

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND
TECHNOLOGY, KUMASI, GHANA**

**Framework for Assessing the Effectiveness of Competitive Tendering
Process in Public Works Procurement at Pre-contract Stage in Chad**

By

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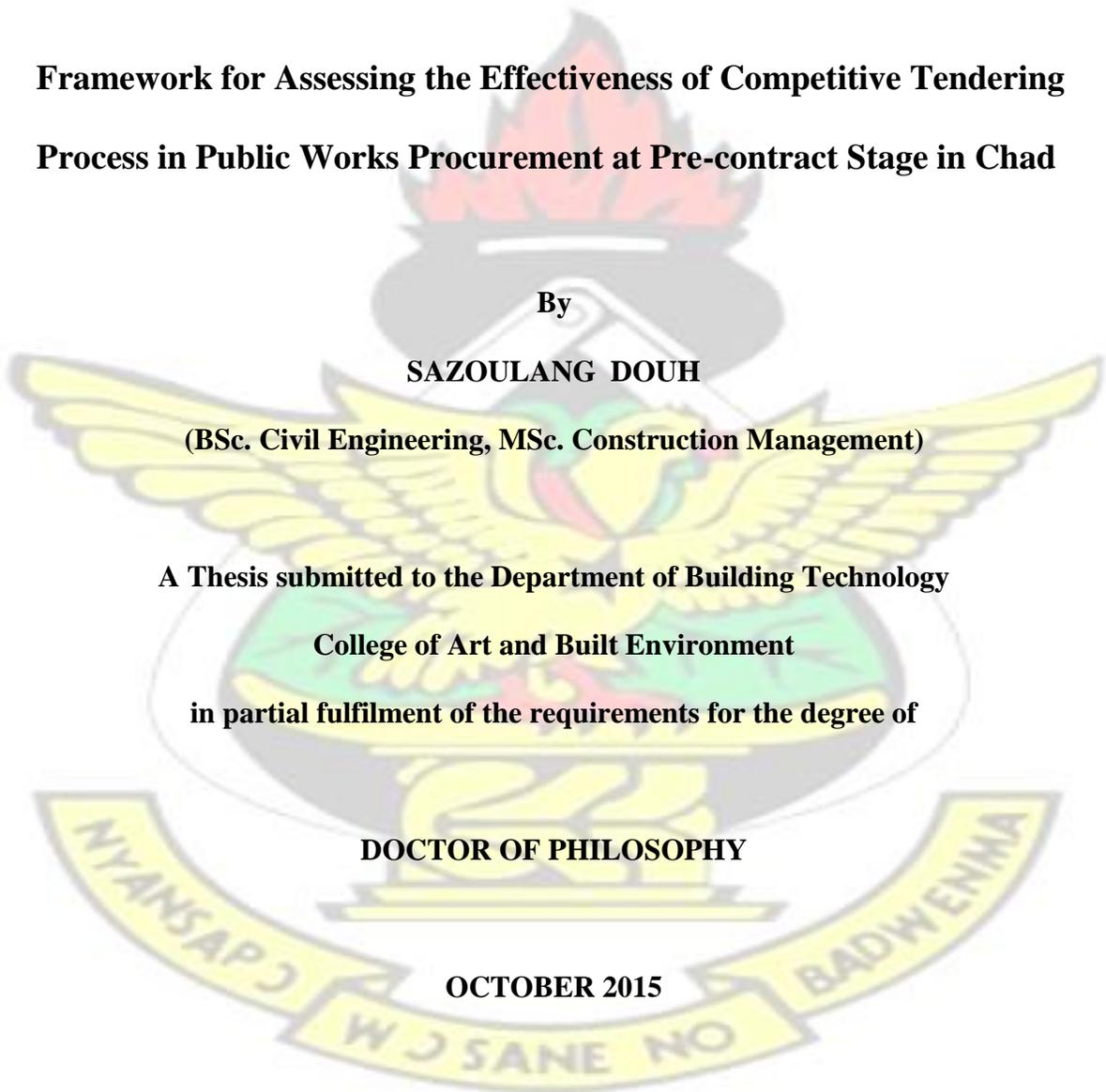
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ABSTRACT

Competitive Tendering (CT) implementation in Chad is confronted by many challenges despite reforms put in place in 2003 resulting in a very poor performance of government procurement especially in works. Field survey reveals that the lack of effectiveness assessment and management of tendering processes is one of the root causes of this ineffectiveness. Therefore, the study aims at developing a framework for assessing the effectiveness of CT Process in public works procurement at a pre-contract stage with six specific objectives: to appraise the major challenges facing the implementation of CTP, to define the baseline of standard practices, to determine the relevant criteria, to establish Key Measurable Indicators (KMIs), to establish the contributions of critical phases of CTP, and to develop a framework. Designed as a survey, the study adopted deductive approach and a mixed-method (qualitative and quantitative) with questionnaire as primary data collection instrument and desk study. Data were collected from 60 structures including public procurement entities, consulting firms, contractors and sponsors purposively selected through census sampling technique. The simplified Analytic Hierarchy Process (AHP) scale of five points (1, 3, 5, 7 & 9) was used in designing the main part of the questionnaire. Out of the 60 questionnaires administered, 38 valid ones were returned representing 63.32%. The majority of respondents (60.52 %) are construction professionals, highly qualified and having more than 10 years of experience. Data analysis was done by an adapted AHP methodology involving nine steps. The study has established the following main findings: The major challenges confronting CT in Chad are delay, no respect for laws and regulations, corruption, lack of transparency and public accountability, poor performance of structures and staff, and a lengthy process. Thirty-eight (38) standard practices along the five critical phases were identified. The most relevant effectiveness criteria are Transparency and public

ABSTRACT

accountability, Fairness and Equity, Competitiveness, and Compliance. The established KMIs are Time for tender preparation, Advertisement total duration, Number and Nationalities of Bidders, Publicity frequency, Time Performance Index, Number of complaints or requests generated, Cost Estimate Accuracy, Publicity extent, and Approvals Compliance Rate. Planning phase is the first with 0.363 followed by Tender Documentation and Tender Solicitation with 0.261 and 0.161 respectively. With the above findings, a framework was developed consisting of a systematic sequence of six (6) steps involving assessment of elementary effectiveness of the five phases and the overall effectiveness for the whole process. An assessment procedure and a scoring system are proposed and used in an illustrative example. The study concludes that the implementation of the developed framework, the monitoring of the relevant criteria and the mandatory use of defined standard practices at all levels of public works will certainly improve the effectiveness of CT in Chad. The study also demonstrates a practical and successful application of AHP in overall effectiveness assessment in construction project management. Above all, the developed framework has the potential for improving the Effectiveness of CTP in Chad as well as in developing countries. To address research limitations, the study recommends the full implementation of the developed tool by contracting authorities and construction projects managers in Chad as well as further investigations in new areas.

Key words: Competitive Tendering, Effectiveness assessment, Framework, Works procurement, AHP and Chad.

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LIST OF ABBREVIATIONS

ACA	Australian Constructors Association
AfBD	African Development Bank
AHP	Analytical Hierarchy Process
ANAO	Australian National Audit Office
CCCA	Construction Contract Compliance Auditing
CCSRP	Collège de Contrôle et de Surveillance des Revenus Pétroliers
CIDB	Construction Industry Development Board
CINTERFOR	Inter-American Research and Documentation Centre on Vocational Training,
COJO	Commission d'Ouverture et de Jugement des Offres
CPAR	Country Procurement Assessment Report
CRRA	Comité de Recours et de Règlement Amiable
CT	Competitive Tendering
CTP	Competitive Tendering Process
DAC	Development Assistance Committee
DBB	Design – Bid – Build
DESA	Department of Economic and Social Affairs
DPADM	Division for Public Administration and Development Management
EKMI	Effectiveness Key Measurable Indicator
ENSTP	Ecole Nationale Supérieure des Travaux Publics
EOI	Expression of Interest
FL	Fuzzy Logic
GFCC	Global Federation of Competitiveness Councils
IFAD	International Fund for Agricultural Development
ICIDA	International Conference on Infrastructure Development in Africa
KMI	Key Measurable Indicator
KPI	Key Performance Indicator
MACBETH	Measuring Attractiveness by a Categorical Based Evaluation Technique
MOE	Measure of Effectiveness
NIQS	Nigeria Institute of Quantity Surveyors
NSW	Naval Special Warfare

NZQA	New Zealand Qualifications Authority
LIST OF ABBREVIATIONS	
OCMP	Organe Chargé des Marchés Publics
OECD	Organization for Economic Co-operation and Development
PAA	Public Assets Authority
PM	Performance Measurement
PMS	Performance Measurement System
PMPF	Performance Management Process Conceptual Framework
PP	Public Procurement
PPA	Public Procurement Act
PPDA	Public Procurement and Disposal of Public Assets of Uganda
PPME	Public Procurement Model of Excellence
RDTL	Republica Democratica de Timor-Leste
SCP	Sous-Commission de Présélection
SCTE	Sous-Commission Technique d'Evaluation des offres
SIGMA	Support for Improvement in Governance and Management
TE	Tender Evaluation
TEP	Tendering Process
TEP	Tender Evaluation Process
TP	Tendering Process
UK	United Kingdom
UK/OGC	United Kingdom Office for Government Commerce
UN	United Nations
UNDP	United Nations Development Program
US/BEEB	United States' Bureau of Economic, Energy and Business
US/GAO	United States of America's General Accounting Office
US/VFMC	United States Value for Money Committee
USA	United States of America
VfM	Value for Money

WB	Word Bank
WTO	World Trade Organization
WABER	West Africa Built Environment Researchers

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DEDICATION

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To **Almighty God and my Lord Jesus Christ** for his abundant grace that permits this fruitful adventure.

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- 1) A framework for assessing the effectiveness of competitive tendering process in public works procurement at pre-contract stage in chad : A research proposal, West African Built Environment Research (**WABER**), 09 – 11 August 2013, Accra, Ghana
- 2) An appraisal of challenges facing competitive tendering implementation in public works procurement in Chad Republic, West African Built Environment Research (**WABER**), 09 – 11 August 2013, Accra, Ghana
- 3) A conceptual framework for assessing the effectiveness of public works procurement process at pre-contract stage in Chad, **3rd ICIDA Conference**, Abeokuta – Nigeria (17 - 19 march 2014)
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CHAPTER ONE

GENERAL INTRODUCTION

1.1 INTRODUCTION

This chapter introduces the thesis and highlights the research background and the problem statement. The aim and objectives of the study are also included followed by the need for the study, scope and assumptions, and finally the structure of the thesis.

First of all, the following terms and expressions constituting the topic are defined below within the context of the present study:

- *Framework* is a methodological approach of performing a process assessment sequence after sequence.
- *Assessment* is a part of the management cycle that consists in measuring process performance, take necessary remedial action in order to improve the final achievement.
- *Effectiveness* is a process characteristic indicating the degree to which the process output conforms to the pre-determined requirements. The measure of effectiveness determines if the right things are being done independently of the means of achievement. Consequently, *Assessing the Effectiveness* means measuring the actual performance of the process against the expected outcome based on relevant criteria and related key measurable indicators.
- *Competitive Tendering Process (CTP)* is a procurement activity consisting of contractor selection through competition that starts with the development of procurement plan up to the award of contract. However, the study focuses at Pre-Contract stage that ends at the provisional or pre-award of contract.

Briefly, the study is about the development of a procedural management tool for measuring the overall performance of competitive tendering process in public works procurement at pre-contract stage with the aim of assessing systematically the elementary effectiveness“ of all competitive tendering operations at every procuring entity level, for every individual project, by every contracting authority.

1.2 BACKGROUND

The most important and broadly accepted principle underlying any procurement system is open competition (UNDP, 2003). In construction industry, Competitive Tendering (CT) is a procurement method whereby contractors are invited to make a firm and unequivocal offer of the price and terms which on acceptance shall be the basis of subsequent contract (Oladejo, 2000). So, competitive bids are submitted on the same basis, under the same conditions and using the same criteria for evaluation (Adetola, 2000). Consequently, CT is widely recognized as an attractive procurement mechanism and is commonly advocated by international organisations like World Bank (WB), European Union (EU), African Development Bank (AfDB), and the Organisation for Economic Co-operation and Development (OECD). As a result, the majority of developing countries prescribed CT as the prime method of public procurement due to its widespread benefits. These include promoting competition and hampering corruption (Steven and Patrick, 2006), reducing cost by broadly 20% (Simon et al., 2005) and providing the enabling environment for effective utilisation of scarce resources in the economy (Dikko, 2000). Furthermore, one important hallmark of a high standard of public governance is a well-developed, effective and efficient system of government procurement (David, 2007). An effective system is characterised by the degree to which its

output conforms to the pre-determined requirements. So, as stated by Richard (2006), a Measure of Effectiveness (MOE) concerns how well a system tracks against its purpose or normative behaviour. Not only effectiveness reflects the quality of the actual result compared to the expected one (CINTERFOR, 2007), it also determines if the right things are being done and can be considered invariant to means of achievement (Richard, 2006). Besides, Oladepo (2000) among others asserted that an effective CTP has to be open, transparent, fair, timely and cost effective and comply with rules, regulations and procedures. Thus, if these criteria are evaluated earlier (i.e. prior to the award of contract), they can inform the final decision and so, associated risks are mitigated and performance will be improved.

