                | 123  | 61   | 28  | 22.76                  | 44%        |
|     |      |                 | Foreign     | 412                | 137                | 80   | 57   | 19  | 28.78                  | 56%        |

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|   |      |    |         |     |    |    |    |    |       |     |
|---|------|----|---------|-----|----|----|----|----|-------|-----|
| 2 | 2018 | 28 | Local   | 212 | 72 | 45 | 27 | 15 | 11.84 | 46% |
|   |      |    | Foreign | 246 | 72 | 45 | 27 | 13 | 13.86 | 54% |
| 3 | 2019 | 22 | Local   | 208 | 92 | 61 | 31 | 10 | 20.15 | 48% |
|   |      |    | Foreign | 185 | 82 | 71 | 11 | 11 | 21.85 | 52% |

From the above table (4.3), 97 projects from 2017 to 2019 G.C, (47 projects in 2017, 28 projects in 2018, and 22 projects in 2019) were signed between winner bidders and ERA. From 47 projects signed in 2017, 551 local contractors and 412 foreign contractors have participated in the bidding. From this, 184 local and 137 foreign contractors were submitted their offer to ERA. However, 123 local contractors and 80 foreign contractors were technically qualified and 61 local and 57 foreign contractors were failed during evaluation. Finally, 28 local contractors and 19 foreign contractors win the bid. This was 44% local contractors and 56% foreign contractors in terms of the value of projects.

On the other hand, from 28 projects signed in 2018, 212 local contractors and 246 foreign contractors participated in a bid at ERA. From this, 72 local contractors and 72 foreign contractors submitted their offer. Nevertheless, 45 local contractors and 45 foreign contractors were technically qualified and 27 local contractors and 27 foreign contractors were disqualified. Finally, 15 local contractors and 13 foreign contractors win the bid. This was 46% local contractors and 54% foreign contractors in terms of the value of projects.

From 22 projects signed in 2019, 208 local contractors and 185 foreign contractors have participated in tender. Accordingly, 92 local contractors and 82 foreign contractors were submitted their offer to the client. Consequently, 61 local contractors and 71 foreign contractors were technically qualified. Out of which 31 local contractors and 11 foreign contractors were disqualified during evaluation. Finally, 10 local contractors and 11 foreign contractors win the bid. This was 48% for local contractors and 52% for foreign contractors in terms of the value of projects.

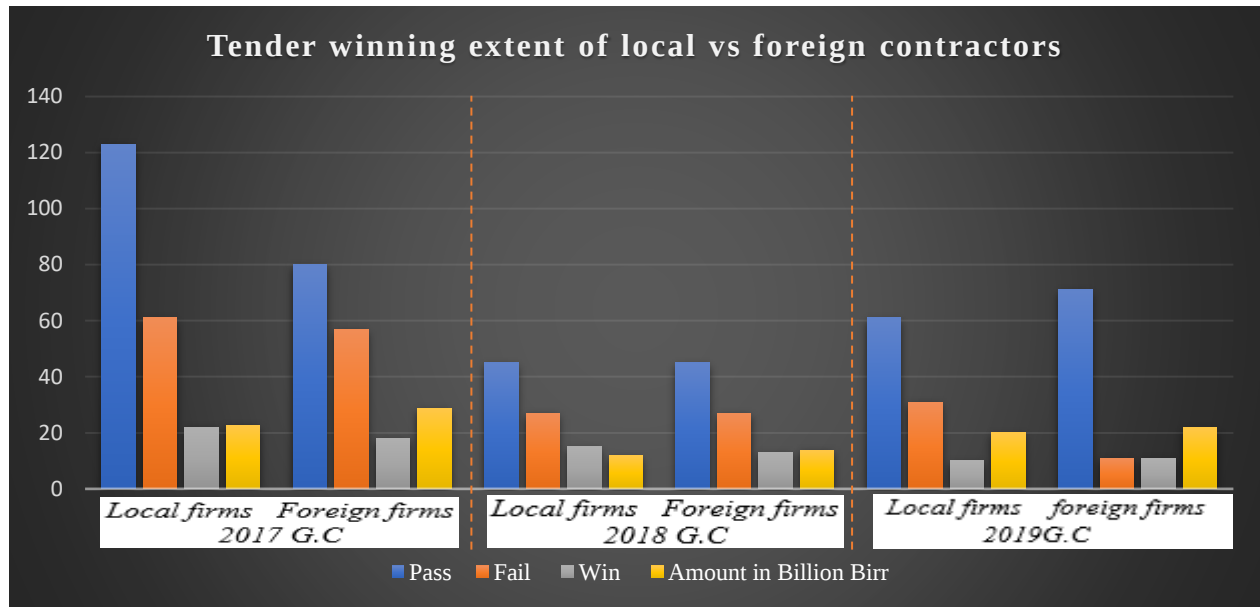


Figure 4. 1: Tender winning extent of local vs foreign contractors for three consecutive operation years

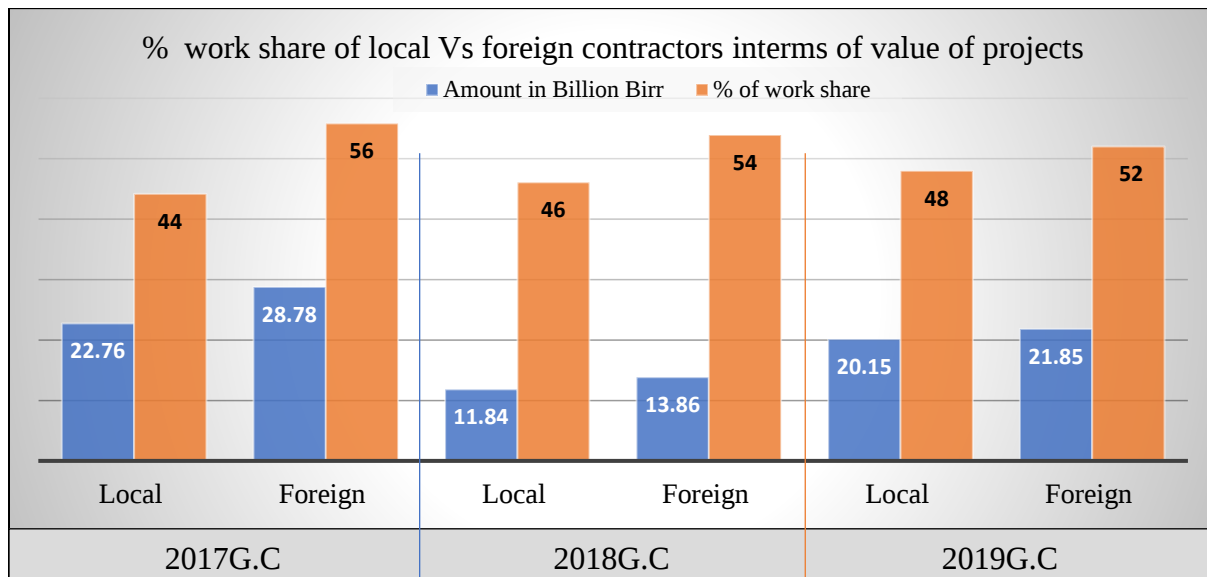


Figure 4. 2: Percent share of local vs foreign contractors in terms of project value  
Generally, based on the above analysis, the average extent of competitiveness of local contractors measured by the value of projects signed for the three consecutive operation years was 46.07% as presented in the following figure below.

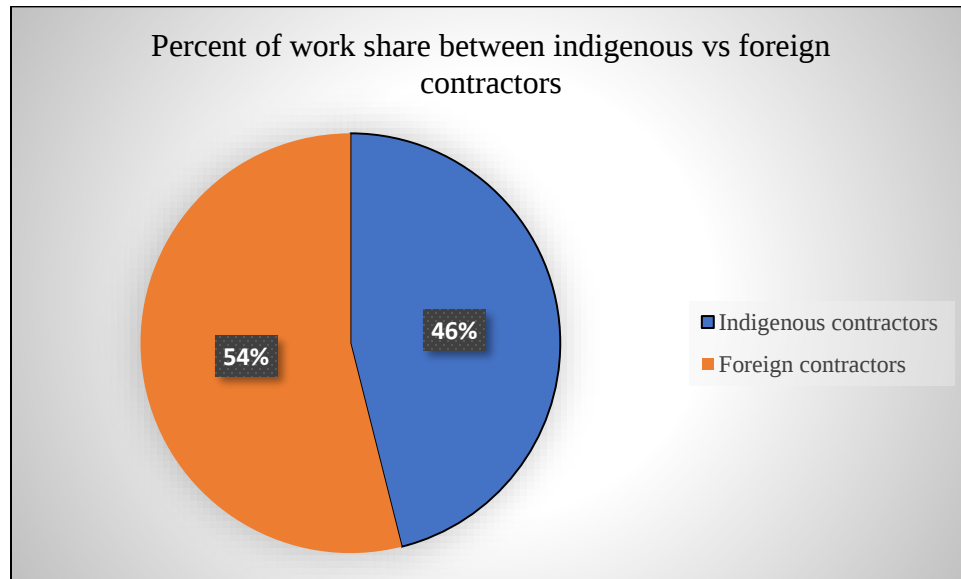


Figure 4. 3: Percent of work share between local and foreign contractors

This result further reveals that most of the projects are out-sourced to foreign contractors and local contractors' competitiveness is still inadequate even below half of the countries road projects in terms of value. This is because of ERA requirements; evaluation criteria and contractor's commitment. As a result, the local contractors were disqualified during the technical evaluation and a dependency of foreign contractors were happened especially huge and difficult terrain road projects.

#### 4.2.3 Actual project implementation performance

As stated in section 2 (refer section 2.7.3), the performance of contractors is calculated by dividing the project period in to three phases regarding the projects at hand. Concerning on the actual performance of contractors in actual project implementation, performance rating documents was critically studied.

Accordingly, a total of 243 projects by 54 local contractors and 204 projects by 49 foreign contractors are used to assess the actual performance of local contractors. The following table further presents the number of projects and number of passed and failed contractors during performance assessment.

Table 4.4 The performance evaluation of contractors

| Operation year | Contractor | No of project | No. of Passed contractors | Pass in % | No. of Disqualified contractors | Fail in % |
|----------------|------------|---------------|---------------------------|-----------|---------------------------------|-----------|
| 2015           | local      | 53            | 15                        | 28.3      | 18                              | 34.0      |
|                | Foreign    | 51            | 13                        | 25.5      | 12                              | 23.5      |
| 2.016          | local      | 44            | 12                        | 27.3      | 11                              | 25.0      |

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|      |         |    |    |      |    |      |
|------|---------|----|----|------|----|------|
| 2017 | Foreign | 49 | 11 | 22.4 | 9  | 26.5 |
|      | local   | 69 | 12 | 17.4 | 16 | 23.2 |
| 2018 | Foreign | 57 | 12 | 21.1 | 10 | 17.5 |
|      | local   | 77 | 15 | 19.5 | 19 | 24.7 |
|      | Foreign | 47 | 13 | 27.7 | 10 | 21.3 |

From evaluated 104 projects during 2015 operation year, 15 local contractors and 13 foreign contractors are passed and 18 local contractors and 12 foreign contractors are failed. From evaluated 93 projects during 2016 operation year, 12 local contractors and 11 foreign contractors are passed the evaluation whereas 11 local contractors and 9 foreign contractors are failed the evaluation. From evaluated 126 projects, 12 local contractors and 12 foreign contractors are passed the evaluation, where as 16 local contractors and 10 foreign contractors are failed the evaluation. From evaluated 124 projects, 15 local contractors and 13 foreign contractors are passed the evaluation, whereas 19 local contractors and 10 foreign contractors are failed the evaluation process.

Furthermore, the following figure presents the number and percentage of local vs foreign contractors performance measurement result for the above four operation years.

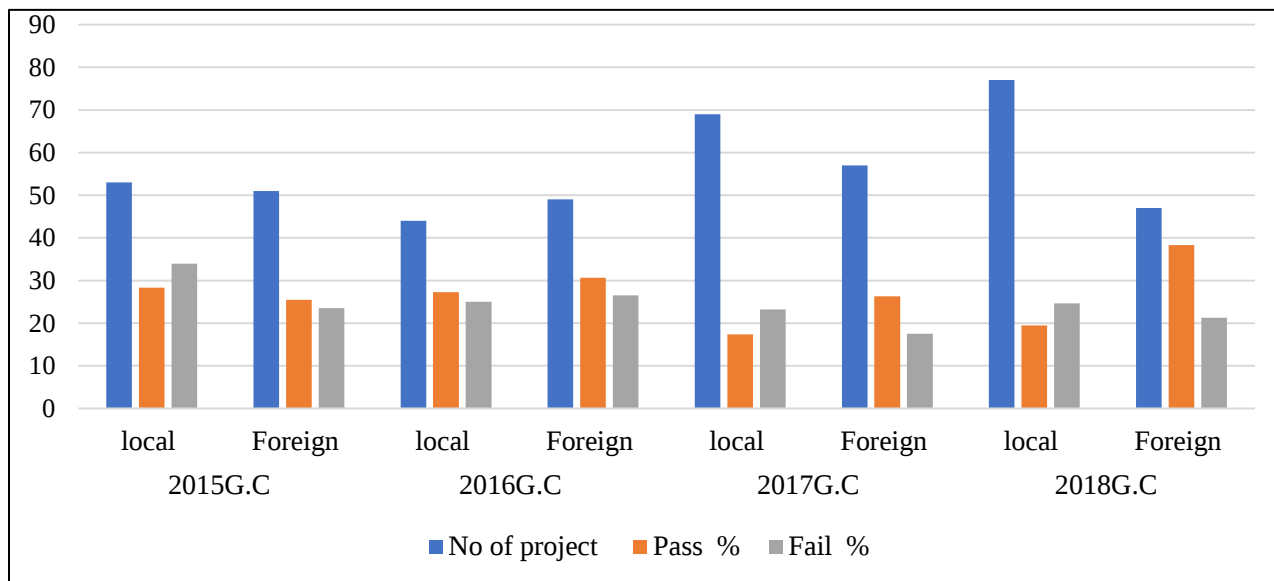


Figure 4.4: The performance rating of local vs foreign contractors

From the above figure 4.4, the performance of both local and foreign contractors is decreased from 2015 to 2017. But, from 2017 to 2018 their performance has increased for both contractors. Even though, the performance of local contractors is not good as compared to foreign contractors. Foreign contractors have an average of 4-5 projects on their hand whereas local

contractors have 1-2 projects on their hand. As the number of projects on hand increased, the difficulty of assuring performance is difficult.

