ANALYSING THE EFFECTIVENESS OF THE LOWEST EVALUATED TENDER AWARD SYSTEM IN ROAD CONSTRUCTION: A CASE STUDY OF ROADS AUTHORITY (MALAWI)

MSC (INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT) THESIS

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MSc (Infrastructure Development and Management) Dissertation

By

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Submitted to the Department of Mechanical Engineering, Faculty of Engineering, The Malawi Polytechnic, University of Malawi, in partial fulfilment of the requirements for the degree of Master of Science in Infrastructure Development and Management.

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DECLARATION

I **Derick Suzgo Manda** declare that this thesis is my own original work. Where other sources of information have been used, they have been acknowledged. I hereby certify that this work has not been submitted before in part or full for any other degree or examination.

SIGNATURE :

DATE :

CERTIFICATE OF APPROVAL

We, the undersigned, certify/recommend for acceptance by the University of Malawi thesis entitled: Analysing the effectiveness of the lowest evaluated tender award system in road construction: A case study of Roads Authority.

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DEDICATION

I dedicate this work to my late father Mr. Mackon Zebedea Manda and Mama Tafwakose Nkhata for being around for me, my wife and children.

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First and foremost, I would like to thank God for his mercies in allowing me to undertake the study.

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ABSTRACT

The aim of the study was to analyse the effectiveness of the lowest evaluated tender award system in road construction, a case study of Roads Authority of Malawi. This was important because the procurement function helps in selection of service providers, hence needs to be given ultimate attention. Literature review highlighted many challenges from this system that have led other countries and organisations to start using alternative methods in order to realise value for money. The methodology used included an extensive literature review and a field survey conducted on Roads Authority, contractors and consultants. The research used a questionnaire for data collection and the respondents were identified randomly. Data was analysed using descriptive statistics, cross tabulation and content analysis through SPSS and Microsoft Excel software.

The main findings were that the advantages of the method included promotion of competition and ensuring transparency during tendering while there were many disadvantages including unreasonably low bids, contractors struggling to fund projects, poor quality of works, time overruns and adversarial relationships between project parties. The disadvantages result in project objectives not being achieved and inhibiting contractors' growth. Professionals in the industry prefer a lowest evaluated bid system whose price is evaluated against an engineers' estimate. The implication of the findings is that unless price is evaluated against an engineers' estimate or other responsive bids, the construction industry will continue to suffer under this method.

The study recommends that clients should ensure that price is evaluated and that they should procure for value rather than price. In addition, clients should invest in research and lobby for amendment of procurement laws to allow for use of other contractor selection methods. On the other hand, contractors should price according to market prices.

By establishing that lowest evaluated tender method enhances the integrity of the procurement process, negatively affects the project implementation stage, and does not promote contractors' growth in Malawi, the research has contributed to the enhancement of understanding of this subject.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

ADB	:	Asian Development Bank
AfDB	:	African Development Bank
APM	:	Association for Project Management
BS	:	British Standard
CIOB	:	Chartered Institute of Building
CIPS	:	Chartered Institute of Procurement and Supply
CNC	:	Commission Nacional De La Competancia
CSPro	:	Census and Survey Processing System
EBRD	:	European Bank for Reconstruction and Development
EMAT	:	Economically Most Advantageous Tender
EU	:	European Union
GDP	:	Gross Domestic Product
JICA	:	Japan International Cooperation Agency
LETAS	:	Lowest Evaluated Tender Award System
MABCATA	:	Malawi Building and Civil Engineering Contractors and Allied Trades Association
MAT	:	Most Advantageous Tender
MEAT	:	Most Economically Advantageous Tender
MGPPR 2004	:	Malawi Government Public Procurement Regulations of 2004
MW	:	Malawi
NCIC	:	National Construction Industry Council
NRA	:	National Roads Authority
OECD	:	Organisation for Economic Cooperation and Development
ODPP	:	Office of the Director of Public Procurement
PERT	:	Project Evaluation and Review Technique
PIPS	:	Performance Information Procurement System
PPA 2003	:	Public Procurement Act 2003 of Malawi
PPDA 2005	:	Public Procurement and Disposal Act 2005 of Kenya
PPP	:	Public Private Partnership

RA	:	Roads Authority
RAA 2006	:	Roads Authority Act 2006 of Malawi
RFA	:	Road Fund Administration
UNDP	:	United Nations Development Programme

CHAPTER 1
INTRODUCTION

1.1 Background

The construction industry is important as it contributes significantly to the economic growth of Malawi. The industry contributes up to 5.3 percent gross domestic product (GDP) (African Development Bank [AfDB], Organisation for Economic Cooperation and Development [OECD], United Nations Development Programme [UNDP], 2014). Infrastructure contributes about 1.2 percent points to annual per capita growth of Malawi (Vivien & Maria, 2010). Other studies argue that it contributes about 10 percent of the GDP of the country's economy (Chilipunde, 2010). However, the industry faces many challenges including poor performance in respect of cost, time and quality at project implementation stage (Roads Authority, 2012).

While there are many contributing factors to the challenges stated above including delayed payments by clients, lack of ethics, shortage of skilled labour and construction plant, inadequate supervision, lack of access to credit facilities and poor or no quality management systems (Chilipunde, 2010; Kamanga & Wynand, 2013); the lowest evaluated tender award system (LETAS) of selecting contractors contributes to this problem (Emuze & Kadangwe, 2013). In this regard, Khan and Khan (2015) posited that improvements in the procurement process would be in the interest of both the construction sector and the general public.

Although there are many systems for selecting contractors, most public entities use LETAS (Shreshtha, 2014; World Bank, 2014). The system is preferred because of its perceived advantages which include promoting good governance, lowest cost of completing projects and being legally acceptable (Puri & Tiwari, 2014; Shreshtha, 2014). However, the performance of contractors selected under this system has mostly been poor leading to multiple problems for example overruns in time and cost and poor quality products leading to adversarial relationship between contractors, consultants and clients (Huang, 2011; Kashiwagi , Parmar & Savicky, 2004).

In Malawi, the selection of contractors for public projects is regulated by *Public Procurement Act 2003* (MW) which emphasises on the use of LETAS except for special cases like emergency

situations. The method has resulted in a myriad of challenges among them cases of abandoned projects, poor quality works and general public discontentment with public institutions. While the challenges could be attributed to many factors, Albano, Bianchi, and Spagnolo (2006) opined that these are sometimes blamed on the method of contractor selection. The Roads Authority of Malawi (RA), which was the case study for this research conducts its procurement in line with *Public Procurement Act 2003* (MW), therefore, using LETAS.

Public Procurement Act 2003 (MW) recommends use of LETAS for all public procurement unless approved otherwise by the Office of Director of Public Procurement (ODPP). This has led to many challenges during project implementation stage. The ODPP is mandated by *Public Procurement Act 2003* (MW) to propose improvements in public procurement in Malawi which can only be done if assessments are done on performance of the current system.

The public road network is generally poor (Roads Authority, 2011) while many stakeholders are investing in the sector. Government and development partners pump a lot of resources to improve the situation. The government has further shown big intentions for the sector by putting in place institutional and legal framework to manage the road network. Roads Authority and Road Fund Administration work in tandem with other legal frameworks like *Public Procurement Act 2003* (MW) and *Corrupt Practices Act* 1995 (MW). Further to that, road projects continue to have overruns in cost and time and finish with poor quality (Emuze & Kadangwe, 2013).

Despite many authors attributing the problems to factors like scarcity of construction plant, delayed payments by clients, lack of skilled and trained personnel (Emuze & Kadangwe, 2013; Kamanga & Wynand, 2013), few have taken interest in linking this to contractor selection. However, Enshassi *et al*. (2013) conclude that the problems are also a result of the lowest evaluated method of contractor selection. The research opines that problems of failing to satisfy project objectives of time, cost and quality in Malawi could also be related to the contractor selection method (in this case, LETAS). For this reason, an analysis of LETAS in Malawi is pertinent. It is against this background that the research analysed the performance of LETAS in the Malawi construction industry.

1.2 Statement of the problem

Public Procurement Act 2003 (MW) mandates the use of LETAS in public procurement. However, there have been many challenges at project implementation stage when this system is used as compared to other systems like average bid, project evaluation and review technique (PERT) and multi criteria method (Albano *et al*., 2006; Hatush & Skitmore, 1998; Kashiwagi *et al*., 2004). The challenges results in many undesirable effects like termination of contracts and retendering, time and cost overruns, adversarial relationships between clients and contractors, abandonment of projects and unrealistically low tenders (Huang, 2011; Kashiwagi *et al*., 2004).

The challenge is compounded because alternative systems of selecting contractors may not be used in Malawi because of the restriction in *Public Procurement Act 2003* (MW), and lack of knowledge and merits of other systems (Enshassi, Mohamed, & Zuhair, 2013). The restriction forces public clients to use LETAS despite the challenges at project implementation stage.

1.3 Overall objective of the study

The main aim of the study was to analyse the effectiveness of LETAS in construction projects. To this end, the study set out to produce three outputs namely: an explanatory account of the pros and cons of the system, an explanatory account of the performance of projects awarded under this system and finally the preferred method of contractor selection by professionals in the sector. Thus the following specific objectives were identified.

1.3.1 Specific objectives of the study

The specific objectives of the study were to:

- Analyse the pros of the lowest evaluated tender award system in Malawi,
- Analyse the disadvantages of the lowest evaluated tender award system in Malawi,
- Assess the performance of projects awarded based on lowest evaluated tender award system in Malawi, and
- Investigate the preferred system of contractor selection by professionals in the construction industry in Malawi.

1.3.2 Research questions

The research specifically attempted to answer the following questions:

- What are the pros of the lowest evaluated tender award system in Malawi?
- What are the disadvantages of lowest evaluated tender award system in Malawi?
- What is the performance of projects awarded based on the lowest evaluated tender award system in Malawi?
- What is the preferred system of contractor selection by professionals in the construction sector in Malawi?

1.4 Significance of the study

The procurement function is very important in infrastructure development as it ensures selection of suitable service providers. The study unearthed implications of using the traditional LETAS in Malawi and made practical recommendations on how to improve contractor selection to improve performance at project implementation stage.

The study would, therefore, help in informing policy on public procurement particularly on methods of procuring works contractors by offering an in depth analysis of the current method and alternative systems used elsewhere. It would also add to the body of knowledge on the subject on issues peculiar to the Malawian construction industry.

1.5 Scope of the study

The study focussed on Roads Authority, particularly projects implemented in a period of four financial years (2013-2017). Roads Authority staff, contractors and consultants formed the main group of respondents. These helped in providing information on the pros and disadvantages of LETAS, performance of contractors under this system and on alternative methods of contractor selection. In addition, data on performance of projects under the system was restricted to RA consultants' reports for contracts executed in the said financial years. Interpretation and application of the results is therefore, based on these aspects.

1.6 Organisation of the dissertation

The report is divided into five parts as shown in the following section. Chapter one is the introduction which has provided background information and has stated the research problem, aim and specific objectives of the study. In addition, it presented the research questions and finally gives an outline of the report.

Chapter two is the literature review that highlights variables underpinning this area of research. It introduces RA and ODPP and discusses lowest evaluated tender award system of selecting contractors by exploring its pros and cons, assessing performance of contractors selected under this system and its current usage. The review further highlights alternative contractor selection methods, current trends in different countries and organisations, and links procurement management with project implementation management.

Chapter three (methodology) discusses methods employed in the study focusing on the philosophy underpinning the study, data collection and analysis techniques, issues of validity and reliability and ethical considerations. The theory behind these choices is also presented.

Chapter four (results, analysis and interpretation) presents and systematically analyses the data from the research and is structured around the four objectives. The section thus analyses the pros and cons of LETAS, performance of projects under this system and preferred method of contractor selection. The analysis has also included possible methods of improving contractor selection.

Chapter five (summary, conclusions and recommendations) summarises findings from the study, makes conclusions and finally offers recommendations on the subject matter for future action. It has also offered direction for future research and gives a conclusion of the whole research process.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

The LETAS of selecting contractors is widely used in the public sector in Malawian in line with *Public Procurement Act 2003* (MW). While it promotes good governance in the procurement of works, the method is losing its popularity amongst professionals in the construction sector because of many negative effects (Enshassi *et al*., 2013). Clients do not get value for money and contractors complain of minimal or no profits from contracts (Khan & Khan, 2015). Professionals in the construction sector feel that contractors selected under this system do not fulfil critical project success factors of cost, time and quality (Hatush & Skitmore, 1998).

The literature review as guided by the relevance tree / conceptual framework (Saunders, Lewis, & Thornhill, 2009) in figure 2.1, therefore, places the study in context of available knowledge.

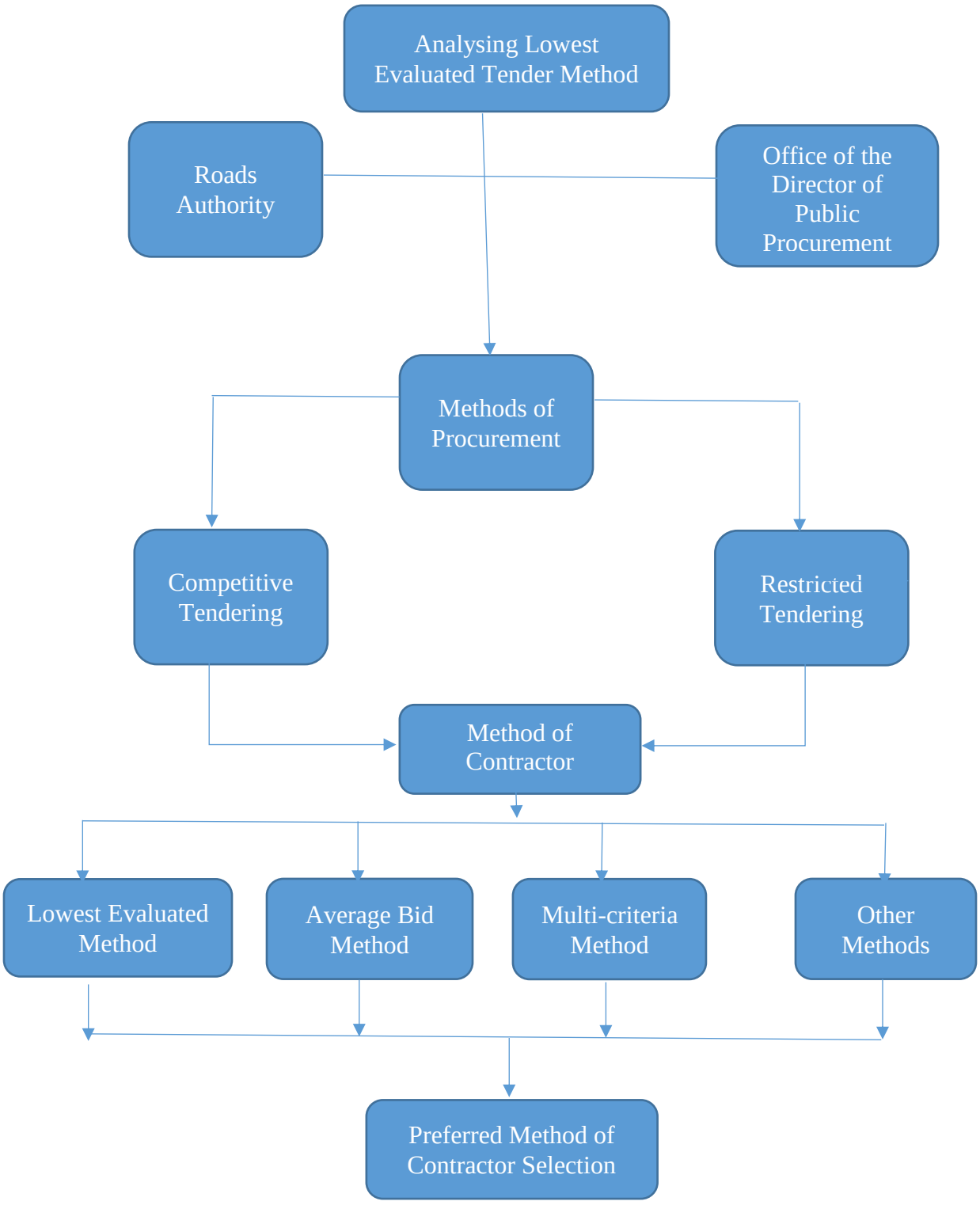

Figure 2.1 - Relevance tree for literature review

2.2 Roads Authority (RA)

The RA was established by the *Roads Authority Act 2006* (MW) to ensure that public roads are constructed, maintained and rehabilitated at all times and to advise the minister responsible for transport (and local government) on the preparation, efficient and effective implementation of the annual national roads programme according to *Roads Authority Act 2006* (MW). This came after implementation of reforms to split National Roads Authority (NRA) into RA and Road Fund Administration (RFA).

The RA consists of three functional departments namely planning and design, construction, and maintenance which are supported by the finance, administration and human resource department (Roads Authority, 2012). There is also a procurement section which coordinates all procurement activities for the authority. To implement its mandate, RA employs consultants and contractors to provide different services according to *Roads Authority Act 2006* (MW). The procurement process for works and service contracts is guided by *Public Procurement Act 2003* (MW) and NRA operations manual (Roads Authority, 2005).

The public road network is generally poor (Roads Authority, 2011) although many stakeholders are investing in the sector. Government and Development partners pump a lot of money into the roads sector to improve the situation. The government has further shown big interest for the sector by creating legal entities (RA and RFA) to manage the road network. These work in tandem with other legal frameworks like *Public Procurement Act 2003* (MW) and *Corrupt Practices Act 1995* (MW). The road network, however, remains poor suggesting that there is a problem. Further to that, road projects continue to have cost and time overruns and finish with poor quality (Emuze & Kadangwe, 2013; Kamanga & Wynand, 2013).

Emuze and Kadangwe (2013), Kamanga and Wynand (2013), and Roads Authority (2010) attribute the poor road network to many factors for example scarcity of construction plant, delayed payments by clients, lack of skilled and trained personnel but have not taken interest in linking contractor selection methods with achievement of project objectives in Malawi. However, others (Enshassi *et al*., 2013; Khan & Khan, 2015; Shreshtha, 2014) conclude that the problems are also a result of the lowest evaluated system of contractor selection.

2.3 Office of Director of Public Procurement

Public procurement in Malawi is regulated by *Public Procurement Act 2003* (MW) and Malawi Government Public Procurement Regulations of 2004 (MGPPR 2004). The *Public Procurement Act 2003* (MW) provides for the principles and procedures to be applied in, and to regulate, the public procurement of goods, works and services and provides for the establishment of ODPP as the main authority responsible for monitoring and oversight of public procurement activities, and for development of related regulatory and legal framework, and professional capacity of public procurement.

The *Public Procurement Act 2003* (MW) directs that public entities should use open competitive tendering and award works contracts to lowest evaluated bidders for all normal procurement. However, the system allows use of other methods like restricted tendering in special circumstances. It should be noted that in their (ODPP) interpretation, price is not evaluated.

The *Public Procurement Act 2003* (MW) will be replaced by the *Public Procurement and Disposal of Public Assets Act* (MW) 2016 gazetted in August 2017. The major change is the establishment of the Public Procurement and Disposal of Assets Authority replacing ODPP and adding procedures for disposal of public assets (to the procedures for public procurement). However, procedures for public procurement remain unchanged.

2.3.1 Lowest evaluated bid versus lowest bid

The lowest evaluated bid may be described as "the lowest bid that meets requirements set forth in the bid proposal" (Dictionary of Construction Online, 2017). This is in line with MGPPR 2004 clause 79 (b) and *Public Procurement Act 2003* (MW) clause 31 (18). On the other hand, lowest bid can be described as the lowest bid at tender opening without undergoing any form of evaluation.

It should, however, be noted that including criteria as stipulated in section 2.5.1 (lowest evaluated tender); client institutions need to evaluate the bid price. This is because some bidders submit unrealistically low bids which negatively affect the implementation stage. MGPPR 2004 clause 52 provide for a mechanism to check against this malpractice. For checking of bid price to be possible,

clients need to have realistic estimates for each tender or use other checks and balances. These include comparing the lowest bid to engineers' estimates or other substantially responsive bids, and whether the price can be explained by the technical solution chosen (World Bank, 2016).

2.4 Methods of procurement

The methods of procurement include competitive and non-competitive ones according to *Public Procurement Act 2003* (MW). Competitive methods have an element of competition from bidders whereas the non-competitive ones do not.