Although CT appears to be the most acceptable method of selecting contractors in developing countries (Akubueze, 2000) and the most beneficial to local construction industries (Oladepo, 2000), its implementation has been the most difficult (Dikko, 2000). Despite the profound reforms of the Public Procurement (PP) Policies, Acts, Regulations and Procedures effected at the beginning of 2000s in many developing countries with the aid and support of WB and OECD, PP practices still remain questionable (OECD, 2009). In fact, CT does not benefit fully to developing countries as expected due to following challenges: excessive delay, massive violation of laws and regulations, weak institutions and structures, poor performance of personnel, generalised fraud and corrupt practices, and above all the lack of good performance management (Ameyaw et al., 2011; Patrice, 2008). Therefore, developing a framework for assessing the effectiveness of CTP may be a starting point for the improvement of PP performance in any developing country.

1.3 PROBLEM STATEMENT

In Chad, many public contracts awarded through Competitive Tendering fail to meet government expectations. Studies of Patrice (2008), CCSRP (2009), and Douh (2013b) found many reasons for that: poor performance of tendering procedures resulting in more than 70% of time lost and cost incurred during construction phase; only 48% of contracts are awarded through CT versus 52% of negotiations; award of many contracts to incapable contractors and project overpricing reaching 40%. Many causes of this poor performance can be traced to excessive delay, massive violation of laws and regulations, weak institutions and structures, poor performance of personnel, generalised fraud and corrupt practices, and above all the lack of effectiveness assessment tool, enabling informed decision making during the contract award (Patrice, 2008; Ameyaw et al., 2011; and Douh, 2013b). Also, as stated by Richard (2006), effectiveness assessment provides decision makers feedback on the impact of deliberate actions and affects critical issues such as allocation of scarce resources, as well as whether to maintain or change strategy. Indeed, early performance assessment in the life of the construction project is particularly crucial, as decisions made at pre-contract stage carry more far-reaching consequences than the relatively limited decisions which can be made after the contract award. Moreover, it is during the tendering phase that many objectives of the project regarding transparency, accountability, fairness and equity, cost, time, and quality can be achieved as the possibility to take remedy actions for improvement is still there. To be able to assess the effectiveness of tendering processes using multiple criteria, procurement officers must have a formal and systematic procedure to follow and contracting authorities an appropriate tool to use.

In this regard, studies of SIGMA, (2011); Mäki, (2012); and Patrick, (2006) have revealed that many assessment instruments were developed including Prior-approval or Nonobjection mechanisms, Internal control, Independent or External audit, Pre-award risk analysis, Pre-award survey, Pre-contract Effectiveness Audit, Public Procurement Model of Excellence (PPME), and Country Procurement Assessment Report (CPAR). However, Preaward risks analysis, Pre-award survey and Pre-contract Effectiveness Audit are solely focused on cost criterion and the output may disgrace or credit the contractor alone. Also, pre-contract effectiveness audit fails to assess the procurement institutions and processes. Then, according to Adjei (2010), though PPME exhibits features that comply with the concept of performance measurement system and even covers tendering processes at pre and post-contract stage, it fails however to tell the level of Effectiveness attained by a particular contract even if it is effectively processed. Not only that, it is goal centred (focus on entities) rather than process centred. Lastly, CPAR is used to diagnose a particular country's procurement system in order to find out the degree to which the system is following its own regulations.

In fact, the review above has shown that governments are using various but sectorial assessment tools; but none of them is able to assess systematically the overall effectiveness of tendering operations at every procuring entity level for every individual construction project by every contracting authority. Thus, there is still a constant need for more effective control instruments, reporting mechanisms, investigation methods and best practices as far as PP is concerned argued Patrick, (2010) and Cornela et al., (2011). Therefore, there is obviously a knowledge gap that the present study intends to bridge. In an attempt to make progress in this regard, the following questions have been formulated to drive the research

effort:

1. What are the major challenges facing the implementation of CT Method in Chad?
2. What are the standards practices for an effective CTP in developing countries?
3. What are the relevant criteria and how do they influence the Effectiveness of CTP?
4. What are the Key Measurable Indicators and corresponding target values that are to be used for the assessment of the Effectiveness of CTP?
5. What are the Contributions of critical phases on the overall effectiveness of the process?
6. How can the Effectiveness of CTP in public works procurement be assessed?

Consistent with these questions are the following aim and specific objectives of the study.

1.4 AIM AND OBJECTIVES OF THE STUDY

The study aims at developing a Framework for Assessing the Effectiveness of Competitive Tendering Process in Public Works Procurement at Pre-contract stage in Chad. To achieve this, following specific objectives are set:

1. To appraise **Major Challenges** facing the implementation of CT Method in Chad;
2. To define a **Baseline of Standard Practices** for an effective CTP ;
3. To identify **Relevant Criteria** that influence the Effectiveness of CTP ;
4. To establish **Key Measureable Indicators** for assessing the Effectiveness of CTP ;
5. To determine the **Contributions of critical phases** of CTP at the pre-contract stage;
6. To propose and validate a **Framework for Assessing the Effectiveness** of CTP in Chad.

1.5 NEED FOR THE STUDY

In developing economies, the contribution of Public Procurement (PP) to GDP varies between 15 to 25 % (OECD, 2010). Therefore, PP is viewed as an important area which deserves special attention from government. Unfortunately, questionable practices depicted earlier do persist and have led to Paris Declaration on the Aid Effectiveness for partner countries; which declaration stressed the urgent need for improvement of effectiveness in PP practices (OECD/DAC, 2005). To corroborate this declaration, OECD (2010) has estimated losses due to inappropriate PP procedures between 20 to 30% of grant-in-aid. So, if we add a potential gain of 20% that can be generated by the use of pre-contract effectiveness surveys alone (US/GAO, 2009; Moro, 2011), the likelihood of benefiting from performance evaluation implementation will be more than 40% as compared to current procurement performance. Not only that, US/NPR (2007), claims that the effectiveness of TP impacts directly on the Value for Money (VfM) and also, the implementation of performance evaluation stimulates the systemic documentation of every critical phase of the process. In this way, transparency and public accountability are enhanced. Owing to what precedes on one hand and the various advantages offered by CT method on the other hand, any improvement in effective implementation of CTP is therefore welcomed in developing countries. It is noteworthy that different aspects of competitive tendering were advocated in a number of papers presented by experts at a workshop organised by the Nigeria Institute of Quantity Surveyors (NIQS) held in Lagos, Nigeria in 2000 but significantly, the aspect of effectiveness evaluation prior to the award of contract was not treated. Although, many researches have been carried out on building projects performance at pre and post occupancy stages based on golden triangle (time, cost, quality), but little research has particularly considered multiple and balanced

criteria and at pre-contract phase. Recently, Patrice (2008) studied specially the effectiveness of government contracts procedures in Chad but the resulting report shows that no evident studies have been addressing specifically the development of a management tool for assessing the effectiveness of CTP. Therefore, the present work intends to fill this gap too. In the light of the above exposition, it is indisputable that there is a need for developing appropriate framework for assessing the effectiveness of CTP in public works procurement in Chad.

1.6 SCOPE OF THE STUDY

First, the scope of the study is limited to CT for the following reasons: (i) CT is predominant and popular in construction field, (ii) It is implemented in the majority of developing countries, (iii) Its process is more elaborate and can be considered as objective, and (iv) CT is the most suitable procurement method in ordinary public projects. The present work focuses on CTP as required by the PPA 503 enacted on 5th December 2003, which is currently in use in Chad Republic. Subsequently, CTP starts from the development of procurement plan and ends at the pre-award of contract. The study concerns particularly Public Works Procurement for, works is a major element in public procurement in terms of volume and in Chad particularly, it counts for more than 70% of total procurement expenditures (CCSRP, 2010). Also, it is in works procurement that Competitive Tendering is the most suitable. Lastly, construction procurement is the area of interest of the author.

1.7 STRUCTURE OF THE DISSERTATION

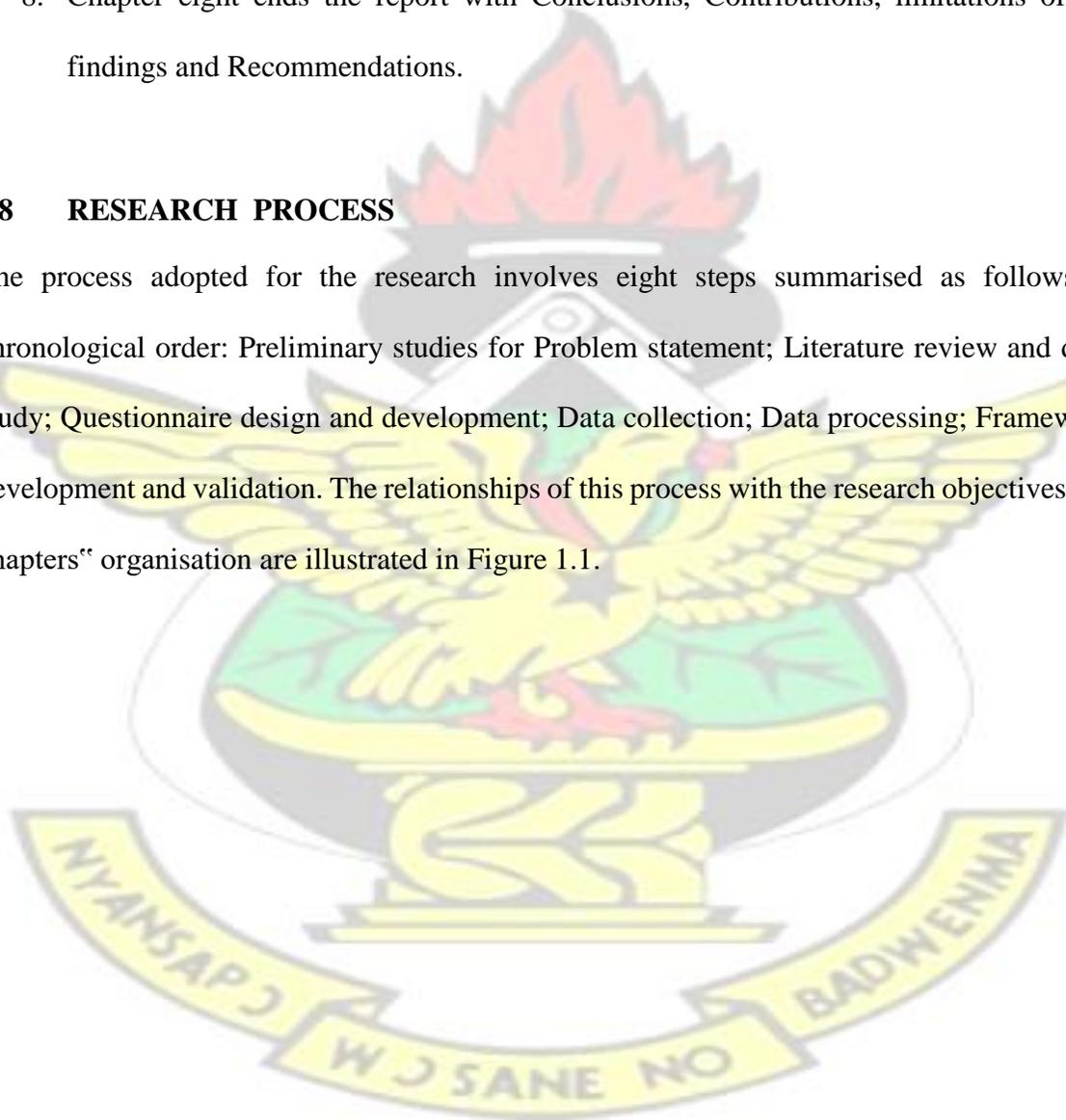
The dissertation report is organised into eight chapters as follows:

1. Chapter one is the General Introduction to the dissertation,
2. Chapter two deals with the Competitive Tendering Theory and Process,

3. Chapter three is devoted to Challenges facing the implementation of CTM in Chad,
4. Chapter four is concerned with the Research Conceptual Framework,
5. Chapter five presents the adopted Research Methodology,
6. Chapter six shows the Results and discussions,
7. Chapter seven describes the developed Framework, and
8. Chapter eight ends the report with Conclusions, Contributions, limitations of the findings and Recommendations.

1.8 RESEARCH PROCESS

The process adopted for the research involves eight steps summarised as follows in chronological order: Preliminary studies for Problem statement; Literature review and desk study; Questionnaire design and development; Data collection; Data processing; Framework development and validation. The relationships of this process with the research objectives and chapters' organisation are illustrated in Figure 1.1.