According to the studied reports (2015-2018) from ERA, there are critical factors that influence local contractors to assure expected performance. These are, inadequate planning and scheduling, insufficient and inexperienced workers, low productivity, unproductive equipment, weak site management, usage of poor material quality, weak resource management, poor communication among stakeholders, late delivery of materials and resources, weak cashflow management system and errors and reworks are the major difficulties identified during assessment.

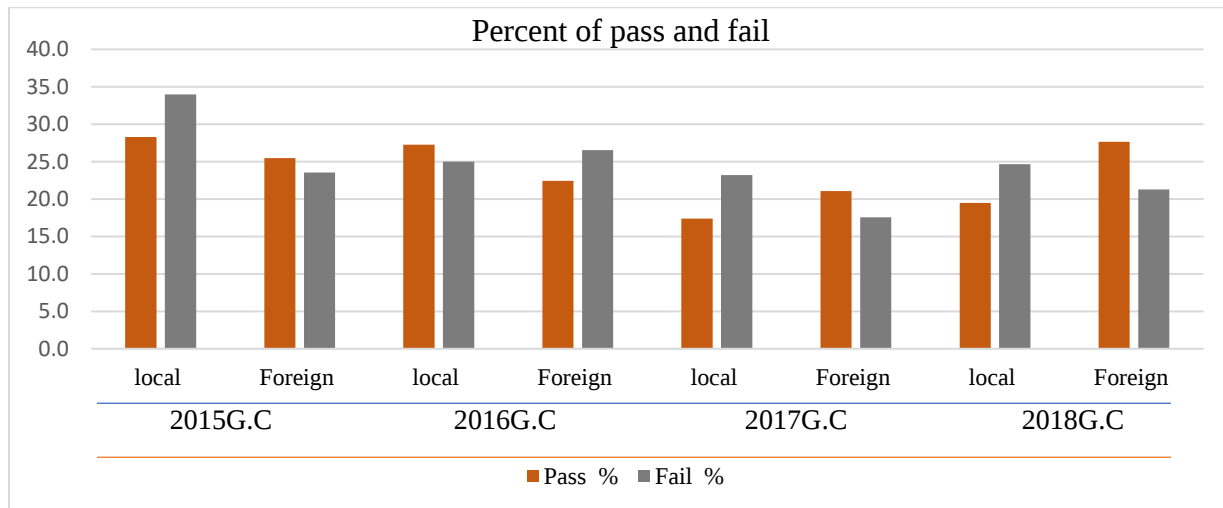


Figure 4.5: Percent of pass and fail during performance evaluation

Furthermore, the following figure also presents the overall performance of local vs foreign contractors.

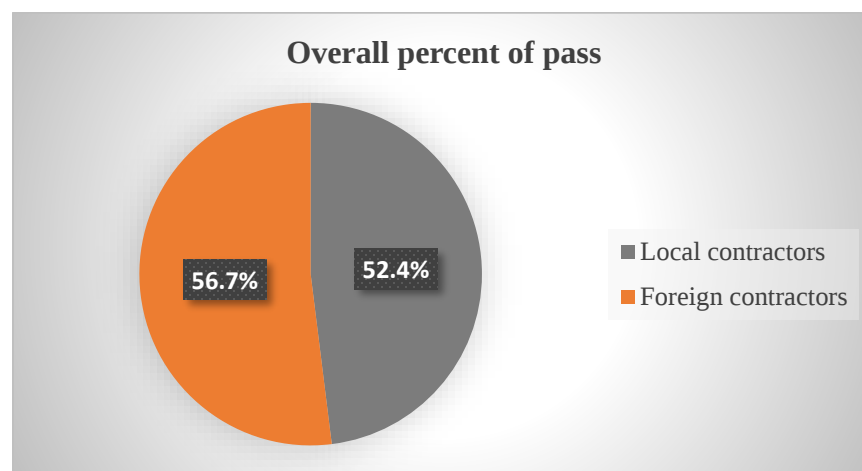


Figure 4.6: The overall actual performance of foreign vs local contractors

Generally, from the above figure the overall actual performance of local contractor is 52.4% whereas foreign contractor is 56.7% out of 104 selected projects. This shows, the actual performance of local contractors is substantially less than foreign contractors.

The major principal factors identified from the above analysis that affect the competitiveness extent of contractors is presented in the following table;

Table 4. 5: The major indigenous contractor competitiveness affecting factors during the tendering stage and actual implementation

| Sn. | Factors identified that influence the competitiveness of indigenous contractors during tendering stage & actual implementation |
|-----|--------------------------------------------------------------------------------------------------------------------------------|
| 1   | Inadequate planning                                                                                                            |
| 2   | Project scope                                                                                                                  |
| 3   | Historical financial performance                                                                                               |
| 4   | General and Specific experience                                                                                                |
| 5   | Annual construction turn-over                                                                                                  |
| 6   | Required plant and equipment                                                                                                   |
| 7   | Required key professionals                                                                                                     |
| 8   | Inappropriate price offer by contractor                                                                                        |
| 9   | Experience of workers                                                                                                          |
| 10  | Low Productivity                                                                                                               |
| 11  | Poor resource management                                                                                                       |
| 12  | Late delivery of materials                                                                                                     |
| 13  | Weak cashflow management                                                                                                       |

From the analysis, most of the factors recorded were common and almost the same for all contractors. Generally, the following summary was noted;

1. The analysis reveals that almost all contractors are suffering to win projects due to difficult qualification criteria set by ERA even if most of local contractors have participated in the tender. Besides, due to the failure of requirements and qualification criteria, they did not submit their offer to the client.
2. Due to the design inefficiency and the contractor's in adequate knowledge, many contractors submit inappropriate price offer to the employer (ERA). Additionally, there is a weak commitment by indigenous contractors while they prepare their offer.

3. Due to unsatisfactory ability of local contractors, most of the projects especially (huge in scope and difficult terrain projects) are awarded to foreign contractors. Consequently, there is a high dependence of foreign contractors.
4. Even if some projects awarded to local contractors, the value of projects as compared to foreign contractors is small and inconsiderable.
5. The presence of inadequate planning also influences most of the local contractor's cost-time performance during the project implementation.
6. Due to late delivery of materials and resource and poor management of the resources, many local contractors are suffered to assure required actual performance.

Generally, in most of the projects observed in the analysis, the failure of local contractors during the tender process was qualification requirements set by ERA in the bid document and failure by contractors to fulfill the requirements.

#### 4.3 Factors affecting competitiveness of indigenous contractors

##### 4.3.1 Competitiveness factors identification

This section aims to identify factors affecting competitiveness for indigenous contractor. Hence, as indicated in the literature review, several factors affect the competitiveness of indigenous contractors and all factors affect competitiveness to a certain degree. As a result, there was a need to determine the relative importance index of each competitiveness parameter. Therefore, the first task was to re-arrange the factors as a suitable manner for calculating their relative importance index. The RII value of each affecting factor is consecutively presented. Finally, the significant factors were selected and ranked based on their RII value which has an "important and above" category (refer section 3.7).

##### A) Management ability

Table 4. 6: Relative importance indexes of management-ability factors

| Coding | Affecting factors           | $\Sigma$ Weights | Mean | RII  | Rank |
|--------|-----------------------------|------------------|------|------|------|
| F1     | Cash flow management method | 159              | 4.82 | 0.96 | 1    |
| F3     | Risk management method      | 149              | 4.52 | 0.90 | 2    |
| F2     | Time management method      | 147              | 4.45 | 0.89 | 3    |

Based on the results obtained in the above table, the highest RII value in the group of management-ability factors is cash flow management (0.96), meaning that respondents strongly agree with it as the main competitiveness factor. Then, risk management (0.90) and time management (0.89) followed respectively. This shows that almost all the respondents agreed that the above factors are critical and highly affect competitiveness.

This demonstrates that, by applying efficient cash flow, time and risk management system, the contractor can improve the quality of project performance to improve competitiveness internally

and increase trust externally. Hence, the company can get the trust from the project owner and will get sustainable construction project work.

### B) Human resource

Table 4. 7: Relative importance indexes of human resource-related factors

| Coding | Affecting factors               | $\Sigma$ Weights | Mean | RII  | Rank |
|--------|---------------------------------|------------------|------|------|------|
| F5     | Capacity of human resource      | 137              | 4.15 | 0.83 | 1    |
| F8     | Employee productivity           | 128              | 3.88 | 0.78 | 2    |
| F31    | Availability of skilled workers | 125              | 3.79 | 0.76 | 3    |
| F6     | Job satisfaction of workers     | 116              | 3.52 | 0.70 | 4    |

Human resources are the live resources in the construction field who have all the types of needs and risks. According to the respondents' agreement, the capacity of human resources (0.83) is the first factor. Also, employee productivity, availability of skilled labor, and job satisfaction of workers with an RII value of 0.78, 0.76, and 0.70 respectively. Human resources are the key risky resources to manage the construction environment, as they are not mostly permanent like other industries. They may change from project to project, place-to-place, time to time, depend on the type and scope of work, (Wilkinson, A. Johnstone, S. Townsend, K. 2012). So, HR should critically managed because project success mainly depends on these resources.

### C) Finance

Table 4. 8: Relative importance indexes of financial-related factors

| Coding | Affecting factors             | $\Sigma$ Weights | Mean | RII  | Rank |
|--------|-------------------------------|------------------|------|------|------|
| F10    | Cash flow status              | 156              | 4.73 | 0.95 | 1    |
| F9     | Annual construction turn-over | 153              | 4.64 | 0.93 | 2    |
| F11    | Financial capital             | 148              | 4.48 | 0.90 | 3    |

As all respondents strongly agreed that, cash flow status (0.95) is the first critical factor. According to Yong-Tao *et al.* (2007), a healthful and well stable finance is recognized by all of the top managers as one of the key important factors for contractor firm's competitiveness.

The second major factor is annual construction turnover with the RII value of (0.93). Many contractors are being disqualified during bid evaluation because their annual construction turnover does not fulfill the client requirement. According to the ERA ToR document, local contractors are asked to submit peak annual turnover whereas foreign contractors are asked to submit average annual turnover, this influences bid-offer results. Financial capital (0.90) is also the third factor. For processing bids, issuing different bid and performance bonds, and performing work before advance payment needs a great capital in the road sector. Therefore, each contractor has to be developed their financial capital to be strong and competent for ensuring their competitiveness sustainably.

#### D) Relationship

Table 4. 9: Relative importance indexes of relationship-related factors

| Coding | Affecting factors                 | $\Sigma$ Weights | Mean | RII  | Rank |
|--------|-----------------------------------|------------------|------|------|------|
| F14    | Relationship with creditors       | 113              | 3.42 | 0.68 | 1    |
| F15    | Relationship with suppliers       | 107              | 3.24 | 0.65 | 2    |
| F12    | Relationship with clients         | 105              | 3.18 | 0.64 | 3    |
| F13    | Relationship with sub-contractors | 101              | 3.06 | 0.61 | 4    |
| F16    | Relationship with consultant      | 101              | 3.06 | 0.61 | 5    |

The road sector has always faced problems in relationship issues such as weak cooperation, limited mutual trust, ineffective communication (Chan *et al.* 2004) as cited in Yong-Tao Tan, (2017). The confrontational relations among different construction participants may result in poor project performance (Meng, 2012). Table (4.8) shows the ranking of relationship-related competitiveness factors according to the respondents' agreement. The relationship with creditors is ranked first (0.68), and the relationship with suppliers (0.65) is the second and the relationship with clients (0.64) is the third factor agreed by the respondents. Relationship with sub-contractor and with the consultant are also the fourth and fifth factors with an RII of 0.61.

The construction market is still very large and projects with large budgets widely available in government. To reduce risks and enhance the competitiveness of a firm's relationships must be maintained to increase the likelihood of winning project tenders domestically. Therefore, contractor companies need to maintain good relationships jointly with partners, especially creditors, suppliers, owners and consultants to improve project performance and win more contracts in the future.

#### E) Bidding

Table 4. 10: Relative importance indexes of bidding related factors

| Coding | Affecting factors           | $\Sigma$ Weights | Mean | RII  | Rank |
|--------|-----------------------------|------------------|------|------|------|
| F18    | Client bidding requirements | 138              | 4.18 | 0.84 | 1    |
| F17    | Company bidding experience  | 132              | 4.00 | 0.80 | 2    |
| F19    | Bidding price               | 130              | 3.94 | 0.79 | 3    |

Fu, Drew and Lo (2002) agrees that rather than inexperienced contractors who bid occasionally, experienced contractors who bid more frequently are more competitive. The study also found that contractors who have specific bidding experience have a greater opportunity to be more competent than contractors who have general bidding experience. This was due to the adaptations and continuous grasping on the lessons from their mistakes from previous tenders. Concerning this, to select experienced contractors, ERA requests specific testimonial documents for evaluation when tender documents are offered to bidders.

According to the respondents' agreement, among the factors listed from the above Table (4.9), client-bidding requirement (0.84) is the first and significant factor which influences contractors. Company bidding experience (0.8), and bidding price 0.79 are also another major factors.

Bowen *et al.* (2007) found that bribery and manifestation of the incidence of unfair bidding practices as some of the ethical issues in the South African construction industry. In the same manner, the un-ethical practice of bidders and procurement evaluators is also one of the challenges in the road sector. According to respondents, all the factors are very critical and highly affect contractors. Therefore, this result demonstrates that each contractor company shall be able to win project bids to secure employment while maintaining the survival of the company. As a result, experience in the bidding of the construction projects bidding strategies are needed to compete for job projects. The company itself has its strategy so that this factor is considered important in the road construction sector.