Competitive tendering is recommended for most public and donor funded projects (Arrowsmith, Treumer, Fejo, & Jiang, 2011; World Bank, 1998) with a view of enhancing transparency, competition and equal treatment of bidders. Non-competitive methods and other forms of competitive tendering may be used for reasons including national defence, emergency situations, specialist goods and services, and continuation of an existing contract according to *Public Procurement and Disposal Act 2005 (Kenya).*

2.4.1 Competitive tendering

Competitive tendering may be defined as a

> *"…transparent procurement method in which bids from competing contractors, suppliers, or vendors are invited by openly advertising the scope, specifications, and terms and conditions of the proposed contract as well as the criteria by which the bids will be evaluated" (Business Dictionary Online, 2017*).

Similarly, this is defined as a "general process where a company acquires goods or services by extending to suppliers an invitation to tender a proposal and that in general, the tender with the lowest price wins the order" (The Black's Law Dictionary Online, 2017). Other factors related to quality, shipping, timeliness, and efficiency, may also be considered. These definitions are in tandem with principles of *Public Procurement Act 2003* (MW).

The method is encouraged because it promotes competition and therefore brings down pre-contract prices (Chinyio, 2011). However, some contractors quote abnormally low prices just to win contracts and later struggle to perform (Megremis, 2014). Adedokun, Ibironke, & Babatunde (2013) observed that construction projects procured under this method are prone to financial, political and logistical risks. The risks could be because contractors would do anything possible including falsifying qualification information and unrealistically lowering bid prices to win a contract. Similarly, projects procured under this system suffer cost and time overruns, and poor quality works (Favie, Mass & Abdalla, 2009). These challenges are further discussed in the next section. Competitive bidding may be open or restricted depending on the circumstances.

2.4.1.1 Open competitive tendering

Open competitive tendering can be defined as a method of procurement in which any interested supplier may submit a tender (Arrowsmith *et al*., 2011) and is the recommended method for most public institutions. This method has many advantages including fairness, transparency, accountability of the procurement process and low bid prices (OECD, 2011). However, the method exposes clients to many risks (Kashiwagi *et al*., 2004; Shreshta, 2014) including time and cost overruns and poor quality works. In addition, Chinyio (2011) found that many bidders participate which results in high transaction costs and increases chances of awarding contracts to unrealistically low bidders.

2.4.1.2 Restricted competitive tendering

Chartered Institute of Building (2009) (CIOB, 2009) defines selective tendering as 'a method of selecting tenderers and obtaining tenders whereby a limited number of economic operators are invited to tender". The tender list is made up of shortlisted bidders identified through a prequalification process. This could happen for reasons including national defence and if services are available from a limited number of suppliers according to *Public Procurement Act 2003* (MW).

Competitive restricted tendering is considered an accountable process because of the competition (Kwakye, 1994). In addition, clients can justify the shortlist of contractors through a prequalification process report. This method reduces risks posed by open tendering method

(Smith, Merna, & Jobling, 2009) possibly because the shortlisted contractors would be those that have a proven performance history.

Despite these advantages, some shortlisted bidders may submit cover bids or collude with others (Ofori, 1990) resulting in higher bid prices. To counter this, Ofori (1990) suggests that clients should assure shortlisted bidders that they would not be blacklisted if they do not participate in the process. They would then refrain from submitting bids unlike submitting cosmetic ones. In addition, OECD (2011) recommends designing tender systems that maximize participation of genuine competitors, and those that effectively reduce communication between bidders.

2.4.2 Non-competitive tendering (Single sourcing)

Non-competitive tendering occurs when there is no competition involved in the procurement process, for example single sourcing of a service provider. This system is allowed within certain financial thresholds, if one supplier has the technical capacity and when services needed are of an emergency nature according to *Public Procurement Act 2003* (MW). In this method, a client directly negotiates with the targeted contractor (Cunningham, 2015).

This method has advantages of a quick start to works, contractors' early involvement and a chance to get reputable contractors (Cartlidge, 2009). In addition, expectations of smooth project implementation are high as all contract aspects are pre-negotiated before signing a contract which improves the relationship between project parties (Cartlidge, 2009). On the other hand, this method leads to higher contract prices because there is no competition (Cunningham, 2015). This is because contractors charge very high rates as a basis for negotiation and even the agreed negotiated rates are usually above average market rates. Furthermore, for public clients, the process is deemed not transparent and accountable.

2.4.3 Serial (Continuity) tendering

Griffith, Knight, and King (2003) define serial tendering as a method used when one tender serves as a basis for subsequent tenders by the same contractor. It could thus be a combination of competitive and negotiated tendering methods. This method has advantages of continuity, and minimisation of tendering and establishment costs (Chinyio, 2011; Cunningham, 2015). This is

because the client avoids going through normal tendering and the contractor is already established on site, hence continuity. However, the method inhibits competition, resulting in higher contract prices. In addition, the method deprives other economic operators the opportunity to participate in tender processes (Cunningham, 2015).

2.5 Contractor evaluation and selection criteria

Salama *et al*. (2006) assert that selecting a contractor for construction works is a crucial decision made by client institutions. This is because a wrong choice might result in challenges at implementation stage and failure to fulfil client objectives. To reduce the risk, clients devise criteria which they use in procuring contractors. Most governments use specific evaluation and qualification criteria to identify responsive bidders and award contracts to the lowest responsive bidder (Bussink, 2014). However, depending on circumstances, other criteria like average bid price, multi-criteria and quality based selection (Shreshtha, 2014; Wong, Holt, & Harris, 1999) are also used.

There is, thus, price and non-price criteria for selecting contractors. Good procurement practice demands that the criteria be included in tender documents (EBRD, 2011) to allow for competition on fair terms.

2.5.1 Lowest evaluated tender

A lowest evaluated tender may be defined as a responsive tender that offers the lowest price for a job (Dictionary of Construction Online, 2017). Common evaluation criteria used include the following as confirmed in *Public Procurement Act 2003* (MW) and *Public Procurement and Disposal Act 2005 (Kenya)*:

- Legal capacity to enter into a contract,
- Professional and technical qualifications,
- Financial resources,
- Past performance,
- Debarment, and
- Payment of taxes (Hatush and Skitmore, 1998).

The tender evaluation team reviews all bids to check compliance on a pass or fail basis. All responsive bids are checked and corrected for arithmetic errors and the bid with the lowest price is recommended for award of a contract. World Bank recommends that the lowest price should be evaluated against the clients' estimate, other responsive bids or the technical solution offered (World Bank, 2016). The merits and demerits of this system are discussed in subsequent sections.

2.5.1.1 Advantages of lowest evaluated tender method

Meland, Robertsen, and Hannas (2011) report that LETAS is the most widely used method for public construction projects, possibly because procuring entities have to abide by legislation. The method has many advantages including:

- Promotion of transparency in the tender process;
- It ensures lowest cost of completing projects;
- It provides a way to avoid fraud;
- It provides a way to avoid corruption;
- Promotion of competition;
- It is legally acceptable;
- It is easy to use by evaluators;
- It is acceptable by cooperating partners;
- It ensures fairness of the tender process; and
- It provides a way to avoid favouritism.

These could be summarised as advantages related to good governance, economic (financial) and legal aspects (Arrowsmith *et al*., 2011; Lambropoulos, 2013).

i. Transparency of the tender process

Arrowsmith *et al*. (2011) suggested that transparency refers to the idea of openness of the procurement process. The openness is viewed in:

- Publicity for contract opportunities and rules governing each procedure,
- A principle of rule-based decision making, and

- The possibility of verification that rules have been followed and for enforcement where they have not (Arrowsmith *et al*., 2011; United Nations, 2008).

The definition fits well with LETAS.

Shreshtha (2014) argues that LETAS promotes transparency. This is because tenders are advertised publicly with all willing bidders free to participate, evaluation and selection criteria included in tender documents and bidders have a chance of being debriefed on the procurement outcome. Similarly, Lambropoulos (2013) found that the lowest price criteria constitute an objective and transparent approach for contractor selection as compared to other methods. The comparison is because there are higher chances of collusion in alternative methods.

On the other hand, Bussink (2014) found that while LETAS was used more than other methods, the method was deemed to be as transparent as other methods like Most Economical Advantageous Tender (MEAT) and the average bid as they all use principles of open tendering.

ii. Lowest Cost of Completing Projects

The lowest evaluated tender method has the advantage that it ensures the lowest cost of completing a project (Shreshtha, 2014). This is as a result of the competition from bidders which encourages bidders to find better ways of doing the same job, resulting in them lowering prices. This, however, needs a mature industry with bidders that submit realistic rates. Others submit abnormally low rates which are abhorred by both bidders and clients as bidders do not get the desired profits and clients do not get value for money (Megremis, 2014).

Khan and Khan (2015) asserted that this method saves public money, thereby protecting the interest of the general public. This is because other methods like the average bid and multi-criteria award contracts at comparatively higher prices. For this benefit to be real it is assumed that the submitted bids are free, with genuine competition and the integrity of bidders is guaranteed. Similarly, Hardie and Saha (2012) found that LETAS can continue to supply contracts for effective contractors who would lower bid prices just to remain in business.

iii. How to avoid fraud

Public Procurement Act 2003 (MW) defines fraudulent practices as

> ...a misrepresentation of facts in order to influence a procurement process or the execution of a contract, and includes collusive practices among bidders, whether prior to or after bid submission, designed to establish bid prices at artificial, non-competitive levels and to deprive the procuring entity of the benefits of free and open competition.

This could be perpetrated by bidders and or staff within client organizations. Fraud can occur at both pre contract and post contract stages (Delloitte, 2014). Forms of fraud include bid rigging, bid suppression, complementary bidding and bid tailoring (Delloitte, 2014).

A good procurement system should be detect, control and discourage fraud at all stages. Shreshtha (2014) argues that LETAS is universally accepted because it provides a way to avoid fraud. Similarly, Huang (2011) asserts that LETAS protects the public from improper practices including fraud. Unlike other systems where bidders would collude, it is difficult for this to happen on LETAS.

iv. A way to avoid corruption

Public Procurement Act 2003 (MW) defines corrupt practice as the "offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution". Forms of corruption include bribes, embezzlement, conflict of interest and kickbacks (Sohail & Cavil, 2006). Corruption has a huge economic cost to all countries in the world estimated at US$ 2.6 trillion, which is more than 5% of the global GDP (The International Chamber of Commerce, Transparency International, United Nations Global Compact, WEF-PACI, 2008).

Transparency International (2011) asserts that the construction industry is the most corrupt sector in the world with many devastating effects like collapsing of buildings, failure to conclude contracts within budget and time frame, and ghost projects. OECD (2016) confirms that 15% of corruption in OECD countries happens in the construction sector which is second to the extractive

industry at 19%. Nawaz (2012) and Magombo (2016) confirm the existence of corruption in the Malawian construction sector despite there being adequate institutional and regulatory framework.

To reduce corruption, procuring entities should use systems that ensure integrity, are transparent, involve stakeholders, allow access to public procurement contracts, and allow oversight functions (OECD, 2016). In addition, a good procurement system should promote principles of transparency, promotion of competition and use objective decision making criteria (United Nations, 2013). In this regard, LETAS is found to be more favoured to help avoid corruption as compared to other methods (Shreshtha, 2014).

v. Promotion of competition

Commission Nacional De La Competancia, (2011) (CNC, 2011) confirm that competition between bidders provides the means for ensuring that public entities obtain the benefit of the best price offers, quality and innovation of purchased products. They further assert that deficient competition means government will spend more for goods and services they acquire which increases the burden borne by citizens.

It is therefore, prudent to promote competition in public tenders. OECD (2011) and CNC (2011) propose opening up participation, preventing and combating potential collusion, reducing barriers to entry and bidders' participation, reducing bid preparation costs and capacity building of procurement staff to promote competition. Shreshtha (2014) asserts that LETAS promotes competition among bidders compared to other methods. The assumption is that with the open process, competition would be maximised. Other methods like average bid, restricted tendering and MEAT approaches also have an element of competition but they increase chances of collusion (Albano *et al*., 2006).

vi. Legal acceptance

All public procurement needs to be conducted within certain principles, procedures and legislation (Arrowsmith *et al*., 2011). In Malawi this is guided by *Public Procurement Act 2003* (MW). There are also block regulations where apart from national legislation, member states also abide by block rules (EU & OECD, 2011). LETAS is recommended in most countries because it promotes

accountability, integrity, transparency, competition, economy and efficiency and enforceability of legislation (Enshassi *et al*., 2013). However, after noting that it does not always achieve value for money, countries started using other methods like average bid and multi-criteria (EU, 2014; Shreshtha, 2014).

vii. Ease of use

For a tender process to ensure fairness, equality and impartiality, it is important for the evaluation team to understand the evaluation and qualification criteria. It is suggested that the easier the criteria, the better the implementation. Enshassi *et al*. (2013) opine that among others, LETAS is popular because it is easy to use. This could be because the process does not require specialised skills. On the contrary, in MEAT approach, specific human capacity is required to formulate evaluation criteria and conduct bid evaluations (Government of Malta, 2014).

Similarly, in average bid some skills in mathematics are required (Shreshtha, 2014; Khan & Khan, 2015). The bespoke approaches, multi-attribute analysis, multi-attribute utility theory, cluster analysis, multiple-regression, fuzzy set theory and multivariate discriminant analysis are other methods that have been found to be more significant for research than for practice because of their complexity (Holt, 1998).

viii. Donor acceptance

World Bank made a number of recommendations to improve public procurement in Malawi in mid-nineties (World Bank, 1998). These included creating a legal and institutional framework that would oversee public procurement (Arrowsmith *et al*., 2011). The major principles that guided these reforms include integrity, transparency and accountability, promotion of competition and efficiency of the procurement process.

These reforms resulted in the formulation of legislative frameworks that recommend the use of lowest evaluated bid method (Arrowsmith *et al*., 2011) for example *Public Procurement Act 2003* (MW). Similarly, most development partners recognize this method for public procurement (Asian Development Bank, 2015; European Commission & OECD, 2011). However, after noting that LETAS does not always guarantee value for money, others have started legalising the use of

alternative methods (EU 2014; Tzeng, Chien-Chung Li, & Chang, 2006). The alternative approach is being considered by other institutions (AfDB, 2014; Asian Development Bank, 2015) to ensure that they are in line with emerging global best practices. Thus as Enshassi *et al*. (2013) asserts, one advantage of LETAS is its universal acceptability by donors.

ix. Fairness of the tender process

A good procurement system is supposed to be fair and conducted in an open and transparent manner (Republic of South Africa, 2015). The fairness should be to bidders, clients and the public. The public benefits because the process would ensure an economic use of their taxes, or the choice of an economically advantageous bid that would ensure both economy, and other qualitative factors of a project, thus they are protected from unfair practices (Huang, 2011; Rosenbaum, 1942).

Bidders benefit in their freedom to participate and having adequate tender information to submit a responsive bid and knowing that they stand an equal chance of winning the tender (Arrowsmith *et al*., 2011; EU & OECD, 2011). Client institutions benefit from the image and trust from the general public in procurement processes. With the perception that the construction sector is very corrupt (Transparency International, 2011), a fair procurement system would help improve the image. LETAS is deemed a fair procurement process (Rosenbaum, 1942) as compared to other systems which increase chances of collusion or subjectivity in decision making.

x. Avoidance of favouritism

Ostrovnaya and Podkolzina (2014) defined favouritism as "a special type of corruption when the procurer receives a bribe only from its preferred bidder and manipulates the requirements for the purchased product or service in order to change his chances of winning the auction". The oxford dictionary defines it as "the practice of giving unfair preferential treatment to one person or group at the expense of another". Favouritism is rife in the procurement of works contracts (Transparency International, 2011). However, there is need to consider both the positive and negative sides.

Favouritism is negative where some bidders are favoured over others for selfish gains which renders the procurement process not trustworthy. However, some favouritism is positive in that the bidding process is deliberately designed to help improve participation and capacity of nationals

or other marginalized groups (AfDB, 2014). However, the study will concentrate on the negative side, thus a procurement system that checks this malpractice is considered good. In this regard, LETAS is considered good because the procurement process is open to all willing bidders, hence difficult to manipulate (Rosenbaum, 1942).

xi. Summary of advantages of lowest evaluated tender method

In summary, LETAS has the advantage of conforming to core principles of public procurement as required by most nations, blocks and the donor community. However, the advantages are more towards the procurement process than at implementation stage, hence need for improvement.

2.5.1.2 Disadvantages of lowest evaluated tender

Despite the advantages, LETAS has many disadvantages which have led to other countries and institutions to start using alternative methods like average bid and multi-criteria (Albano *et al*., 2006; EU, 2014). The disadvantages include:

- It results in unreasonably low bids;
- It results in time overruns;
- It leads to lack of innovation by contractors;
- The cost of procurement is high;
- It leads to poor quality work;
- The method results in cost overruns;
- It results in adversarial relationships between parties;
- It encourages predatory bidding;
- It leads to selection of unqualified contractors;
- Evaluators handle many tender documents; and
- Contractors reduce bids to uneconomic (Favie *et al*., 2009; Shreshtha, 2014).

i. Unreasonably low bids

Abnormally low bid may be defined as “one in which the bid price, in combination with other elements of the bid, appears so low that it raises material concerns with the borrower as to the

capability of the bidder to perform the contract for the offered price" (World Bank, 2016). These can be identified by comparing with engineer's cost estimate or prices of other responsive bids, checking if profit margin is available or comparing with the technical solution proposed.

Iannou and Leu (1993) found that such low bids are submitted accidentally or deliberately. Accidental bids may be submitted when a bidder misplaces a decimal or misunderstands the specifications while deliberate submissions would be those where a bidder notes an error in bid documents and hopes to benefit from that after award of contract. In addition, Iannou and Leu (1993) found that these low bids are disadvantageous to both the client and the bidders.

Huang (2011) suggests that LETAS is blamed for unreasonably low bids. Due to the openness of the process, many bidders participate resulting in increased competition. This forces some bidders to reduce their bid prices to enhance chances of winning. In contrast, it is difficult for a contract to be awarded at abnormally low prices in average bid or multi-criteria methods. Other countries and institutions have devised means of dealing with unreasonably low bids which include excluding them (Albano *et al*., 2006; World Bank, 2016).

ii. Time overruns

Dolage and Rathnamali (2013) defined time overrun as "the non-completion of the project within the original or stipulated or agreed contract period". This considers the initial period and any approved extension of time. Time overrun can be caused by factors related to all project parties (Dolage & Rathnamali, 2013; Endut, Akintoye & Kelly, 2009) which include delayed payments by clients, increment weather, poor liquidity, shortage of labour force, delays in approvals and poor site management (Emuze & Kadangwe, 2013; Kamanga & Wynand, 2013).

Others have linked procurement methods with time performance of projects. For instance, Iannou and Leu (1991) found that low bids resulted in schedule delays. This is collaborated by Huang (2011) and Shreshta (2014) who also asserted that LETAS results in time overruns. Comparatively, in average bid method, it is assumed that with higher contract prices contractors are motivated and would strive to finish on time (Albano *et al*., 2006). Similarly, in multi-criteria method, the project time aspect is given a score which reduces the risk of time overruns (Tzeng *et al*., 2006).

iii. Poor quality of works

Jha and Iyer (2006) defined quality as "meeting the customer's expectations, or compliance with customer's specification". Thus poor quality works entails failure to comply with the customer's specification. This has negative consequences on contractors as it leads to loss of productivity, additional cost due to reworking, contractors' loss of reputation and loss of life and property. Emuze and Kadangwe (2013) found that use of LETAS contributes to poor quality works in Malawi. This is because with low prices, contractors end up using substandard materials, and incompetent site personnel.

Khan and Khan (2015) assert that bidders (under lowest bid method) concentrate on lowering prices other than on quality enhancing measures and reduces chances of awarding the contract to the best performing contractors. Generally, contractors selected under the lowest evaluated method would want to cut corners (which results in compromising quality) in order to realize profits (Favie *et al*., 2009; Schneider, 2005).

iv. Predatory pricing

OECD (1989) defines predatory pricing as "a strategy undertaken by a company intended to drive competition out of business by offering its goods or services at a price far below the market rate". The predator in the long run ends up exploiting consumers with high prices after eliminating competition. This is bad as it drives out competition but may also be considered good as consumers benefit from cheap products. This is related to submission of a tender at significantly lower prices than the best estimate for costs, profit margins, and risks of a construction project (Liu, Bannerman, Ding, Elliot, Ewart & Kong, 2016).