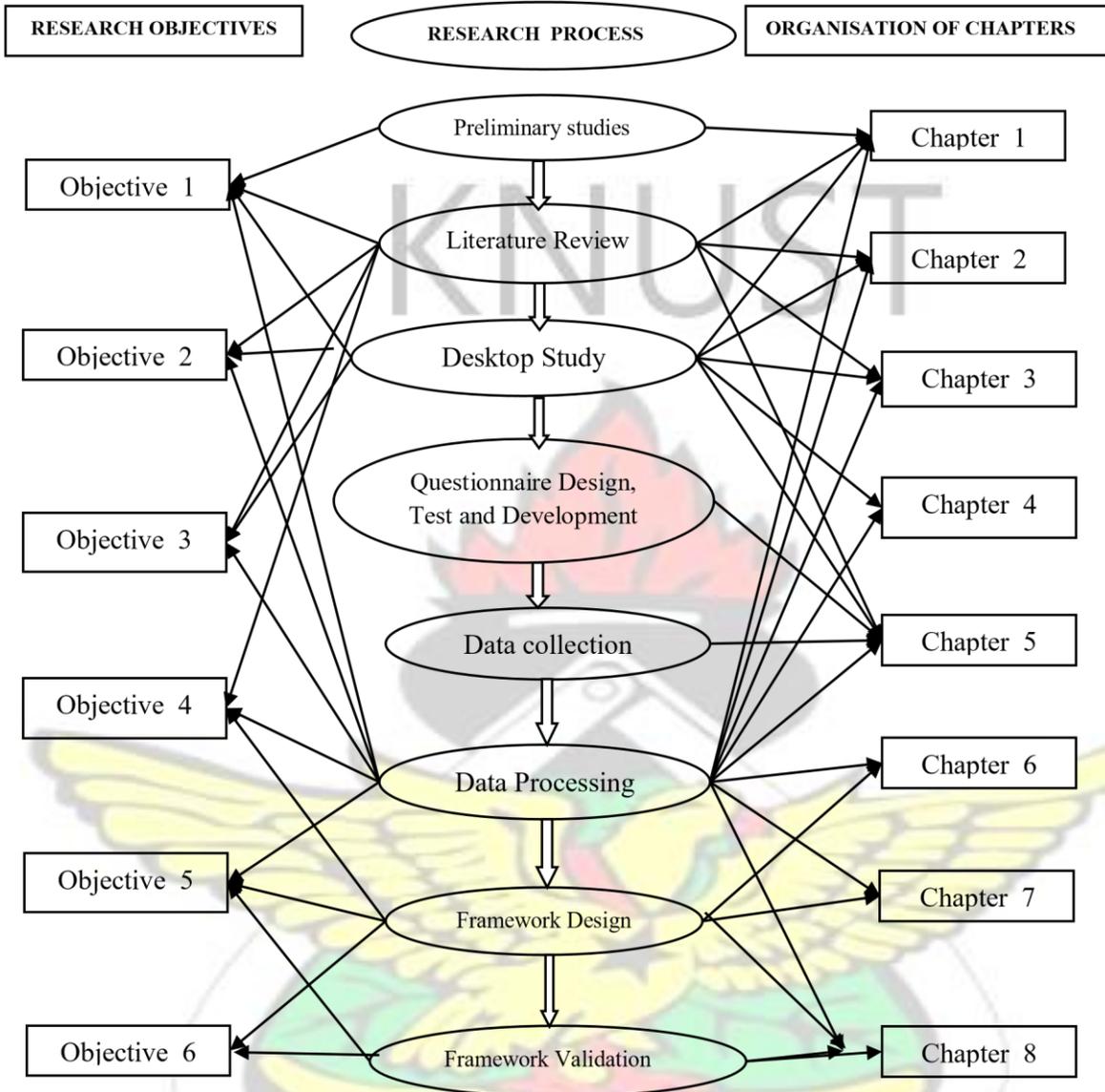


Figure 1.1: Research Process Source: Author's Construct

CHAPTER TWO COMPETITIVE TENDERING THEORY, PROCESS AND PRACTICES

2.1 INTRODUCTION

This chapter overviews Competitive Tendering (CT) theory, process and practices and is divided into following sections: Public Procurement Principles, Competitive Tendering theory, benefits and disadvantages, CT process and standard practices, and key features of an effective CT process.

2.2 PUBLIC PROCUREMENT PRINCIPLES

Procurement is an overall process of acquiring goods, works and services which includes all functions from the identification of needs, selection and solicitation of sources, preparation and award of contract, and all phases of contract administration through the end of a services“ contract or the useful life of an asset (UNDP, 2003; Watermeyer, 2013). Further, procurement includes strategy and policy of Contracting Authority (CA), methods and procedures, personnel and institutions, and information system (Thai, 2009). In the Construction Industry (CI), Procurement is viewed as the process used to deliver construction projects through elaborated methods and procedures performed by professionals skilled in procurement (Osei-Tutu and Adjei-Kumi, 2000). According to Arrowsmith (2011), the term „public“ referring to Government, Public Procurement (PP) is also designated by „Government Procurement“ by World Trade Organisation (WTO) or „Government Contract“ or „Public Contract“ in USA. Therefore, PP is an important government function that deserves to be mainstreamed and well integrated into the public sector governance system (Arrowsmith, 2011; Thai, 2009; OECD-DAC, 2005).

There is a general agreement on the following principles for public procurement: competition, fairness and equity, transparency and accountability, efficiency-effectiveness-economy, and Value for Money (VfM) (Arrowsmith, 2011; UNCITRAL, 2009; IFAD, 2010; Trepte, 2007). Competition is known as the cornerstone of public sector procurement and the primary driver of Value for Money (GOJ, 2012). In addition, it provides the enabling environment for effective utilisation of scarce resources (Dikko, 2000), and also gives a good image of the public governance (David, 2007). Besides, competition underpins fairness and transparency. Fairness suggests that the procurement procedure is conducted in an open and impartial manner and is consistent and therefore reliable (WB, 2003). Also, Fairness is closely related to justice; otherwise contracts are awarded mainly on merit (John, 2001) whereas Equity means equal access, equal opportunities, and equal treatment to all potential contractors. Most often, equity is applied when equal shares are not fair and allows a special allocation of opportunities to qualified but disadvantaged contractors (Watermeyer, 2012). Indeed, according to Dos Santos et al., (1998) transparency and public accountability are foundations of excellence and pillars of competitive construction companies. In addition public accountability and transparency help to detect early any deviation from fair and equal treatment, hence protecting the public interest (Appiah and Moro, 2011). Moreover, transparency prevents fraud and corruption and hence improves performance of Public Procurement (Steven and Patrick, 2006).

However, underpinning all is the need to obtain VfM through the strict pursuit of goals and objectives set for (Dawar and Evenett, 2010; Trepte, 2007). Finally, all these principles are to endeavour yielding the best returns in terms of quality, quantity, timeliness and price in projects implementation (OECD, 2009).

2.3 COMPETITIVE TENDERING THEORY

2.3.1 Competitive Tendering Definition

Tendering is a formal and legal procedure of soliciting tender offers in order to select the most suitable supplier (TASMANIA, 2006). According to the US Value for Money Committee (1999), CT is a means for buyers to make best use of competitive market forces to obtain the best offer that can be obtained from the market at that point in time. In the construction sector, CT is a procurement method whereby contractors are invited to make a firm and unequivocal offer of the price and terms which on acceptance shall be the basis of subsequent contract (Oladejo, 2000). Thus, competitive bids are submitted on the same basis, under the same conditions and using the same criteria for evaluation (Adetola, 2000).

In this context, more often the contractor who submits lowest tender prices wins. However, CT is similar to performing common value auctions with a sealed-bid procedure except that price may not be the only criterion but also compliance and technical qualifications are evaluated. Therefore, CT combines traits, advantages, disadvantages and risks, of both auctions and beauty contests.

2.3.2 Competitive Tendering Theory

According to Gunnar and Hultén (2006), the introduction of CT has been theoretically motivated by a general belief that the private sector is more effective than public sector, and competition fosters efficiency, excludes monopoly and influences strongly markets. Fair market price discovery is often touted as a beneficial result of such tendering.

2.3.2.1 Competitive Market Price

The market can be considered as a process of interaction between buyers and sellers of a commodity for a mutually agreed price. In a competitive market, price determination is based

on the interaction of demand and supply because market conditions affect tendering behaviour (Gunnar and Hultén, 2006). That is why in a boom period, contractors generally bid at higher profit margins, and competition for projects is relatively less intense. On the contrary, in a slump period, contractors bid lower because competition becomes more intense. Consequently, market conditions do affect contractors' bid prices independently of the competition intensity for a project. Not only that, bids prices might also be influenced by external factors such as competitors' policies, the number of tendered projects, the number of contractors competing in a tender, project characteristics, and the client experience in procurement (Arrowsmith, 2011). Ideally, bidders place bids that relate to their best estimates of costs and revenues allowing the most suitable offer to win the competition; this can stimulate unsuccessful competitors to improve their competitiveness in the next tender. However, some contractors, on some occasions, place very low or very high bids, not necessarily related to actual costs or revenues, but strategically.

2.3.2.2 Low Bids in Tenders

There are four reasons where contractors place low bids: (i) They have a unique competence on production methods that result in a completely different cost structure, (ii) Faulty calculations or a lack of relevant knowledge of costs and revenues related to the business, (iii) Because with public procurement tenders, it is the lowest bid that will win a tender, all things being equal, (iv) They have the knowledge of the budget so they bid based on that information. But, offering low bids reduces profits and potentially makes development less attractive. It can also lead to „winner's curse effect" which is the extreme difficulty even failure to successfully execute the won contract with low bid (Gunnar and Hultén, 2006).

2.3.2.3 High Bids in Tenders

According to Horton and McAlister (1996), to place high bid, a bidder may have real cost disadvantages compared to its competitors. For example, a big bureaucracy can produce high overhead costs. In addition, a bidder placing a high bid may strategically want to signal to other competitors that he has no interest in the market and expects them to likewise signal back that they have no interest in other markets. A tenderer may also place a high bid in one period with the intention to present a much more competitive bid in a later period, expecting that a high bid, although may not win now, but could change the expectations of competitors and drive up the price level in later tenders. Furthermore, another strategic motive for submitting a high bid is that a firm wants to demonstrate a continuing market presence to the public agency; for sometimes, the way bids with multiple criteria are evaluated opens up the possibility for a clever use of strategically high bids. Thus, by placing a high bid, a bidder will increase the overall difference between bids and thereby distort the relative importance of costs compared to quality factors in a competitive tender (Mwikali and Kavale, 2012). This may occur when the procuring entity evaluates bids by means of awarding points based upon the relative position of each bid compared to the other bids. In such tenders, the end result may be very sensitive to the appearance of extreme bids, regardless of their underlying reasons. Again, like for low bids, the presence of faulty calculations or a lack of relevant knowledge of costs and revenues related to the sector can also cause high bid. Lastly, rational firms that are aware of the winner's curse may also consciously place more conservative bids as the number of competitors increases (Hong and Shum, 2002).

2.3.2.4 Cartel Problem

According to Omole (2000), „Cartel problems“ are usually illegal conspiracies among high level contractors to keep prices artificially high (i.e. they meet in secret to fix prices, rig tenders and intimidate anyone who does not play along). „Cartel problem“, known also as „Cover Price“, is usually encountered when there are more projects available in the construction market (Omole, 2000) and this is the case in Chad where cartel problem is mentioned as one of cost overpricing cause (CCSRP, 2009).

2.3.3 Competitive Bidding Strategies

However, Banki et al., (2008) suggested that bidding strategy models can be grouped into three main categories: Models based on probability theory, those based on decision-support systems, and newly emerging models. Models based on probability theory [e.g., Friedman (1956) and Gates (1967)] aim at maximising the expected profit whereas those based on decision-support systems [e.g., Ahmad and Minkarah (1987)] are using the multi attributed nature of bidding decisions. With these models, contractors need to understand their specific resources that generate competitive advantage and accordingly develop strategies to win contracts. Unfortunately, due to the multiple requirements of clients, contractors are to consider newly emerging models to deliver additional benefits besides offering a low-price bid. Not only that, the bids prices might be influenced by external factors such as competitors“ policies, the number of tendered projects, the number of contractors competing in the current tender, project characteristics, etc. which have to be considered too. That is why, arriving at the final bid price is a critical decision which is mostly done through experiences and intuitions rather than smart strategy (Stephen et al., 2002).

2.4 COMPETITIVE TENDERING OPTIONS

There are three main CT options: open, restrictive and negotiation (Arrowsmith, 2009; Haruna, 2010). Open tendering is a one-stage bidding process where all interested suppliers will be invited to submit a tender; whereas restricted procedure or shortlist is a two-stage bidding process in which potential suppliers are subject to a pre-qualification stage. The latter is recommended where large numbers of applicants are anticipated. Pre-qualification is the selection process where potential suppliers must demonstrate their financial standing and technical ability to meet the requirements. The client will also take account of potential suppliers' past performance and experience with reference to contracts of a similar nature before the pre-selection. Another form of it is an Expression of Interest (EOI) process which is performed before formal tenders are called in order to select suitably qualified tenderers. Competitive dialogue procedure is recommended for complex projects where open or restricted procedure may be inappropriate whereas it allows discussion of potential solutions with the contractors (Arrowsmith, 2009). Here, potential contractors are subject to a prequalification stage and are directly invited to participate in a competitive dialogue. When dialogues are completed, bidders are invited to submit final tenders and no further negotiation can take place. However, under certain limited circumstances, client can negotiate directly with one or two suppliers. Negotiation procedure is very rare and occurs either when other options have failed or by means of derogation for emergency circumstances. Although these options are considered to be completely different, there may be some elements of open tendering in selective tendering procedure. Further, in both open and selective tendering methods, an element of negotiation may be required. For this reason, Arrowsmith (2009), classify both methods as one and name it „**Competitive Tendering**“.