### F) Marketing

Table 4. 11: Relative importance indexes of marketing-related factors

| Coding | Affecting factors                     | $\Sigma$ Weights | Mean | RII  | Rank |
|--------|---------------------------------------|------------------|------|------|------|
| F20    | Market price fluctuation              | 129              | 3.91 | 0.78 | 1    |
| F21    | Costing experience                    | 123              | 3.73 | 0.75 | 2    |
| F22    | Ability to collect market information | 117              | 3.55 | 0.71 | 3    |
| F23    | Availability of product information   | 116              | 3.52 | 0.70 | 4    |

The above table (4.10) shows that market price fluctuation (0.78) is ranked as the first factor and affects the competitiveness of indigenous contractors. The variation of market price may be caused by various factors such as the monopoly of suppliers could be one of the main reasons for fluctuation of price (Ismail Abdul, *et al.* 2014). As he also states that un-availability of competent suppliers in the local market can also cause price fluctuation and finally affect contractors.

The second factor is the costing experience (0.75) of contractors. This factor is found in large road construction projects (Memon, Rahman, & Azis, 2010) as mentioned in (Ismail Abdul, *et al.* 2014). The respondents also agreed that different contractors lose winning of different bids due to poor experience in costing, especially for huge and complex projects.

The third and fourth factors are the ability to collect market information and the availability of product information. In the assessment of cost escalation in Nigeria (Omoriegbe & Radford, 2006), found that shortage of product information and the poor ability of getting these information's is highly influencing the contractor firm's competitiveness in the road sector. Therefore, indigenous contractors shall to practice and develop their costing approach to be competent with other contractors.

### G) Technology and innovation

Table 4. 12: Relative importance indexes of technology and innovation-related factors

| Coding | Affecting factors                  | $\Sigma$ Weights | Mean | RII  | Rank |
|--------|------------------------------------|------------------|------|------|------|
| F25    | Availability of latest machineries | 129              | 3.91 | 0.78 | 1    |
| F26    | Firm attitude to technology        | 113              | 3.42 | 0.68 | 2    |
| F24    | Utilizing construction software's  | 109              | 3.30 | 0.66 | 3    |

Technology and innovations are the critical issues in road construction sector to modernize the development and change the capacity of the contractors. According to the respondent's agreement, the Availability of the latest machinery (0.78) is the first affecting factor of indigenous contractors. Firm attitude to technology and Utilizing construction software are also the second and third affecting factors with an RII value of 0.68 and 0.66 respectively.

The competitiveness of contractors can be improved by using technologically advanced machineries and as a result productivity will be assured and difficult jobs can be easily executed, (Mustefa and Flanagan, 2012). In this way, the importance of using the latest technology and innovation is that it supports the provision of services and allows the management of imposed demands (Agnihotri and Trainor *et al*, 2017). However, it was evidenced that, the Ethiopian indigenous contractors do not practice a good utilization of the latest technology and advanced machinery to ensure their competitiveness. In this light, their attitude to technology is also another factor limiting contractors to utilize advanced machineries and technologies.

Therefore, it is essential to indigenous contractors to utilize machineries and technologies to renew and increase productivity. Additionally, the more appropriate technological equipment and software in the same way helps to guide resources and capacities in the development of basic work skills regarding technology, (Kang, S. 2015).

#### H) Technical skill and experience

Table 4. 13: Relative importance indexes of technical skill and experience related factors

| Coding | Affecting factors                   | $\Sigma$ Weights | Mean | RII  | Rank |
|--------|-------------------------------------|------------------|------|------|------|
| F28    | General and specific experience     | 141              | 4.27 | 0.85 | 1    |
| F27    | Project type                        | 138              | 4.18 | 0.84 | 2    |
| F29    | Availability of materials           | 120              | 3.64 | 0.73 | 3    |
| F30    | Ability of estimating of quantities | 116              | 3.52 | 0.70 | 4    |

From the above table (4.12), the respondents agreed that General and specific experience is the first affecting factor of indigenous contractor firm's competitiveness with an RII value of 0.85. Fu, Drew and Lo (2002) agrees that contractors who have construction experience are more competitive than inexperienced contractors are. The study also reveals that specific experience in previous similar projects is very critical and substantially important for contractors to easily compete in the market.

Project type is also the second important factor affecting the competitiveness of contractors with an RII value of 0.84. According to respondents, when the project is huge and complex, the project requirement is also wide for both managerial and technical aspects.

Therefore, its relevant for the contractors to develop experience on huge and complex projects. Similarly, the availability of materials and the ability to estimate quantities is the third and fourth factor with an RII value of 0.73 and 0.70 respectively.

### I) Environmental factors

Table 4. 14: Relative importance indexes of environmental-related factors

| Coding | Affecting factors                | $\Sigma$ Weights | Mean | RII  | Rank |
|--------|----------------------------------|------------------|------|------|------|
| F34    | Political stability              | 113              | 3.42 | 0.68 | 1    |
| F32    | Regulatory and legal restriction | 111              | 3.36 | 0.67 | 2    |
| F33    | Knowledge construction laws      | 108              | 3.27 | 0.65 | 3    |

As most of the respondents agreed that, Political stability (0.68) in the country is affecting the competitiveness of contractors (both foreign and indigenous), but the foreign one has the capacity (resource) to recover the damage regarding political case in the community (if occurred), whereas the local contractors are highly influenced and very difficult to recover again as foreign contractors. This affects indigenous contractors' continuous competency in the future.

Environmental regulation and legal restrictions (0.67) and Knowledge of construction laws (0.65) have also an impact on the competitiveness of indigenous contractors. Regulatory and legal restrictions are not well comfortable for the local contractors and the contractors are not well experienced and educated on local construction laws. Therefore, the government should adjust the stability of the political problems of the country to protect the construction contractors resource damage and work stoppage. In addition, the contractors should emphasize the local construction laws and regulations.

### J) Image and reputation

Table 4.15: Relative importance indexes of image and reputation related factors

| Coding | Affecting factors                | $\Sigma$ Weights | Mean | RII  | Rank |
|--------|----------------------------------|------------------|------|------|------|
| F36    | Previous performance on Projects | 128              | 3.88 | 0.78 | 1    |
| F35    | Past history                     | 117              | 3.55 | 0.71 | 2    |
| F37    | Environmental services           | 101              | 3.06 | 0.61 | 3    |

Almost all sectors rely heavily on their corporate reputation to attract and retain their customers (Nguyen and Leblanc, 2001). The research also argues that the customers are more inclined to purchase the products or services from companies whom they perceived as having a favorable reputation among their competitors.

From the above table (4.14), Previous performance on projects (0.78) highly influences local contractors because of their poor image on their previous performance. Accordingly, previous

performance on projects (0.78), past history (0.71), and Environmental service (0.61) are the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> competitiveness affecting factors. Generally, local contractors' history is depending on their previous performance. Therefore, the contractors should invest in their image and reputation to sustainably build their history and profile.

Finally, the significant affecting factors from 37 factors based on their RII value are; cash flow management (F1), cash flow status (F10), annual turnover (F9), risk management (F3), financial capital (F11) time management (F2), experience (F28), client bidding requirements (F18), project type (F27), capacity of human resource (F5), and bidding experience (F17) are the major factors.

#### **4.3.2 Project Implementation parameter**

It is a common eye that local contractors in road sector are facing difficulties to accomplish projects equally computing with international contractors for various reasons. Inadequate commitment regarding project management is a major factor affecting local contractors. The following section depicts some cases of road construction projects that have been signed and executed by local contractors to show major challenges and factors affecting contractor's extent of contractually completion competency.

##### **4.3.2.1 Project implementation practice**

According to ERA project implementation practice, the project execution phase can be divided into three phases; project startup & mobilization, project execution, and finally handover of the project. In each particular process, the ERA's together with the supervision consultant perform various tasks of the project body. The assigned counterpart (project engineer) within the regional directorate (ERA), in consultation with the team leader, follows the implementation processes. The project engineer acts as the hub of the communications from ERA's side whereby progress is monitored, efforts are coordinated and productions are conducted as per the standards set in the contract.

The project execution process is a well-known phase by consuming the substantial cost and resources of the project. As a result, the phase is the stage at which major characteristics of a project's performance challenges occurred. (Solomon, s. 2015). These performance characteristics should be well managed during the phase. Nevertheless, if these factors are not well managed effectively during the phases, they not only affect the project's performance but may also expose the client to none value adding expenses through opportunism. (Williamson, 1975) as cited in (Solomon, S. 2015). The performance of contractor's project execution process is affected by various factors. This none value-adding practice of execution not only scarifies the client but it also leads to the contractor failing expected performance and competency.

According to ERA's project supervision and controlling manual, there are substantially significant causes of contractor failure to ascertain competency such as the commitment of stakeholders, insufficient documentation, stand-by decisions, weakness by the contractor to

follow procedures, unstrict follow-up of consultant on contractor and contract compliance are some of the factors.

On the other hand, however, ERA asserts that the negligence and inappropriate conduct of supervising consultants and professionals have become detrimental to the execution process (Solomon, S. 2015). In addition, contractors' fault and inadequate commitment are other problems. Concerning this, in the literature (refer 2.8.2), poor financial management, variation order, frequent design change, inadequate planning and scheduling, errors in design and unrealistic contract requirements and unethical practice by the contractor are cited as the major problem in the project implementation period.

Additionally, the practice of applying the execution process in two separate ways is also another issue. The ERA as an employer in the contract oversees the overall performance of the process and acts on limited issues that are identified in the contract whereas the consultant oversees the site execution process. Concerning this, the contract demands the consultant to accomplish all supervision services and the contractor to furnish all the implementation services. Generally, this separate responsibility leads to substantial limitations and challenges to the stakeholders especially to the client and the contractor. This a yoke to the local contractors still and creates a chance for foreign contractors to get different contracts easily.

#### **4.3.3 Project implementation factors**

The explanation of each project presented below mainly emphasized on the major contractor execution performance in terms of different project parameters such as time, cost, quality and health & safety. Hence, local contractors execute the construction of those projects. As a result, by critically reviewing the project history, significant factors were identified and selected for each project and generally summarized in common. Finally, the best way of improvement mechanism will be discussed in detail in the improvement section depending on the factors identified. The description of each project is presented in the table (refer Appendix C)

##### **A) Project-1**

The first project project-1 was delayed by 1141 calendar days excluding the approved 1070 EOT. The project was faced a cost overrun of 135,673,992.1ETB over the original contract price. The project has also quality- problems.

This was due to the contractor's poor site coordination and management, mobilization of low productive machines, the unwillingness of contractors to apply consultants' advice regarding site coordination and resources, improper control of the efficiency of the site crew and key staff. In addition, late commencement of pavement works (poor preparation and mobilization of asphalt and related materials), late commencement of side drains, and slow progress of structure works (even if the road has a huge workload, the contractor is very poor in progress).

Quality problem due to (poor workmanship, lack of adequate work crew, stone production, contractor's negligence and shortage of technical staffs), suspension of the construction activity

due to financial problem (due shortage of finance, contractor cannot supply fuel and construction materials, and faced to pay machinery rental costs). In addition, financial problem (shortage of fuel, construction materials and payments for rental equipment and workforces), slow removal of obstructions in the ROW limit, and fail to fulfill the engineer's facility as per contract.

Additionally, adverse weather conditions, RoW problems especially late removal of electric poles, alignment change by employer requested by consultant, design change, increase in quantity (rock excavation) were main challenges occurred.

### **B) Project-2**

The next project, project-2 was also faced a cost overrun of 160,404,866.77ETB over the original contract price and the project has also faced 1268 days of time overrun. There were substantial reasons why the project was in cost overrun such as lack of standardized productive equipment, lack of technically competent key personnel, delay in mobilizing of staff, an unforeseen condition which was evidenced by delay in initial mobilization and planning.

The project also faced by sliding of places, realignments (due to geographical situation), ROW Problems (due to delay of compensation payments, fuel supply problem (insufficient), cash flow problems (contractor cash flow problem), lack of experienced professionals of key skilled and semi-skilled staffs, shortage of materials such as cement, shortage and frequent breakdown of equipment because of their age.

### **C) Project-3**

As like the above projects (project 1 and 2), project-3 also challenged by cost overrun of 32,028,931ETB over the original contract price. The project has a time overrun of 180 days.

The cost overrun was due to the scope change (original contract length increments due to the interest of the employer). One of the key problems especially in Design Bid Build projects is the variation of scope, design error, and fluctuation. Such a problem has a wide influence on the performance of contractors.

### **D) Project-4**

Project-4 also faced cost, time, and quality issues/problems/. Concerning this, the project has a cost overrun of 254,747,577.7ETB over the original contract price. As a result, the project was finished a total of 356 calendar days in addition to the original contract time.

This was due to the reason that high quantity increments, shortage of principal construction materials especially sand and water, shortage of locally skilled and semi-skilled labor, the remoteness of the project area, poor project condition, and un-organized project coordination

### **E) Project-5**

This project was completed with a total time overrun of 425 days. The project also has a cost overrun of 336,478,484.2ETB over the original contract price and with little quality and health & safety issues. The cost increment was due to Price increment, unforeseen rock strata, lack of

equipment and plant, lack of technically competent key personnel, and even the supporting staff, shortage of water (contractor delayed on drilling of the borehole).

Also, sliding of places, realignments (due to geographical situation), Right of Way (RoW) Problems (due to delay of compensation payments, fuel supply problem (insufficient), cash flow problems (contractor cashflow problem), lack of experienced professionals of key staffs, skilled and semi-skilled, shortage of materials such as cement, shortage and frequent breakdown of equipment because of their age.

#### **F) Project-6**

This project is found in a progress that is 56.9% completion. Even if so, the project was in 2.59% delay over the original contract time until the report period. Due to the presence of the time delay, cost overrun has happened to the amount of 249,821.8ETB and the client and the contractor was suffered those problems.

This was mainly due to; learning exercise of the contractor had to endure at the beginning of the project, improper planning by the contractor, insufficient resources available on-site, contractor's inability to complete the design on time (town section design not completed), and contractor's inability to perform the works in more than two fronts. Additionally, non-commencement of asphaltic works, non-commencement of sub-base and base course works, poor curing process of base course and asphalt aggregate. Generally, the type of delivery method (Design-Build system) has been also its impact on the performance of the contractor such as the inability to finalize the design on time.