Liu *et al*. (2016) assert that this practice led to collapse of contractors in Australia due to bankruptcies but also confirms that other construction firms use the strategy to enter markets. It can therefore, be concluded that this practice has both positives and negatives. Shreshtha (2014) highlights that LETAS is blamed for encouraging predatory bidding. This is because it uses lowest price as a deciding factor. This would be difficult if average bid method were used as bidders

would put realistic market rates to be competitive (Albano *et al*., 2006) and in multi-criteria method as the final decision is not based on price alone (Holt, 1998).

v. Cost overruns

Lee (2008) defines cost overrun as the "difference between the actual and estimated costs as a percentage of the estimated cost, with all costs calculated in constant prices" and found that many construction projects experience cost overruns which heavily burdens clients, especially for public institutions which have to demonstrate prudence in management of finances. Subramani, Sruthi and Kavitha (2014) identifies slow decision making, increase in material/equipment prices, poor designs and problems in land acquisition as some of the factors that cause cost overruns in construction projects.

On the other hand, Shreshtha (2014) and Aziz (2013) highlight that the lowest evaluated method leads to cost overruns on construction projects. Similarly, Khan and Khan (2015) assert that projects awarded under LETAS result in high incidences of claims and litigation which increases costs. They further conclude that use of alternative methods like multi-criteria would help reduce these problems.

vi. Adversarial relationships between project parties

Haughey (2012) notes that most projects have an inherent tension among stakeholders and that proper management of relationships between these parties would enhance proper execution of contracts. Khan and Khan (2015) argue that procuring contractors using LETAS tends to promote adversarial relationships. This is because clients expect a project to be completed timely, within budget and to the right quality while the contractor would want to maximize profits after heavily reducing their tender price.

It is suggested that by using other methods like average bid (Iannou & Leus, 1993) and multi-criteria method (Hatush & Skitmore, 1998; Holt, 1998) relationships can be improved as contractors are expected to perform better as compared to those selected under LETAS. Other methods like Public Private Partnership (PPP), Design and Build approaches further enhance the relationship between parties as there is an early involvement of all parties in a project.

vii. Selection of unqualified contractors

Selecting contractors for construction works is a crucial decision to be made by client institutions (Banaitiene & Banaitis, 2006), as a wrong choice results in multiple problems during the implementation stage. Idrus, Sodang and Amran (2011) found that some criteria like LETAS increased chances of selecting unqualified contractors.

Similarly, Herbsman and Ellis (1992) as cited in Shreshta (2014) notes that use of low bid price as a sole award criterion encourages unqualified contractors to submit bids, thus increases chances of awarding contracts to them. Conversely, when alternative methods are used, chances of getting better contractors are increased. In this regard, Idrus *et al*. (2011) recommend that the best criteria is one that involves both price and non-price factors.

viii. Collapse of contractors

Huang (2011) suggests that LETAS is blamed for unreasonably low bids that cause reduction in profits and sometimes results in collapse of contractors. Similarly, Liu *et al*. (2016) report that the low bid method resulted in collapse of many Australian construction contractors. This could be because these firms tried to use predatory pricing to drive out competitors but ended up suffocating themselves economically. In addition, Favie *et al*. (2009) found that this method does not lead to more value for all parties as the client gets a poor or no product while contractors get marginal or no profits.

ix. Evaluators handle many tender documents

CIPS (2013) highlights that prequalification is a recognised means of limiting the bid list where the likelihood of receiving more bids than it is reasonably acceptable to handle is high. JICA (2000) (with its amendments), agrees with CIPS (2013) on the use of prequalification and further propose that the shortlist should consist of no more than 10 bids. This becomes a problem to institutions like RA, who issue a lot of small valued tenders which attracts many bidders (Roads Authority, 2013). Basing on JICA (2000) threshold, it can be concluded that open tendering (in which the lowest evaluated method falls) leads to evaluators handling too many documents.

x. Cost of procurement is high

The procurement costs incurred by public institutions include those for producing tender documents and evaluating tenders. The administrative costs of producing tender documents for open procedures is high as compared to restricted procedures (Chinyio, 2011). This cost may not be fully recouped as regulations encourage public institutions to reduce cost of tender documents so that price does not become a barrier to participation as highlighted in *Public Procurement Act 2003* (MW).

Good evaluation practice demands that at least three evaluators are involved per tender and evaluations should be held at a convenient place to allow evaluators to concentrate and minimize external influence (CIPS, 2013; JICA, 2000). Thus, there is a cost for the venue and welfare of evaluators which tends to be high for open tendering in which LETAS falls (Chinyio, 2011; Lingard, Hughes, & Chinyio, 1998).

xi. Lack of innovation by contractors

In construction, there could be more than one method to arrive at the same solution which demands innovation from both clients and contractors. However, with LETAS, this is difficult because bidders reduce prices to uneconomic levels (Shreshtha, 2014). Favie *et al*. (2009) confirms that LETAS does not encourage innovation as compared to other methods. For instance, in single sourcing, the contractor is involved in both design and implementation (Cunningham, 2015), which makes innovations possible; however, contract prices are higher.

Similarly, selection of contractors using the MEAT approaches encourages innovation as some parameters other than price are scored (EU, 2014). Hence contractors would ensure that they submit innovative bids to get high scores on qualitative factors.

xii. Summary of the disadvantages of lowest evaluated tender award system

In summary, the competition forces bidders to lower prices to un-economic levels in LETAS. This results in multiple challenges at implementation stage and contractors' growth is negatively affected. The implication is that continued use of LETAS in its current form will continue causing problems for both clients and contractors.

2.5.1.3 Performance of contractors selected using lowest evaluated tender award system

The performance of contractors selected under LETAS in respect of time, cost, quality and scope is mixed. Some find it satisfactory while others not.

i. Performance related to time

Contractors selected under LETAS generally complete works beyond the contract period. Khan and Khan (2015) found that half of projects under this system completed works beyond the contract period. This agrees with Post (1998) who found that 42% of projects finished late.

On the other hand, Post (1998) asserts that use of other systems like Performance Information Procurement System (PIPS) improves contractors' performance in respect of time. For instance, he found that 96 percent of projects under this system were completed on time. This is a great improvement from the 50 percent under the lowest evaluated system. It is also suggested that the use of other methods like average bid or multi-criteria would improve contractors' performance in respect of time (Holt, 1998; Shreshtha, 2014).

ii. Performance related to cost

Shreshtha (2014) found that projects awarded under LETAS have the disadvantage of cost overruns. Similarly, Post (1998) found that 33 percent of projects under this system finish over budgets and 13 percent had claims. This could be because with the lowest price, the likelihood of contractors looking for mistakes so that they initiate change orders or claims is high. Khan and Khan (2015) also reported that more than 50 percent of projects awarded under LETAS finished with cost overruns. However, Post (1998) found that 98% of contracts under PIPS finished within budget and no variations, suggesting that use of alternative systems may improve performance related to cost.

iii. Performance related to quality

Most contracts whose contractors were selected under lowest evaluated system perform dismally in respect of quality. Khan and Khan (2015) found that quality of completed projects by lowest bidders was just satisfactory (an index of 59%). This could be attributed to the fact that contractors cannot put in more resources to improve quality. The finding agrees with those of Emuze and

Kadangwe (2013) who found that poor quality of works in Malawi was attributed to the lowest evaluated bid method.

In the same vein, Hardie and Swapan, (2012) found that 35 percent of jobs awarded to lowest bidders resulted in unsatisfactory quality of work. Comparatively, Holt (1998) found that quality of works was better for other methods like multi-criteria method.

2.5.2 Average price

In average price method, the winning contractor is one whose bid satisfies a certain relationship with the average of all bids (Shreshtha, 2014). This is an alternative to LETAS, and proponents of this method argue that contractors selected under this system perform better as compared to those from LETAS. The average bid method has several forms as discussed in the next sections.

2.5.2.1 Arithmetic mean

The first form of average bid method is to calculate the arithmetic mean of all bids and award the contract to the bid that is closest to the mean. This could be higher or lower than the average (Albano *et al*., 2006; Shreshtha, 2014), as used for instance in Taiwan and State of Florida (USA). Other countries like Italy use the same average but award the contract to a contractor whose bid is closest to but lower than the average (Albano *et al*., 2006). This method is found to work better when fewer bids are submitted (Albano *et al*., 2006). Where more bids are submitted, additional rules may be used to eliminate outliers.

2.5.2.2 Average of remaining bids

In this method, some bids are removed either because they are outliers or they differ with the average by a certain margin. A new average of remaining bids is then calculated and a contract is awarded to the bid whose sum is closest to the new average. For example, in Switzerland, they remove the highest and lowest bids from consideration and calculate a new average as a basis for comparison of remaining bids (Shreshtha, 2014). Similarly, in Peru, bids that lie 10 percent below or above the average are removed (Albano *et al*., 2006). Then a new average is computed and the closest bidder to but lower than the average is awarded the contract.

In Europe, they developed the Danish system which helps in deciding a reasonable bid (Khan & Khan, 2015). Here, the lowest and highest offers are out rightly rejected and a new average (NA) calculated using the formula, NA = (NL+4A+NH)/6 where NL is the New low, A is average of all offers and NH is new high. The bid that is closest to (but above) the new average is treated as the acceptable bid. The method is related to the Project Evaluation and Review Technique (PERT) (Hatush & Skitmore, 1997).

2.5.2.3 Advantages of average bid method

Proponents of the average bid system opine that contractors selected under this system would finish contracts within time and with good quality (Shreshtha, 2014). This could be because with better contract prices, contractors would be motivated to execute contracts professionally. Another advantage is that the method helps contractors to realise higher profits as compared to LETAS (Iannou & Leu, 1993; Shrestha, 2014). This is because of higher contract sums, as an average price would generally be higher than the lowest. This would, however, be looked at as negative from clients because of higher contract prices as compared with LETAS (Khan & Khan, 2015).

In addition, this method also promotes competition as it follows open tendering principles (Khan & Khan, 2015) and safeguards parties from entering into a contract with unrealistically low bids (Iannou & Leu, 1993).

2.5.2.4 Disadvantages of average bid method

The average bid method deprives clients from benefiting from price competition (Khan & Khan, 2015). This is because if lowest evaluated method were used, the contract price would have been lower. The method is also prone to collusion between contractors (Albano *et al*., 2014; Salem Hiyassat, 2001). Collusion could happen when sister companies participate in the same tender and agree to submit bid prices that could skew the average to one of them. This creates cosmetic competition and contracts may be awarded at higher prices as compared to when competition is real.

Lastly, Albano *et al*. (2014) notes that the benefits of this method may not be there in real practice. For example, they argue that a higher contract price cannot guarantee increased profit because

other factors come into play. Similarly, it can be argued that quality of works does not only depend on the contract price.

2.5.3 Multi-criteria method

The LETAS has been the dominant system for contractor selection for a long time (Wong *et al*., 1999). Improvements to this system have been developed but with little improvement to construction project success rate (Hatush & Skitmore, 1998). This could be because most improvements like the average bid still look at price as the final deciding factor. To further improve this, researchers propose using a multi-criteria analysis (Topcu, 2004; Wong *et al*., 1999; Zou, 2007). In this method, they use both financial and technical criteria with assigned weights. The criteria are developed looking at specific needs of each project and aimed at marrying clients' objectives and contractors' capabilities (Hatush & Skitmore, 1998). The proposed criteria include (but not limited to):

- Financial soundness;
- Technical ability;
- Management capability;
- Health and safety; and
- Reputation (Hatush & Skitmore, 1997).

In most cases, financial soundness is given a higher weighting but the inclusion of other qualitative factors helps reduce the risk of recommending a wrong contractor (Wong *et al*., 1999). For instance, in Palestine financial evaluation had a weight of 40.1% (Enshassi *et al*., 2013) and in the United Kingdom 55% (Hatush & Skitmore, 1998). Likewise, Yang and Wang (2003) indicate that in China the weighting for price factor should not be more than 50%.

There are many variants of multi-criteria methods including the most advantageous tender (MAT) (Yang & Wang, 2003) and economically most advantageous tender (EMAT) (Shreshtha, 2014). The latter is also called most economically advantageous tender (MEAT) (Telgen & Lohmann, 2012). The similarity is that both use price and non-price criteria with assigned weights to select contractors while the difference is in the weighting of different criteria.

2.5.3.1 Advantages of multi-criteria method

The major advantage of the multi-criteria method is that it ensures value for money (Hatush & Skitmore, 1998; Yang & Wang, 2003). This is because apart from price, clients use other qualitative criteria during tender evaluation which reduces the risk of selecting a wrong contractor. The method also promotes competition (Yang & Wang, 2003), as contractors participate either through open tendering or shortlisting. In addition, European Commission and OECD (2011) asserts that multi-criteria method allows client institutions to take into account innovation and innovative decisions and it allows the client to consider life cycle costs of a product.

2.5.3.2 Disadvantages of multi-criteria method

Multi –criteria methods present a challenge of the difficulty in determining weights of different criteria so that tender evaluation is objective, transparent and fair (Government of Malta, 2014). With both price and non-price criteria being used, procuring entities need to balance the points assigned to each criteria to suit the procurement need. Since there's no direct formula for this, the process may be deemed subjective. Related to the above, this method is difficult to implement as it is complex (European Commission & OECD, 2011). As such, procuring entities need to adequately train procurement officials before its use (Government of Malta, 2014). This is because with qualitative criteria involved, it is difficult to uniformly apply the criteria without being seen to favour or victimise some bidders.

Furthermore, multi-criteria method is not universally accepted by legal frameworks. For instance, the method is acceptable in Europe and OECD countries (European Commission & OECD, 2011), but not in most parts of Africa. To further support this, African Development Bank (AfDB) highlights that the bank was realigning its policy to consider global issues like value for money (AfDB, 2014). This suggests that these were not yet domesticated by the AfDB. Lastly, the method may result in relatively higher contract prices (Holt, Olomolaiye, & Harris, 1994).

2.5.4 Other contractor selection methods

There are other systems for contractor selection like bespoke approaches, multi attribute analysis, multi attribute utility theory, cluster analysis, multiple regression, fuzzy set theory and multivariate

discriminant analysis which have been found to be more significant for research than for practice (Holt, 1998).

2.6 Preferred method of contractor selection

Professionals in the construction industry have different views on different contractor selection criteria, whether price based or multi criteria based. Some prefer lowest evaluated method, others average bid method while another section prefer multi-criteria methods.

2.6.1 Current usage

The LETAS is the most widely contractor selection method (Banaitiene & Banaitis, 2006; Kashiwagi *et al*., 2004) because it is acceptable by most legal frameworks and that other methods have not been institutionalised in some countries. The average bid method is used in some countries like United States of America, Italy, Switzerland and Peru (Albano *et al*., 2006; Shreshtha, 2014) while multi-criteria methods are also used in many nations (EU, 2014; OECD, 2011) where the legal frameworks supports its use.

2.6.2 Preferred method

Most legal frameworks recommend LETAS and this is the most widely used contractor selection method (Wong, Holt, & Cooper, 2000). However, research confirms the increasing appreciation of other contractor selection methods like average bid and multi-criterai (Wong *et al*., 2000; Banaitiene & Banaitis, 2006). For example in Gaza, 65% of procuring entities agreed to the use of multi-criteria method against 35% who wanted to maintain LETAS (Enshassi *et al*., 2013) and procuring entities were encouraged to push for legislative changes to regularise other methods. Similarly, Shrestha (2014) reported that in Nepal, contractors asked government to amend procurement laws to allow for usage of average bid method.

In contrast, in Australia builders were supportive of LETAS (Hardie & Saha, 2012). This could be because the method still helps some bidders to get contracts. However, a move to value based procurement is recommended as it may assist in improving performance of the construction industry and customer satisfaction (Hai & Watanabe, 2014; Hardie & Saha, 2012).

2.6.3 New trend

In view of numerous research done on the performance of LETAS, the new trend is that some governments and institutions have moved to a value based approach (Hai & Watanabe, 2014; Topcu, 2004) which use both price and qualitative criteria in contractor selection (OECD, 2011). For instance, EU, China and OECD states allow the use of MEAT criteria (OECD, 2011; Yang & Wang, 2005). The Asian Development Bank (ADB) and AfDB are also considering adopting this (Asian Development Bank, 2015; AfDB, 2014).

2.7 Project procurement management and implementation management

There are many definitions of a project. However, the common elements are that there are some planned tasks to be executed over a fixed period, within certain costs and other limitations to create a unique product, service or result (Lock, 2007; Nigel, 2002).

2.7.1 Project management

Many authors agree on the basics of project management which include some form of control over a planned process of explicit change (Association for Project Management [APM], 1998; Lock, 2007). The controlled aspects include human and material resources aimed at achieving predetermined goals of scope, time, cost and quality (BS 6079, 2000; APM, 1998). Issues of safety (APM, 1998) and environment (Roads Authority, 2011) are also highlighted in some definitions. A successfully managed project would be considered as one that finished on time, according to specified performance (quality) and within the budget (Hatush & Skitmore, 1996; Lock, 2007). As such, proper contractor selection mechanism is critical in the fulfilment of project objectives.

2.7.1.1 Project procurement management

Project Management Institute (2013) defines project procurement management as the "processes necessary to purchase or acquire products, services, or results needed from outside the project team". This definition suits the RA definition (Roads Authority, 2005) and setup as RA uses contractors and consultants to implement its activities. In some instances, procurement is deemed as the process done by contractors in acquisition of materials and services for the actualization of the project (Lock, 2007). For purposes of this study, the procurement definition by Project Management Institute (2013) will be adopted.

2.7.1.2 Project implementation management

Project implementation can be referred to as a process whereby project inputs are converted to project outputs as set out in the project framework (Lock, 2007; Nigel, 2002). This is a critical stage as any deficiencies from the client, consultant or contractor can result in failure to achieve project objectives. For instance, delays by client to fulfil their obligations might affect the contractors and consultant's performance (Emuze & Kadangwe, 2013). An example is where a client delays to make payments or delays to respond to important communication.

2.7.2 Factors for project success or failure

While project success or failure is directly linked to critical factors of time, cost and quality (Hatush & Skitmore, 1996) which could be ascertained at the end, some factors like poor scope definition, poor selection of service providers, and poor risk assessment would be early predictors of project performance (Lock, 2007). This may also be looked at from the angle of stakeholders (Lock, 2007) who look at serviceability of constructed infrastructure. It is important, therefore, to link contractor selection methods to project implementation and finally project success or failure (Hatush & Skitmore, 1998).

2.8 Conclusions from previous studies

The study notes that great strides have been made through studies on the subject but further observes that none of the studies zeroed in on an organizational setup like RA of Malawi. Furthermore, countries where these studies were conducted have bigger economies compared to Malawi (International Monetary Fund, 2016). This makes generalisation of results to Malawi difficult due to different economic environments. In addition, the maturity of the construction industry in Malawi would be different from the developed countries as regards submission of realistic tenders. In this regard, the researcher felt it was prudent to proceed with the study.

2.8.1 Gaps in literature

Despite there being a lot of literature on the performance of the lowest price bid method, ways of improving contractor selection and construction professionals preferred method of selecting

contractors, RA is still bound to use the lowest price method as required by *Public Procurement Act 2003* (MW).

Studies that have looked at performance of the road construction industry in Malawi have also not specifically zeroed in on contractor selection method. For instance, Kamanga and Wynand (2013) concentrated on causes of delays in road construction projects but did not link this to the procurement method. Similarly, Emuze and Kadangwe (2013) in their diagnostic view of road projects found that delayed payments by clients severely affects performance of contractors and that most projects had defects. They, however, managed to link poor quality only to lowest evaluated tender method.

Chilipunde (2010) and Kulemeka, Kululanga, and Morton (2015) found that economic/ financial issues were the major factors that contribute to dismal performance of small and medium contractors in Malawi but did not link them to contractor selection method. The researcher thus finds that there is a gap to link project success factors of cost, time and quality with the lowest evaluated contractor selection method, hence the need to continue with the research.

2.9 Conclusive Remarks from literature review

Literature review has highlighted a number of issues. Firstly, procurement in public sector is regulated by legislation in each country. These legislation recommends usage of different methods for contractor selection including LETAS, average bid and multi-criteria. The guiding principles for public procurement include transparency, fairness, promotion of competition and accountability. Issues of value for money are also gaining ground.