2.5 COMPETITIVE TENDERING BENEFITS AND DISADVANTAGES

2.5.1 Competitive Tendering (CT) Benefits

CT is widely recognised as an attractive procurement mechanism and is commonly advocated for its several following benefits: promoting competition, hampering corruption, reducing cost, enabling effective utilisation of scarce resources, ensuring transparency and Fairness (Tonge and Willett, 2009). Most notably, CT is viewed as a procedure that stimulates and promotes competition (Steven and Patrick, 2006). Open competitive option is also known for its transparency, public accountability, fairness, justice and ethics in project procurement. It promotes sound contract practices, growth of indigenous contractors, reliable environment for all industry operators, and strengthens public service system (Oladepo, 2000). Furthermore, CT helps to reduce cost by broadly 20% (Simon et al., 2005), promote competition and hamper corruption (Oladepo, 2000; Steven and Patrick, 2006). It can also enhance the national socio-economic development as agreed both projects beneficiaries, public authorities and sponsors of the Paris Declaration (OECD-DAC, 2005). According to the same source, efficient, effective and ethical procurement practices enable Governments to achieve best value for money without compromising on quality, delivery and other price and non-price factors. However, although CT has the advantage of unbiased awarding of contracts, it fails to respond optimally to ex-post adaptation of the contract especially for complex projects where there is a need for flexibility. Other disadvantages of CT are briefly described below.

2.5.2 Competitive Tendering Disadvantages

Mwikali and Kavale (2012), identified several disadvantages including the following:

Leading suppliers may not tender; Barriers to communication between suppliers and clients; Use of cheaper, poor quality materials and/or labour; Safety shortcuts; Competitive tendering can be extremely slow; and Insufficient profit margin to allow for investment in research and development, new technology or equipment. Worse of all, CT consumes time and has high associated costs argued Steven and Patrick (2006). For instance, in a study of contracts awarded in the construction industry in Northern California, Simon et al., (2005) found that in the private sector there is widespread use of negotiations (more than 43% of over 4,000 private sector contracts between 1995 and 2000 were awarded using negotiations with a sole supplier, while only 18% were awarded using open CT; the rest was awarded through a selected group of invited bidders). Simon et al., (2005) also argue that there are two conditions where cost-plus contracts awarded through negotiations could be more attractive than fixed-price contracts awarded through CT. The first is flexibility for complex projects (difficult to be completely designed) where a cost-plus contract that cannot be competitively tendered in a sensible way. The second is the use of the knowledge and experience of a contractor before design is complete and construction begins. Moreover, as mentioned above, if a project will be awarded using competitive bidding, then a contractor has an incentive to hide information about possible design flaws, submit a low bid, and recoup profits when changes will be required in construction phase. Based on all these arguments, it appears clear that CT is not so beneficial as opined by its supporters even though it has demonstrated its numerous advantages in developed countries in the past (Oladapo, 2000; Simon et al, 2005; Steven an Patrick, 2006).

2.6 COMPETITIVE TENDERING PROCESS

A process is a logical series of related transactions that converts input to output (Andersen and Lehman, 1999). Tendering Processes are generally prescribed by laws and regulations of every government. Going by the Chadian PP Act 503 (2003), tendering process starts with procurement planning, tender documents development, preparation of tenders, submission and opening of tenders, evaluation of bids and award of contract. ACA - Australian Constructors Association - (2006), suggests that a typical tendering process involves three distinct phases: (1) Tender preparation that involves project definition and scoping, selection process for tenderers, tender documentation and development of criteria for selection; (2) Tender implementation that comprises the call for tenders, responding to invitations to tender, developing the commercial offer, tender meetings and enquiries, amendments to tender documents, submission and closing of tenders; (3) Tender evaluation with tender analysis, tender clarifications, tender selection and award as main components.

Added to other sources namely the countries' PPAs, five main phases are identified as follows: Tender planning; Tender documents development; solicitation of tenders; tender evaluation; and contract award. Detailed activities are listed in Table 2.1.

2.7 STANDARD PRACTICES IN COMPETITIVE TENDERING PROCESS

Standard practices refer to best practices widely-accepted, informally-standardised activities, techniques, principles, methods or processes that are regarded as effective to achieve certain goals in a sector or sphere of business (Williams-Elegbe, 2009; Arendale, 2010). In addition, best practice is a practice that has shown through experience to consistently lead to the desired result (RDTL, 2010). Further, specific to construction project procurement, best practice is a process, method or activity when executed effectively leads to superior project performance

(Agoba and Shipman, 2009). Literature review has revealed a list of 38 common practices implemented in developing countries (see Table 2.2) where Art = article and S = section.

These common practices are amply discussed below phase after phase.

Table 2.1: Main phases and detailed activities of CT Process at Pre-contract stage

N°	Main Phases	Detailed Activities/steps in chronological order
1	Tender planning	<ol style="list-style-type: none"> 1. Needs assessment 2. Project brief 3. Budget estimation 4. Procurement plan draft 5. Procurement plan approval 6. Procurement plan publication 7. Appointment of tender committee 8. Project Initial design 9. Feasibility study 10. Project outline 11. Project scheme design 12. Project detailed design 13. Technical specifications draft 14. Elaboration of Bills of Quantities 15. Final estimation of the budget 16. Project Approval
2	Tender Documents Development	<ol style="list-style-type: none"> 17. Selection of competitive tender option 18. Determination of Eligibility/Participation conditions 19. Establishment of Evaluation criteria 20. Definition of Award criteria 21. Definition of time limits include dates of submission 22. Drafting of contract conditions 23. Definition of Tender guaranties" conditions 24. Tender document approval
3	Solicitation of Tenders	<ol style="list-style-type: none"> 25. Tender Advertisement / Invitation to tender

26. Pre-tender meeting
27. Distribution / Selling of Tender document
28. Clarification of tenderers' requests
29. Amendments to tender documents (eventually),
30. Tenders submission and reception
- 4 Tender Evaluation
 31. Bids opening
 32. Bids examination
 33. Bids complementary information
 34. Bids analysis and scoring
 35. Bids comparison and classification
 36. Risks Analysis
 37. Tender Evaluation Report
- 5 Pre-contract award
 38. Pre-award meeting
 39. Evaluation report review & approval
 40. Request for Funds Availability Attestation
 41. Notification to successful bidder
 42. Notification to unsuccessful bidders
 43. Public publication of results
 44. Tender Debriefing meeting
 45. Reception of formal award acceptance letter
 46. Requirement of Performance Security
 47. Pre-contract audit

Source : Author's construct

Table 2.2: Common practices of Competitive Tendering Process in some Developing Countries

Baseline Standard/Best practices	Chad	Ghana	Kenya	Rwanda	Senegal	Cameroun	Uganda	UNCITRAL	Remarks
A. Tender Planning Phase									
1. Needs assessment and formulation of project initial brief	Art 14	S 21			Art 5	Art 6	Art 58		
2. Publication of approved Annual Procurement Plan	Art 14	S 21		Art 6	Art 6, 56	Art 6	Art 54,58	Art 6	
3. Provision of an adopted accurate estimate in the national budget	Art 15				Art 8	Art 6	Art 58	Art 12	
4. Selection of an appropriate Tendering Option	Art 36						Art 63	Art 26	
5. Appointment of an Independent and Free Tender Committee	Art 22	S 17	Art 28		Art 36		Art 26, 38		
6. Development of detailed project design by competent professionals	Art 15				Art 5		Art 31		
B. Tender Document Development Phase									
7. Provision of complete project design documentation						Art 6	Art 59		
8. Setting of Non-discriminatory Eligibility/Participation conditions	Art 15	S 22			Art 46	Art 17	Art 43, 63	Art 8	
9. Use of Standard Tender Documents		S 50	Art 52		Art 10		Art 56	Art 39	
10. Use of neutral & standard Technical specifications	Art 15	S 49	Art 34	Art 25	Art 7		Art 61	Art 10	
11. Pre-disclosure of Evaluation criteria and expected terms of contract	Art 29						Art 71		
12. Pre-disclosure of Tender Award criteria							Art 66	Art 11	
13. Alignment with primary & secondary objectives	Art 7		Art 39						
14. Requirement of approval of Tender documents or No-objection	Art15, 23,30				Art 58				
C. Solicitation of Tenders Phase									
15. Pre-Tender meeting									Papyrus
16. Allocation of sufficient time to Advertisement of tender proposals	Art 30	S 44	Art 54	Art 28	Art 63	Art 20		Art 33	
17. Use of multiple and/or dedicated media for Tender Advertisement	Art 30	S 44	Art 54	Art 29	Art 63	Art 20		Art 33	
18. Grant of enough time for preparation of Tender Bids			Art 55	Art 29	Art 63		Art 64	Art 33	
19. Sale of Tender document at a minimum price					Art 58				
20. Reception and response to Requests for Clarifications	Art 38	S 51			Art 66		Art 65	Art 15	
21. Reception/Submission of Tenders and Public Opening of Bids	Art 51	S 56	Art 58, 60	Art 32,34	Art 67	Art 25	Art 68	Art 40,42	

D. Evaluation of Bids Phase									
22. Constitution of qualified and ethical Tender Evaluation Panel	Art 52	S 63	Art 44, 139	Art 15-17	Art 38,40			Art 26	
23. Appointment of an Independent Observer to monitor the process	Art 22	S 19				Art 96	Art 37		
24. Evaluation of tenders using Points system of scoring		S 58	Art 66	Art 39	Art 68-70	Art 27		Art 43	
25. Requiring of necessary clarification of bids	Art 52	S 57	Art 62	Art 38			Art 73	Art 16	
26. Requiring of tender security covering the Validity Period	Art 66	S 54, 55	Art 57, 61	Art 31,35	Art 113	Art 23		Art 17, 41	
27. Appropriate use of Margin of Preference	Art 13	S 60		Art 41	Art 50	Art 31			
28. Risk analysis									CIDB
29. Production and Signature of Tender Evaluation Report	Art 52				Art 83				
E. Pre-Award Phase									
30. Provision of Complete recordkeeping of procurement proceedings		S 27, 28	Art 45	Art 8	Art		Art 41,55	Art 25	
31. Pre-Award meeting and Review of Tender evaluation report						Art 31		Art 22	
32. Requirement of the No-objection of Tender Evaluation Report	Art 55				Art 83				
33. Commit and secure necessary funds (Attestation of Availability)									
34. Publication of tender results including successful & Unsuccessful			Art 46, 67	Art 43	Art 85-87	Art 33	Art 54	Art 23	
35. Debriefing meeting with successful and Unsuccessful tenderers									
36. Right to challenge and appeal tender procedures (complain/ dispute			Art 93		Art 88	Art 95		Art 64	
37. Provisional award of contract	Art 55		Art 67	Art 43	Art 84	Art 33			
38. Pre-Contract Audit									GOJ

Source : Author's construct



2.7.1 At Tender Planning phase

Thai (2009) states that adequate planning and prioritisation of needs by every procurement entity is an essential prerequisite for effective procurement. Here, a key element is Procurement Plan which provides contracting authority with project brief that has to comply with national or local goals and both primary and secondary objectives of development (PPA Act 663, 2003; Watermeyer, 2013). The Procurement Plan is a central document from which all activities in a certain procurement process shall flow. Indeed, wide, earlier and timely publication of a realistic annual procurement plan allows the private sector to respond more effectively to the requirements and specifications of a project.

A second element is the selection of an appropriate procurement method in compliance with the provisions of laws and compatible with the nature of the project. At that level, the emphasis will be on Participation and Eligibility conditions which are to be nondiscriminatory because all bidders must be given equal opportunity to win (Oladepo, 2000).

Another aspect to consider is the appointment of a suitable team for the project design. Lastly, it is important to ascertain the accuracy of the allocated budget and ensure that required approvals are obtained. From the above explanation, key issues to consider are project initial brief; procurement plan and its alignment with the national development goals; proposed procurement option; participation and eligibility conditions; project design quality; and accuracy and availability of the budget. To increase the effectiveness of CTP at planning phase, following best practices are therefore identified: Develop a realistic procurement plan including an accurate budget, get the required approvals; publish the procurement plan; appoint a suitable project design team; obtain a complete project design; and select an appropriate tendering option.