Finally, from the above case study projects, the following major factors affecting local contractors during implementation were identified and selected. These factors were common to all selected projects and have maximum influence extent on the contractor competency. The factors are improper planning by the contractor, contractor cash flow problem, shortage of finance, mobilization of poorly productive machines, lack of technically competent key professionals, shortage of principal construction materials, contractor's poor site coordination, improper control of the key staffs, poor efficiency of the site crew, and price increment are the critical factors. Concerning the findings in the survey and document review, more than 95% are the same, which means the factors identified by the questionnaire are almost the same as factors identified by document review.

According to different industry expert's arguments, there are some challenges that affect both contractors (local and foreign). These factors are not competitiveness challenges of local contractors such as Right of Way, unforeseen condition, and insufficient design (DBB) etc. Therefore, the main concern of this section was to select critical factors affecting local contractor's competitiveness during the project's execution stage. The major common factors are discussed in the following section;

#### **A) Cash flow management**

An acceptable financial plan is very compulsory in cash flow management. (Mawdesley, *et. Al.* 1997), cited in (Kassahun, M. 2016). This helps the cash flow situation to be monitored using approaches such as the pre-project cash flow plan during project phases. If cash flow cannot be properly managed, it harms other parameters too. McCaffer, (2001) argues that, contractors shall emphasize to properly control cash flow in both tendering (for estimation or forecasting cash flow) and implementation. It is obvious that deficiency in cash is one of the headaches for the success of Ethiopian contractors and causing performance failure. The unavailability of enough professionals to manage cash flow is also another limitation. Concerning this, a contractor should assign enough professionals to properly manage cash flow.

On the other hand, in ERA projects, cash flow is also another construction supply-chain issue that highly affects local contractors. As a result, time and money issues regarding weak cash flow management is the worst scenario. Inappropriate utilization of advance payment (disbursing it not to specific to the project use), weak method of planning cash flow, payment delay from client, and price increment are the significant factors causing cashflow problem. (Kassahun M. 2016).

Most of the Ethiopian local contractors are not well practiced to utilize reserve cash as a contingency to deficit cash shortages. Besides, they depend on borrowing financial funds from different financial institutions (such as Banks) and they did not manage properly. This results in paying huge interest for banks and affect their cash flow.

## **B) Experience**

Experience is one of the critical factors for contractors to win different bids (refer section 4.2.1). Most of the time in ERA projects, contractors are suffered different challenges especially when difficult terrain and huge scope projects. Due to the espoused reason that since contractors has inadequate specific experiences, they made faults during construction. Huge in scope and difficult terrain projects need efficient technical knowledge and experience to implement as per the design requirement. However, many contractors use insufficient technical staff to earn illegal profit. As a result, projects are implemented with quality problems; this is mainly due to insufficient technical staff, weak specific experience with similar projects and misunderstanding of the design drawings.

On the other hand, due to poor understanding of the specification and design drawings, the worst relationship between stakeholders was practiced in ERA during project implementation. Concerning this, many contractors was not positively accepting the instruction and advice of the supervision consultant. Even though, the contractors absorb the engineer's instruction since the contract enforces, they did not try to take a lesson from their previous errors and mistakes.

Another worst case of inadequate experience effect on competitiveness is the management of active projects on hand. Fu and Drew, (2003), noted that poor performance of contractors on one project has a substantial effect on the performance of other active projects. If the contractor has one project in a difficult claim, it becomes a cause for other projects to be improperly managed. This problem is highly practiced largely of the Ethiopian construction sector. As a

result, weak project coordination, financial challenges, and worker de-morals will happen. Generally, the above problems were occurred due to poor particular experience of contractor on previous projects.

### **C) Shortage of finance**

ERA requests contractors to submit their advance payment disbursement schedule while delivering a bid response. All the bidders submit their disbursement schedule to bring an advance payment from the client. The client procedurally evaluates the compatibility of the schedule. Concerning this, most contractors did not utilize the entire advance to the proposed project efficiently. As a result, the project will be suffered a finance shortage. Improper use of advance payment causes delays in mobilization of construction materials, delays in mobilization of equipment, inability to utilize adequate and well-educated technical staff, inability to provide a facility to the supervision consultant and ERA representatives. (Kassahun, M. 2016).

Crew productivity and efficiency also affected because of the delay of payment. Even though, conditions are fulfilled and possibilities are found, required plants, equipment's, and materials are delayed and not mobilized just in time. As a result, due to the poor performance of the project, the performance of the contractor is influenced. Generally, a shortage of finance is being the worst headache for most of the local contractors in the road sector.

### **D) Capacity of human resource**

The Ethiopian construction works and regulatory authority has set out must meet requirements fulfilled by the contractors when they are coming to register as a contractor within different grades. By depending on their grade, contractors are requested to fulfill a required labor and equipment. However, many contractors were not utilizing adequate skilled and semi-skilled workers. There was a bad habit of doing the job within a small number of workers. This was being a critical factor affecting the project performance. Consequently, the project will not be implemented as per the planned period and budget.

Furthermore, the working crew also not properly managed and coordinated at site. This poor habit of site worker coordination highly affects the efficiency and crew productivity. Additionally, the major reason for efficiency and productivity decrement was contractors are not trusted to pay the monthly salary of permanent and temporary staffs because of a shortage of finance.

### **E) Plant and equipment**

Plant and equipment have a direct influence on the contractor competitiveness. In today's world of the living, it is impossible to ascertain the interest of a client in labor-based bases. Construction plants and machinery are one of the significant physical resources in the sector. (Mekdim, 2017). He also argues that equipment plays a key role and constitutes a substantial volume of work especially in the road sector.

The mobilization of standardized machinery for the implementation of the road is one of the contractual rules in ERA. However, local contractors have a wrong habit of mobilizing low productive equipment for the work. This substantially causes a high decrement of actual site productivity of the contractor work crew. Related to this the contractor cannot finish as per the planned time, even the progress also affected. As it was discussed in the literature (refer section 2.6) the progress performance is a pre-request to participate in a new tender. Finally, insufficient productivity leads to time delay, cost increment, quality problem, client dissatisfaction and harsh relationship to the consultant. Consequently, contractor ability becomes weak.

#### **F) Time planning & management**

The right startup of any project has a positive effect on the proper completion. Contractors have their time plan and way of management during implementation. The basic focus point is proper time planning at the starting of the project is required. In ERA practice, it is obvious that contractors prepare a time plan and expected to implement the project as per the plan. Besides, due to inadequate time management, different circumstances have encountered and the way of their time management ability was poor and questionable.

As one old report in the UK noted that, low productivity, time waste and enormous delays happened on construction projects was due to improper time planning and management. The problem was the same as Ethiopian local contractors in ERA projects. During the startup & mobilization phase of the project, contractors' lack full commitment to utilize acceptable time management system as per planned. Consequently, small errors cause other critical time delay issues. Finally, they lead the stakeholders to claim and unwanted controversy. At present, the enhancement of effective time management activities becomes substantially significant for the completion of projects with positive outcomes and even for equally competing for the contractors in the sector. In the history of ERA, almost all contractors have suffered time management problems. This local contractor's weak time management system generates a negative effect on the project environment, specifically on project cost, profit and contractor image & reputation.

Inadequate time plan, resource unavailability and delay in mobilization, low productivity, poor contract commitment, rough relationship and shortage of technical staff are the main cause of time delay problems. Therefore, contractors shall to manage time properly.

#### **G) Material availability**

Most types of materials used for road construction are produced from the quarry sit. Sometimes, the unavailability of some principal materials happened. This was mainly due to price escalation, the remoteness of the area and delay in the initial mobilization period. After signing the contract, the contractor can access local materials such as quarry aggregate and water. This is an opportunity for the contractor with free access without any payment. The contractor only budget costs for preparing and mobilization. Other materials manufactured

from the industry are fully supplied by the contractor. Concerning this, the delay of mobilization occurred, especially on these manufactured materials.

On the other hand, contractors are not genuinely committed to supply materials at the start-up phase. Concerning this, some contractors mobilize inadequate materials that are not satisfying contractual specifications. Weather is also another critique of the lack of principal materials.

#### **H) Price increment**

ERA projects are known for their bad image in increasing construction budget, quality issues, and time delay. Most contractors have experienced the sting of an unexpected cost impact during the execution of projects. Inadequate contingency and exchange currency have more power for the cause of price increment. In ERA, price escalation was one of the challenging issues. This is a result of improper execution progress or delay of the project. Consequently, substantial claims are requested by the contractor to minimize the damage.

As it was practiced by ERA, contractor's price increment is a result of contractors' poor planning, unreasonable contingency, poor marketing system and the inability of contractor's risk consideration.

#### **I) Crew productivity**

Low crew productivity is a result of the different problems encountered. According to different reports by ERA, insufficient control of key staff, employee dissatisfaction, project location, working condition, management and motivation skill of the project manager and difficulty of the work are the major causes. Furthermore, the moral motivation and readiness of the workers is a critical factor for good productivity and efficiency improvement.

Even though in most projects administered by ERA, contractors do not pay monthly salary of workers on time and no standard human resource handling guideline. As a result, the efficiency and productivity of the contractor become damaged. Consequently, the contractor cannot finish on time and within budget. This will cause weak competency and performance.

Generally, the factors identified during the survey are the same as the factors identified through the document review.

#### **4.3.4 Major factor identification affecting indigenous contractors**

From the above two sections (refer to section 4.2 and 4.3) the major factors identified that affect the competitiveness of indigenous contractors participating ERA projects in both tendering and implementation are presented in the following table (4.15) below. These factors are selected based on the sequential factor identification method. Major affecting factors identified are;

Table 4.16: The major factors identified that affects competitiveness

| <b>Sn.</b> | <b>Major factors identified</b> |
|------------|---------------------------------|
| 1          | Cash flow management            |
| 2          | Experience                      |

|    |                              |
|----|------------------------------|
| 3  | Annual turn-over             |
| 4  | Shortage of finance          |
| 5  | Time planning and management |
| 6  | Capacity of human resource   |
| 7  | Plant and equipment          |
| 8  | Price increment              |
| 9  | Crew productivity            |
| 10 | Project scope                |
| 11 | Inappropriate price offer    |
| 12 | Material availability        |

The above case study presentation gives a clear picture of the severity of challenges on local contractors during project implementation. Concerning this, the following key findings was noted;

1. The finding reveals that most of the local contractors are suffering to satisfy the client (ERA) concerning completing the project in time, with budget and design quality.
2. Local contractors are substantially affected by cash flow, inadequacy in physical resource & key professionals due to poor planning by the contractor at the project start-up stage.
3. Most of the contractors are weak in the initial planning and they were not able to mobilize all the required resources at the project startup phase properly.
4. Most of the contractors were suffered to get skilled and semi-skilled workers especially projects found in remote areas.
5. When project scope is huge and the terrain is difficult, the degree of local contractor challenge is more severe.
6. Cash flow and adequate labor creates other negative effects on the contractor, if they are not well managed.
7. In general, most of the projects observed in the analysis, the cause of weak implementation performance of local contractors during the execution phase was technical competency (initial planning ability, key professional's knowledge and physical resources) and financial capacity (cash flow problem).

Mainly, the extent of the challenges that occurred from the referred cases calls for the importance of emphasizing the issue and the need for investigating the key factors causing the problem in a wider perspective to be able to substantially minimize their impacts on the upcoming projects. Finally, the findings found from the document review was likely the same with the investigation from the questioner survey.

#### **4.4 Mechanism of improving competitiveness of indigenous contractors**

Over participation of foreign contractors is not a healthy condition for Ethiopian road sector that wants to build sustainable contracting capacity in the nation. However, foreign contractors could not be blamed since they are filling a wide gap between construction needs and capacity in the

sector (especially for ERA projects). The major focus is how to improve the competitiveness of indigenous contractors to make more competitive within the road sector in particular. To ascertain this, it is important to understand problems and related factors and draw up strategies to alleviate the problem.

Consequently, there was a need to identify mechanisms of improving competitiveness. Therefore, the next section was challenged to find improvement mechanisms of local contractors' competitiveness.

#### 4.4.1 Competitiveness improvement mechanism identification from survey

A total of 8 macros, 9 meso, and 4 micro-level factors that helps to improve the competitiveness of indigenous contractors were identified through a questionnaire survey. The degree of significance was determined by the relative importance index (RII) during the analysis. In line with this, the first task was identifying the important factors that helps to improve the competitiveness. Then, the factors were ranked by using their RII value.

The following tables (4.16) below presents Relative importance indexes for each factor that helps to improve the competitiveness of indigenous contractors and ranks as per the overall respondent's survey data.

To determining the factors that are important to improve the competitiveness of indigenous contractors in federal roads, different factors were selected as macro, meso and micro level.

Table 4.17: Relative importance indexes of Macro-level factors

| Coding | Macro level Competitiveness Improving factor | $\Sigma W$ | Mean | RII  | Rank |
|--------|----------------------------------------------|------------|------|------|------|
| F23    | Continuous capacity building                 | 154        | 4.67 | 0.93 | 1    |
| F10    | Suitable government policy                   | 133        | 4.03 | 0.81 | 2    |
| F6     | Quality management system                    | 125        | 3.79 | 0.76 | 3    |

According to the respondent's agreement above (Table 4.16), continuous capacity building is the first factor ranked with an RII value of 0.93. The result revealed that continuous capacity building highly increases the competitiveness of contractors. In line with this, contractors should improve, the skills, and knowledge, equipment, and other resources needed to do the jobs in a competent manner or to a greater capacity.

Suitable government policy is the second factor ranked with an RII value of 0.81. According to the respondent's agreement made in the Ethiopian road sector, suitable construction policy is a headache especially for the contractors. Due to the inadequacy of the suitability of the policy, many contractors were sacrificed for different challenges such as foreign currency.

On the other hand, the RII value shows, Quality management system has ranked in the third level based on the respondent's agreement with an RII value of 0.76. As far as the contractor should not utilize policies, processes and procedures required for the bidding and execution area of the organization (i.e., areas that can influence the organization's ability to meet customer

requirements, contractual requirements, specification and design requirements), it is impossible to be competitive.

Generally, contractors should emphasize capacity-building programs and follow quality policy whereas the government of Ethiopia jointly with the ERA should utilize suitable policy to enhance the competitiveness of indigenous contractors in the road sector. The following table also presents the meso level factors that helps to improve the competitiveness of indigenous contractors.