Secondly, literature confirms that LETAS is transparent, fair and promotes competition but the selected contractors mostly do not achieve critical project success factors of cost, time and quality. This has necessitated research and trial of other contractor selection methods in different countries. Others have gone further to start pushing for change of legislation to allow for use of alternative methods. Thirdly, there are many alternative contractor selection methods like the average bid and multi-criteria methods which may be used upon passing legislation. Furthermore, there are many other methods that are being used for research purposes but may in future be practically used.

Lastly, while laws are mostly mandating the use of LETAS, professionals on both contractors and client side do not like this method as it favours none of them. They would, rather use alternative methods like average bid or multi-criteria. The trend is moving towards ensuring that value for money is realised for all public procurement.

After reviewing the literature, the research topic and questions were re-examined to check consistency and relevance with the initial direction. This was important to allow for incorporation of new revelations from literature which would further guide the research methodology. In this regard, the relevance tree in the literature review was reviewed to link with research methodology. The reviewed literature guided the formulation of the research methodology. The flow chart in figure 2.2 summarises the sequence of activities to follow:

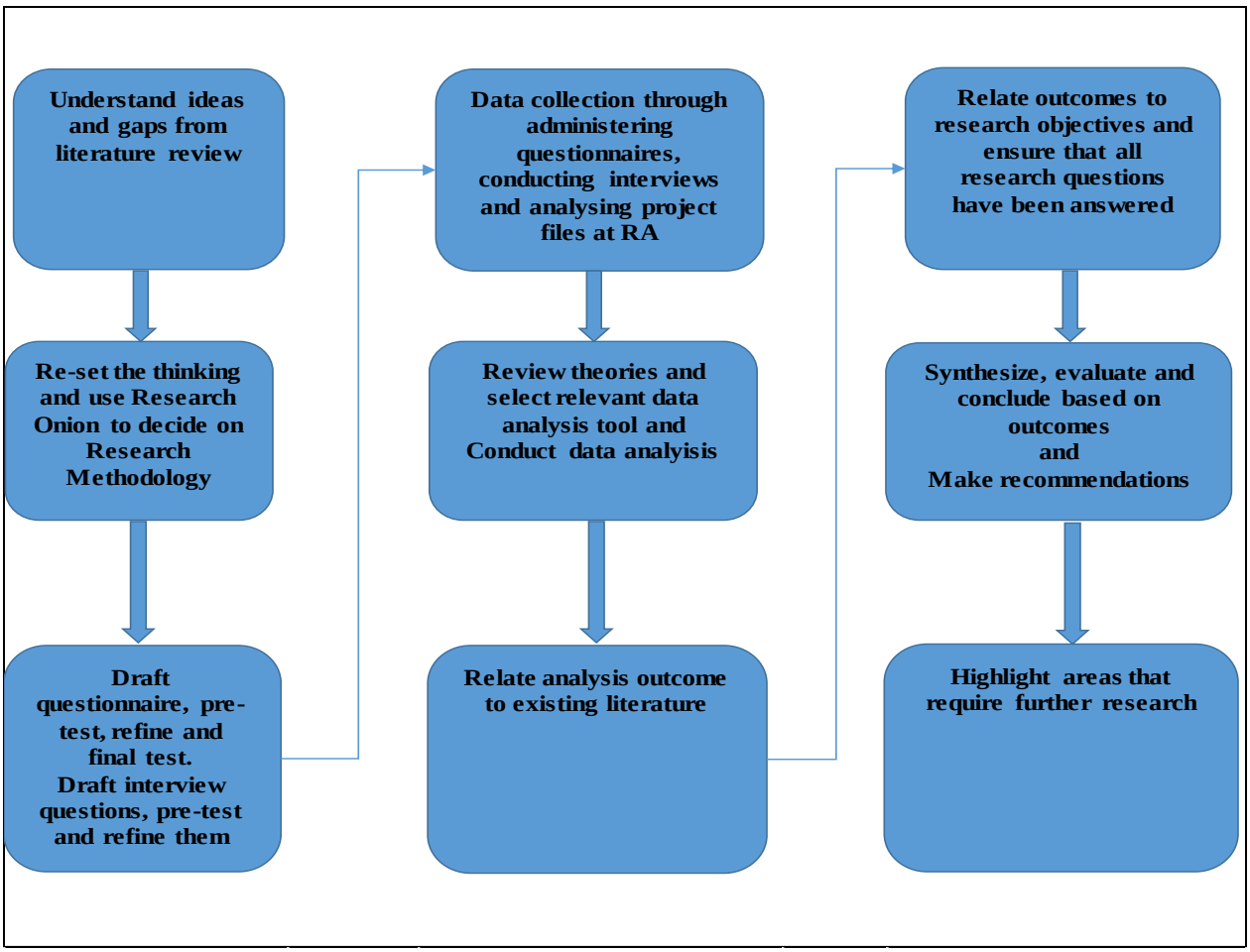

Figure 2.2- Conceptual framework leading to research methodology

CHAPTER 3:
RESEARCH METHODOLOGY

3.1 Introduction

The section aims at highlighting the philosophy underpinning the research, approach that was followed, strategy used, chosen method, time horizon and data collection techniques and analysis. The section also highlights how the research was controlled to ensure validity and reliability of the process. The methodology followed the research "onion" adapted from Saunders *et al*. (2009).

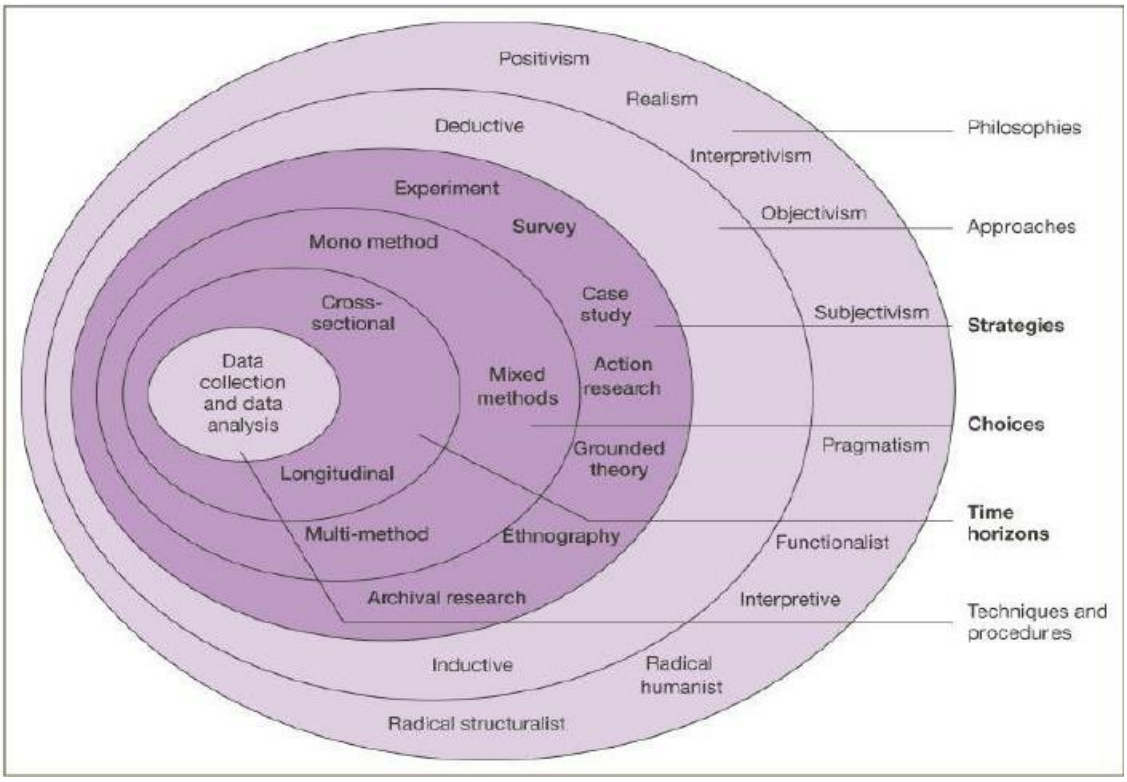

Figure 3.1: Research Onion adopted from Saunders *et al*. (2009)

3.2 Objectives of the research versus research paradigm

The main aim of the study was to analyse the effectiveness of the lowest evaluated tender award system in public-sector construction projects, with a case study of Roads Authority. To this end, four specific objectives were set which were to:

- Analyse the pros of the lowest evaluated tender award system in Malawi,
- Analyse the disadvantages of the lowest evaluated tender award system in Malawi,
- Assess the performance of projects awarded based on lowest evaluated tender award system in Malawi,
- Investigate the preferred system of contractor selection by professionals in the construction industry in Malawi.

The guiding philosophy in carrying out the research was the positivist paradigm which is associated with quantitative methods of collecting, analysing and interpreting data (Mackenzie & Knipe, 2006; Saunders *et al*., 2009). The research was, however, open to the pragmatic approach where data collection and analysis methods were chosen on their likelihood to provide insights into research questions. The pragmatic approach is a combination of positivist and constructivist paradigms (Sobh & Perry, 2006), and is also called triangulation.

3.2.1 Positivist paradigm

Positivism is the term used to describe an approach to the study of society that relies specifically on scientific evidence. This includes experiments and statistics that reveal a true nature of how society operates. The positivist paradigm is generally associated with quantitative methods of collecting, analysing and interpreting data (Krauss, 2005; Mack, 2010). In positivism, knowledge is statistically generalised to a population by statistical analysis of observation about an easily accessible reality (Sobh & Perry, 2006).

3.2.2 Constructivist paradigm

A constructivist approaches research with an intention of understanding the world of human experience (Mackenzie & Knipe, 2006). In this paradigm, it is suggested that reality is socially constructed (Mackenzie & Knipe, 2006). It can, therefore, be concluded that reality is perception based (Sobh & Perry, 2006). The constructivist paradigm is generally associated with qualitative method of collecting, analysing and interpreting data (Mack, 2010).

3.2.3 Pragmatic paradigm

According to Mackenzie and Knipe (2006), pragmatic paradigm is the paradigm that provides the underlying philosophy for mixed methods research as it is not committed to one philosophy. This is related to the triangulation paradigm as described in Fellows and Liu (1997) which looks at using more than two methods to investigate the same problem, thereby utilising the advantages of each method.

3.3 Research type

The research followed descriptive and explanatory types as described in Saunders *et al*. (2009). The descriptive aspect was through describing advantages and disadvantages of the lowest evaluated tender method. This went on to a higher order of analysing the same through ranking. In addition, there was also a description of alternative contractor selection methods. The explanatory aspect was through trying to explain the relationship between lowest evaluated tender method and performance of projects in respect of critical project success factors of cost, time and quality.

3.4 Research approach

The research largely followed a deductive approach as it sought to establish the relationship between the lowest evaluated tender method and performance of projects (Saunders *et al*., 2009). However, the inductive approach was also used as some qualitative data was collected through interviews. The mixed approach helped to enhance the validity of the research.

3.5 Research strategy

Saunders *et al.* (2009) outlines many strategies that can be used in research. These include experiment, survey, case study, action research, grounded theory, ethnography and archival research. The research adopted a case study strategy and it focused on the Roads Authority of Malawi.

The strategy was chosen because it allows for multiple data collection techniques which enabled triangulation of findings (Saunders *et al*., 2009). In addition, Robson (2002) argues that this method allows “an empirical investigation of a contemporary phenomenon within its real life

context". The RA uses LETAS and the research was thus in real life context. The case study was complemented by the archival strategy as some data was collected from archived reports as supported by Saunders *et al*. (2009).

3.6 Research choice

The research adopted a mixed method system that allowed for different methods of collecting and analysing data. The research thus used a combined approach of quantitative and qualitative methods. The questionnaire and analysis of data from project reports provided the quantitative approach while interviews were on the qualitative part.

3.7 Time horizons

The research adopted a cross sectional time horizon because it is appropriate for case studies and time constraints of the academic calendar (Saunders *et al*., 2009). The research was done in a snapshot of time. The longitudinal time horizon was not used as laws on contractor selection may not be static over time and the academic calendar would not accommodate it.

3.8 Research techniques and procedures

The section discusses methods that were employed in collecting and analysing data. The research was done using a combined approach of quantitative and qualitative methods. The questionnaire and analysis of data from project files provided the quantitative part while interviews were on the qualitative part.

The methods of data analysis were also both quantitative and qualitative. The Statistical Package for Social Sciences (SPSS), Census and Survey Processing System (CS-Pro) and Microsoft Excel were on the quantitative part while content analysis of interview data was on the qualitative part.

3.8.1 Data collection method

Data for this research consisted of primary and secondary data, and also quantitative and qualitative data. This helped in triangulation of information.

3.8.1.1 Primary data

Welman and Kruger (2001) defined primary data as that data collected by the researcher for purposes of their own study. For this research, primary data consisted of information that was obtained from questionnaire responses and interviews.

i. Questionnaire

The questionnaire was designed to capture information relevant to each research objective. Effort was made to ensure that the language used in this instrument was un-ambiguous, clear and simple so that participants did not have challenges in completing it while at the same time not diluting meaning (Saunders *et al*., 2009). Information from literature review guided the formulation of the questionnaire. The content of the questionnaire was validated by experts in construction, procurement and academia after which it was pre-tested on part of the sample as recommended by Kelly *et al*. (2003) and Mathiyazhagan and Nandan (2010). After pre-testing, the questionnaire was finalised by incorporating all valid comments.

Section 1 of the questionnaire captured background information on the respondents. Section 2 sought to understand respondent's understanding of lowest evaluated bid system and analysed its advantages. Section 3 analysed disadvantages of the lowest evaluated tender method. Section 4 sought participants' views on performance of projects awarded based on lowest evaluated system in respect of project success factors. Section 5 analysed methods that can be used to improve contractor selection. Finally, section 6 solicited participants' views on their preferred method of contractor selection for public construction projects.

Table 3.1: Questionnaire sections

Section	Section name	Specific objective addressed
1	Demographic information	Used to determine background information of respondents
2	Advantages of lowest evaluated tender method	Specific objective One
3	Disadvantages of lowest evaluated tender method	Specific objective Two
4	Performance of projects selected under LETAS	Specific objective Three
5	Improvement of contractor selection	Specific objective Four
6	Preferred method of contractor selection	Specific objective Four

The questionnaire largely carried closed questions with choices on a Likert scale from which respondents chose their responses (Vagias, 2006). This helped in standardisation of data and made it easy for statistical analysis. However, there were some open questions that solicited participants' comments and ideas in case the questionnaire did not cover all the points.

The questionnaire was then distributed to respondents by the investigator who also collected them. Some were hand delivered to respondents while others were sent by private couriers. These were returned using the same mediums. A covering letter introducing the study, encouraging respondents to participate, detailing use of the data and stressing informed consent accompanied each questionnaire.

ii. Semi structured interviews

Appointments with targeted interviewees were sought by telephone and the interviews were done face to face at their offices. The interviews were conducted by the investigator and generally followed a semi structured approach to allow for uniform information, comparison of data and give room for new information to arise (Dawson, 2002).

The interview captured data ranging from background information of interviewees, their perception of the advantages and disadvantages of the lowest evaluated tender method in context of their organisation, their knowledge of alternative contractor selection systems and their preference of which system to use. The data also included their perception of the effects of the lowest evaluated system of contractor selection on project success factors of cost, time and quality.

3.8.1.2 Secondary data

Secondary data is obtained by reviewing of existing published material like journal publications, books, official reports and conference papers. The sources of secondary data were based on their relevance to help answer specific objectives of the research (Saunders *et al*., 2009).

i. Data from project files

The plan was to analyse data from files for projects executed in the 2013/2014 – 2016/2017 financial years from RA. Due to the state of documentation at RA (RA had just introduced a new data management system, so at the time of the study different documents {including project files} were put together and were being reorganised by an external consultant), this was not done and instead information from consultant's reports for the same period was used to gather this data. The consultant reports were used to assess performance of projects with respect to scope, quality, cost and time. It should be noted that projects at RA are managed by consultants who submit monthly reports to the client and a final report at the end of the service contract highlighting all issues affecting the works contracts. The reports form part of official records on projects.

3.8.2 Data sources

The sources of primary data for the research were professionals in the Malawian construction industry. The questionnaire was administered to staff of RA, RFA, consultants and contractors that had projects with RA in the last four financial years. Interviews were conducted with the publicity secretary of Malawi Building and Civil Engineering Contractors and Allied Traders Association (MABCATA). The interview with RA chief executive officer was cancelled because of his tight schedule and the tight academic calendar. The secondary data was collected from consultant reports at RA. This helped in reviewing performance of projects and triangulation with questionnaire responses.

3.8.2.1 Sampling procedure

The sampling techniques included both random and non-random sampling. Random sampling was used on the sample for contractors as the population was greater than 50 while non-random sampling was used on the population for RA/RFA staff and Consultants as their individual

populations were less than 50. This is recommended by Henry (1990) who suggetsed the use of an entire population as a sample for populations of less than 50 and a sample for populations greater than 50. Purposive heterogeneous sampling (Saunders *et al*., 2009) was used on selection of participating institutions for interviews. RA represented client institutions while MABCATA represented contractors.

Considering that the main unit of analysis was the respondent, the targeted respondents were groups that participated in procurement and implementation of the works at RA. These included engineering staff at RA/RFA, consultants and contractors. All the 38 (34 from RA and 4 from RFA) engineering staff at RA/RFA were selected in order to have a balanced view from all three operating regions and all the departments on the subject. Six consultants had worked for RA central region in the period between the 2013/2014 – 2016/2017 financial years and four key staff were selected from each (Team Leader and 3 Highway Engineers) because they are the ones in charge of managing the contracts. Similarly, the RA central region had worked with 72 contractors in the period (number of contracts was more as some contractors had more than one contracts in the period).

In addition, the RA Chief Executive Officer was selected as an interviewee to provide an overall opinion on how RA views the performance of LETAS while the MABCATA publicity secretary was selected to provide an overall opinion from contractors' and to benefit from non-verbal communication (gestures, facial expression and tone of voice) as the president of MABCATA was based in Mzuzu. In a similar manner, in order to collaborate information from respondents, data from consultant reports (at RA) who worked in the central region for the targeted period was assessed on 72 contracts. These were used to check the actual reported performance of contracts with respect to time, cost, quality and scope.

The sample size was calculated using the formula n = N/1+N (e) ^2 by Yamane, where; N is population, n is sample size and e is the level of precision. The formula assumes a level of confidence of 0.5. The samples and response rates were as tabulated in table 3.2.

Table 3.2: Summary of Respondents

Organisation	Sample	Questionnaires distributed	Questionnaires received	% of respondents within Organisation
Roads Authority	34	34	25	74
Roads Fund Administration	4	4	4	100
Consultants	23	16	9	56
Contractors	62	60	39	65
Total	**123**	**114**	**77**	**68**

3.8.3 How data was analysed and interpreted

The data collected was both quantitative and qualitative, as such, different methods were used to analyse and interpret it. Quantitative data from questionnaires was analysed through statistical packages, mostly SPSS and CS-Pro. Data was coded in CS-Pro and exported to SPSS version 20.0 and analysed for specific relationships using descriptive statistics like frequencies and cross tabulation. Data from consultant reports was analysed through Microsoft Excel.

Qualitative data from interviews was analysed through content analysis. Recorded data from interviews was transcribed by converting the oral history from interviews to a written record by the author through an iterative process that allowed for correction of errors. An independent checker was used to listen to the oral history and compare with the written record. The summaries of the interview were then compiled.

The data was assessed for completeness and evaluated for effects of chance or bias. The results were compared with those from similar studies and between the different methods employed. Emerging trends have been highlighted and possible areas for further research suggested. As much as possible bias was avoided by sticking to the planned methods and interpreting the results objectively. An assessment of how well research objectives were met was done, and problems and limitations have also been discussed.

3.8.4 Issue of validity and reliability

Validity refers to how well a test measures what it is purported to measure while reliability refers to the extent to which the use of data collection methods and analysis would ensure consistency of findings even if used by a different researcher (Easterby-Smith, Thorpe, Jackson, & Lowe, 2008).