2.7.2 At Tender Documentation phase

Given that the quality of tender documents is a key success factor in CT, standard tender documents were developed and adopted during PP reforms undertaken in 2000s in the majority of developing countries under the auspices of WB and OECD (WB, 2002; OECDDAC, 2005). Since then, there is a worldwide agreement on the mandatory use of standard tender documents in both international and national transactions (OECD, 2009). A prominent component of tender documents is „Instructions to tenderers“ (including various forms) which provides clear instructions on the marking, sealing and submission of tenders as well as on the procedures to be followed in tender preparation. Evaluation criteria and award criteria should be well discussed and agreed upon before tender documents publication. Another requirement is the use of neutral and well drafted specifications as recommended Mensah (2013). Then, another fundamental document is the „Bill of Quantities - BOQ“ that summarises the extent and the nature of works to be procured. It is also the basis of the estimation of costs and the subsequent contract total amount. Moreover, the BOQ serves as the reference plan to justify works variations. Ideally, tender documents must be complete, precise and clear in an applicable language as well. However, the procuring entity must request the approval of tender documents before any publication. At this phase therefore, critical issues to look at are evaluation and award criteria; tender presentation and submission conditions; technical specifications; contract type and format; time limits for tender preparation; and non-objection. Resulting best practices identified are as follows: Secure project design quality; Use standard documents; and Review and Approve tender documents before publication.

2.7.3 At Tender Solicitation phase

Solicitation of tenders begins with tender announcements. Ideally, a tender proposal should be advertised in a way to attract a wide pool of potential contractors by using several media and allocate sufficient time for preparation. That is why regulations impose at least two national newspapers of wide circulation (Chad) or a dedicated procurement gazette (Uganda, Rwanda & Kenya) or Public Procurement Authority Electronic Bulletin or a website (Ghana), or international newspapers for large projects. Obviously, tender announcements' channels play a vital role as well as advertisement duration. Another issue is the sale of tender documents that could limit participation of small contractors. That is why the price must reflect only the cost of printing and provision of the tender documents in order to lowering selling price (PPA Act 503, 2003). In addition, prospective tenderers should be authorised to inspect tender documents before purchasing. For transparency reasons, every purchaser is registered and fees received are recorded and subsequent receipt issued. The next issue is the handling of requests for clarifications which in all cases, has to be answered and copies placed in the procurement record file. So, any response to a tenderer's request for clarifications must be communicated to all tenderers without mentioning the author's name. It will be noted that when a response to request for clarifications generates substantial modifications in the project, it is recommended to extend the submission date accordingly. It is recommended to register bids received before storing them away in the designated box in a prominent place and kept locked until the opening session. Finally, tender opening commences immediately and must take place on the date, time, and venue advertised. A tender opening panel shall comprise at least 3 persons including a member of the entity's tender committee. For purpose of transparency, it is not allowed for a tender opening session to be halted or postponed once the

process has begun. The following recommendations are made to guarantee the effectiveness of the process: ensure that opening session is public and minutes of proceedings are duly written and signed as well as the attendance list, and original copies of bids are secured at all times. In case of rejection, the offer must be returned unopened. Based on the above explanations, issues to consider are tender advertisement channels and duration; tender documents selling price; requests for clarifications and responses; tender reception conditions; opening panel and proceedings; and tender preparation time frame. However, the following best practices are identified: Wide and long advertisement of tender proposals, Proper handling of requests for clarifications, and Public opening session.

2.7.4 At Tender Evaluation phase

Evaluation of bids is a very sensitive step in tendering process and when performing it, following aspects have to be considered carefully. These are panel size and composition, evaluation criteria, award criteria, scoring system, and evaluation report. Concerning panel size and composition, the highest ethical standards shall be applied to ensure fairness, transparency and trust. To comply with the standard, an evaluation team should be selected among the specialists in the area and comprising at least three to six people. It is highly recommended the use of an independent observer on the evaluation panel because his presence helps ensure that competing bids are impartially evaluated and provides reassurance to participants as to the integrity of the evaluation process (Lloyd, 2009). Regarding the evaluation proper, only criteria listed in the bidding documents will be applied. No meetings or consultations between the Procurement Entity and tenderers are permitted. Evaluation process involves necessarily administrative, technical and financial evaluations and may follow preliminary examination, responsiveness analysis, scoring and comparison of tenders,

and finally ranking and reporting. The points scoring system, perceived as more objective than others, has to be encouraged. At the end, an evaluation report shall be drafted and signed by all participating members for submission to Tender Committee. Though there are many options in awarding the contract, the commonly used is „the lowest cost“ when tendering process was effective. So, a clear recommendation for the award has to be made in the report. From the foregoing, the following best practices are identified: Appoint a suitable evaluation panel team; Use of points scoring system; Submit a report on time using standard format; and provide clear recommendation of the winner. Finally, during the financial evaluation, a thorough scrutiny of eventual cartel problem is necessary.

2.7.5 At Tender Pre-award phase

Generally, a pre-award meeting is held to review and adopt the tender evaluation report. Prior to the meeting, a formal commitment of the required funds must be done in the form of „Funds Availability Attestation“. After evaluation report approval, the procuring entity should send a provisional notification to both successful and unsuccessful tenderers. A debriefing is to be organised with all tenderers to publicly release tender results. A minimum period of 10 to 14 days is granted for eventual complaints, because bidders have the right to protest the results (Lloyd, 2009). When there is a formal founded protest, the award process is suspended till the settlement of the case. If no formal complaint is registered after this period, so a provisional notification is issued to the winner who shall be required to confirm in writing acceptance of the tender award and submit the appropriate performance security; after what the final notification is issued. Failure to do that may constitute grounds for the annulment of the award. In that event, the Procurement Entity may award the contract to the next lowest

evaluated bidder, whose offer is substantially responsive and qualified to perform the contract satisfactorily. In the light of what precedes, key issues to consider are: tender evaluation results; award conditions; and tender results publication. Resulting best practices identified are as follows: Review and adoption of tender evaluation report; Publication of tender results; and Resolution of eventual protest/disputes before final award. In conclusion, a list of critical points to look at and corresponding practices resulting from literature review of various procurement laws and associated documents of seven developing countries is given in the Table 2.3.



Table 2.3: List of Critical Points to look at and corresponding practices phase per phase

Phases	Critical Points to look at	Common Practices
1. Tender Planning	<ul style="list-style-type: none"> - Project definition or formulation - Project primary objectives - Project secondary objectives - Procurement strategy proposed - Tendering option - Initial Budget - Compliance with procedures 	<ul style="list-style-type: none"> - Development of Procurement Plan - Adoption of a realistic Procurement Plan - Wide Publication of the adopted Procurement Plan - Appointment of a suitable Project Manager - Implementation and adoption of Feasibility study - Estimation of accurate budget - Privilege the Open Tendering - Appointment of an appropriate Tender Committee - Adequate & complete proceedings documentation
2. Tender Documentation	<ul style="list-style-type: none"> - Eligibility conditions - - Evaluation criteria and scoring system, - Award criteria, - Tender presentation and submission conditions - Tender opening conditions - Time frames of tendering process - Usage of standard documents - Drawings quality and completeness - Bill of quantities quality and completeness - Estimate accuracy - Dispute resolution mechanism - Technical specifications, - Contract type & format, - Different standard forms to be completed - Compliance with procedures 	<ul style="list-style-type: none"> - Prior Approval of Project Complete Design - Non-discriminatory Eligibility conditions - Open Participation - Alignment with primary & secondary objectives - Neutral & standard Technical specifications - Standard Contract draft - Adoption of Tender documents
3. Tender Solicitation	<ul style="list-style-type: none"> - Bids presentation conditions - Bids submission conditions - Bids opening conditions - Request for clarifications treatment /handling - Time frames for tender announcements - Sale price of tender documents - Composition of Opening ceremony panel 	<ul style="list-style-type: none"> - Wide and long Advertisement - Use of appropriate media for adverts - Pre-tender meeting - Reasonable Selling Price - Proper handling of Requests for clarifications - Safe venue for tenders box - Public opening session
4. Tender Evaluation	<ul style="list-style-type: none"> - Composition of the Evaluation Panel - Quality of the Panel Chairperson - Evaluation method used - Responsiveness conditions adopted - Scoring system used - Bids prices and rates - Time frames for tender evaluation - Ethics issues on Evaluation Panel members 	<ul style="list-style-type: none"> - Confidential Evaluation meetings - Use of Points system for scoring - Use of pair or triple evaluation method - Adequate use of Margin of Preference - Separation of technical, financial and legal evaluations - No communication with tenderers - Formal requests for clarification from tenderers - Formal tender evaluation report - Involvement of a neutral observer

5. Tender Pre-award	<ul style="list-style-type: none"> - Pre-award meeting - Publication of tender results - Debriefing meeting - Commit and secure funds - Resolution of disputes (if any) before final award - Adoption of Evaluation Report 	<ul style="list-style-type: none"> - Pre-award meeting - Publication of tender results - Debriefing meeting - Commit and secure funds - Resolution of disputes (if any) before final award - Adoption of Evaluation Report
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Source : Author's Construct

2.8 KEY FEATURES OF AN EFFECTIVE COMPETITIVE TENDERING PROCESS

A public procurement system can be said to be functioning well if and only if it achieves the objectives of compliance with laws and regulations, transparency and public accountability in all steps, competition, economy and efficiency, fairness and equity, and integrity (Oladepo, 2000; Appiah, 2011; WB, 2003; Pauw and Wolvaardt, 2009). To achieve these objectives, procurement system must be well organised, carried out correctly with regard to quantity, quality and timeliness, and at the optimum price; above all in accordance with the appropriate guidelines, principles and regulations (Dikko, 2000). From the above assertions and considering PP objectives set by the Republic of Cameroun, Chad, Ghana, Rwanda, Uganda, Senegal, Kenya, key features of an effective CTP can be summarized as follows:

Public confidence underpinned by attributes of accountability, transparency, equity and fair dealing in relation to procurement processes; **Efficiency and Effectiveness** in the use of public monies to achieve VFM and efficiency of delivery of procurement outcomes; and **Laws, Regulations and Policy compliance and consistency** of both the processes and outcomes of procurement in relation to other policy objectives and expectations of the public sector such as environmental issues, training and apprenticeships, International obligations and especially business and regional employment impacts (Agoba and Shipman, 2009;

Schapper et al., 2006). Briefly, a CT process which complies with laws and regulations should be fair, transparent and competitive. Surely, a transparent process will enhance competitiveness, and fairness and equity. Therefore when transparency, fairness and equity are secured, inevitably competition is promoted. As a matter of fact, competition results in economy of cost and time.



CHAPTER THREE

CHALLENGES FACING THE IMPLEMENTATION OF COMPETITIVE TENDERING METHOD IN CHAD

3.1 INTRODUCTION

This chapter targets the challenges facing the implementation of Competitive Tendering Method (CTM) in Chad. Before exploring these challenges through literature, a brief profile of Chad Republic is given to provide the specific context in which the study is conducted.

3.2 BRIEF PROFILE OF CHAD REPUBLIC

Chad Republic is a big land of 1,284,000 sq.km situated in the heart of the African continent as shown by the map including other facts about the country summarised in Figure 3.1. A general census conducted in 2009 put the population at 11 Million (INST, 2009). The country achieved its Independence on 11 August 1960 but its economy has long been handicapped by its landlocked position which is both a disadvantage and barrier to development according to Liam and James (2009). With a per capita income of \$1,600 and the rate of GDP growth of 0.6% (BAfD/OCDE, 2008), Chad is ranked 170 out of 177 countries in the Human Development Index and classified as the 12th poorest country in the world by the World Bank (UNDP, 2011). According to United States Bureau of Economic, Energy and Business Affairs (US/BEEBA, 2011), Chad's commercial climate suffers from limited infrastructures, chronic energy shortages, high energy costs, scarce skilled labour, high tax burden and corruption. As briefly depicted above, Chad's economy has been confronted by many challenges and has naturally affected the construction sector (BAfD, OCDE, PNUD, and CEA, 2012).

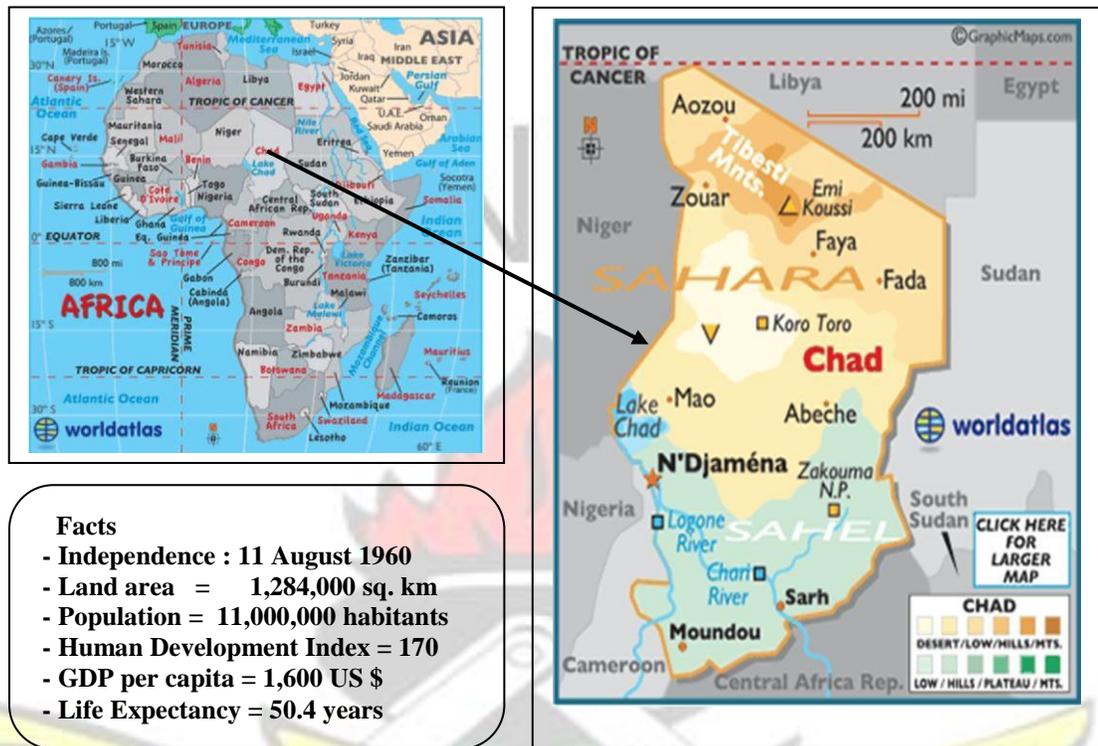


Figure 3.1: Africa and Chad Republic maps

Source: World Atlas Publications, 2010.