Table 4.18: Relative importance indexes of Meso-level factors

| <b>Coding</b> | <b>Meso level Competitiveness Improving factor</b> | <b><math>\Sigma W</math></b> | <b>Mean</b> | <b>RII</b> | <b>Rank</b> |
|---------------|----------------------------------------------------|------------------------------|-------------|------------|-------------|
| F1            | Adequate funding                                   | 142                          | 4.30        | 0.86       | 1           |
| F5            | Utilizing foreign contractors' best practice       | 138                          | 4.18        | 0.84       | 2           |
| F11           | Utilizing latest technology                        | 132                          | 4.00        | 0.81       | 3           |
| F2            | Utilizing joint venture approach                   | 131                          | 3.97        | 0.80       | 4           |
| F9            | Subdividing contracts in to small value packages   | 124                          | 3.76        | 0.76       | 5           |
| F8            | Cooperation in decisions and problem-solving       | 126                          | 3.82        | 0.75       | 6           |
| F10           | Price information on labor, materials, and plants  | 123                          | 3.73        | 0.75       | 7           |

From the above table (Table 4.17) respondents agreed that, Adequate funding, utilizing foreign contractors' best practice, utilizing the latest technology, are the top three ranking factors that helps to improve the competitiveness of indigenous contractors with their RII value 0.86, 0.84, and 0.81 respectively. Luqman Oyewobi, (2014), argues that a contractor firm that has adequate funds, unique resources and achieves a strategic fit with its environment would familiarize with the construction sector better and will be more competitive and perform better.

Utilizing joint venture approach, Cooperation in decisions & problem-solving, sub-dividing contracts into small value packages and price information on labor, materials & plants are the next four factors with an RII value of 0.80, 0.76, 0.75 and 0.75 respectively. The RII value in the above table revealed that all the seven factors are very important and extremely necessary to improve the competitiveness of indigenous contractors. According to ERA, (2019), during their operation, international contractors have their own best way of working methods and practice as compared to Ethiopian indigenous contractors depend on different parameters such as (health and safety, time, quality-based management, knowledge and reliable technology).

Therefore, in addition to getting adequate funds, the indigenous contractors should apply foreign contractors' best practices, utilize latest and advanced technologies.

In addition, joint venture and cooperation in decision making is another solution to internationally ensure their competitiveness in the market. When contractors are in a joint venture consortium, they can get enough resources, capacity and knowledge in one. Furthermore, they should also fulfill the bid requirements of ERA such as experience, machinery, annual turnover and human resource. In addition to meso level factors, there are also micro level factors

that helps to improve the competitiveness of indigenous contractors. The following table presents micro level factors.

Table 4.19: Relative importance indexes of Micro-level factors

| Coding | Micro level Competitiveness Improvement factor | $\Sigma W$ | Mean | RII  | Rank |
|--------|------------------------------------------------|------------|------|------|------|
| F3     | Efficient use of advance payment               | 151        | 4.58 | 0.92 | 1    |
| F15    | Competent project manager                      | 139        | 4.21 | 0.84 | 2    |
| F4     | Well-defined work plan                         | 137        | 4.15 | 0.83 | 3    |

The above table (4.18), demonstrates that efficient use of advance payment with an RII value of 0.92 is the first significant factor for enhancing the indigenous contractor firm's competitiveness. Every contractor firm needs adequate liquid resources to maintain day-to-day cash flow. Eyiah, (2001) found that enough advancement of an amount of money to the contractor after winning a bid even before a project has started is more positive approach. It is very helpful concerning in minimizing the need to lobby working capital. He also recommends that contractors should practice wise use and utilization of working capital (an advancement of money) to reduce challenges due to financial constraints.

A competent project manager is the second significant factor with an RII value of 0.84. As the respondents agreed that, to assure a project performance as per the client and technical requirements, the contractor should assign a competent project manager. A well-defined work plan is also another factor with an RII value of 0.83. Concerning this, indigenous contractors are highly competent if they utilize these improvement factors wisely.

Generally, according to the respondent's agreement in the above three tables (macro, meso, and micro-level improvement factors), all the selected improving factors were found in a very important category for competitiveness improvement of indigenous contractors. Among this, factors that have an RII value greater than 0.80 are selected as the best mechanisms of improvement and triangulated by the document review. These key improvement factors selected are continuous capacity building, suitable government policy, efficient use of advance payment, adequate funding, utilizing foreign contractors' best practice, competent project manager, well-defined work plan, utilizing latest technology, utilizing joint venture approach.

#### 4.4.2 Competitiveness improvement factor identification from document review

From the case projects, for the sake of alleviating the problems different solution and decisions was made, hence, it helps to minimize the project impact. Consequently, this was the major focus of the document review.

Most of the local contractors of Ethiopia were suffered to win bids. As was discussed in section 4.2, the bid requirements of ERA were the first limitation. The overall aim of categorizing contractors and packaging contracts is to increase the local contracting capacity. Small and simple contracts allow new contractors to gain experience before being committed to a large investment or the risks involved in undertaking a large project. Concerning this, it is

considerably harder and will take longer to improve their financial, risk management and tendering expertise.

The number and type of machinery & equipment's, key professionals and amount of bid security would be the first factors. Concerning this, the local contractor should practice or utilize a joint venture approach while offering their proposal. However, the joint venture regulation set by ERA says the leading bidder shall take the responsibility for any risk occurred. Also, ERA not directly contact with the second party. One of the most important joint venture advantages is that, it can help the contractor to grow fast his business, increase productivity, generate greater profit, access to new bids & distributions of work networks, increase capacity, sharing of risks and cost liabilities, access to new knowledge & experience with outshined professionals. In addition, access to resources such as technology & finance and increase the ability of adding a value to the client. Therefore, ERA should make situations comfortable to attract bidders in joint-venture consortium.

On the other hand, especially, during the project implementation, the capacity of contractor resources such as human, materials and equipment were the key factor. Weak capacity leads to improper ways of contractor execution. It is obvious that indigenous contractor's capacity building especially for ERA projects is a way helps to improve the skills, knowledge, equipment and other resources needed to do jobs competently. It helps to the contractor to perform better than the previous one, hence, capacity building mainly on labor and equipment is among the key improvement factors for success.

For ERA projects, key personnel with relevant experience from the inception of the project is essential to surpass the triple constraints of cost, time, quality and make the project successful. In line with this, improving the capacity of its human resources by imparting onsite training and continuous follow-up of plants and equipment is very essential. On the other hand, when RoW problems have occurred due to uncompensated residents, workers are disturbed and sometimes different strikes happened which highly affects the performance of contractor. Generally, the contractor shall build the capacity of all the resources knowledge, skill, and increase both the human and materials resources to cater for the needed progress of the works.

Another improvement factor that helps to the contractor is utilizing the latest technology. Employer and designing consultant should give due attention to the project requirements are met and the design is to the highest professional standard. Most of the contractors are missing the contract requirements such as plant and equipment. In line with this, many contractors were mobilizing unstandardized equipment (low productive equipment) for different tasks.

Adequate finance was the one, that helps to the contractor to solve problems regarding different circumstance. To ascertain this, there should be a close relationship and cooperation of the employer with the financiers and Funding agencies. Not only justified risks affect the contractor, rather, there were unjustified obstacles too. Therefore, indigenous contractors need to have

adequate funds and financial capital to tackle such a worst scenario. Additionally, during tender preparation, the designing consultant/the Employer should make sure the quantified amounts are in line with the actual site scenario and sufficient contingencies are made for the uncertainties on quantification, hence insufficient contingencies and quantity increment cause shortage of finance especially during implementation.

Chinese contractors were not suffered on finance issues; the reason behind is their establishment is linked with the Chinese government. When risk has occurred on contractors, the government will handle and keep the contractors from risk damage. Even, if risk will be occurred on these contractors, the Chinese government will help by funding finance until they recover themselves. However, Ethiopian indigenous contractors were highly challenged by a shortage of finance and finance-related crises. The financial crises were resulting from poor execution/implementation practice of projects having a devastating effect on contractors especially less experienced ones.

It is better than local contractors to utilize foreign contractor's best practice are. From my observation during and before the research period, foreign contractors have the best way of implementation system regarding time control, cost efficiency, health & safety issue, and risk handling & management.

After contractors enter into a contract, they will have requested by the employer (ERA) to submit an advance payment disbursement schedule for the sake of bringing an advance payment. Besides many contractors have a bad habit of using an advance payment. As a result, delays in mobilization of physical resources and key professionals occurred. Therefore, each contractor must use the advance payment properly. Concerning this, both the client and supervision engineer should apply the critical follow up of the contractor on the regard.

Performing tasks as per the contract time is very essential to the contractor to be free from cost, quality and time risk. From Project-I and project-V, there were substantial delays that happened on the project. This time delay causes cost and quality problems on the project. Finally, there will be a non-value-adding product to the client. Furthermore, there should be strong relationships between the administrative body on the project site and the parties to the contract. Concerning this, weak cooperation and link cause's poor achievement of the project output due to improper application of planned time. On the other hand, the employer should also set regulating mechanisms to minimize staff turnover from both consultant and contractor.

The project manager also should be technically and managerially competent to hand-over project problems and to forward professional standard decisions. As it has seen on the case projects, project managers are not technically and managerially competent enough. This is due to contractors' default that they did not pay enough salary. With small salary, it is impossible to get well experienced professional project managers.

#### 4.4.3 Major improvement factors identified

As it was discussed in section 4.4.1, improvement factors were identified by their RII value. To triangulate whether the factors are best-fit cases, the research was challenged to identify from case projects during tendering and implementation. Here improvement factors are identified and the factors found from survey and document review are the same.

Table 4.20: The identified major improving factors of indigenous contractors

| Sn. | Mechanism's helps to improve the competitiveness of indigenous contractors identified |
|-----|---------------------------------------------------------------------------------------|
| 1   | Continuous capacity building                                                          |
| 2   | Suitable government policy                                                            |
| 3   | Efficient use of advance payment                                                      |
| 4   | Adequate funding                                                                      |
| 5   | Utilizing foreign contractors' best practice                                          |
| 6   | Competent project manager                                                             |
| 7   | Well-defined work plan                                                                |
| 8   | Utilizing latest technology                                                           |
| 9   | Utilizing joint venture approach                                                      |

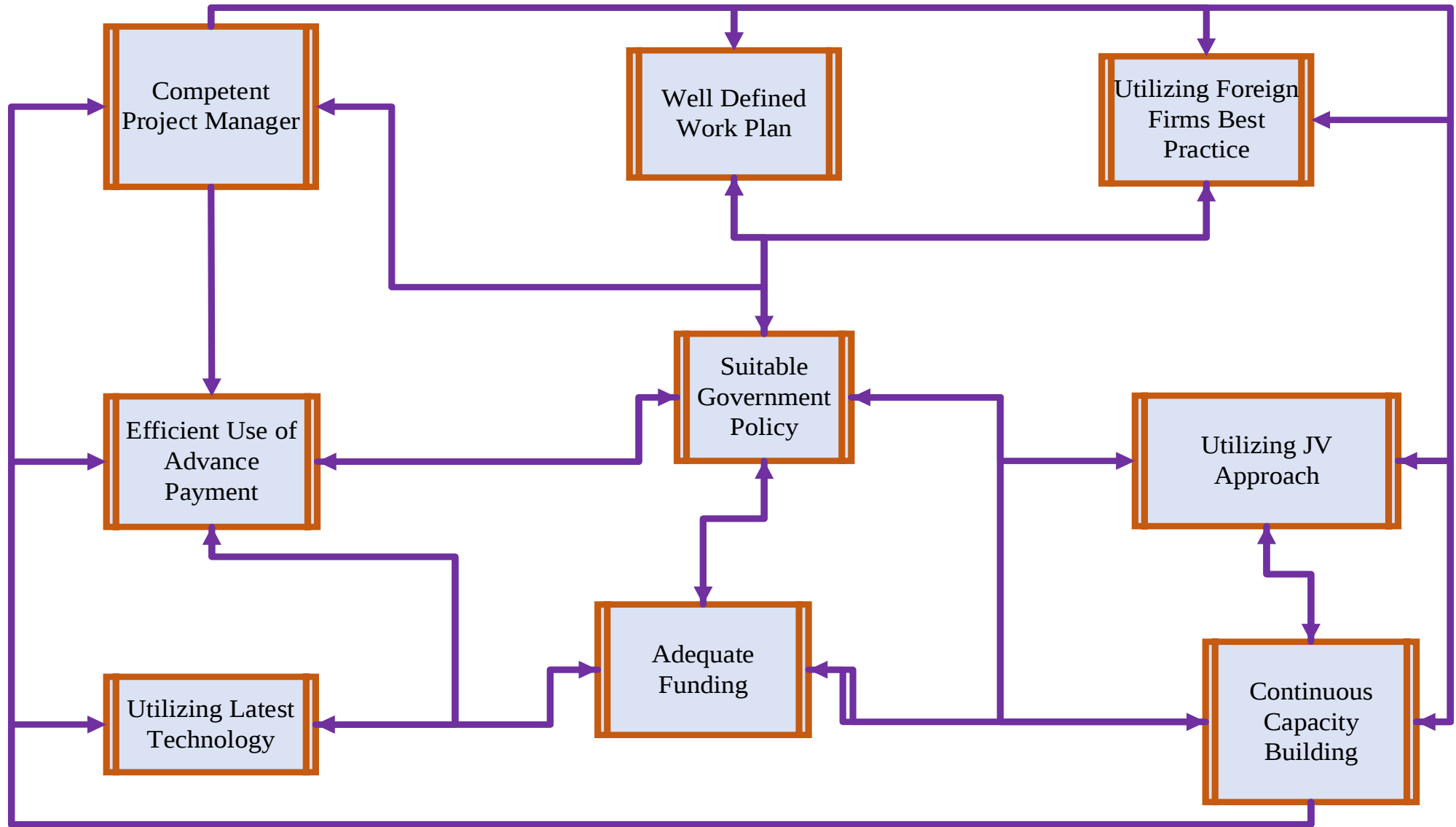
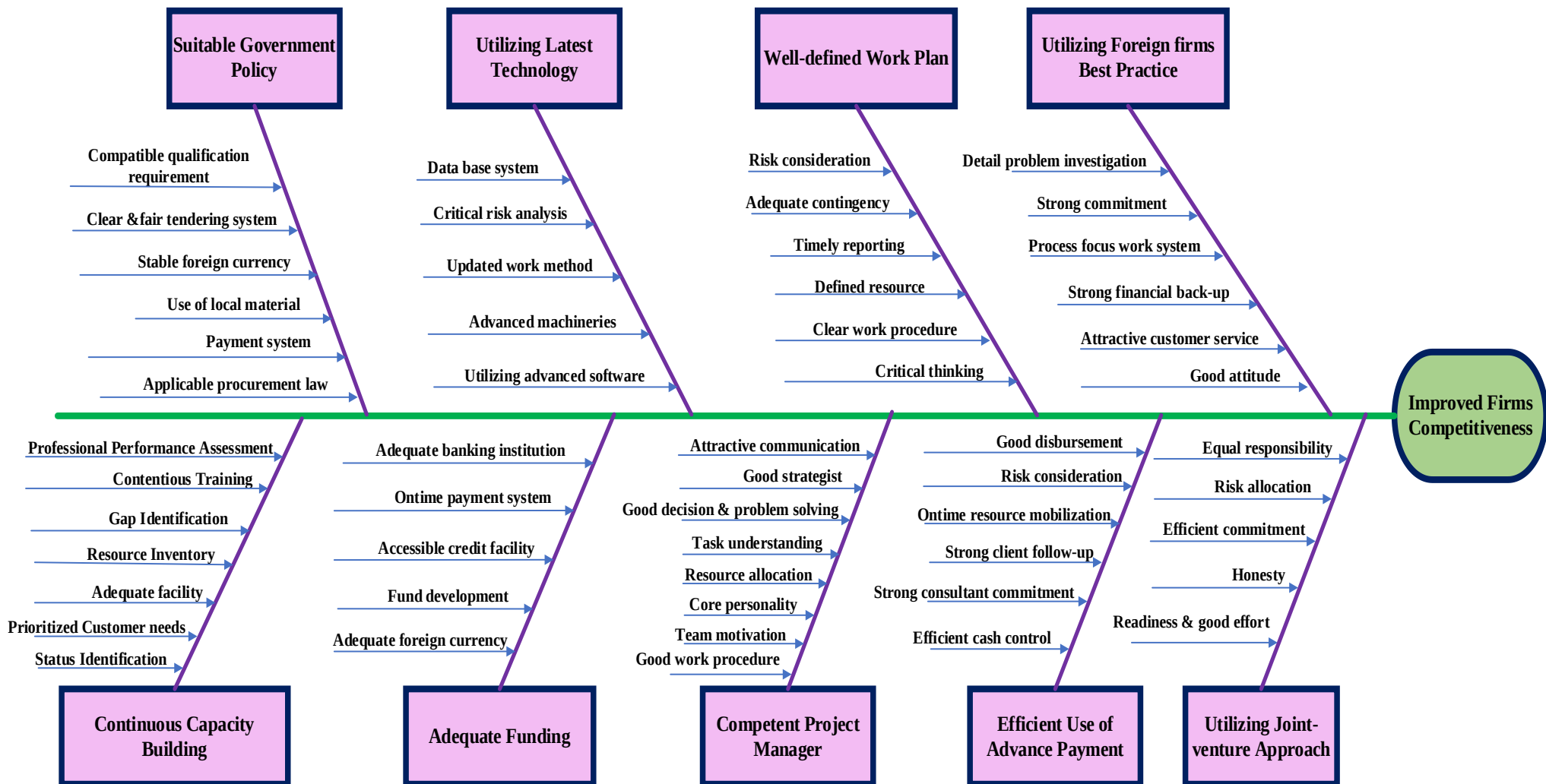