3.8.4.1 Content validity

Content validity is defined as the agreement that a question, scale or measure appears logically to reflect accurately what it was intended to measure (Saunders *et al*., 2009). Content validity was achieved through piloting of the questionnaire and review of literature. Experts in engineering, procurement, academia and participants in the construction sector were contacted for their opinion on the data collection tool(s). In addition, the research used an entire population as respondents on groups whose population was less than 50 and random sampling in others. Triangulation of data from the questionnaire, consultants' reports and interviews was also used to validate the research. The results were also compared with findings from other studies.

3.8.4.2 Reliability

Reliability refers to the extent to which data collection techniques will yield consistent findings, similar observations would be made or conclusions reached by other researchers (Esterby-Smith *et al*., 2008). Participants were allowed to fill questionnaires in a free environment where they could not be influenced. These were also returned through a registry to preserve anonymity. In addition, the language of the questionnaire was direct and simple with a narrow range of responses. Finally, the data collection and analysis techniques did not allow for manipulation.

Table 3.3: Case processing summary for SPSS procedure on reliability

		N	%
Cases	Valid	77	100.0
	Excluded [a]	0	.0
	Total	77	100.0

a. List wise deletion based on all variables in the procedure.

Table 3.4: Reliability statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.829	.801	69

Cronbach's alpha coefficient statistical procedures was used to help in the internal consistency of individual questions in the questionnaire. This is as asserted by Cronbach (1951) (as cited in Roberts, Priest, and Traynor, 2006). From the case processing summary (Table 3.3), it can be seen that no case was excluded. Table 3.4 shows that the Cronbach alpha value is 0.829 which shows the data is reliable and that the internal consistency is good as values ranging from 0.7 to 0.95 are acceptable (Tavakol & Dennick, 2011).

Other tests like the test and retest method were not used on the research because the short academic calendar could not allow for such and the laws governing procurement may not be static over time. The split half test as supported by Drost (2011) and Roberts *et al*. (2006) was also not used because of time constraints.

3.8.5 Ethical consideration

The researcher as much as was practical, adhered to ethical standards in the conduct of the research. The ethical issues included harm and benefits, privacy and confidentiality, informed consent and deception and social control (Dawson, 2002). An approval to use RA as a case study was sought and granted.

The data for the research would remain confidential and solely used for academic purposes. Identities of participants would remain anonymous. Participants were provided with background information to the study and were advised on voluntary participation and freedom of withdrawal. There was no physical harm to participants; however, there was provision of accessing results of the study. The questionnaire requested for contacts of those that needed the results of the survey.

3.8.6 Specific treatment of specific objectives

The section looks at how the researcher captured and analysed data pertaining to specific objectives. These are as discussed in the next section.

3.8.6.1 Treatment of advantages of the lowest evaluated tender award system

LETAS has many advantages. The data required was the documentation of advantages of this system which were listed from literature, after which they were confirmed by local experts through a questionnaire and interviews. The data was analysed using statistical packages and content analysis to determine and rank advantages of LETAS in Malawi.

3.8.6.2 Treatment of disadvantages of the lowest evaluated tender award system

The LETAS has disadvantages. The data required was the documentation of disadvantages of this system which were listed from literature, after which they were confirmed by experts through a questionnaire and interviews. The data was analysed using statistical packages and content analysis to determine and rank disadvantages of LETAS in Malawi.

3.8.6.3 Treatment of Performance of projects under lowest evaluated tender award system

The performance of projects awarded based on LETAS is deemed poor. The data required were the performance indicators of public projects in respect of critical project success factors of cost, quality and time. Respondents to a questionnaire were requested to give their opinion on the performance of projects awarded through this system.

The information was complemented by an analysis of data from consultants' reports from RA and interviews. The data was analysed using statistical packages and content analysis to determine the performance of public projects in respect of critical project success factors of cost, time and quality in Malawi.

3.8.6.4 Treatment of Preferred method of contractor selection

There are various contractor selection criteria as alternatives to LETAS. A list of alternative methods of contractor selection were identified from literature, confirmed and prioritised by experts through a questionnaire and interviews. The data were analysed using statistical packages and content analysis to determine the preferred method of contractor selection by professionals in the Malawian construction industry.

3.9 Limitations

The study focused much on RA and particularly projects done in a period of four financial years (2013-2017) because of the ease of accessing information and data as compared to other institutions. This has a potential of excluding views from other client institutions, contractors and consultants that have not had a chance to work with RA during this period. Further constraints include time and financial resources which have limited the scoping and distribution of questionnaires. Generalisation of results has assumed that characteristics of the subjects do not vary much with other public institutions. This is because apart from RA and RFA staff, consultants and contractors also have contracts with other public and private clients.

3.10 Chapter Summary

The methodology section has highlighted that the research largely followed the positivism paradigm but was open to the pragmatic paradigm. The study used a case study strategy and cross sectional time horizon. Data was collected through questionnaire surveys, interviews and consultants reports at RA. Respondents included staff from RA, RFA, consultants and contractors that had previously worked with RA. This data was analysed through SPSS and Microsoft Excel.

In addition, the section highlighted the methods followed to ensure validity and reliability of data and how the researcher ensured that he worked ethically. Finally, limitations that include time, financial resources and scoping were also discussed. The next chapter will present results, analyse and interpret data.

CHAPTER 4

RESULTS, DATA ANALYSIS AND INTERPRETATION

4.1 Chapter overview

The chapter presents the findings of the study emanating from the questionnaire survey, interviews and data from consultant's reports from RA (for 2013/2014 to 2016/2017 financial years). These are in form of tables, histograms and pie charts. The chapter further provides an analysis and interpretation of the lowest evaluated bid method.

The main statistics used are the mean, mode and frequencies. Warmbrod (2014) asserts that the variance test is appropriate for detecting variations within a sample while the mode and median are appropriate for Likert scale data as there is no clear difference between choices. The results were found reliable as the Cronbach alpha coefficient was 0.829 for 69 items (Table 3.4).

The study had planned for a sample size of 123 respondents (as highlighted in section 3.8.2.1 of this dissertation) but 114 questionnaires were distributed. The difference was because of different geographical locations of the researcher and the respondents. 77 completed questionnaires were returned and this represented 63% of the sample or 68% of those distributed. 65 respondents requested to know the results through post or email. This is considered a statistically high response rate for academic studies as even 30% is acceptable as reported by Chilipunde (2010) quoting Wisiniewski (1994) or 35% (Baruch, 1999).

The high response rate could be attributed to personal distribution and collection of questionnaires and the interest generated by the topic. The unreturned questionnaires could be attributed to failure by the respondents to complete and submit the questionnaire timely due to pressure of work and negative attitude towards research by some respondents.

4.2 Demographic information

The demographic information collected included age, gender, professional background, work place, years of experience in the construction industry and procurement, familiarity with *Public*

Procurement Act 2003 (MW) and highest qualification attained by respondents. These helped in understanding, analysing and interpreting their level of comprehension of the questionnaire.

4.2.1 Age of respondents

The study wanted to know the age groups of respondents. The results are presented in table 4.1.

Table 4.1: Age of respondents

Age Group	Frequency	Percent	Cumulative Percent
25 – 34	14	18.2	18.2
35 – 44	30	39.0	57.1
45 – 54	30	39.0	96.1
55 – 99	3	3.9	100.0
Total	77	100.0	

The majority of respondents were in the age bracket from 35 to 54 years (78 %) seconded by those in the 25 to 34 years (18.2 %) bracket with, the least being the 55 to 99 years' group (3.9 %). This could be related to the experiences that respondents have in both procurement and the construction industry. The results are deemed correct in that there is a group joining the industry (25-34 years), those established (35-54) and the least group (55-99) being ages where professionals retire. The ages further confirm that the majority of respondents would be experienced enough to understand the lowest evaluated tender method, hence responded objectively.

4.2.2 Gender of respondents

The study wanted to know the gender of respondents. The results are presented in table 4.2.

Table 4.2: Gender of respondents

Gender	Frequency	Percent	Cumulative Percent
Male	71	92.2	92.2
Female	6	7.8	100.0
Total	77	100.0	

The respondents were predominantly males (92.2 %) while only 7.8% were females. This is a true reflection of the construction industry set-up in Malawi and the world in general (Chilipunde, 2010).

4.2.3 Respondent's profession

The study wanted to find out the profession of respondents. The results are presented in table 4.3.

Table 4.3: Respondents' profession

Profession	Frequency	Percent	Cumulative Percent
Engineering	63	81.8	81.8
Procurement	1	1.3	83.1
Other	13	16.9	100.0
Total	77	100.0	

The respondents were mostly from the engineering profession at 81.8% with few in procurement (1.3 %) and several (16.9 %) in other disciplines. The high number of those from engineering profession could be attributed to the case study approach as RA employs mostly engineers. In addition, RA works with contractors and consultants who also employ engineers or technician engineers who are referred to as key personnel in contracts. It should be noted that while most respondents are not in mainstream procurement, they are involved in procurement processes for example packaging and evaluation of tenders and bidding. Hence, the majority are experienced in procurement of works as highlighted in section 4.2.6.

4.2.4 Respondents work place

The study wanted to know where respondents work. The results are presented in table 4.4.

Table 4.4: Respondents' work place

Organization	Frequency	Percent	Cumulative Percent
Roads Authority	25	32.5	32.5
RFA	4	5.2	37.7
Consultant	9	11.7	49.4
Contractor	39	50.6	100.0
Total	77	100.0	

Half of the respondents were working with contractors (50.6 %), seconded by those from RA (32.5 %), then Consultants (11.7 %) and lastly RFA (5.2 %). This is in order considering the case study approach used and the fact that there are more contractors than consultants in the National Construction Industry Council (NCIC) register. In addition, RA works with more contractors than consultants. This distribution helped in having a balanced view of issues from all concerned groups. RA/RFA are clients, contractors are the implementers while consultants offer project management services.

4.2.5 Respondents experience in the construction industry

The study wanted to know the experience of respondents in the construction industry. The results are presented in table 4.5

Table 4.5: Respondents experience in the construction sector

Years of Experience	Frequency	Percent	Cumulative Percent
0 to 5	7	9.1	9.1
6 to 10	22	28.6	37.7
11 to 15	11	14.3	51.9
16 to 20	25	32.5	84.4
21 and above	12	15.6	100.0
Total	77	100.0	

The majority of respondents (89.9 %) had experience of more than 5 years in the construction sector as only 9.1 % was in the 0 to 5 years' bracket. This is because RA/RFA mostly employs experienced staff and also procures contractors and consultants that have related past experience. The experience was important because it helped respondents understand the issues affecting different aspects of the construction sector. They would thus comment objectively on issues and make constructive suggestions on how to improve performance in the construction industry.

4.2.6 Experience in procurement

The study wanted to know the experience of respondents in procurement of works. The results are presented in table 4.6.

Table 4.6: Respondents experience in procurement

Experience in Procurement	Frequency	Percent	Cumulative Percent
0 to 5	16	20.8	20.8
6 to 10	28	36.4	57.1
11 to 15	23	29.9	87.0
16 to 20	8	10.4	97.4
21 and above	2	2.6	100.0
Total	77	100.0	

The results showed that 79.2% had equal to or over 6 years' experience while the rest (20.8 %) had an experience of 0 to 5 years. This could be because RA staff are involved in procuring contractors and consultants, while those on the contractor and consultant's side bid for contracts. Hence, in one way or another, they had an experience in procurement. The lower percentage in the 0 to 5 years' bracket is because of the case study approach as RA usually engages experienced contractors/consultants and have few programmes for new entrants.

The variation in the respondents also shows there is a group that has been involved in procurement before and after the enactment of the *Public Procurement Act 2003* (MW) as 16 years before data collection dates back to September 2001. This assisted them in offering an informed comparison between different systems.

4.2.7 Familiarity with Public Procurement Act 2003 of Malawi

The study wanted to know how familiar the respondents were with the *Public Procurement Act 2003* (MW). The results are presented in table 4.7.

Table 4.7: Familiarity with Public Procurement Act 2003 (MW)

Familiarity with PPA 2003	Frequency	Percent	Cumulative Percent
Not at all familiar	3	3.9	3.9
Slightly familiar	9	11.7	15.6
Somewhat familiar	12	15.6	31.2
Moderately familiar	29	37.7	68.8
Very familiar	24	31.2	100.0
Total	77	100.0	

Table 4.7 shows that 96 % of the respondents were familiar with *Public Procurement Act 2003* (MW) while only 3.9 % were not familiar with the act at all. This is because all targeted groups are either involved in procuring or bidding for contracts which requires knowledge of the laws governing the procurement process. This suggests that the responses to the questionnaire were objective.

4.2.8 Qualification of respondents

The study wanted to know the highest qualification of respondents. The results are presented in table 4.8.

Table 4.8: Qualifications of respondents

Highest Qualification	Frequency	Percent	Cumulative Percent
Postgraduate	24	31.2	31.2
Degree	27	35.1	66.2
Diploma/ Certificate	25	32.5	98.7
Other	1	1.3	100.0
Total	77	100.0	

The findings showed that 31% of respondents had a postgraduate qualification, 35.1% had a bachelor's degree and 32.5% had either a diploma or a certificate. This suggests that most respondents were able to understand the questions and answered from an informed point of view.

4.3 Research results

Results from the questionnaire survey, interviews and analysis of project files are presented in this section through frequency tables, histograms and pie charts. These were then analysed and interpreted based on the outcomes of the questionnaire responses, interviews and data from consultant's reports in relation to existing knowledge and practice.

4.3.1 Results on advantages of the lowest evaluated tender award system

The advantages of LETAS were analysed by listing the pros of the system which were confirmed by respondents through a questionnaire. The respondents were given an option to include other advantages but none was proposed.

4.3.1.1 Understanding of lowest evaluated bid system

The study firstly wanted respondents' understanding of the lowest evaluated bid method. The results are presented in figure 4.1.

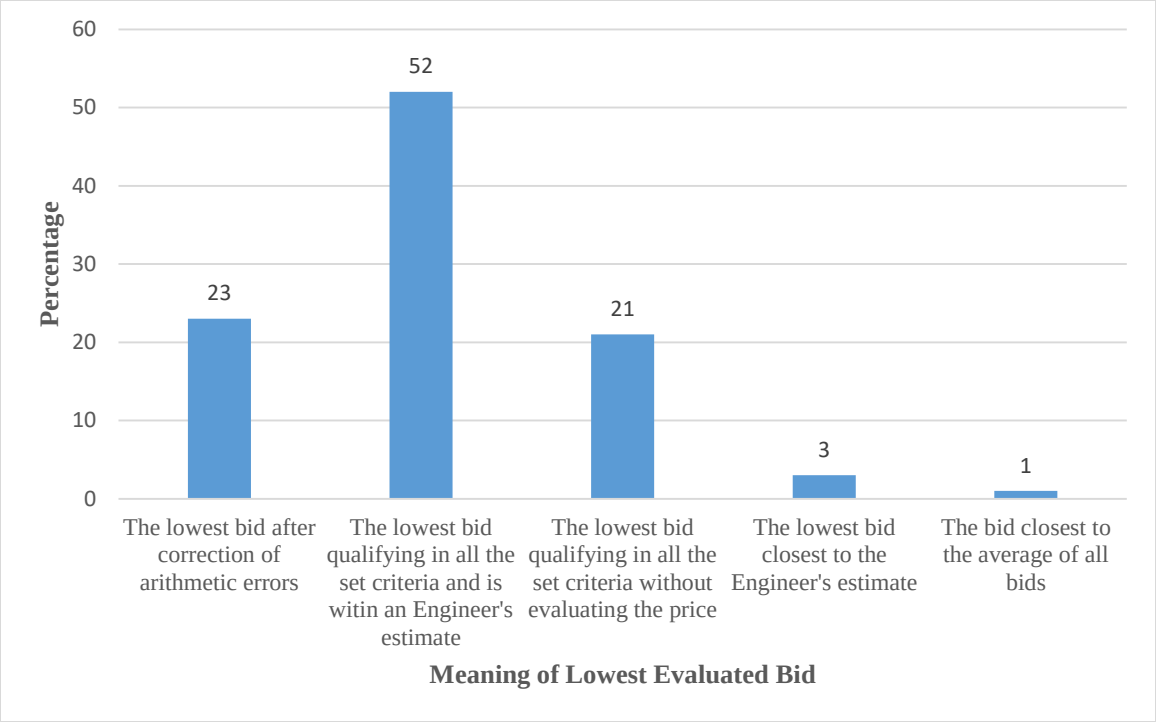

Figure 4.1: Meaning of lowest evaluated bid

Figure 4.1 shows that 52% understood that this is the lowest bid qualifying in all the set criteria and is within an engineer's estimate while 23% said it is the lowest bid after correction of arithmetic errors. 21% thought this was lowest bid qualifying in all the set criteria without evaluating the price while 3% understood it as the bid closest to the engineer's estimate. The last group 1% said this is the bid closest to the average of all bids.

The results demonstrate mixed understanding of this critical principle in tender evaluation and that 48% (overall) do not understand how to correctly apply this principle which may result in many wrong awards. In this regard, the proceeding analysis only considered the 52%.

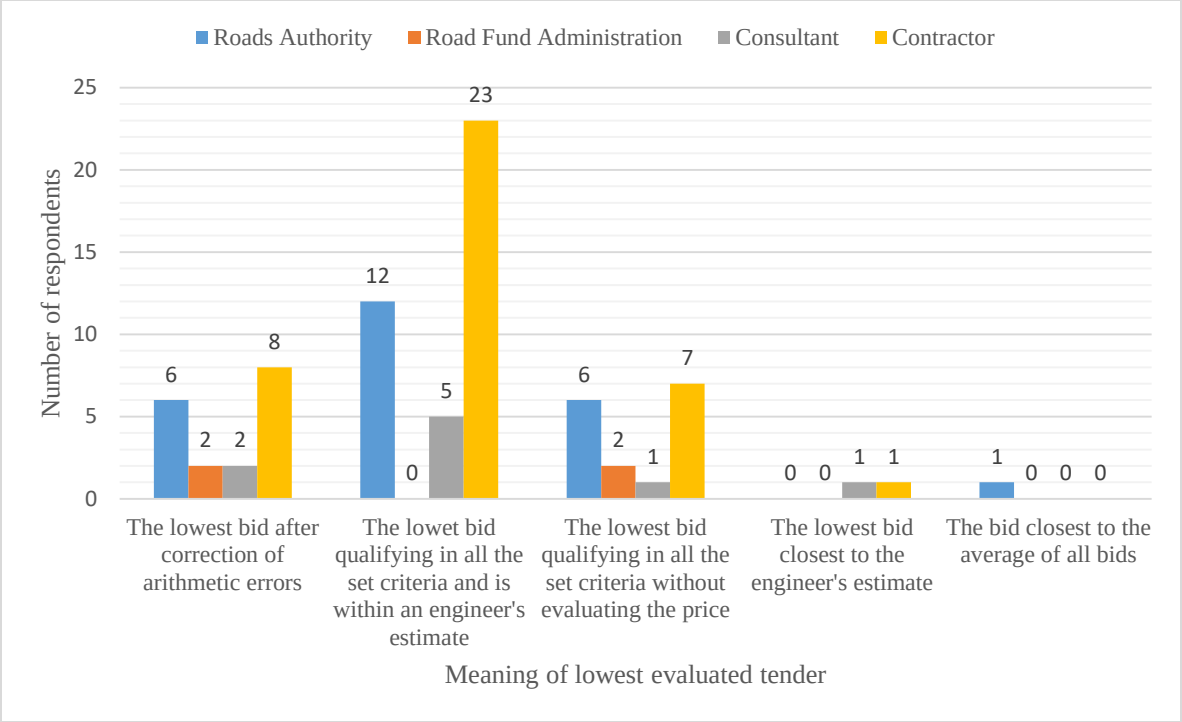

Figure 4.2: Meaning of lowest evaluated bid by organisation

Figure 4.2 shows that most organisations (apart from RFA) responded that lowest evaluated bid meant the lowest bid qualifying in all the set criteria and is within an engineer's estimate. This contrasts the practical application in Malawi where the lowest bid qualifying in all the set criteria without evaluating price is recommended for award of a contract.

4.3.1.2 Correct definition of lowest evaluated tender award system

The results confirm that the correct definition of lowest evaluated bid is that this is the bid that qualifies in all the set criteria and is within an engineers' estimate. This suggests that those institutions applying it differently risk awarding contracts to wrong bidders as the engineers' estimate guards against abnormally low or high bids.