3.3 CHADIAN CONSTRUCTION INDUSTRY

After many years of stagnation, the Chadian Construction Industry (CI) started growing since 2007, boosted by substantial financial resources drawn from oil exploitation. As illustration, Table 3.1 presents amounts spent in construction projects from 2007 to 2010 (OCMP, 2010). Consequently, the contribution of the Construction Industry to the GDP has risen from 4% in 2006 to 7% in 2011 and has reached 17% in 2014 confirming the industry growth trend (INST, 2015).

Table 3.1: Evolution of expenditures in construction projects

Year	No of Contracts	Total Amount of Works ^o Contracts in CFA	% of Contracts awarded through Negotiations	% of Contracts awarded through CT	No of Contractors
2007	162	251,073,017.000.00	30.00 %	70.00 %	85
2008	184	119,460,000.000.00	51.40 %	48.60 %	88
2009	202	385,313,000.000.00	55.00 %	45.00 %	85
2010	140	446,949,887,781.00	60.00 %	40.00 %	72

Source: Author^os survey (2012) compiled from OCMP annual reports

Although the tendency is towards rapid growth, Chadian CI is still confronted by excessive bureaucracy that delays every procurement process, weak construction materials supply base that maintains very high prices, economic uncertainties with uncontrolled inflation, unregulated labour market and poor management practices (Chavantas, 2009). Despite the passage of the PPA Act 503 since 2003 and the establishment of a procurement cadre in Government Ministries, State Institutions and Public Agencies, the procurement system is not functioning as it ought to and is rather riddled with delays, corruption, fraud and irregularities. Again, political interferences, prevailing weak technological capacity, economic and structural conditions, have also been reported as in many other developing countries (Ofori, 1999; CCSRP, 2008; Basheka, 2009). The weak capacity of the stakeholders ranging from materials^o suppliers, contractors, consulting firms up to procurement officials can also be mentioned. In fact, according to OCMP (2010), indigenous contractors capable of executing large projects are very few, leaving hence the market to foreign companies. The same can be said of consulting firms. Regarding construction materials, apart from sand and gravels, other construction materials are all imported resulting a construction cost that is among the highest in Africa with a cement bag of 50 kg costing more than US \$ 25 (Market survey in 2010). In

addition, an informal census of staff in charge of PP has revealed that procurement professionals are less than 50 people distributed among all operational procurement institutions compared to the need of about 300 people (OCMP, 2010). Certainly, this huge deficit is responsible for malpractices as well as the poor performance of the procurement entities. Further, as shown above in Table

3.1, an average of 50% of contracts is awarded through negotiation procedure (OCMP, 2008) which is perceived as one of the avenues for corruption and fraud (UN, 2004; OECD, 2009). The massive usage of negotiation rather than CT is not only a violation of the laws and regulations, but it is an indication that reforms of public procurement have failed or may still be considered as work-in-progress after ten years of implementation (Basheka, 2009). Certain improvements have been made but much remains to be done to achieve competitive, transparent, incorruptible and competently managed procurement systems (Douh et al., 2013).

3.4 CHADIAN PUBLIC PROCUREMENT FRAMEWORKS

3.4.1 Legal and regulatory framework

Since Independence in 1960, Government contracts were governed by the “Code des Marchés Publics” which is out of date for many years. As in many other developing countries, a reformed Public Procurement Act (Act 503) was enacted on 5th December 2003 under the auspices and with the support of International sponsors, namely AfDB, WB, OECD, EU, and UNDP. This law stands on the following five pillars: (i) Comprehensive, transparent, legal and institutional framework, (ii) Clear and standardised procurement procedures and standard documents, (iii) Independent control system, (iv) Proficient procurement staff, and (v) Anti-corruption measures. Its main objectives are clearly stipulated in the Article 1 as follows: free

access to the public contract by all and equality in the treatment of bidders and transparency in the procedures. The PPA Act 503 (2003) comprises hundred and thirty three (133) clauses distributed into Seventeen (17) chapters which are grouped under Eight (8) parts. For its full implementation, the act is completed by a series of presidential decrees listed below:

- *Décret N° 458/PR/PM/SGG/2004 portant attributions, composition et modalités de fonctionnement de l'OCMP*
- *Décret N° 459/PR/PM/SGG/2004 portant Règlement Intérieur de l'Organe Chargé des Marchés Publics*
- *Décret N° 460/PR/PM/SGG/2004 portant attributions de tous les organes en charge et les modalités de fonctionnement*
- *Décret N° 462/PR/PM/SGG/2004 fixant les seuils de passation et les compétences d'approbation des Marchés Publics*
- *Décret N° 464/PR/PM/SGG/2004 portant RI des COJO, SCTE et SCP ;*
- *Décret N° 465/PR/PM/SGG/2004 fixant les conditions d'obtention du certificat de qualification par les entreprises de travaux*
- *Décret N° 466/PR/PM/SGG/2004 fixant le recours à l'Appel d'Offres Restreint*
- *Décret N° 467/PR/PM/SGG/2004 déterminant les attributions et le fonctionnement du CRRA*
- *Décret N° 468/PR/PM/SGG/2004 portant attributions, composition et fonctionnement du Comité de Suivi et de réception*
- *Décret N° 469/PR/PM/SGG/2004 fixant le taux et les modalités de calcul des Intérêts moratoires*
- *Décret N° 470/PR/PM/SGG/2004 portant révision des prix en matière des marchés publics*
- *Décret N° 522/PR/PM/SGG/2004 Fixant la procédure de contrôle des coûts et marges des titulaires des Marchés publics*
- *Décret N° 523/PR/PM/SGG/2004 portant CCAG des travaux*
- *Décret N° 525/PR/PM/SGG/2004 portant CCAG des prestations intellectuelles*
- *Décret N° 526/PR/PM/SGG/2004 portant publication du DAO type des travaux*
- *Décret N° 527/PR/PM/SGG/2004 portant publication du DAO type des fournitures*
- *Décret N° 528/PR/PM/SGG/2004 portant publication du DAO type des prestations intellectuelles.*

In the light of the above, it seems the standard law and basic regulations and procedures are in place but the problem resides in the lack of enforcement that causes massive violation. However, although the Act 503 (2003) provides guidelines for best practices, on the ground, the quality of outputs and outcomes remains challenged even where the process complies with the provisions.

3.4.2 Institutional framework

According to Act 503 (2003), institutional framework can be diagrammed as in Figure 3.2.

Operational procurement independent bodies are Public Procurement Board (OCMP), Tender Committee (COJO) and Procurement Appeal Board (CRRA). The entities currently operational are Contracting Authorities, Technical units in charge of tender documents development and the follow up of construction projects, Procurement Unit of Ministries, and Chamber of Counts of the High Court of Justice acting as control/audit body. Also, the Commission of Qualification or Selection of contractors, Commission of Pre-qualification of bidders, Tender Evaluation Panel (SCTE) are all functioning.

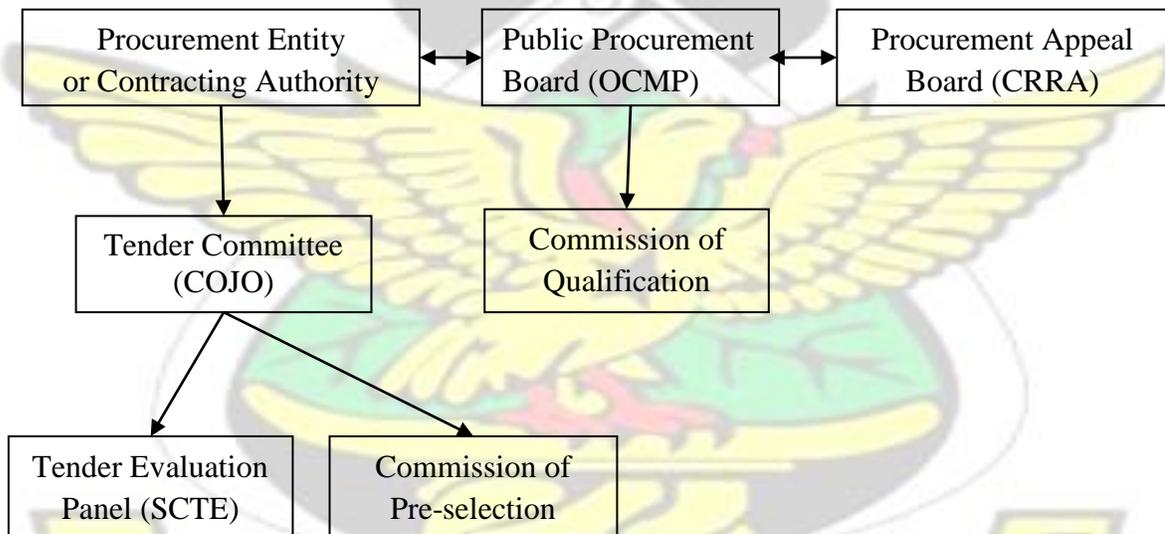


Figure 3.2 Typical Procurement structures

Source : Author's construct

3.4.3 Competitive Tendering process prescribed by the PP Act 503

The Act 503 (2003), prescribes in its Article 4 that Open Competitive Tendering is the default procurement method in Chad. For that purpose, the recommended process to follow is illustrated in Figure 3.3.

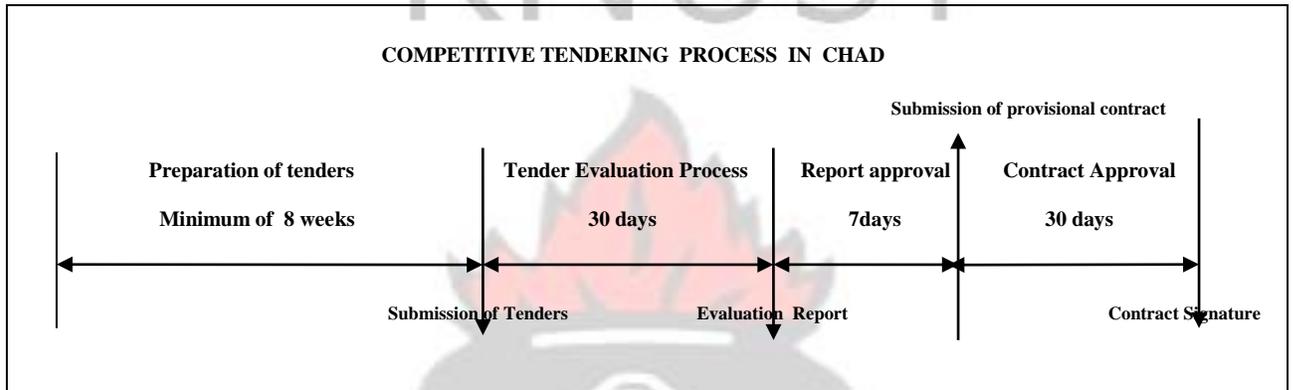


Figure 3.3: Tendering process illustration w.r.t. to times allocated by the Act 503 of Chad

Source: Author's construct

3.4.4 Concluding remarks

The implementation of CTP in Chad has revealed following weaknesses: (1) Proper procurement audits are lacking, so neither internal nor external audits are done at either pre or post contract phases giving room to malpractices and other vices; (2) The absence of the Review Board is another root cause of many deficiencies in the legal and regulatory frameworks because laws and regulations have to be reviewed regularly to accommodate changes generated by the complex and dynamic nature of public procurement processes; (3) There is a generalised disrespect for legal time limits without any sanction. This laxity undoubtedly is responsible for the poor performance and chronic ineffectiveness in Chadian procurement system. Worst of all, whilst CT is the prime method in public contracts except

in limited situations, practices on the ground still favour negotiation procedure in flagrant violation of law. Besides, even recommendations and action plan formulated by the Country Procurement Assessment Report since 2005 are not fully implemented. Moreover, despite the reforms instituted ten years ago, legislation regulating public contracts and required standard manuals and procedures are not all in place. Based on that, it is easy to infer that progress is so slow that Chad has a long way to go to yielding expected benefits from CT and therefore PP achievements are unsatisfactory in Chad (CCSRP, 2006-2010). However, there is a commitment at the highest level of the Government of Chad to sound procurement principles in order to meet international standards as proved by the steps taken and discussed in the following section.