Figure 4.7: A concept for indigenous contractor competitiveness improvement mechanisms

The following (figure 4.5) further presents the breakdown of competitiveness improvement mechanisms using fishbone diagram. The mechanisms under each parameter helps to improve the competitiveness of local contractors by applying efficiently.



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Figure 4.8: The Fishbone model diagram for improvement mechanisms

From both survey and document review, findings were achieved. From this, the following summary were noted,

1. The project objective can be easily achieved by proper cooperation between the administrative body and parties in the contract. The proper cooperation of site staff is the key to increase efficiency and productivity. Again, deploying standardized equipment can also helpful to the contractor for efficient productivity.
2. Proper attention should be given by the employer and design consultant. Consequently, it will helpful to reduce variations that cause cost and time claims.
3. Preparing sufficient contingency for uncertainty can minimize the cost and financial risks of the contractors during implementation.
4. The key personal with relevant experience from the inception of the project is essential to surpass the triple constraints of time, cost and quality and to make the project successful.
5. Adequate on-site training can improve the capacity of human resource.
6. The adequacy of funds for the contractor can help to assure the project objective and consequently to be competent in the market.
7. Efficient and proper utilization of an advance payment also very crucial to deploy all the required resource and avoid financial constraints.
8. The analysis has revealed that, indigenous contractor firm's competitiveness (ability to bid, win and successfully execute the project), and involvement in the road sector especially in federal roads has substantial economic significance on the construction industry as well as in the country. The advantages include, resolving foreign currency problem, producing competent contractor (enable to the client to get reasonable offer), creates job opportunity for workers, helps to knowledge transfer in the sector and increasing in gross domestic product (GDP) and contributes to the overall development of the country that have a multiplier effect on the economy of the country.

#### **4.5 Research validation**

Discussions in the concept of research validations have traditionally attached to the quantitative research. On the other hand, to make qualitative research plausible, credible, trustworthy and defensive, research finding validation is mandatory (Burke Johnson, 2015). As it was presented in chapter 3 (refer section 3.8), interpretive validation method was used for research validation purposes.

Based on the above system and process, the first task was finalizing the research finding and conclusion. After the research finding were completed and concluded, experts that work in the sector such as ERA, contractor companies, consultant companies and ministries of construction were selected and identified based on a guideline (refer Appendix-D, Part-I). Then after, questions (refer Appendix D, Part-II) are prepared and provided for the experts based on the research objective and correspondent findings.

Accordingly, almost all experts agreed that the competitiveness extent of indigenous contractors in terms of winning tender is not enough and needs a greater commitment of construction stakeholders along with the government. This were not only due to the problem of contractors; it was a result of the problems of related stakeholders in the sector. As one participant said that, if the government doesn't take an urgent action, all the contractors will be disappeared from the market because of different factors affecting contractor's ability.

The experts also agreed on the factors identified that cause poor contractor competitiveness. They strongly agreed that, cashflow management, experience and planning are very critical factors. The experts said and agreed that almost all of the contractor companies are very weak in managing cashflow and resources. They didn't effectively use and manage advance payment. As one participant said that, Ethiopian contractors prepare a plan just for the sake of getting the work. They didn't further apply their plan and methodology. In addition, the shortage of competent professionals also the other factor they agreed. Furthermore, there is a bad attitude in contractors in using very small number of key professionals in one project.

Government policy is also very crucial affecting factors according to the participants agreement and opinion. In line with this, many contractors were challenged to do so. For example, the procurement law set by the federal procuring agency is not practiced by the procuring entity (clients) during RFP preparation. The type and number of physical and human resource, annual turnover and satisfactory execution history are not surely requested as per procurement law (i.e. clearly abused).

Once the project was awarded, payment should be released on time unless the project will be delayed. As one contractor participant said that, foreign contractors not stop working properly even if payment will be delayed because of the reason that, they have enough cash on their hand. They expect the payment will be released one day. But this is not done for local contractors because no cash on their hand. Additionally, there is also high government interference on contractors.

The government should also critically control a currency devaluation problem. Due shortage of foreign currency contractors can't easily import construction materials and machinery spare parts. As one ERA region director said that, due the occurrence of such delay, projects will be delayed even if time extension was allowed to the contractors. As a result, the project performance and contractor image will be affected.

On the other hand, even if such a problem were occurred contractors doesn't utilize their positive effort. As one participant said that, the contractor's wrong attitude is a critical problem towards the use of plan, advance payment, variations and resource utilization. He strongly said that, most of the contractors forget the aim why being a contractor, they only focus on profit.

As per participants agreement, factors were ranked in ascending order of influence as cash flow management, experience, time planning and management, shortage of finance, capacity of human resource, annual turnover, plant and equipment, project scope, price fluctuation, material availability, crew productivity and inappropriate price offer.

Furthermore, the participants agreed that, there are also other affecting factors such as government policy, foreign currency, resource management system, contractor attitude, poor investigation of problems, ERA bid requirement and shortage of competent machinery renting companies.

On the same manner, participants also asked to comment the improving mechanisms and they agreed on the identified improving mechanisms. Almost all agreed that, suitable government policy, adequate funding and efficient use of advance payment are the top improving methods for local contractor competitiveness. As one participant strongly said that, in the previous time ERA was experienced in giving a capacity building training for local contractors. Besides, contractors didn't apply it properly for change. Therefore, continuous capacity building should be utilized.

ERA shall be also utilizing a clear contractor control system regarding resource mobilization, use of advance payment, and implementation of the proposed work plan. As the participants strongly emphasized that, contractors should be punished for their defective work and wrong attitude. They agreed that, contractors must care about their reputation and image. Contractors should also establish efficient cashflow management system and mobilize enough resource for the project. As one participant said that, most of contractor are not willing to take risk. Even if so, they didn't in-depth investigate it to solve the risk permanently. He strongly recommends contractors to apply foreign contractors' practice regarding in risk identification and investigation.

On the other hand, the government should also provide enough banking (financial) institutions. For the sake of reducing foreign currency problem, the government should invite foreign banks in Ethiopia for investment. As one participant from contractor company said that, the existing Ethiopian banks are not enough to get credit access.

As all participants were agreed that, the improvement factors were ranked as suitable government policy, adequate funding, efficient use of advance payment, well defined planning, competent project manage, continuous capacity building, foreign contractors' best practice, latest technology and joint venter approach. The participants further recommended that there are also other improving methods such as continuous research on contractor action, cash flow management training, gap identification, reward and penalty of contractors, contractor readiness and commitment, integrated data base system, ethical procurement system, efficient strategy and industry wide and clear communication among stakeholders. As all participants strongly agreed that, the contractor's positive attitude is the first and foremost mechanism to change the contractors itself.

Generally, from the invited nine experts in the sector, almost all of the participants were agreed by the identified competitiveness affecting factors and improvement mechanisms. They furtherly agreed if the above factors were clearly investigated and improvement mechanisms will be applied, the competitiveness of contractors will be step up in a greater scale.

## CHAPTER FIVE

### CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Introduction

The competitiveness of indigenous contractors in the road sector has substantial importance in the country. Hence, their weak competitiveness has a significant negative impact on the developments of the road sector as well as the country GDP.

On the other hand, a successful completion of a road project results many advantages for the sector as well as for the nation such as GNP increment, increased job opportunity, increased foreign currency. To enhance such an advantage, every stakeholder in the industry should have to be stand against assuring the quality of the road network. This issue mainly requires experienced and competent indigenous contractors in the sector. Getting a competent contractor in both technical and managerial aspect in the road sector have paramount importance. Therefore, conducting research in this area has substantial significance too.

Knowing the competitiveness extent and identifying factors affecting indigenous contractors, competitiveness in the road industry is the first and foremost task to find out mechanisms of competitiveness improvement. The objective of this research was to assess the competitiveness extent, identifying factors affecting it, and finally to find mechanisms to improve the competitiveness of indigenous contractors participated in ERA projects. Therefore, this chapter was aimed in the intention to see into 'what was required?', 'what were the Objectives?' and 'what are the findings?'. Accordingly, the conclusions and recommendations were presented.

#### 5.2 Conclusions

By understanding its importance, the research was challenged to address its objectives. The results obtained in the analysis of the survey and the case study have been discussed and presented in the previous Chapters in detail. Therefore, the following major conclusions have been drawn:

- Most of the experts participated in the study have agreed that indigenous contractors are weak in winning tender and accomplishing the project as per the contractual requirements.
- The finding also revealed that the work share of indigenous contractors is below half of the country's projects in terms of value of projects. Hence, their extent of tender winning ability is 46.07% and their ability of performing the work during implementation as per contractual matter is inadequate especially in project time, cost, quality and safety issues.
- The main affecting factors that affect the competitiveness of indigenous contractors identified from this study are cashflow management, experience, annual turnover, shortage of finance, time planning and management, capacity of human resource, plant and equipment, price increment, crew productivity, project scope, inappropriate price offer by contractor and material availability in order of their effect.

- The main improvement mechanisms that help to improve the competitiveness of indigenous contractors identified from this study are continuous capacity building, suitable government policy, efficient use of advance payment, adequate funding, utilizing foreign contractors' best practice, competent project manager, well-defined work plan, utilizing latest technology, utilizing joint venture approach are the major mechanisms in order of their significance to enhance competitiveness.
- It was found that, indigenous contractors' weak competitiveness has significant effects on the construction sector in such a way that, weak competitiveness will limit the road construction business, wear down mutual trust, and respect among the parties, and it breeds negative attitude towards the public.
- It is also found that, adequate cooperation of stakeholders jointly with the government is essential to enhance indigenous contractor's competitiveness. Additionally, there must be a great commitment by the contractors throughout the project period.
- A capable and competent participation of indigenous contractors in the road sector has substantial benefits on the country overall development such as creating job opportunity for skilled and unskilled workers, helps the client to get reasonable offer, solve hard currency problem, knowledge transfer and improve gross domestic product of the country.

### 5.3 Recommendations

After a detailed investigation on the indigenous contractor's competitiveness, relevant recommendations have forwarded to contractors, design and supervision consultants, employer (ERA), and to the nation as well. Depending on the analysis finding, the following relevant recommendations are noted;

#### A) The Contractor

Contractors were playing a fundamental role in the road sector to alleviate the shortage of road access by producing visible products to the society in the construction process. There is a need to get quality products as per the design and contractual requirements by the employer to ascertain the societal needs. Therefore, indigenous contractors have expected to satisfy the need of the society by providing quality service. The following recommendations has been given to indigenous contractors

- In most of local contractors, there is shortage of skilled workforce and latest machineries for each project on hand. Therefore, the contractors should have to deploy adequate skilled and semi-skilled work force and machineries to the site. Concerning this, the contractor has recommended to give onsite trainings to improve the capacity and competency of his employees both in technical and managerial aspects.
- Obviously, during the mobilization period, all the required resources should be deployed in a required quantity as per the contractual agreement. Hence, it was observed that, there is a problem of using advance payment effectively by many contractors. Therefore, the contractors are recommended to ensure efficient use of an advanced payment. Furthermore,

the contractors are also advised to establish proper coordination and management for the workers to ensure site efficiency and productivity. It also recommended that the contractors should give emphasis for productivity, hence it influences their overall performance.