4.3.1.3 Implications of differences in understanding of evaluation criteria

Figure 4.1 highlighted that 52% of respondents were unanimous on the understanding that the "lowest price" needs to be evaluated. However, the difference (comprising of 23%, 21%, 3% and 1% groups) understood the lowest evaluated bid method differently which may have effects when

applying the evaluation criteria. These could be at preparation and evaluation of tenders, and contract award.

Firstly, at preparation of tenders, bidders with an understanding that price would be evaluated would submit realistic rates that would enable execution of a contract with a profit. These would compare well with the budget/engineers estimate. However, a bidder who thinks this is just the lowest bid (without evaluating the price) would try to lower the prices (unreasonably) to ensure that they are the lowest in order to win a tender, just to remain in business. This creates many challenges at implementation as discussed in section 4.3.2.

Secondly, at tender evaluation, there are chances that the evaluation criteria is applied wrongly resulting in wrong awards. For instance, those believing that price should be evaluated would be able to scrutinise the bidder's rates and prices to check if they are reasonable while those who do not, would simply rank and recommend the lowest bid regardless of how realistic (or otherwise) the rates are.

Lastly, at award, institutions may offer contracts to different contractors with different understanding of the lowest evaluated bid method. Those that feel price should be evaluated would award to realistically pricing contractors unlike those that believe in any lowest price. Public institutions like RA tend to follow the latter which results in many needless problems at implementation stage.

4.3.1.4 Correct application of lowest evaluated tender award system

The results in the study highlighted that clients should ensure that the price should be included in the evaluation criteria in the lowest evaluated tender method. This is because clients face many problems with contractors selected under LETAS when engineers' estimate is disregarded. Similarly, contractors experience challenges during implementation because of low prices. Thus, clients want a system that would minimise costs but produce a quality product within time and budget while contractors want a system that would enable them perform but also realise profits.

From the foregoing, it can be concluded that the lowest evaluated bid is one that qualifies in all set criteria whose price is within an engineer's estimate. ODPP may consider noting this observation by the construction sector to be highlighted in *Public Procurement Act 2003* (MW) or any future amendments.

4.3.1.5 Ranked advantages of lowest evaluated tender award system

The research wanted to find out the advantages of LETAS and the results are presented in table 4.9. Values ranged from 1, (strongly disagree) to 5, (strongly agree).

Table 4.9: Advantages of lowest evaluated tender award system

1=Strongly disagree	**2=Disagree**	**3=Neutral**	**4=Agree**	**5=Strongly Agree**						
				Frequency						
Advantages of lowest evaluated tender method				**1**	**2**	**3**	**4**	**5**	**Mean**	**Standard Deviation**
Ensures transparency of tender process				4	5	6	11	14	3.65	1.35
Ensures lowest cost of completing projects				10	9	3	7	11	3.00	1.60
Provides a way to avoid fraud				6	7	6	14	7	3.23	1.35
Easy to use by evaluators				5	5	8	12	10	3.43	1.34
Legally acceptable				6	4	3	20	7	3.45	1.32
Acceptable by development partners				6	7	3	14	10	3.38	1.43
Ensures fairness of the tender process				5	6	6	11	12	3.48	1.40
Provides a way to avoid corruption				7	5	5	13	10	3.35	1.44
Promotes competition during tendering				3	7	3	14	13	3.68	1.31
Provides a way to avoid favouritism				6	5	5	13	11	3.45	1.41

An analysis of the results in table 4.9 shows the level of agreement by respondents on the advantages of LETAS. Basically, the respondents said that the method has two advantages; the method ensures transparency of the tender process and promotes competition during tendering with a mean of 3.68 and 3.65 respectively. The results suggest that respondents view this system as not offering many meaningful advantages to both clients and contractors. This could be because of the many challenges posed by the system.

The method ensures transparency of the tender process and promotes competition because it uses principles of open tendering where bidding is open to all those willing to participate and meet the eligibility criteria. With many involved, bidders reduce tender prices to increase chances of winning as they are aware that prices will not be evaluated. The uncertainty of other bidders' submissions further increases competition.

Price competition would have been advantageous to clients if bidders offered realistic prices. The competition would have resulted in clients getting value for money at the lowest price. However, because prices are not evaluated, the lowest bidders are usually well below market prices and struggle to perform.

4.3.1.6 Implications of promotion of transparency and competition during tendering

The transparency and competition are important as they add value to the procurement process and need to be encouraged in public procurement. The image of the procurement process and the procuring entity at large is enhanced. However, it is worth noting that it is the same unreasonable competition that results in contractors lowering prices. In addition, the other listed pros mostly concern the procurement process but not implementation of contracts. The one that touched on implementation (ensures lowest cost of completing projects) was the least ranked, with a mean of 3.00. Thus, while enhancing good procurement practices, clients should ensure that procurement systems should result in good project implementation.

4.3.2 Results on disadvantages of the lowest evaluated bid system

The study attempted to find out the constraints of the lowest evaluated bid system and the results are presented in table 4.10. In the findings, values ranged from 1, (strongly disagree) to 5, (strongly agree).

Table 4.10: Disadvantages of LETAS

1=Strongly disagree	**2=Disagree**	**3=Neutral**	**4=Agree**	**5=Strongly Agree**						
				Frequency						
Disadvantages of the lowest evaluated bid system				**1**	**2**	**3**	**4**	**5**	**Mean**	**Standard Deviation**
It results in unreasonably low bids				5	3	1	8	23	4.03	1.44
It results in time overruns				6	5	0	14	15	3.68	1.47
It results in lack of innovation by contractors				4	4	0	16	16	3.90	1.32
It results in high cost of procurement				5	9	5	14	7	3.23	1.33
It leads to poor quality work				5	1	3	12	19	3.98	1.35
It results in cost overruns				4	8	4	14	10	3.45	1.34
It results in adversarial relationships between project parties				6	4	2	15	13	3.63	1.43
It encourages predatory bidding				4	3	3	11	19	3.95	1.34
It leads to selection of unqualified contractors				5	6	0	10	19	3.80	1.49
Evaluators handle too many tender documents during evaluation				8	9	6	8	9	3.03	1.48
It leads contractors into bankruptcy				3	5	5	9	18	3.85	1.33
It results in termination of contracts				4	7	3	12	14	3.63	1.39
It results in abandonment of projects by contractors				3	7	2	9	19	3.85	1.39
It results in contractor's struggling to fund projects				3	5	1	13	18	3.95	1.30
It results in failure to meet project objectives				5	5	1	13	16	3.75	1.43

An analysis of the results in table 4.10 shows the level of agreement by respondents to the disadvantages of LETAS:

- The highest ranked disadvantage is that the method results in unreasonably low bids with a mean of 4.03;
- The second ranked disadvantage is that the method leads to poor quality work with a mean of 3.98

- Thirdly, the method results in contractors struggling to fund projects and that the method encourages predatory bidding with a mean of 3.95;
- Fourthly, the method leads to lack of innovation by contractors with a mean of 3.90;
- The fifth ranked disadvantage is that it leads contractors into bankruptcy and that the method results in abandonment of projects by contractors with a mean of 3.85;
- The sixth ranked disadvantage is that it leads to selection of unqualified contractors with a mean of 3.80;
- The seventh ranked disadvantage is that the method results in abandonment of projects by contractors with a mean of 3.75;
- The eight ranked disadvantage is that the method results in time overruns with a mean of 3.68; and
- The ninth ranked disadvantage is that the method results in adversarial relationships between project parties and results in termination of contracts with a mean of 3.63;

This showed that the method resulted in many problems during tendering and at implementation of projects. The method forces contractors to engage in bad practices for example unrealistically lowering bid prices and predatory bidding just to win contracts. The challenges of the method are also compounded by the fact that the price is not evaluated as discussed in section 4.3.1.2. The result is selection of unqualified contractors.

The abnormally low bid prices further results in problems at implementation stage as contractors struggle to fund projects, use substandard materials and employ unqualified and inexperienced key site personnel as they cannot afford the best. This results in failure to meet project objectives as works are of poor quality, finish beyond contract periods and sometimes contracts are terminated or abandoned.

The results also suggest that the method inhibits growth of contractors as it is difficult to make reasonable profits with unrealistically low bids. Similarly, with poor quality works, chances are high that contractors would be ordered to rework at their own cost resulting in further reduction of profits. In addition, contractors might be charged liquidated damages due to time overruns.

4.3.2.1 A comparison of pros versus cons of LETAS

The study attempted to compare the results on the advantages and disadvantages of LETAS to analyse the level of emphasis of the respondents. Mean values were used as in table 4.11.

Table 4.11: Comparing pros and cons of lowest evaluated tender award system

Advantages of the lowest evaluated bid system	Mean	Mean	Disadvantages of the Lowest Evaluated Bid System
Promotes competition during tendering	3.68	4.03	It results in unreasonably low bids
Ensures transparency of tender process	3.65	3.98	It leads to poor quality work
		3.95	It encourages predatory bidding
		3.95	It results in contractor's struggling to fund projects
		3.90	It leads to lack of innovation by contractors
		3.85	It leads contractors into bankruptcy
		3.85	It results in abandonment of projects by contractors
		3.80	It leads to selection of unqualified contractors
		3.75	It results in failure to meet project objectives
		3.68	It results in time overruns
		3.63	It results in adversarial relationships between project parties
		3.63	It results in termination of contracts
2 out of 10 with a mean above 3.5 (from table 4.9)		**12 out of 15 with a mean above 3.5 (from table 4.10)**	

Table 4.11 shows that the highest mean on the advantages of lowest evaluated tender method was 3.68 (the method promotes competition). Comparatively, the highest mean on the disadvantages is 4.18 (it results in unreasonably low bids) with eleven more above 3.5 and could be rounded off to 4 (an agree score). There were three disadvantages only with a mean of less than 3.5

This suggests that respondents do not appreciate the advantages of this method. This could be because the pros are more skewed towards the procurement process than project implementation. On the other hand, the disadvantages are more pronounced with high means, and negatively affect contractors and clients at the implementation stage and the effects are clearly visible. It can, therefore, be concluded that LETAS poses more problems than solutions in Malawian context.

4.3.2.2 Implications of disadvantages of lowest evaluated tender award system

The implications of the disadvantages can generally be grouped into three categories:

- They cause failure to fulfil project objectives;
- They cause poor performance of contractors; and
- They inhibit growth of contractors.

The underlying challenge is the lowest price that is not evaluated. This results in all parties suffering as clients get poor quality products with time overruns while contractors struggle to perform (and resort to bad practices) and fail to grow because of low or no profits. Similarly, the public is dissatisfied with how their taxes are used.

4.3.3 Results on performance of projects under lowest evaluated tender award system

The study attempted to find out how projects awarded under LETAS performed in respect to time, cost, quality and scope according the respondents' perceptions. The results are presented in table 4.12 and values ranged from 1, (strongly disagree) to 5, (strongly agree).

Table 4.12: Performance of projects under LETAS

1=Strongly disagree	2=Disagree	3=Neutral	4=Agree	5=Strongly Agree					
					Frequency				
Performance of projects awarded under LETAS					**1**	**2**	**3**	**4**	**5**	**Mean**
Projects are generally completed within time					8	17	2	13	0	2.50
Projects are generally executed in extended contract period					4	4	2	21	9	3.68
Projects generally experience time overruns					4	5	2	21	9	3.63
Projects are generally completed before time					13	20	2	3	2	2.03
Projects are generally terminated					4	9	8	9	10	3.30
Projects are completed without exhausting budgeted funds					7	17	4	10	2	2.58
Projects are generally completed within budgeted funds					7	12	3	14	4	2.90
Projects are completed with cost overruns					5	14	8	9	4	2.83
Projects are done within specifications & very good quality					8	20	5	7	0	2.28
The works are generally done with acceptable quality					6	15	6	13	0	2.65
The works are generally done with poor quality					3	13	2	13	9	3.30
The works are generally done with very bad quality					6	11	5	11	7	3.05
All works are executed as planned					4	18	10	5	3	2.63
There are generally many variations in the scope of works					5	14	3	16	2	2.90
The scope of works is completely changed					7	13	2	13	5	2.90

The results in table 4.12 showed that respondents feel that projects awarded under LETAS were completed with time overruns (a mean of 3.63). Responses on the aspect of time highlighted that respondents were clearly following the issues as questions were deliberately varied to give negative and positive performance on time. For instance, respondents disagreed that projects finished on time with a mean of 2.50 and that projects finished before time with a mean of 2.03.

On quality of works, table 4.12 shows that respondents disagreed that works are done within specifications and are of very good quality with a mean of 2.28. They were however neutral (towards disagreeing) that works were done with acceptable quality with a mean of 2.65 and neutral (towards agreeing) that works were generally done with poor quality with a mean of 3.30.

The results further showed that respondents were neutral that projects finished with cost overruns (mean of 2.83) and that there were many variations in scope of works (mean of 2.90). The neutrality is because these two aspects are generally controlled by clients.

In addition to the survey results above, the study attempted to find out performance of projects awarded under LETAS from consultant reports at RA to compare with the results of the survey. The results are presented in figures 4.3 - 4.6.

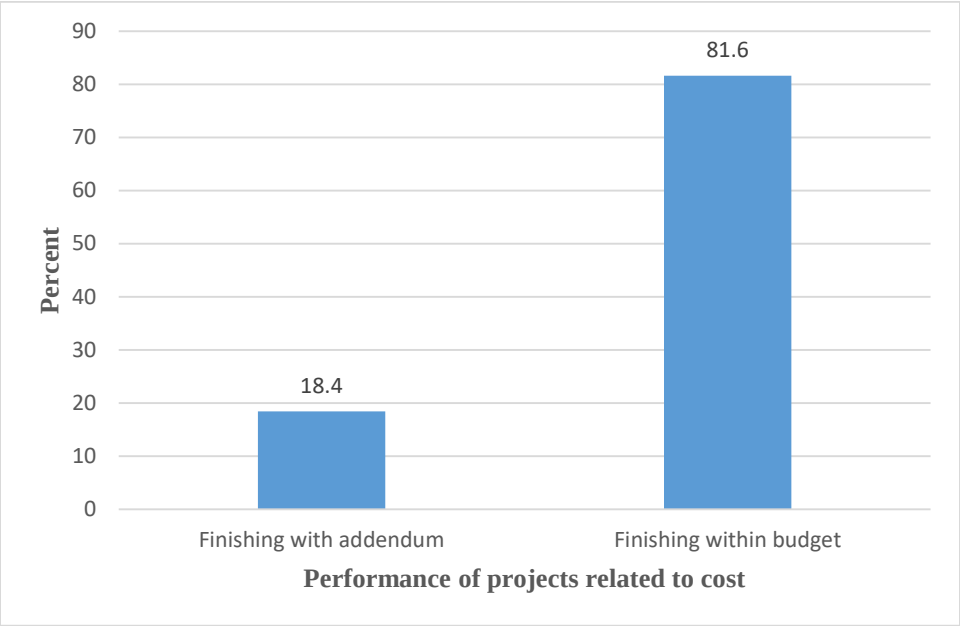

Figure 4.3: Performance of projects related to cost (from consultant reports)

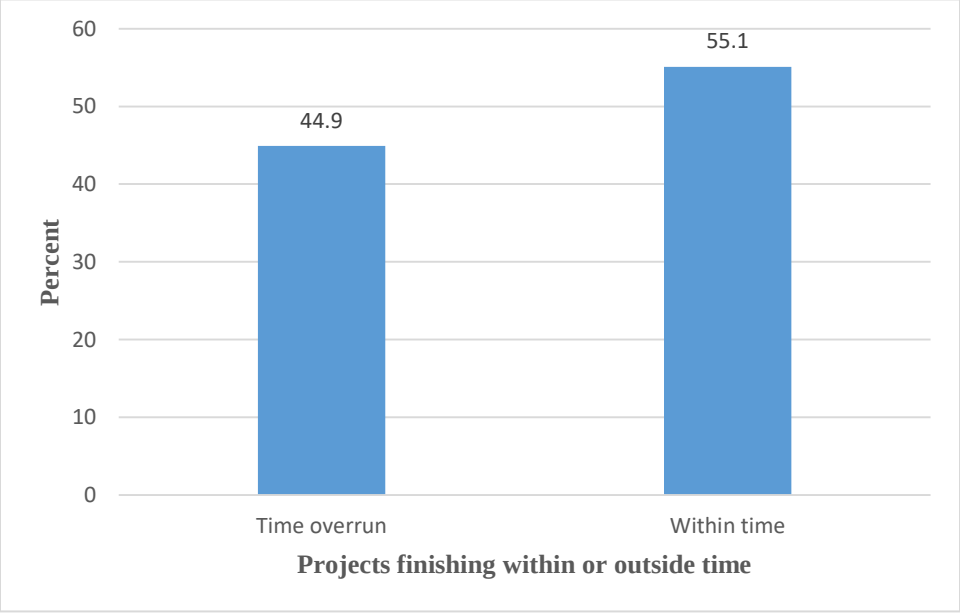

Figure 4.4: Performance of projects related to time (from consultant reports)

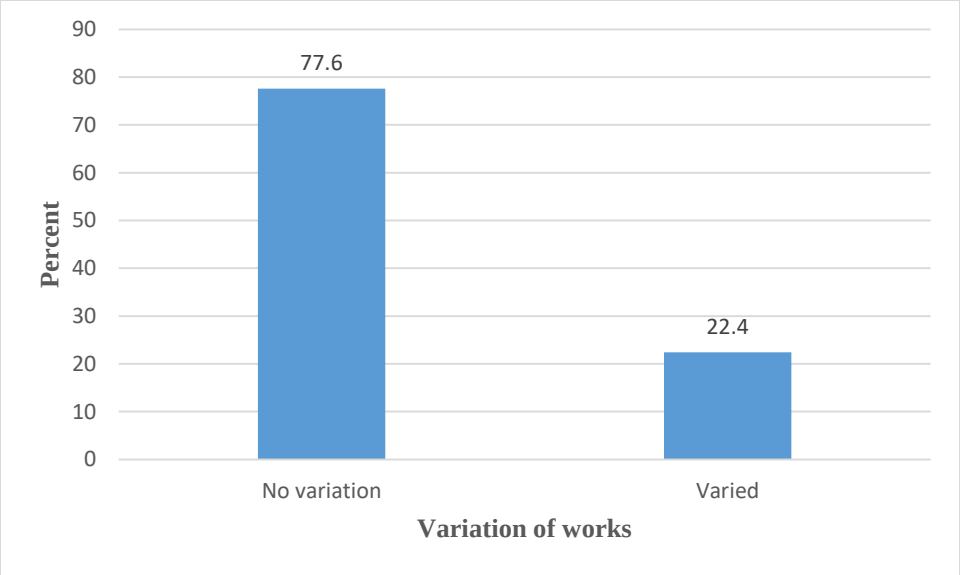

Figure 4.5: Variation of works from consultant reports

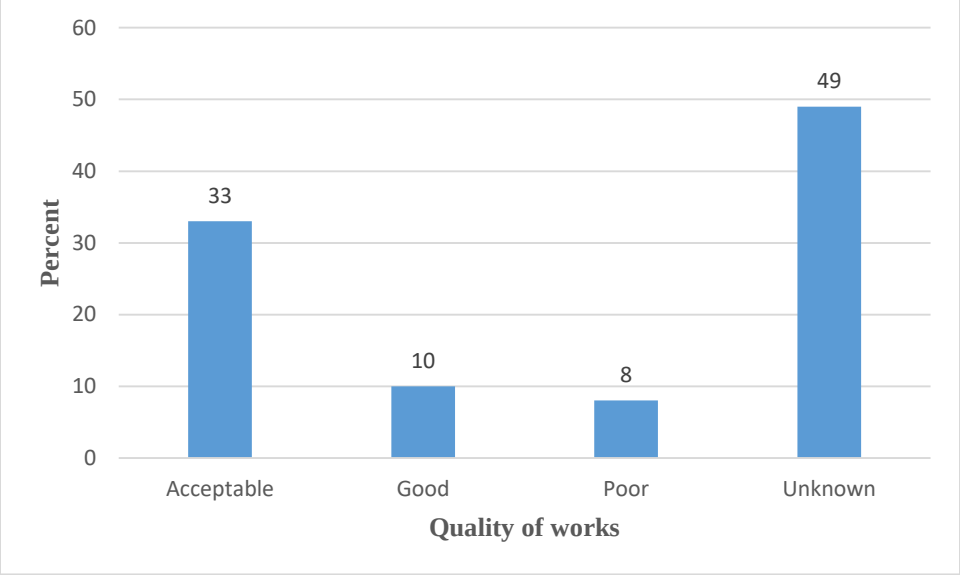

Figure 4.6: Performance of projects related to quality (from consultant reports)

Results from consultants' reports (figures 4.3 – 4.6) show that 81.6% of projects were completed within budget while 18.4% had addenda. 45% were completed with time overruns while 55.1% were completed on time (some with extensions). 77.6% of projects had no variation orders while 22.4% were varied. Lastly, 43% of projects had good or acceptable quality, 8% had poor quality while 49% had no comment on quality.