3.5 STEPS TO SEEKING EFFECTIVENESS OF PP IN CHAD

To address the poor performance depicted above, the following four measures were initiated in order to improve the effectiveness of public contracts.

3.5.1 Creation of the Direction Générale des Grands Travaux Présidentiels (DGGTP)

The first action is the creation in 2004 of the DGGTP which means literally *General Direction of Major Presidential Construction Projects*. This institution was put in place with the mission of implementing construction projects funded by special funds to respond to some emergencies or President's political agenda. Overtime, the institution has become the first public works provider ahead of the Ministry of Works and is able to award, sign and approve a contract within 7 to 14 days through negotiation. Even though this performance appears important in terms of timeliness; the cost and quality of works are most often questionable due to lack of proper documentation and poor supervision of works both of which are attributable to hurried nature of the contract award procedures (CCSRP, 2010).

Unfortunately, the institution is still functioning despite the record of poor performance.

3.5.2 Concentration of all construction projects under one Ministry

In 2006, a Ministry of Infrastructures in charge of all building and civil works and equipment was created with the mission of accelerating the execution of construction projects all over the country (a sort of unique central authority). This experience has been working for years now but the effectiveness of public works procurement is still very poor (CSCR, 2010). Main criticisms which have arisen are: no respect of procedures; ad hoc award of contracts; and delay in contracts payments and systematic corruption even though there is a little improvement in the award of contracts in terms of time. Once again it is obvious that this practice is not in line with the reforms that seek to promote the decentralisation of procurement activities rather than the centralised system where bureaucracy and abuse of power are frequent (Sakane, 2009; Shakeel, 2010).

3.5.3 Institution of „Guichet Unique“

A third step is the establishment in 2008 of a „*Guichet Unique*“ which means literally „Unique desk“ with the aim of gathering key officials a certain day of a week in one office to examine and sign contracts and other related documents in order to quicken the procedure and reduce delay. According to OCMP (2009), this initiative did not last due to non-availability of the designated officials and lack of results.

3.5.4 Implementation of a Study on the Public Contracts Effectiveness

Considering all these fruitless initiatives described above, a diagnosis survey was funded by the EU delegation in Chad, to explore the weaknesses and constraints of government contracts in order to improve the effectiveness. The study is titled “*Etude pour l’amélioration de l’Efficacité pour la Passation des Marchés Publics*” (i.e. Study on

Effectiveness Improvement in Public Contracts Award) and the final report was submitted in July 2008. This document has analysed critically current practices and their negative effects on the procurement system. The following weaknesses were pointed out: absence of some laws and regulations; rigid and ambiguous regulations; lack of appropriate procedures attributable to the absence of explanatory manuals, poor capacity; and others. Recommendations formulated are as follows: review of laws and regulations to provide the legal environment; the promotion of capacity building to perform efficiently the procurement missions; the simplification of the process by eliminating unnecessary steps. Unfortunately, it is still observed that the implementation of these recommendations are lacking.

From the foregoing, it is clear that there is a political will to improve the performance of procurement system in order to achieve development goals in Chad. But, there is a lack of commitment on the part of the majority of procurement officials and contractors. In addition, the absence of some key players (e.g. review and audit bodies) of the system is reducing the expectations. Therefore, the present work may be one of appropriate responses to this chronic ineffectiveness because the proposed framework is a systematic and procedural assessment tool of the effectiveness at all critical phases of the tendering process for every construction project before approving the award of contract by every contracting authority.

3.6 POTENTIAL CHALLENGES FACING THE IMPLEMENTATION OF CT

Public procurement is a multi-faceted challenging field, so practitioners do face numerous challenges caused by internal and external factors (Thai, 2009). For instance, in Southern Asia, David (2007) identified six areas of challenges confronting public procurement: legal framework, institutional and human resource capacity, competition and access, corruption, transparency and decentralisation. In Bangladesh, Shakeel (2010) asserts that PP process is

far from satisfactory due to poor advertisement, short bidding periods, poor specifications, non-disclosure of selection criteria, contract awards by lottery, one-sided contract documents, negotiations with all bidders and rebidding without adequate grounds. Even occurrences of corruption involving donor agencies are not uncommon at local, national or global levels concluded Shakeel (2010) and Bolton (2009). In Kenya, challenges are similar to those in Bangladesh and Southern Asia except the capacity issue (Mette et al., 2007). Nonetheless, most developing countries are facing rapid changes in PP requirements that are putting pressure on how the procurement function performs (Kakwezi and Nyeko, 2008). According to Arrowsmith (2011), issues like professionalism, staffing levels and budget resources, procurement organisational structure whether centralised or decentralised, procurement regulations, rules and guidelines, and internal control policies need attention because they influence the performance of the procurement function.

In Chad, PP is confronted by some challenges namely delay, weak and incomplete legal frame, poor institutions, low procurement capacity, and so on so forth. Firstly, delays have led to a very low rate (25%) of project execution (CCSRP, 2006) with an average of three months instead of 7 days as prescribed for contract approval (PPA 503, 2003). Incontestably, lateness is registered at all levels of the process and consequently, every project has to experience inherent delay without any tangible reason.

Secondly, rigid and incomplete laws, vague and flexible regulations and complex or ambiguous procedures have given room to massive violation, abusive use of power in the award of contracts (OCMP, 2010). Furthermore, inconsistency, confusion and lack of transparency and public accountability, obsolescent laws and regulations and absence of some key implementing decrees and manuals are also reported (OCMP, 2009 and CCSR, 2009).

As result, little award of public contracts comply with laws and regulations. The ignorance of how the public procurement operates (Arrowsmith, 2011) and the lack of laws and regulations enforcement (Ameyaw et al., 2011) also have been the principal causes of these challenges. Thirdly, poor performance of procurement institutions in addition to the lack of the human resource, working equipment, offices and premises, funds, institutional, administrative, legal and regular frameworks are identified as constraints to the smooth functioning of procurement entities. Consequently, this deficiency in capacity has in many cases affected the ability of the procuring authority to properly follow the procurement rules and thus they are unable to deliver the required outcome. The OCMP's 2010 annual report revealed poor capacity of personnel as a root cause of the very low performance of the institution. Other causes like poor qualification, lack of experience, overload of work, lack of motivation, deficiency in ethics, old age, shortage of high qualified staff, are also reported by independent auditors when assessing human resource issues.

Fourth, the absence of central procurement authorities to oversee procurement's policy and practices, review procurement rules, draft bidding standard documents, advertise projected procurements, and monitor compliance are absent on the scene making it difficult to implement periodic controls and audits of PP operations in Chad.

Lastly, overpricing is mentioned as a product of lack of competition which may arise from a bidding system subject to preferential margins and quota restrictions to discriminate against foreign contractors. According to Bolton (2009), abnormally high prices could be also attributed to the absence of the yearly updated official prices list, massive utilisation of negotiation procedure, cartel problem, inflation of materials' costs, monopoly of some contractors in certain domains, and corruption. Furthermore, CCSRP (2009) identified the

lack of procurement plan and its publication, poor advertisement of tender announcements, no publication of tender results, fraud, corruption, political interferences, and abuse of power as indicators of the lack of transparency in the system. Obviously, PP practitioners have always faced other challenges imposed upon them by a variety of environment factors including market, legal, political, organisational, and socio-economic (Thai, 2006). Another external factor that came to light is the mismatch between budgetary allocations and the actual release of funds, which often prevents procuring authorities from meeting financial obligations to contractors. In short, at least fifteen (15) potential challenges are identified as relevant in Chad and listed in the Table 3.2.

Table 3.2: List of Potential Challenges identified through literature

No	Major Challenges
1	Delay in the processing of CT document
2	No respect for regulations and prescribed time-limits
3	Complexity of laws and regulations of CT
4	Length or duration of CT procedures
5	Poor capacity of personnel in charge of the implementation of CT
6	Poor performance of structures in charge of the implementation of CT
7	Generalized and systematic overprice of bids
8	Lack of transparency and public accountability
9	Lack of openness of the competition in CT
10	Absence of Equity and Fairness in the award of contracts
11	Corruption in the acquisition of contracts
12	Political interferences in the award of contracts
13	Abuse of power in the award of contracts
14	Fraud and other mal-practices
15	Absence of Regulatory and Control/ Audit bodies

Source: Author's construct

CHAPTER FOUR

CONCEPTUAL FRAMEWORK OF THE RESEARCH

4.1 INTRODUCTION

This chapter is devoted to the conceptual framework which can be thought of as a map or travel plan (Sinclair, 2007) and a collection of interrelated concepts that guides research (Marilla, 2010). It comprises the following sections: Effectiveness definition and concept, Effectiveness assessment approach, an overview of existing public procurement assessment instruments and frameworks, and relevant criteria identified through literature review and related key measurable indicators.

4.2 EFFECTIVENESS DEFINITION AND CONCEPT

According to Richard (2006) and Van-Weele (2006), Effectiveness expresses the degree to which objectives are achieved and also indicates the degree to which the process output conforms to requirements. Drucker (1985) cited by Richard (2006) defines Effectiveness as the way of doing the right things that means achieving the optimal relation of inputs and outputs. Watermeyer (2013) argues that Effectiveness focuses on the achievement of the intended outcome from an activity and at the same time Effectiveness relates to how successfully a process achieves its intended output and subsequent impacts which are realised. In other words, effectiveness designs the accomplishment of organisational goals as well as representing the extent to which planned activities are realised and planned results are achieved. Besides, Mihaiu et al. (2010) make it clear that effectiveness is defined as how well an organisation is doing what it sets out to do (mission) and achieving the change desired

(outcomes and impacts) for those served. From the preceding, it appears that the concept of “**effectiveness**” has been elusive and difficult to define in few words as opined by Mihaiu et al. (2010). But, to get a sound understanding of the effectiveness concept, one has to comprehend the link between performance, effectiveness and efficiency.

Performance is the effectiveness of the way of doing something and according to Maylor (2003), performance is not conformance and has shifted to excellence and expressed as: what is the shortest possible project duration, what is the lowest cost and what is the highest level of quality that can be achieved. Practically in the production field, performance level equals the standard time for an activity when directly compared with the actual time spent on the task (Harris and McCaffer, 2001). Regarding Effectiveness and efficiency, Richard (2006) made it short that effectiveness means “doing the right things” whereas efficiency means "doing the things right". On one side, Mihaiu et al., (2010) argue that effectiveness is the indicator given by the ratio of the result obtained to the one programmed to achieve; whilst efficiency is an indicator that is obtained by reporting the outcome effects of the efforts made. On the other side, Richard (2006) is of the opinion that there is no efficiency without effectiveness, because it is more important to do well what you have proposed (i.e. effectiveness) than do well something else that was not necessarily concerned (i.e. efficiency). Thus, effectiveness is a necessary condition to achieving efficiency and may be seen as long-term while efficiency may be seen as short-term achievement (Mihaiu et al., 2010). In the light of these definitions, it can be concluded that performance is not an end in itself but a means to appreciate if the organisation is effective and efficient. For instance, a process can be effective and fail to be efficient, that is why it is argued that effectiveness is invariant to means of achievement (Richard, 2006). Therefore, effectiveness is considered as an attribute of performance rather

than its component and becomes the quality of the overall performance of a process or organisation. In this context, assessing effectiveness involves necessarily measuring performance and for that, these two words are used interchangeably in the course of the study. However, it is also important to know the sense of terms such as *input*, *output*, *outcome*, *goal* and *objective*, and *organisation* specific to the study before giving the working definition of Effectiveness. So, *Input* relates to construction project, *Output* designs contract and *Outcome* designs the physical works or constructions (e.g. building). *Organisation* here stands for the public administration which puts in place laws, regulations and procedures to achieve national development *Goals* and *Objectives* through effective procurement system like CT. Finally, the working definition of Effectiveness is the way of performing pre-established activities to produce the expected output at a high level of achievement.

4.3 ASSESSMENT DEFINITION AND CONCEPT

Assessment is the act of judging, evaluating or estimating the quality of something and according to Evans (2004), it is also a part of the management cycle that consists in measuring performance. Assessment is an interactive process that provides information about the actual performance in order to improve the final achievement (Richard, 2006). In brief, assessment means measurement and a major problem in assessment is the selection of appropriate indicators; for identifying the wrong indicators or leaving out relevant ones can also mislead the assessment (Evans, 2004). Therefore, indicators should be chosen smartly.

4.4 EFFECTIVENESS ASSESSMENT CONCEPT

As for the definition, effectiveness assessment is better understood in the light of Performance measurement concept. Before that, a brief history of the performance measurement genesis is given below to highlight its rapid evolution.