- During the implementation period, there should be adequate principal material and finance. Due to shortage of finance and weak management itself, the contractors can't deploy enough construction materials and required professionals intime. As a result, projects were suffered time delay and cost overrun finally go to claim. Therefore, contractors are strongly advised to establish good finance and resource management system.
- Obviously, it was observed that, many constraints and problems were encountered especially during the project implementation. Besides, there is a weak practice of investigating such a problem to avoid permanently. Therefore, local contractors are strongly recommended to investigate and study problems to combat forever.

## **B) The Consultant**

The consultant is another major stakeholder with full professional service to the client that comprises investigation and reporting, detail design, contract administration, and supervision service, hence, the consultant insures the wish of the client. As a major stakeholder and its role for the improvement of contractor's competitiveness, the following recommendations are advised to the consultants,

- During tender preparation period, the design consultant should make sure about quantified amounts, and prepare sufficient contingency for uncertainties on quantification. Especially for design bid build (DBB) projects, many controversies were encountered due to design inefficiency. This design deficiency causes quantity increment and leads poor resource and time planning. Therefore, the design consultant shall be sure about the project design completeness and related quantities before the award of the tender notice. Additionally, the assigned project design consultants also advised to conduct critical review and investigation to avoid design and scope changes, and unrealistic contract requirements. This will eliminate unrequired qualification criteria and unwanted claims during tendering and implementation respectively.
- The supervision consultant is recommended to critically control and follow-up the contractor's work. As it was observed, during the project implementation period, many obstacles were occurred due to contractor's management problem and inadequate commitment. Therefore, the supervision consultant should be strong to avoid and manage such challenges for the project success. It is also advised to provide relevant solutions for the encountered problems.
- In most of the projects as a practice, contractors take most of the construction risk. Since all the activities and tasks are done on the approval of the consultant knowledge, consultants should take a risk as equal as the contractor.

### **C) The Employer (ERA)**

The assigned institution ERA's major focus is to provide enough road access to the society. As it was observed from the findings, ERA's have some gaps that shall be improved. Accordingly, the following recommendations were noted,

- The client (ERA) is advised to give due attention to grant contractors timely deployment of project resources and efficient use of advance payment.
- In most times, due to the espouse reason of ERA to answer the community's road access question in a short time, most of the projects are requested for proposal before 100% completion of their designs. This design deficiency causes poor performance of the project. Therefore, ERA should give due attention to the project requirements are met, and the design is in the highest professional standard before award.
- Sometimes, ERA requests the bidders to import special construction materials (example precast). As a result, for foreign contractors, it is easy to import it but not to the local contractors due to shortage foreign currency. Additionally, according to the project difficulty ERA pay 20-40% in dollar for foreign contractors and 100% in birr for local contractors. Therefore, client ERA highly advised to pay some percent of payment for local contractors in dollar to avoid currency problem.
- The client (ERA) is advised to organize capacity building training packages, workshop and skill upgrading programs, at higher, middle and lower level, for local contractors in order to upgrade and empower their project managerial skill. And ERA should a follow-up mechanism for the real implementation of these scenarios practically.

### **D) The Nation**

The government of Ethiopia is one of the essential contributors to improve and enhance the domestic construction sector by eliminating stakeholder's competency problems. Accordingly, the following recommendation were noted to the government.

- Many of the indigenous contractors are suffered by the government policy and strategy such as mode of payment, application of procurement law. The government of Ethiopia should develop better strategies and proper policy to enhance local contractors' competitiveness in order to build up the road construction industry. This can be achieved by developing policy for better access to financial facility and by providing higher margin of preference for local contractors.
- The Ethiopian government is highly advised to establish, facilitate and enforce knowledge transfer scenarios from abroad to the local construction. The government also recommended that sustainable technologies should be provided to alleviate problems at the national level, and then finally to make local construction industry competent in the international market.

#### **5.4 Recommendation for further studies**

Continuous research needs to be conducted in the area until indigenous contractors are able to be competent in the international markets. Therefore, the author further recommends the following research areas for further investigation and assessments;

1. A study should be conducted in developing models for the measurement of local contractors' competitiveness and their status in different competitiveness parameters should be done.
2. A study should be conducted in developing strategies to improve the competitiveness of local contractors in difficult road infrastructure projects should be carried out.

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## Appendix-A

### Case study guideline

This case study examines the indigenous contractors regarding competitiveness by using different competitiveness metrics discussed in chapter two. These metrics will be critically assessed to identify the factors affecting the competitiveness of local contractors participating in federal road projects administered by ERA during tendering and project implementation phase. After the factors are identified in the case study, the assessment will help to provide ways to improve competitiveness.

#### 1. Case study objective

The objective of this case study is to assess the factors affecting competitiveness on indigenous contractors during tendering and implementation. Additionally, the possible ways of mechanisms to improve the competitiveness of indigenous contractors will be suggested based on the findings of the study. In the meantime, the following points will be addressed;

- a) How many projects were awarded to local contractors both in number and value from 2017-2019E.C? How many of local contractors participated and how many of them did win the bid? To what extent does they win bids in ERA project? Concerning this, what factors were affecting indigenous contractors to fail and disqualify there offer?
- b) What was the common implementation challenges for local contractors? To what extent do local contractors execute the work as per the contract as well as their product design period performance? And what were the major factors that occurred during implementation?

#### 2. Case study medium

The case study mainly focuses on,

- ☞ Tendering ability and strategy of contractors
- ☞ Management ability (time, cost, risk and contract related)
- ☞ Resource management (human and physical resources)
- ☞ Relationship and reputation history (any relationship history with stakeholders)
- ☞ Marketing principle and strategy
- ☞ Technological attitude (practical software's and type of machineries)
- ☞ Other technical and practical way of implementation

#### 3. Case study subject

For the sake of addressing the objective and problem, different documents were selected and used as a research data source in a case study at an organization level. These documents will critically be reviewed to make it reliable. The researcher first will be ready what are the issues to be addressed and assessed in the documents. Therefore, based on the above metrics the required documents will be;

- a) Bid evaluation reports

- b) Project completion report
- c) Project progress reports
- d) ERA qualification criteria
- e) ERA ToR documents

Finally, the data will be analyzed through a scientific research procedure.

## Appendix-B

### Questionnaire survey



#### Part-I: General Information

##### A. Objective

The objective of this research is to assess the competitiveness of indigenous contractors, to identify factors affecting competitiveness, and to provide the best-fit competitiveness improvement mechanism for the case of Federal Road projects.

##### B. Purpose of the survey and other important information

1. The purpose of this survey is to obtain data for the specified research conducted as a partial fulfillment of MSc. Degree in Construction Management at Addis Ababa University, Ethiopian Institute of Architecture, Building Construction and City Development, and the data obtained from the survey will be **held confidential** and will be used only for academic purpose.
2. For this research, ***“Competitiveness is the ability of a firm to bid, win and successfully execute a project and achieving and satisfying an objective of a company or a client, what he needs by coping structural changes”.***

##### Confidentiality

All information provided in this survey will be treated with strict confidentiality, and allowed to serve only for the purpose of the research under consideration.

##### Feedback and Results

Interested participants of this study will be given feedback on the overall research results after the completion of the research work.

1. Your open and prompt response is highly essential to fulfill the objective of this research and to address the problem
2. For any further information the researcher can be reached through mobile no. **+251-9-22-71-39-06 (Zemenu Mersha)**

#### Part I: Personal details

# An Assessment on the Competitiveness of Indigenous Contractor's in Road Construction Projects (The Case of Federal Roads)

|                                                                                                                                                                                                              |                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Name of respondent (optional): _____                                                                                                                                                                         |                              |
| Date: _____                                                                                                                                                                                                  | Profession: _____            |
| Name of company / Organization: _____                                                                                                                                                                        |                              |
| Title or Position(s) of respondent: _____                                                                                                                                                                    | Address of respondent: _____ |
| Have you participated in road construction projects in the last 5 years? <span style="float: right;"><input type="radio"/> Yes <input type="radio"/> No</span>                                               |                              |
| Type of organization/company:<br><input type="radio"/> Employer <input type="radio"/> Consultant <input type="radio"/> Regulatory Authority <input type="radio"/> Contractor <input type="radio"/> Financier |                              |

## Part II: Questionnaires

### A) Identification of factors which contributes/ affecting/ indigenous contractors' competitiveness in the road sector

Tables consist of a list of critical factors affecting the competitiveness of indigenous contractors in federal road construction projects identified from literature and various sources. Based on your experience, first try to decide whether the factors can affect the competitiveness or not. Then, what is the likely contribution of these factors to their competitiveness in federal road construction projects that you have involved and rank them, please rate your answer based on the given options by marking (X) under each preference. The marking system used a five-point Likert scale.

Strongly agree=5, Agree=4, Neutral=3, Disagree=2, and Strongly disagree=1. Also, please indicate and add if any factor which is not identified in the table.

**NB:** dear respondents, while you are filling the questionnaire, don't forget that all the factors and related questions are regarding contractor's (local contractors') perspective.

| Sn. | List of possible factors that cause poor competitiveness of local contractors in road construction projects administered by ERA<br>(Please rate these factors based on their degree of impact on the competitiveness of local contractors in the next columns) | Five-point Likert scale used to scale the factors |     |     |     |     |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-----|-----|-----|-----|
|     |                                                                                                                                                                                                                                                                | (5)                                               | (4) | (3) | (2) | (1) |
|     |                                                                                                                                                                                                                                                                |                                                   | X   |     |     |     |
|     | <b>For illustration</b>                                                                                                                                                                                                                                        |                                                   |     | X   |     |     |
|     |                                                                                                                                                                                                                                                                |                                                   |     |     | X   |     |
| 1   | Management related factors                                                                                                                                                                                                                                     | (5)                                               | (4) | (3) | (2) | (1) |
| 1.1 | Cash flow management method                                                                                                                                                                                                                                    |                                                   |     |     |     |     |
| 1.2 | Time management method                                                                                                                                                                                                                                         |                                                   |     |     |     |     |
| 1.3 | Risk management method                                                                                                                                                                                                                                         |                                                   |     |     |     |     |
| 1.4 | Health and safety management method                                                                                                                                                                                                                            |                                                   |     |     |     |     |

An Assessment on the Competitiveness of Indigenous Contractor's in Road Construction Projects (The Case of Federal Roads)

|     |                                                              |     |     |     |     |     |
|-----|--------------------------------------------------------------|-----|-----|-----|-----|-----|
| 2   | Human resource related factors                               | (5) | (4) | (3) | (2) | (1) |
| 2.1 | Capacity of human resource                                   |     |     |     |     |     |
| 2.2 | Job satisfaction of workers                                  |     |     |     |     |     |
| 2.3 | Availability of skilled workers                              |     |     |     |     |     |
| 2.4 | Employee productivity                                        |     |     |     |     |     |
| 3   | Financial resource related factors                           | (5) | (4) | (3) | (2) | (1) |
| 3.1 | Annual construction turn-over                                |     |     |     |     |     |
| 3.2 | Cash flow status                                             |     |     |     |     |     |
| 3.3 | Financial capital                                            |     |     |     |     |     |
| 4   | Relationship related factors                                 | (5) | (4) | (3) | (2) | (1) |
| 4.1 | Relationship with clients                                    |     |     |     |     |     |
| 4.2 | Relationship with sub-contractors                            |     |     |     |     |     |
| 4.3 | Relationship with creditors                                  |     |     |     |     |     |
| 4.4 | Relationship with suppliers                                  |     |     |     |     |     |
| 4.5 | Relationship with consultant                                 |     |     |     |     |     |
| 5   | Bidding strategy related factors                             | (5) | (4) | (3) | (2) | (1) |
| 5.1 | Company bidding experience                                   |     |     |     |     |     |
| 5.2 | Client bidding requirements                                  |     |     |     |     |     |
| 5.3 | Bidding price                                                |     |     |     |     |     |
| 6   | Marketing related factors                                    | (5) | (4) | (3) | (2) | (1) |
| 6.1 | Market price fluctuation                                     |     |     |     |     |     |
| 6.2 | Costing experience                                           |     |     |     |     |     |
| 6.3 | Ability to collect market information                        |     |     |     |     |     |
| 6.4 | Availability of product information                          |     |     |     |     |     |
| 7   | Technology and innovation related factors                    | (5) | (4) | (3) | (2) | (1) |
| 7.1 | Utilizing construction software's                            |     |     |     |     |     |
| 7.2 | Availability of latest construction machineries              |     |     |     |     |     |
| 7.3 | Attitude of the firm to technology                           |     |     |     |     |     |
| 8   | Technical related factors                                    | (5) | (4) | (3) | (2) | (1) |
| 8.1 | Project type                                                 |     |     |     |     |     |
| 8.2 | General and Specific experience of contractor                |     |     |     |     |     |
| 8.3 | Availability of materials confirming contract specifications |     |     |     |     |     |
| 8.4 | Ability of estimating of quantities                          |     |     |     |     |     |
| 8.5 | Availability of technically skilled workers                  |     |     |     |     |     |
| 9   | Environmental related factors                                | (5) | (4) | (3) | (2) | (1) |
| 9.1 | Regulatory and legal restriction                             |     |     |     |     |     |

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|      |                                           |     |     |     |     |     |
|------|-------------------------------------------|-----|-----|-----|-----|-----|
| 9.2  | Knowledge of local construction laws      |     |     |     |     |     |
| 9.3  | Political stability                       |     |     |     |     |     |
| 10   | Company image and reputation              | (5) | (4) | (3) | (2) | (1) |
| 10.1 | Company past-history                      |     |     |     |     |     |
| 10.2 | Previous performance on Projects          |     |     |     |     |     |
| 10.3 | Type and number of environmental services |     |     |     |     |     |

**B) Mechanisms of improving competitiveness of indigenous contractors**

5= Highly necessary, 4=Necessary, 3=Moderate, 2=Low necessary, 1=Un- necessary.