The interview also suggested that works were generally of poor quality while time performance was estimated at 50% on time and the remainder with time overruns. It further stressed that issues of cost and variations are mostly controlled by clients.

4.3.3.1 Time overruns

An analysis of the results in table 4.12 shows that respondents generally agree that selecting contractors using LETAS results in time overruns at implementation stage with a mean of 3.82 despite the fact that there could be other causes. In collaboration, 45% of the sampled projects finished with time overruns while 55% were completed on time. This could be because contractors struggle to finance the works due to the low rates. They could also be looking for opportunities to benefit financially like through lapses in supervision. The findings agree with Iannou and Leu (1991), Huang (2011) and Shrestha (2014) who found that LETAS resulted in time overruns. In addition, Khan and Khan (2015) and Post (1998) who found that 50% and 42% respectively of projects whose contractors were selected under LETAS completed beyond contract period.

4.3.3.2 Cost overruns

An analysis of the results in table 4.12 shows that respondents felt that LETAS does not result in cost overruns at implementation stage (mean of 2.83). However, when responding to a similar question on disadvantages of LETAS, 60% (figure 4.7) agreed that LETAS results in cost overruns. The difference is because at project implementation, approved contract values are controlled by project managers and contractors as payments may not be made beyond the approved amounts. However, because of time overruns, poor quality and variation orders, there are increases in supervision and maintenance costs. Retendering costs may also come in where contracts are terminated or abandoned.

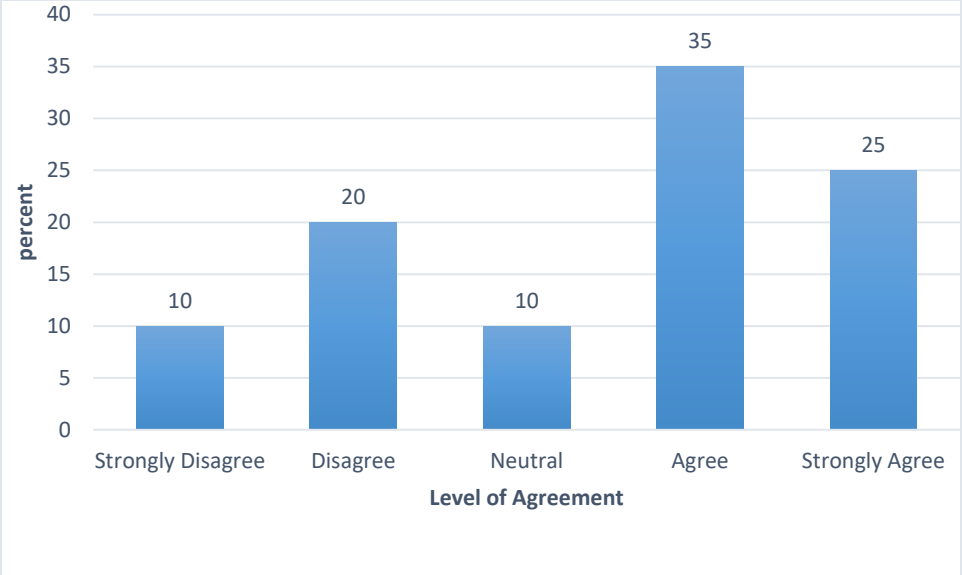

Figure 4.7: Cost overrun bar chart under disadvantages of LETAS

4.3.3.3 Quality of works

An analysis of the results in table 4.12 shows that respondents felt that the quality of works executed by contractors selected under LETAS was generally poor as respondents disagreed that works were of acceptable quality (mean of 2.65). In addition, figure 4.8 shows that 55% of the respondents either agree or strongly agree that the works are of poor quality.

The findings agreed with those of Khan and Khan (2015) who found that quality of projects under this system was just satisfactory. In the same vein, Hardie and Swapan, (2012) found that 35% of jobs awarded to lowest bidders resulted in unsatisfactory quality of work. Locally, the findings agreed with those of Emuze and Kadangwe (2013) who found that poor quality of works in Malawi was attributed to the procurement method that favoured the lowest bid. It is interesting to note that 40% of the 55% agreeing that the method results in poor quality are contractors (figure 4.8). This shows that as implementers, they are aware of the malpractices happening but may not help because they are squeezed by the low prices.

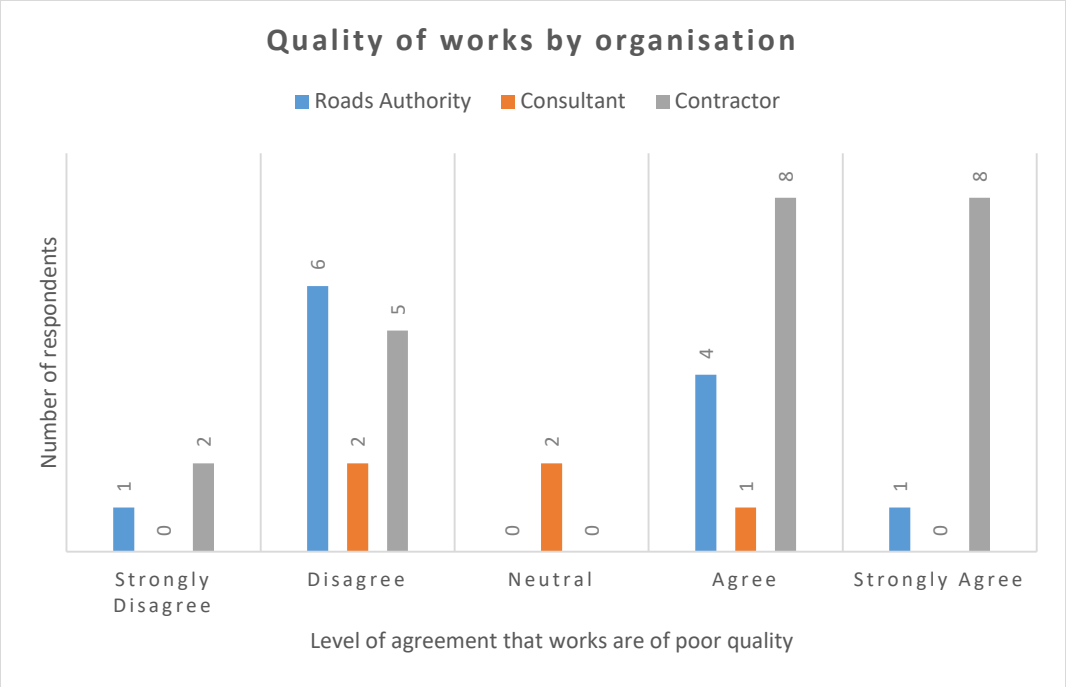

Figure 4.8: Works are of poor quality

4.3.3.4 Scope of works

An analysis of the results in table 4.12 suggests respondents feel that there are variations in the scope of works. However, a mean of 2.90 shows that respondents hold a neutral view on whether the variations in scope are a result of LETAS. The variations could be initiated for normal reasons like unforseable site conditions or necessary design changes. Many variations in the consultant reports originated from the client.

4.3.3.5 Implications on performance of projects

Time overruns and poor quality of works results in additional costs to clients in maintaining or reconstructing the poor infrastructure, and supervision services. Similarly, the image of the clients is battered in the eyes of the public who may assume that employees are accomplices to the problems. On the other hand, the reputation of contractors is also damaged and they may be punished by clients through contractual provisions.

4.3.4 Improvement of contractor selection

The study also attempted to know what ways respondents thought would improve contractor selection methods. The results are presented in table 4.13 and values ranged from 1, (strongly disagree) to 5, (strongly agree).

Table 4.13: Improvement of contractor selection methods

1=Strongly disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree							
	Frequency						
Methods of improving contractor selection	**1**	**2**	**3**	**4**	**5**	**Mean**	**Standard Deviation**
Using average bid	3	13	11	8	5	2.98	1.17
Using total cost	3	11	16	10	0	2.83	0.90
Introducing performance assessment of contractors	2	4	2	20	3	3.90	1.11
Building a bidder classification system	0	10	6	20	4	3.45	0.99
Introducing a difference bond	1	10	18	11	0	2.98	0.80
Using unit rate analysis for major items	2	6	4	16	12	3.75	1.19
Using multiple criteria with weights	2	8	10	13	7	3.38	1.15
Using a ratio of plus or minus 15% with engineers estimate	0	2	2	10	26	4.50	0.82
Using shortlisting of bidders	10	10	3	10	7	2.85	1.49
Maintaining lowest evaluated tender system	16	11	3	7	3	2.25	1.35
Using non price criteria	6	15	17	2	0	2.38	0.81
Random audits of previous evaluation reports	3	7	10	17	3	3.25	1.08
Using multiple methods including engineers estimate	1	4	5	18	12	3.90	1.03

An analysis of the results in table 4.13 shows the level of agreement by respondents to the proposed methods of improving LETAS:

- The highest ranked method was the use of a ratio of plus or minus 15% with engineers' estimate with a mean of 4.50;
- The second ranked method was the introduction of a performance assessment of contractors and the use of multiple methods including engineers' estimate with a mean of 3.90; and
- Thirdly, use of unit rate analysis for major items with a mean of 3.75.

The results suggest that respondents wanted a system where apart from other technical and administrative criteria, the bid price should be evaluated by comparing it with an engineers' estimate or analysing the major items. They further wanted an assessment of the contractors' performance to ensure that nonperformers are eliminated while performers are rewarded.

4.3.4.1 Respondents views towards lowest evaluated bid system

A further analysis of the results highlight that the respondents were very negative towards maintaining LETAS (figure 4.9, and a mean of 2.25 in table 4.13). This is because both contractors and clients have discovered that they did not get value for money by using LETAS, rather there were many undesirable effects. The advantages of LETAS were also seen to be more towards the procurement process but were not transferred to the implementation stage.

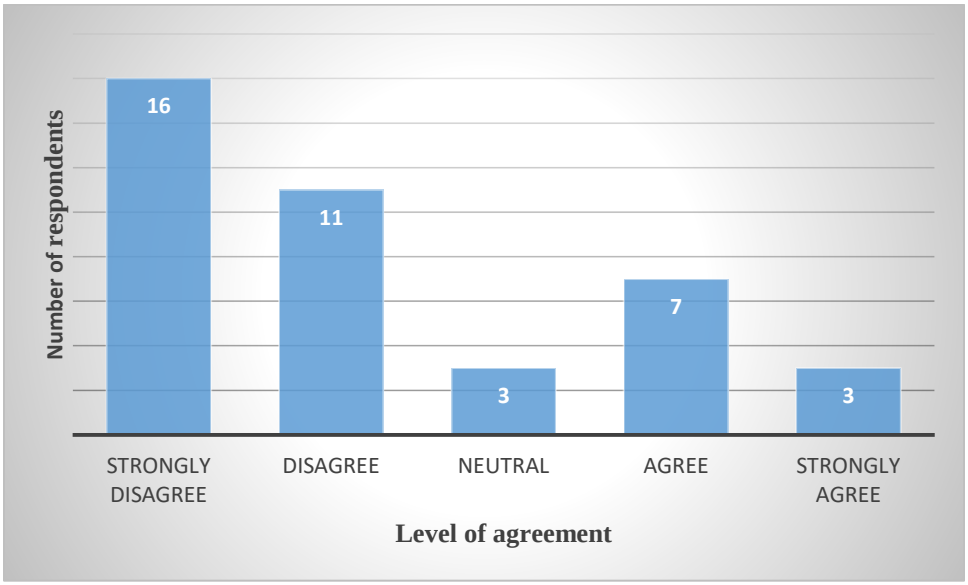

Figure 4.9: Respondents against LETAS

4.3.5 Results on preferred method of contractor selection

Respondents were asked to select their preferred method of contractor selection, better criteria and to indicate whether they would like to have *Public Procurement Act 2003* (MW) amended to allow for use of other contractor selection methods.

4.3.5.1 Preferred method

The study wanted to find out the preferred method of contractor selection by the professionals in the construction industry. The results are presented in figure 4.10.

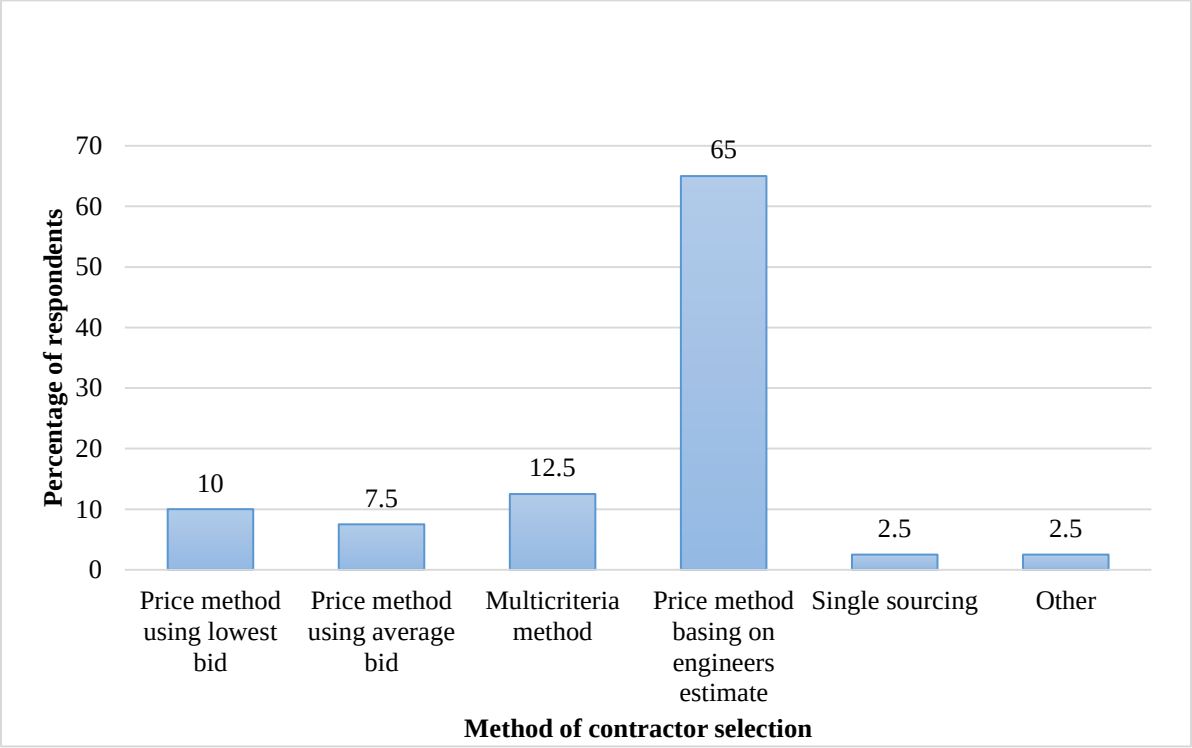

Figure 4.10: Preferred method of contractor selection

An analysis of the results in figure 4.10 suggests that the majority of respondents (65 %) preferred selecting contractors using price method basing on engineers' estimate. This was seconded by multi-criteria method at 12.5%. The LETAS was third at 10% and the rest had less than 5% each.

The price method based on engineer's estimate was preferred because it assures both parties on the reasonability of the contract sum. The challenge is that others deem it not transparent and that

it can be abused to favour some bidders. However, the message is clear that the industry wants the price to be evaluated by comparing it to the engineer's estimate. Procuring entities and regulating institutions should find ways of minimising/stopping the abuse by among others producing estimates after submission of tenders using independent consultants.

The next alternative, multi-criteria method uses both price and other qualitative factors in contractor selection. Here, different criteria are assigned weights and a contract is awarded to a bidder with the highest score. The results are in line with other studies (Enshassi *et al*., 2013; Salama, Adb El Aziz *et al*., 2006; Zou, 2007) who found that there was an increasing appreciation of the multi-criteria method in the construction sector.

4.3.5.1.1 Implication of the preferred method of contractor selection

The choice shows that all groups are using the current system simply to be in line with the law and not because of the benefits it accrues. Clients know that the selected contractors will underperform and produce substandard work but they do not have a choice. Similarly, contractors know they will struggle to perform but continue reducing unit rates to increase chances of winning contracts. The result is that while procurement laws are followed, the construction industry is collapsing.

4.3.5.2 Better criteria

Respondents were asked to choose what they considered to be better criteria between price and non-price criteria. The results are presented in figure 4.11.

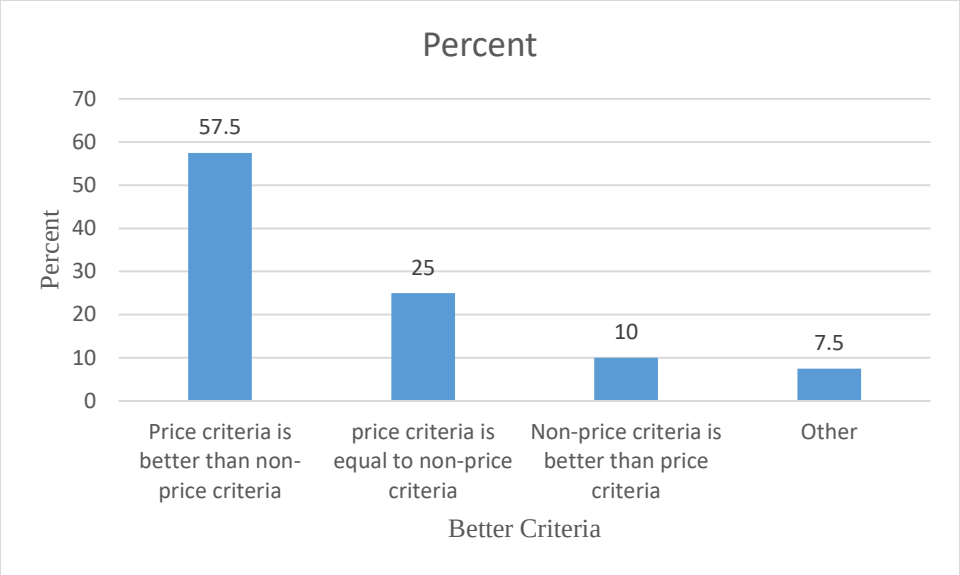

Figure 4.11: Respondents choice of better criteria

An analysis of the results in figure 4.11 shows that 57.5% of respondents felt that price criteria is better than non-price criteria while 25% felt price criteria is equal to non-price criteria. 10% thought non-price criteria was better than price criteria while the rest were not decided. The responses suggest that while other factors may also be used in contractor selection, price should have a higher weighting. This is in line with current practice in other nations (Enshassi *et al*., 2013; European Union, 2014).

The results are in agreement with those of Wong *et al*. (2000) who found that 66% of respondents in public sector (62% private sector) felt that price criteria is better than non price criteria and 22% in public sector (32% private sector) felt price criteria was equal to non-price criteria. It, therefore, makes sense to make price the key criteria in contractor selection, however, this should be augmented by other qualitative criteria to ensure value for money.

The result could be because it is easier to objectively compare tenders using price as compared to non-price factors which may lead to subjectivity. This could be the reason why those that have adopted multi-criteria method insist on competence of those preparing the evaluation criteria and evaluating tenders to ensure objectivity of the procurement process.

4.4 Chapter Summary

The chapter has presented the findings with an analysis and interpretation of the results. The results show that LETAS does not offer meaningful advantages. Generally, respondents feel the method is not good for the Malawian construction sector with many disadvantages that centre on unrealistically low prices, poor project performance and inhibiting growth of contractors. Respondents want the lowest price to be evaluated against the engineers' estimate and, therefore, called for amendment of *Public Procurement Act 2003* (MW) to allow for usage of other methods. The next chapter summarises the findings, and presents conclusions and recommendations for future action.