Also, please indicate and add if any mechanism which is not identified in the table.

NB: dear respondents, while you are filling the questionnaire, do not forget that all the improving mechanisms and related questions are regarding contractor's (local contractors' perspective).

| Sn. | List of possible mechanisms that help to improve the competitiveness of local contractors<br>(Please rate these mechanisms based on their degree of impact to improve competitiveness) | (5) | (4) | (3) | (2) | (1) |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|
|     | For illustration                                                                                                                                                                       |     | x   |     | x   |     |
|     |                                                                                                                                                                                        |     |     | x   |     |     |
|     | <b>Competitiveness improving mechanisms rating scales</b>                                                                                                                              | (5) | (4) | (3) | (2) | (1) |
| 1   | Subdividing construction contracts into small value packages                                                                                                                           |     |     |     |     |     |
| 2   | Utilizing joint venture approach                                                                                                                                                       |     |     |     |     |     |
| 3   | Investing on applied research                                                                                                                                                          |     |     |     |     |     |
| 4   | Well-defined work plan                                                                                                                                                                 |     |     |     |     |     |
| 5   | Utilizing foreign contractors best practice                                                                                                                                            |     |     |     |     |     |
| 6   | Practicing well-established communication chain                                                                                                                                        |     |     |     |     |     |
| 7   | Workers freedom of decision on their responsibility                                                                                                                                    |     |     |     |     |     |
| 8   | On-time payment to sub-contractors'                                                                                                                                                    |     |     |     |     |     |
| 9   | Efficient use of advance payment for projects on hand                                                                                                                                  |     |     |     |     |     |
| 10  | Adequate gov't support on finance& formulating suitable policy                                                                                                                         |     |     |     |     |     |
| 11  | Adopting latest technology                                                                                                                                                             |     |     |     |     |     |
| 12  | Identify & respond to customer needs and expectations                                                                                                                                  |     |     |     |     |     |
| 13  | Strong marketing strategy                                                                                                                                                              |     |     |     |     |     |
| 14  | Implementing a quality management system                                                                                                                                               |     |     |     |     |     |
| 15  | Assigning competent project manager                                                                                                                                                    |     |     |     |     |     |
| 16  | adequate funding & resources                                                                                                                                                           |     |     |     |     |     |
| 17  | Resource control system                                                                                                                                                                |     |     |     |     |     |

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|    |                                                                                 |  |  |  |  |  |
|----|---------------------------------------------------------------------------------|--|--|--|--|--|
| 18 | construction information                                                        |  |  |  |  |  |
| 19 | Clear communication among stakeholders                                          |  |  |  |  |  |
| 19 | Cooperation in decisions and problem-solving                                    |  |  |  |  |  |
| 20 | Providing suitable organization structure                                       |  |  |  |  |  |
| 21 | Establish price information system of construction labor, materials, and plants |  |  |  |  |  |
| 22 | Continuous capacity building                                                    |  |  |  |  |  |

### Appendix-C

Type and number of projects used for case study presentation

| Project name        | Project-I                                        | Project-II                                                            | Project-III                               | Project-IV                              | Project-V                                | Project-VI                                                     |
|---------------------|--------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------|-----------------------------------------|------------------------------------------|----------------------------------------------------------------|
| Location            | Northern Shewa Zone of Oromia and Amhara Regions | Amhara and Tigray Regional States in the northern part of the country | Tigray and Amhara National Regional State | Southern Tigray National regional state | Amhara and Tigray Regional States        | Southern Nations and Nationalities and People's Regional State |
| Length              | 59.437km                                         | 70.66km                                                               | 118.46km                                  | 84.67km                                 | 68.284km                                 | 63.35km                                                        |
| Project type        | Upgrading                                        | Upgrading                                                             | New                                       | Upgrading                               | Upgrading                                | New                                                            |
| Tender type         | ICB                                              | ICB                                                                   | ICB                                       | ICB                                     | ICB                                      | ICB                                                            |
| Delivery type       | DBB                                              | DBB                                                                   | DBB                                       | DBB                                     | DBB                                      | DB                                                             |
| Contract type       | Ad-measurement                                   | Re-measurement (Contract unit item rate)                              | Time based contract                       | Measurement with fixed unit price       | Re-measurement (Contract unit item rate) | Design and build contract                                      |
| Project financer    | GoE                                              | GoE                                                                   | GoE                                       | GoE                                     | GoE                                      | GoE                                                            |
| Commencement date   | July 01, 2010                                    | Oct. 01, 2009                                                         | Dec. 24, 2013                             | Sept. 10, 2011                          | October 10, 2009                         | Aug. 31, 2017                                                  |
| Contract period     | 1095                                             | 1096                                                                  | 1096                                      | 1095                                    | 1096                                     | 1095                                                           |
| Original comp. date | May 30, 2013                                     | Sept. 30, 2012                                                        | Dec. 25, 2016                             | Aug. 30, 2014                           | Sept. 30, 2012                           | Aug. 31, 2020                                                  |

An Assessment on the Competitiveness of Indigenous Contractor's in Road Construction Projects (The Case of Federal Roads)

|                                |                |                |                  |                  |                  |                |
|--------------------------------|----------------|----------------|------------------|------------------|------------------|----------------|
| <b>Actual completion date</b>  | May 4, 2016    | March 23, 2015 | July 25, 2016    | March 13, 2015   | Nov. 24, 2014    | 56.9%          |
| <b>Days of delay</b>           | 1141           | 1268           | 180              | 356              | 425              | 2.95%          |
| <b>Original contract price</b> | 513,451,675.98 | 912,631,312.54 | 1,607,687,055.79 | 777,078,942.38   | 747,432,284.82   | 897,005,974.61 |
| <b>Actual project cost</b>     | 649,125,668.09 | 1,073,036,179  | 1,639,715,986.40 | 1,031,826,520.30 | 1,083,910,769.19 | 483,108,137.91 |
| <b>Cost overrun</b>            | 135,673,992.1  | 160,404,866.77 | 32,028,931       | 254,747,577.7    | 336,478,484.2    | 249,821.80     |

## Appendix-D

### Research Validation Guideline

#### Part-I: Guidelines and participated experts for validation

In qualitative research, validity can be checked by a technique known as respondent validation. This technique involves testing initial results with participants to see if they still ring true. Validity is also a means of actively seek alternative explanations to what appear to be research results. If the researcher is able to exclude other scenarios, he is or she is able to strengthen the validity of the findings.

**Objective:** To critically testing the research findings (results) with participant experts in the sector to see if still ring true

#### Criteria for expert selection

For identifying and selecting best experienced experts in the sector, the following criteria has been applied.

- a) Educational background
- b) Experience in the sector
- c) Familiarity in the topic
- d) Ability to speak out as expected
- e) Genuine interest in the case
- f) Respect for the research purpose

Based on the above criteria's, the following key experts were selected and interview. They clearly comment the research findings and forwarded their opinions.

| Sn. | Experts name  | Year of experience | Organization                     | Position                                            |
|-----|---------------|--------------------|----------------------------------|-----------------------------------------------------|
| 1   | Participant-1 | 16                 | Gemshu beyene Construction       | Engineering department head                         |
| 2   | Participant-2 | 21                 | Ethio infra Engineering          | Owner & General manager                             |
| 3   | Participant-3 | 11                 | Sunshine Construction            | Contract Administration head                        |
| 4   | Participant-4 | 24                 | Ethiopian Contractor Association | President of CAE                                    |
| 5   | Participant-5 | 13                 | Ethiopian Roads Authority        | East Region directorate director                    |
| 6   | Participant-6 | 10                 | Ministry of construction         | Construction Capacity building directorate director |
| 7   | Participant-7 | 9                  | Sunshine Construction            | Contract Leader                                     |
| 8   | Participant-8 | 12                 | Ethiopian Roads Authority        | West Region Directorate Director                    |
| 9   | Participant-9 | 13                 | AAU, EiABC, CoTM                 | CM Chair Holder and Lecturer                        |

## Part-II: Sample of the validation question and responses

### A study on assessing the competitiveness of indigenous contractor firms in road construction projects (a case of federal roads)

Good Morning, Good afternoon, Mr. ☒ Mrs. ☐ Eng. ☐ PhD ☐.

Thank you for your support and giving me your time with in a tight schedule. The purpose of this interview is for the sake of validating my research findings based on your opinions. Therefore, be sure that your valuable opinion only used for validation purpose only

Experts Name: G. A  
Company/Institution/: Ethiopian Roads Authority (ERA)  
Position in the company/organization/ East Region Directorate, Directorate  
Year of experience in the sector: 13 year

#### Research Title: A study on assessing the competitiveness of indigenous contractor firms in road construction projects (a case of federal roads)

The main objective of this research is to assess the competitiveness of indigenous contractor firms, to identify factors affecting competitiveness, and to provide competitiveness improvement mechanism for the case of Federal Road projects.

##### A) Specific objectives

1. To assess the competitiveness extent of indigenous contractor firms
2. To identify the factors that affect the competitiveness of indigenous contractors
3. To find out mechanisms that helps to improve the competitiveness of indigenous contractor firms for federal road projects

##### B) Research questions

1. To what extent does the competitiveness of indigenous contractor firms is found?
2. What are the factors that affect the competitiveness of indigenous contractor firms?
3. What are the mechanisms that helps to improve the competitiveness of indigenous contractor firms on federal roads?

#### Major findings regarding the particular objectives

**Objective-1:** To assess the competitiveness extent of indigenous contractor firms

- Generally, the average extent of competitiveness of local contractors measured by the value of projects signed for the three consecutive operation years is 46.33%.

#### Comments and Suggestions

① We have invested more than 300 Billion ETB for the last five years but we could not have a competent contractor locally. This indicates the degree of extent of competitiveness of local contractors is below this percentage (46.33%). we should do more. if the Govt can't take an urgent action soon, be sure all local contractors will be disappeared from the market.

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the market.

- Reputation building
- Management
- Ethical work habit.

Swiftly of the local law

# An Assessment on the Competitiveness of Indigenous Contractor's in Road Construction Projects (The Case of Federal Roads)

## A study on assessing the competitiveness of indigenous contractor firms in road construction projects (a case of federal roads)

**Objective-2:** To identify the factors that affect the competitiveness of indigenous contractors

**Major factors identified that affects the competitiveness of indigenous contractor firms**

| Sn. | Major factors identified            |
|-----|-------------------------------------|
| 1   | Annual turn-over ✓                  |
| 2   | Experience ✓                        |
| 3   | Cash flow management ✓              |
| 4   | Shortage of finance ✓               |
| 5   | Time planning and management ✓      |
| 6   | Capacity of human resource ✓        |
| 7   | Plant and equipment ✓               |
| 8   | Price increment (current) ✓         |
| 9   | Crew productivity (depend on HR) ✓  |
| 10  | Project scope ✓                     |
| 11  | Inappropriate price offer (still) ✓ |
| 12  | Material availability ✓             |

The contractor and equally responsible as equal or a contractor. No need of additional for for any defects most responsible firms should be liable.

Management about it

### Comments and Suggestions

- ① The Government policy is not suitable, poor commitment and bad contractor attitude.
- ② Poor planning and resource mobilization system
- ③ forgetful with the are commit as a contractor
- ④ poor practice of HR and resource administration system
- ⑤ Currency devaluation & price fluctuation
- ⑥ CRA retirement, contractors have no real vision to be utilized, no real plan and shortage of big and consistent local equipment ready companies
- ⑦ poor government capacity, shortage of bank's expertise, foreign banks (for foreign currency).
- ⑧ Shortage of in-depth investigation of problems and poor resource & cash-flow management system.
- ⑨ weak internal system, poor implementation of procurement law, weak habit of procurement entity, unfair distribution of information from procurement entity to the contractors.

⑩ Political interference, foreign currency devaluation,

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- ① delay of payment and inappropriate and fragmented administrative system of government.
- ② Absence of contractor status and performance rating system
- ③ Absence of comparable penalty rules, firms make mistake
- ④ Generous, bad/unethical attitude of contractor

# An Assessment on the Competitiveness of Indigenous Contractor's in Road Construction Projects (The Case of Federal Roads)

① The main thing is, All the contractors should be well disposed and care about their image & reputation.  
A study on assessing the competitiveness of indigenous contractor firms in road construction projects (a case of federal roads)

**Objective-3:** To find out mechanisms that helps to improve the competitiveness of indigenous contractor firms

The mechanisms of improving competitiveness of indigenous contractors

| Sn. | Mechanisms that helps to improve competitiveness of indigenous contractor firms |
|-----|---------------------------------------------------------------------------------|
| 1 + | Continuous capacity building ✓                                                  |
| 2 * | Suitable government policy ✓                                                    |
| 3 * | Adequate funding ✓                                                              |
| 4 * | Efficient use of advance payment ✓                                              |
| 5   | Well-defined work plan +                                                        |
| 6   | Utilizing joint venture approach +                                              |
| 7   | Utilizing latest technology +                                                   |
| 8   | Competent project manager ✓                                                     |
| 9   | Utilizing foreign firms' best practice ✓                                        |

① Approval Indigenous mode thought (Attitude building) program on central forum

① Reputation Building.

## Comments and Suggestions

- ① The first and foremost thing is, the attitude of contractors should be changed. Also, the government should adjust and revise the policy.
- ① Utilize integrated data base system, utilize equal and fair information from previous contract. Ethical procurement system, efficient strategy, Utilize sub contract approach to prepare Contractors, Contractor ready assess.
- ① critical control and financing by EPA, and consultant must be ethical risk factor.
- ① Give amount for Tender/Participate / award / the second lot to those have first lot.
- ① Clear communication among state holders. Rapid identification and current contract & status investigation.
- ① Apply good risk identification practice, firms should care about their image & reputation.

Thank you!

- ① Utilize adequate training for capacity building.
- ① conduct research to resolve contractor

Zemenu Mersha (Researcher)  
August, 2020  
Addis Ababa, Ethiopia

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- problem
- ① provide efficient frame and management system
  - ① the contractors should clearly understand and investigate the contract document and rules.