CHAPTER 5
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Chapter Overview

This chapter presents the summary, conclusions and recommendations arising from analysing the effectiveness of the lowest evaluated tender award system. Firstly, it examines whether the research objectives were met and the research questions answered. Then it summarises main findings of the research, makes conclusions and recommendations for future action. Finally, the chapter suggests areas where future research could be focussed and makes an overall conclusion on the research process.

5.2 Achievement of research objectives

The research was designed to analyse the effectiveness of the lowest evaluated bid method in Malawi. Literature study suggested that while promoting good governance, the method resulted in multiple challenges at the project implementation stage. In this regard, the study was premised on the following objectives:

- Analysing the pros of the lowest evaluated tender award system in Malawi,
- Analysing the disadvantages of the lowest evaluated tender award system in Malawi,
- Assessing the performance of projects awarded based on lowest evaluated tender award system,
- Investigating the preferred system of contractor selection by professionals in the construction industry in Malawi.

The literature reviewed as presented in chapter 2 of this dissertation investigated effects of LETAS in publications from several countries and organisations including the Netherlands, Vietnam, United States of America, Australia, Turkey, Taiwan, Malysia, United Kingdom, Pakistan, China, EU and OECD states, AfDB and the World Bank. This further highlighted current trends in contractor selection practices.

The research methodology used is presented in chapter 3. The study used a case study of the Roads Authority. Data was collected using a questionnaire, semi-structured interviews and consultant reports at RA. Literature review guided the formulation of the questionnaire, and selection of respondents was largely random except for cases where the whole population was targeted. Data was analysed using SPSS version 20.0 and Microsoft Excel.

The results of the study are presented and analysed in chapter 4, and had an input from staff at RA/RFA, consultants and contractors. The results revealed that LETAS has more disadvantages than advantages to the Malawian construction industry. Based on the results, most projects procured under LETAS experience time overruns and the quality of products is compromised. The results also highlight that industry practitioners would prefer contractors to be selected using a price method whose price is evaluated (for example using on engineers' estimates). Based on the findings, it is clear that the research objectives were met and all the research questions were duly answered.

5.3 Summary of the main findings of the research

The research highlighted that the advantages of lowest evaluated tender method are more pronounced towards improving the image of the procurement process whereas the disadvantages negatively impact on implementation of projects. Most works done by contractors selected through this method experience time overruns and are of poor quality. Respondents prefer that the price in this method should be evaluated against the engineers' estimate.

5.3.1 Summary on advantages of the lowest evaluated tender award system

The confirmed advantages of LETAS in Malawi were that it promotes transparency and competition during tendering stage. While this improves the integrity of the procurement process, the advantages are not pronounced at project implementation stage.

5.3.2 Summary on disadvantages of the lowest evaluated tender award system

The study found that there are many disadvantages of LETAS in Malawi which are mostly as a result of the lowest price ***that is not evaluated***. The disadvantages results in poor performance of

contractors, failure to meet project objectives, and inhibits growth of contractors. The disadvantages are more pronounced at project implementation stage.

5.3.3 Summary on performance of projects under lowest evaluated tender award system

Most projects whose contractors are selected under LETAS face time overruns and have poor quality products. These lead to additional costs to clients for example those of reworking, supervision and retendering.

5.3.4 Summary on preferred method of contractor selection

Professionals in the construction industry in Malawi prefers that contractors should be selected using the lowest evaluated bid method whose price is evaluated against an engineers' estimate. Alternatively, they would prefer multi-criteria method.

5.4 Conclusions and recommendations

In view of the results, a number of conclusions and recommendations are made. These relate to all parties involved in public procurement.

5.4.1 Conclusions

From the findings of the research, the following conclusions are made:

- The advantages of LETAS enhance good governance and integrity of the procurement process. The advantages, however, do not transfer these benefits to the implementation stage where there are many challenges.
- The disadvantages are mostly a result of the lowest price that is not evaluated. These result in poor performance of contractors, failure to fulfil project objectives and negatively impacts on growth of contractors. The disadvantages affect both the procurement process and the implementation stage.
- Most projects procured under LETAS were found to have time overruns, are of poor quality, finish within budget and have minimal variations. Clients suffer added costs of maintaining poor quality infrastructure and supervision of delayed contracts.
- The professionals in the construction industry would like a contractor selection system where price is evaluated or use multi-criteria method where price and other qualitative

factors are evaluated. The lowest evaluated tender method without evaluating the price is completely discouraged, but professionals in the construction industry feel price related criteria is much better than non-price related criteria.

In general, while improving the integrity of the procurement process, LETAS is viewed as not being advantageous to the construction industry in Malawi as it contributes to compromising fulfilment of project objectives of cost, time and quality. Clients do not realise value for money and the private sector (contractors) does not grow.

5.4.2 Recommendations

From the findings and conclusions, the following recommendations are made:

- Clients should maintain and improve on the systems that promote transparency and competition during tendering. These systems will enhance the integrity of the procurement process.
- Clients should lobby with regulating institutions (ODPP) to consider adding systems that would make the procurement systems also advantageous at project implementation.
- Contractors should lobby with clients to change procedures of contractor selection to allow price to be evaluated. This would ensure that contracts are awarded at realistic prices.
- Contractors should be professional at tendering by building realistic unit rates based on market prices. These rates would enable them perform when awarded contracts. Lowest price on its own is not bad if it is realistic.
- Clients should research on and document performance of projects awarded under LETAS and use the empirical evidence to lobby with ODPP to add systems that would make procurement processes to select performing contractors, not just the lowest.
- The ODPP should invest in research with procuring entities to monitor performance of the recommended procurement systems and pilot other methods so that they continue protecting the public from procurement malpractices while at the same time fulfilling project objectives. They should further assess the linkage of lowest evaluated tender method with critical project success factors of cost, time and quality. This would help them

make informed decisions. This is in line with *Public Procurement Act 2003* (MW) clause 5 (g) and (i).

- Clients should maintain and improve on systems that ensure that projects are completed within budget and adherence to scope. They should, however, introduce systems that would ensure that projects are completed timely and to specifications.
- Clients should lobby with ODPP to amend *Public Procurement Act 2003* (MW) (or to change interpretation of LETAS) to include price evaluation in the lowest evaluated bid method or use of alternative contractor selection methods. They should procure for value rather than lowest price.
- ODPP should embrace change as championed by other nations and organisations who have adopted use of alternative methods like multi-criteria which have been found to realise value for money.

5.5 Future research

In order to enhance knowledge and understanding of the subject matter, future research is proposed in the following areas:

- Analysing the lowest evaluated bid method in other sectors like building and water,
- Comparison of actual contractor selection methods between private and public sector clients and their success,
- A comparison of pricing tendencies between Small and Medium Enterprises and Big Contractors,
- Assessment of correlation between LETAS and critical project success factors of cost, time, quality and scope, and
- A study of actual contract management practices in Malawi.

5.6 Chapter Summary

Public Procurement Act 2003 (MW) mandates that all public procurement should use the lowest evaluated tender method except for special circumstances. While promoting good governance and competition in procurement, the method does not add value at implementation. It contributes to

time overruns and poor quality of works. In addition, clients incur added costs on supervision, maintenance and retendering. The major challenge is the lowest price that is not evaluated.

In order to improve service delivery, countries and other organisations are using other methods that have adopted the good aspects of LETAS and enhanced them with systems that would ensure appropriate project execution. These include evaluating the price against the clients' budget or an average of responsive bids or using multi-criteria method where all parameters including price are scored. In this regard, it is important that Malawi moves like other countries and organisations in migrating from price based procurement to value based procurement. From the results, conclusions and recommendations, the message is clear that the country needs to pass legislation to allow for use of other contractor selection methods that would ensure value for money.

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APPENDICES

Appendix A : Covering letter

University of Malawi
The Polytechnic
Private Bag 303
Chichiri
Blantyre 3, Malawi

Cell: 0999 920 486/ 0888 687 111 Email: mandaderick@gmail.com

10 August 2017

Dear Respondent,

RESEARCH: ANALYSING THE LOWEST EVALUATED TENDER AWARD SYSTEM; A CASE STUDY OF ROADS AUTHORITY

I write to seek your assistance in completing the attached questionnaire for the MSc Dissertation on the above mentioned topic.

The research forms part of the requirements in pursuit of studies leading to a Master of Science degree in Infrastructure Development and Management at the University of Malawi, the Polytechnic.

The major objective of the study is to analyse the lowest evaluated tender award system in construction projects. This will help both clients and contractors establish the salient effects when using the method in procurement of works contracts. The government will also benefit as this can give policy direction on public procurement.

You are, therefore, requested to respond to all questions as accurately as possible. All information collected will be kept confidential and used for academic purposes only. Names of respondents and their organisations will not be revealed and respondents reserve their right to withdraw from participating in the survey. A copy of the summary report will be available to willing respondents. It should take about 10 minutes of your time to complete the questionnaire.

I look forward to receiving your response by not later than 20th August 2017 and please receive my thanks in advance.

Yours Faithfully

Derick S. Manda — Student/Researcher

Rodrick Lengama Chilipunde — Supervisor

Appendix B : Questionnaire

QUESTIONNAIRE

SECTION 1: Demographic Information

This section of the questionnaire seeks to gather background information of respondents.

1.1 Age (Tick appropriate box)

16-24	25-34	35-44	45-54	55+

1.2 Gender (Tick appropriate box)

Male	Female

1.3 Profession (Tick or write appropriate box)

Engineering	Procurement	Quantity Surveying	Other (specify)……..

1.4 Which of the following organizations do you work for? (Tick appropriate box)

Roads Authority	Roads Fund Administration	Consultant	Contractor

1.5 Years of experience in construction industry (Tick appropriate box)

0-5	6-10	11-15	16-20	21+

1.6 Years of experience in procurement of works contracts (Tick appropriate box)

0-5	6-10	11-15	16-20	21+

1.7 Your level of familiarity with the Public Procurement Act (2003) of Malawi (Tick appropriate box)

Not at all familiar	Slightly familiar	Somewhat familiar	Moderately familiar	Very familiar

1.8 Highest Qualification (Tick or write appropriate box)

Postgraduate	Degree	Diploma/Cert.	Tradesman	Other (Specify)…….

SECTION 2: Advantages of Lowest Evaluated Tender Method

2.0 The Malawi Public Procurement Guidelines of 2004 chapter 79 (b) states that "the successful bid shall be the lowest evaluated bid responsive to the requirements set forth in the bidding documents, determined on the basis of the criteria set forth in the bidding documents". This is in line with Public Procurement Act 2003 chapter 31 (18) of Malawi. The guideline has been misunderstood in its applicability by many clients during tender evaluations in that the price aspect is simply ranked and not evaluated. This has led to awarding contracts to contractors with abnormally low bids who struggle to perform.

In public procurement in Malawi, which of the following statements correctly describes the meaning of "lowest evaluated bid", which should be followed when awarding contracts (*Please circle the correct answer)*

1. The lowest bid after correction of arithmetic errors
2. The lowest bid qualifying in all the set criteria and is within an engineer's estimate
3. The lowest bid qualifying in all the set criteria without evaluating the price
4. The bid closest to the engineer's estimate
5. The bid closest to the average of all bids

1	2	3	4	5

3.0 The statements below are perceived advantages of the lowest evaluated tender method in public procurement. To what extent do you agree with these statements in relation to public procurement in Malawi? (Tick appropriate box)

Note

1 Strongly Disagree
2 Disagree
3 Not Sure/Neutral
4 Agree
5 Strongly Agree

1 The method ensures transparency of the tender process as it follows principles of open tendering

1	2	3	4	5

2 The method ensures lowest cost of completing projects as it selects the lowest evaluated bidder

1	2	3	4	5

3 It provides a way to avoid fraud during the tendering process since it follows principles of open tendering

1	2	3	4	5

4 The method is easy to use by evaluators since the lowest bidder is awarded the contract and other qualification criteria used on pass and fail basis

1	2	3	4	5

5 The method is legally acceptable by clients because construction works are undertaken at a lowest possible cost and is recommended by the laws of Malawi

1	2	3	4	5

6 It is acceptable by development partners (donor agencies) since resource use is maximized

1	2	3	4	5

7 It ensures fairness of the tender process since all bidders have an equal chance of winning a contract as it is conducted in an open manner

1	2	3	4	5

8 It provides a way to avoid corruption during tendering since it follows principles of open tendering and tender evaluations are done by teams

1	2	3	4	5

9 It promotes competition between bidders during tendering because the process is open to all willing bidders

1	2	3	4	5

10 It provides a way to avoid favouritism during tendering process since it follows principles of open tendering and tender evaluations are done by teams

1	2	3	4	5

11 Other……

…….. (Specify)

SECTION 3: Constraints of Lowest Evaluated Tender Method

The statements below are perceived to be constraints of the lowest evaluated tender method in procurement of works for public institutions. To what extent do you agree with these statements in relation to lowest evaluated tender procurement method in Malawi? (Tick appropriate box)

Note

1 Strongly Disagree
2 Disagree
3 Not Sure/Neutral
4 Agree
5 Strongly Agree

1. The method results in unreasonably low bids (resulting into abandonment and sometimes termination of projects)

1	2	3	4	5

2. It results in time overruns during execution of projects because the project cannot finance itself and contractors give excuses for claims as they struggle to fund the project

1	2	3	4	5

3. It results in lack of innovation by contractors during execution of projects because the low rates may not allow for alternative construction techniques

1	2	3	4	5

4. It results in high cost of procurement both during tender preparation and tender evaluation because of high number of bids due to open tendering

1	2	3	4	5

5. It leads to poor quality work during execution of projects because contractors cut corners to ensure that they realize profits

1	2	3	4	5

6. It results in cost overruns during execution of projects because contractors initiate many variation orders to cushion the low rates

1	2	3	4	5

7. It results in adversarial relationships between project teams and contractors during execution of projects because of issues of time, quality and variation orders

1	2	3	4	5

8. It encourages predatory bidding during tendering as some contractors lower prices just to beat their competitors

1	2	3	4	5

9. It leads to selection of unqualified contractors during the procurement process as lowest price is the deciding factors

1	2	3	4	5

10. Evaluators handle too many tender documents during tender evaluations which may affect their objectivity due to fatigue

1	2	3	4	5

11. It leads contractors into bankruptcy as they do not make profits or make losses or have their projects terminated

1	2	3	4	5

12. It results in termination of contracts due to non-performance

1	2	3	4	5

13. It results in abandonment of projects by contractors because they seem not financially viable

1	2	3	4	5

14. It results in contractor's struggling to fund projects because of low unit rates

1	2	3	4	5

15. It results in failure to meet project objectives by client institutions as projects are not executed as planned

1	2	3	4	5

16. Other……..…….....(Specify)

SECTION 4: Performance of Projects under the Lowest Evaluated Tender Method

The statements below rate the performance of projects *(based on critical success factors of time, cost and quality)* whose contractors were selected under the lowest evaluated tender method.

To what extent do you agree that these statements correctly describe the situation in the Malawian construction industry? (Tick appropriate box)

Note

1 Strongly Disagree
2 Disagree
3 Not Sure/Neutral
4 Agree
5 Strongly Agree

Projects are generally executed within the specified time

1	2	3	4	5

Projects are generally executed in extended contract period.

1	2	3	4	5

Projects generally experience time overruns

1	2	3	4	5

Projects are generally completed before time

1	2	3	4	5

Projects are generally terminated as most contractors cannot meet the cost of construction

1	2	3	4	5

Projects are generally completed without exhausting the budgeted funds

1	2	3	4	5

Projects are generally completed within the budgeted funds

1	2	3	4	5

Projects are completed with cost overruns (beyond approved contract budget)

1	2	3	4	5

The works are generally done within specifications with very good quality

1	2	3	4	5

The works are generally done within acceptable quality

1	2	3	4	5

The works are generally done with poor quality

1	2	3	4	5

The works are generally done with very bad quality (does not meet specifications)

1	2	3	4	5

All planned works are executed as planned (no scope variations)

1	2	3	4	5

There are generally many variations in the scope of works as a way of compensating the lowest contractor

1	2	3	4	5

The scope of works is completely changed from the original plan to find a way of compensating the lowest contractor

1	2	3	4	5

Other…..……..... (Specify)

SECTION 5: Improvement of Contractor Selection Methods in Malawi

The following procurement methods can be used to select contractors for public institutions that can be able to select contractor as compared to the lowest evaluated method.

To what extent do you agree that these methods can improve contractor selection for the Malawi public sector? (Tick appropriate box)

Note

1 Strongly Disagree
2 Disagree
3 Not Sure/Neutral
4 Agree
5 Strongly Agree

1. Using the average bid (bid price that is closest to the average price of all bids) method instead of lowest bid as contractor selection criteria

1	2	3	4	5

2. Using total cost (cost for construction and maintenance) as contractor selection criteria

1	2	3	4	5

3. Introducing performance assessment of contractors during contract execution and using it as part of tender evaluation criteria in future tenders

1	2	3	4	5

4. Building a bidder classification system to categorize contractors into areas of speciality

1	2	3	4	5

5. Introduce a different bond (*a bond to guarantee the difference between the lowest bid price and 80% of the planned budget*)

1	2	3	4	5

6. Use unit rate analysis for major items instead of bid price only during evaluation of tenders

1	2	3	4	5

7. Use of Multiple Criteria (*price and non-price criteria with assigned weights*) during evaluation of tenders

1	2	3	4	5

8. Use of a ratio of plus or minus 15 percent to the clients (Engineers) cost estimate instead of lowest evaluated bid as contractor selection criteria

1	2	3	4	5

9. Use of shortlisting of bidders instead of open tendering (Tick appropriate box)

1	2	3	4	5

10. Maintaining the lowest evaluated tender system

1	2	3	4	5

11. Using non price criteria (with assigned weights) as final decision making criteria during tender evaluation

1	2	3	4	5

12. Random audits of past evaluation reports and acting on them to avoid issues like fraud, corruption and favoritism

1	2	3	4	5

13. The use of multiple methods including the engineers estimate when evaluating bids

1	2	3	4	5

14. Other…….. (Specify)

SECTION 6: Preferred Method of Contractor Selection

The options below relate to procurement methods that can be used to select contractors for public institutions. Select the most applicable option.

1. Which method of contractor selection would you prefer to be used in public tenders in Malawi? (Tick appropriate box)
    1. Price method using lowest evaluated bid
    2. Price method using average bid
    3. Multi criteria method (*Price and Non price criteria using assigned weights*)
    4. Price method basing on engineer's estimate
    5. Single Sourcing
    6. Other…….(specify)

1	2	3	4	5	6

2. In works tender evaluation (Tick appropriate box)

    1. Price criteria is better than non-price criteria
    2. Price criteria is equal to non-price criteria
    3. Non price criteria is better than price criteria
    4. Other……..(Specify)

1	2	3	4

3. The Public Procurement Act (2003) of Malawi advocates for use of lowest evaluated method for works contractor selection. Would you like the act to be amended to allow for usage of other methods of contractor selection? (Tick appropriate box)

    1. Yes
    2. No
    3. Not sure

1	2	3

4. Please write below any comment you may have on contractor selection in the Malawi public sector?

……

5. Would you like to know the results of this research?

1. Yes
2. No If "yes", indicate your contact details below

……

THANKS SO MUCH FOR PARTICIPATING IN THE STUDY. MAY GOD BLESS YOU.

Appendix C : Approval to use RA as a case study

MEMO

ROADS AUTHORITY
CEO's OFFICE
14 AUG 2017
BAG B.328, LILONGWE

To : The Acting Chief Executive Officer

From : Maintenance Engineer – Centre

Date : 11 August 2017

Ref : Studies towards attainment of a Master of Science Degree in Infrastructure Development and Management – Dissertation Requirements

Subject : Request to conduct a research and use staff members for my dissertation output

The above subject matter refers.

I am currently studying with the University of Malawi (Polytechnic) towards attaining a Master of Science Degree in Infrastructure Development and Management. At the moment, I am at dissertation stage.

The topic of my dissertation reads; ***Analysing the Lowest Evaluated Tender Award System: A Case Study of Roads Authority.***

In order to successfully carry out this research, I will need to access information, use some organization facilities such as the library and interact with staff. Please note that all the information will be used for academic purposes only and the results will be shared with the organisation.

It is for the foregoing reasons and in keeping with the University's code of ethics in this regard that I seek your permission to do so.

I remain hopeful of a positive response.

Kindly accept my regards,

Yours faithfully

Derick Manda
Maintenance Engineer - Centre

Approved
25/08/17