4.4.1 The evolution of performance measurement

According to Clivillé (2004), performance measurement has its roots in early accounting systems before 1850. However, with the accelerated growth of industrial organisations in USA, their needs have grown also resulting in the creation of many tools of performance measurement between the 1850s and 1920s. Following the First World War, budgeting and management accounting techniques, such as standard costing, variance analysis, flexible budgets, return on investment and other key management ratios were used by some American companies (Bourne et al., 2003). They added that between 1925 and the 1980s, there were no significant developments in management accounting. Meanwhile, traditional accounting measures were being criticised as inappropriate for managing businesses of the day. Consequently, in the late 1980s and early 1990s, there was a great interest in the development of more balanced performance measurement systems. So, many methods and techniques were developed to measure the performance of organisations and companies throughout the last two decades from which Clivillé (2004), has identified some

Performance Measurement Systems (PMS) listed as follows in chronological order:

- 1990 : ECOGRAI method by Bitton et al.
- 1991 : Activity Based Costing / Activity Based Modeling (ABC/ABM) by Brimson
- 1992 : Balanced Scorecard (BSC) by Kaplan and Norton
- 1995 : Quantitative Model for Performance Measurement System (QMPMS) by Bititci
- 1995 : Process Based Approach by Neely

- 1997 : Integrated Dynamic Performance Measurement System (IDPMS) by Ghalayini
- 1999 : Process Performance measurement System (PPMS) by Kueng and Krahn
- 1999 : European Network for Advanced Performance Studies (ENAPS) by Browne
- 2000 : Quality Management Norm ISO 9000 in the fascicule FD X 50-176)
- 2000 : Supply Chain Operations – Reference (SCOR) by Ayers.

Later on, Berrah et al., (2008) identified six major PMSs ranging from System Measurement Analysis and Reporting Technique (SMART) model in 1988 up to Quantitative Breakdown/Aggregate Performance Measurement Model in 2007. The Table 4.1 shows the popular PMS models and their respective focuses.

Table 4.1: The Major PMS models

PMS Model	Focusses
SMART (System Measurement Analysis and Reporting Technique) model (Cross & Lynch, 1988-89)	Break-down of the objectives of the company along 4 levels – company, business units, business operating units and departments and work centers - according to 10 measures such as delay, quality, customer satisfaction...
ABC/ABM (Activity Based Costing/ Activity Based Modelling) model (Brimson, 1991)	Identification of the activities and processes which generate value in the company and the factors which induce this value production.
Balanced Scorecard BSC (Kaplan & Norton, 1992, 1996)	Definition of 4 axes (criteria) - processes, organizational learning, financial and customers - in order to express company performance.
PPMS (Process Performance Measurement System) (Kueng & Krahn, 1999)	Measurement of the company performance according to 5 aspects - financial, innovation, customer, societal and employee.
ECOGRAI (Bitton 1990) (Ducq et al., 2001)	Identification of 3 criteria - delay, quality and cost –for all the processes/activities of the company.
Quantitative Breakdown/Aggregation Performance Measurement model (Clivillé et al. 2007a)	Identification of the performance indicators and their organization for a reactive control according the systemic approach

Source: Berrah et al. (2008)

As indicated above, PMS models have some both common characteristics and specificities. The invariant characteristics are as follows: (i) they all recourse to the company objectives and production processes; (ii) they all use the key success factors as well as the associated key performance factors of the companies; (iii) they are all used to support the decision making as their final goals. Whilst specificities are that their structures, operational modes and the measurement of indicators are quite different from one to another. Also, some PMSs use one criterion whereas others use multiple criteria to measure the performance. In this sense, two types are distinguished: the mono-criterion and the multi-criteria as displayed in Table 4.2.

Table 4.2: Multi-criteria PMS models types

PMS model	Type	Aggregation Mechanism
PCS (Performance Criteria System) (Globerson, 1985)	Multi Criteria	Aggregation of “critical” performances thanks to the Weighted Arithmetic Mean (WAM)
ECOGRAI (Bitton 91) (Ducq et al., 2001)	Multi Criteria	Aggregation of 3 criteria - delay, cost, and quality – thanks to specific aggregation operators - <i>min, max, sum</i> – w.r.t. both the involved criterion and the combination type of the activities - <i>or, and, sequence</i> – in
QMPMS (Quantitative Model Performance Measurement System) (Bititci 1995) (Suwignjo & Bititci, 2000),	Multi Criteria	Identification of the criteria to be considered thanks to a cognitive map and aggregation thanks to the WAM operator. Integration of a corrective factor to take interactions between criteria into account. Using of the AHP methodology to define weights.
Quantitative Breakdown/ Aggregation Performance Measurement model (Clivillé et al. 2007a)	Multi Criteria	Identification of the criteria to be considered thanks to a cause-effect diagram and aggregation thanks to the Choquet Integral (CI) operator. Using of the MACBETH methodology to identify both elementary expressions and CI parameters

Source: Adapted from Berrah et al. (2008)

According to Neely et al., (2000), the shortcomings of existing PMSs, particularly those based on traditional cost accounting principles, have been widely documented. For instance, companies are using mainly PMSs with a unique dimensional focus. Though, Clivillé (2004), suggested that this problem can be overcome if a firm adopts a balanced set of measures; another major problem in PMS modelling concerns two issues: the identification

of the performance structure (formula) and the identification of the links between the elementary expressions and the overall one in order to express the global objective's satisfaction (Berrah et al., 2013). Most often, the link identification problem is handled with the aggregation of the elementary performance expressions. For the performance aggregation is often defined as the corollary step of the break-down of the objectives as presented in section 4.2.

4.4.2 Performance measurement concept

Performance measurement (PM) has been defined from different perspectives by different researchers but there is a lack of agreement on a single definition argued Khan and Shah (2011). According to Stanley and Matthews (2007), PM is the process of assessing progress towards achieving predetermined goals. In some cases, these are related to outputs such as resources transformed into goods, or they can be results of activities compared to intended results or outcomes (NPR-National Performance Review, 1997 & 2007). However, Bourne et al., (2003) assert that PM is an integral part of the management planning and control system of the organisation being measured. Although it is difficult to define PM with precision, there is an agreement among researchers on the two following features: PM is a multiple dimensions system used to quantify the efficiency and/or effectiveness of an action, and PM is a means to achieve certain pre-defined organisational goals and objectives (Broeckling, 2010). Another issue is that performance cannot be directly measured; so it requires a number of measurable indicators on the basis of which inferences are made about the relative performance (Strand et al., 2011). Therefore, PM system uses a set of measures including both financial and non-financial measures and internal and external measures (Bourne et al., 2003).

It also includes both measures which quantify what has been achieved (results measures) as well as measures which are used to help predict the future (in-process measures).

Furthermore, PM provides the basis for an organisation to know how well it is progressing towards its predetermined objectives, identifies areas of strengths and weaknesses and decides on future initiatives in order to improve performance (Van-Weele, 2000). Meyer (2002) added that measuring performance is addressing following questions: What outcomes have been achieved? What is the gap between what has been achieved and what was intended? Is the performance acceptable? What are the qualitative and quantitative measures of increase or decrease in outputs/outcomes that demonstrate that a project is effective in delivering its intended objectives? However, effectiveness measurement process is fully described below.

4.4.3 Effectiveness Assessment Process

Similar to performance, a Measure of Effectiveness (MOE) indicates how well a system tracks against its purpose or normative behaviour (Richard, 2006). Hamilton and Chervany (1981) cited by Mouzas (2006) opined that effectiveness could be measured in two different ways: goal-centred view and system-resource view. The goal-centred view is concerned with assessing the organisation with respect to its task objectives by finding the difference between performance and objectives. In system-resource view, effectiveness is concerned with resource viability. For the assessment of a process effectiveness, these considerations should converge as suggested by Mouzas (2006). Therefore, Effectiveness measures can be defined in a binary manner (e.g. goal achieved or not achieved) or by specifying a percentage by which the goal has been achieved (e.g. 82% in an assessment).

According to Bourne et al. (2003), effectiveness assessment cannot be done in isolation for it is only relevant within a reference plan against which the efficiency and effectiveness of

action can be judged. Watermeyer (2013) added that in the effectiveness assessment process, the starting point is to clearly define objectives and expected outputs/outcomes as well as time lines, cost and levels of quality; then, perform activities and collect data; the end point is to compare the projected outputs/outcomes against the actual ones. In other words, effectiveness is achieved through setting specific goals and objectives, prescribing the expectations through formalisation of rules and roles, and monitoring conformance to these expectations (Baker and Branch, 2002; Van-Weele, 2006). More explicit is the position of Watermeyer (2011a), who asserted that assessing a procurement process begins with the identification of project milestones to be reached, activities to be undertaken, products to be delivered, and/or projected costs likely to be incurred in the course of attaining a project's final goals. Then, the degree of difference from the expected process is used to evaluate success or failure (Teelken and Smeenk, 2003).

From the foregoing, effectiveness assessment process follows the same pattern of performance measurement explained above. Therefore, it consists of defining a baseline (reference plan), identifying relevant criteria, determining related key indicators and setting corresponding target values, performing activities, collecting data, assessing the performance and finally comparing the actual results to the expected, judging the level of achievement that is the effectiveness.

4.4.4 Effectiveness Quantification

According to Berrah et al., (2004) and Clivillé (2004), the quantification of performance can be viewed as a procedure which, in a first step, quantifies the elementary performances. The second step then consists in their synthesis in an overall performance expression, generally

thanks to an aggregation operator. Hence, the **performance aggregation (Ag)** can be formalised by the following mapping:

$$\begin{aligned} \text{Ag} : E_1 \times E_2 \times \dots \times E_i \times \dots \times E_n &\rightarrow E \quad (1) \quad p_1, p_2, \dots, p_i, \dots, p_n \rightarrow p_{\text{Ag}} \\ &= \text{Ag } p_1, p_2, \dots, p_i, \dots, p_n \quad (2) \quad \text{where} \end{aligned}$$

E_i 's are the universes of discourse of the elementary performance expressions **p1, p2, pi,...**, **pn** and **E** is the universe of discourse of the overall performance expression **pAg**.

As the universes E_i 's and **E** can be different, the determination of the aggregation mapping **Ag** is generally not straightforward. So, the transformation of physical measures into performance expressions can be given by the following relation (Berrah et al., 2004) :

$P : O \times M \rightarrow E ; (o, m) \rightarrow P(o, m) = p$ where **O**, **M** and **E** are respectively the universes of discourse of the set of objectives **o**, of the set of measures **m** and of the performance expression **p**.

4.5 PERFORMANCE MEASUREMENT IN CONSTRUCTION INDUSTRY

The pioneering effort in this regard is the Performance Management Process Conceptual Framework (PMPF) of Kagioglou et al., (2001) which integrates the main themes of performance management in a simple performance measurement relationship matrix-like arrangement. PMPF is based on the Balanced Score Card (BSC) of Kaplan and Norton with its four perspectives. So, Kagioglou added two perspectives (i.e. „project“ and „supplier“) that are tailored to construction industry specific needs to have six perspectives. Though the PMPF provides indicators for effective performance management and can be adapted for any

organisation, it is solely focused on contractor strategic goals and objectives and its application in two companies fails to display data under the perspective „project“ (see Kagioglou et al., 2001). Despite this, PMPF has the merit of explaining clearly ways of performance measurement in construction industry as briefly presented in section 4.5.1 below. Another work is that of Huyssteen et al., (2010) known as Construction Industry Indicators (CIIs) that cover an extensive array of activities within the overall industry development. Examples of proposed CIIs are growth, productivity, costs, payments, public sector spending, participation by the emerging sector, health and safety, procurement, client satisfaction and training; which were categorised into two sets : economic indicators and project indicators (see section 4.5.2).

4.5.1 Ways of Performance Measurement in construction

According to Kagioglou et al. (2001), performance measurement in construction industry is also approached in two ways: in relation to the product as a facility, and in relation to the creation of the product as a process. Consequently, there are two general types of performance measures: Results measures and In-process measures. Results measures which track outcomes after the fact, measure only success or failure of the project, and are not sufficient to assess the overall performance of construction projects. Moreover, results measures only provide historical information that can be inconsequential for present assessment or inaccurate information that may mislead decision-making advance Hoover and Schubert (2007). Unlike, In-process measures track leading indicators and anticipate potential problems before they happen (Hoover and Schubert, 2007). Therefore, in-process measures are appropriate to the present study which intends to assess processes using leading indicators. However, in the effort of establishing balanced and leading performance indicators specific to the Construction

Industry combining the two ways, some researches were undertaken to determine Key Performance Indicators (KPI).

4.5.2 Key Performance Indicators (KPI) in Construction Industry

The prime performance assessment of construction has been generally the extent to which client objectives like cost, time and quality were achieved (CURT, 2005). In addition, clients of the construction industry want their projects delivered on time, on budget, free from defects, efficiently, right first time, safely, by profitable companies (UK KPI Working Group, 2000). Unfortunately, these indicators are criticised of being too centred on client's interest and are hence insufficient to capture the overall performance of construction projects which are complex in nature (ANAO, 2011). Further, Anon (2010) identified 30

KPIs grouped into three categories comprising ten indicators each. First, the **Economic KPIs** are following: Client Satisfaction–Product, Productivity, Client Satisfaction–Service, Safety, Profitability, Defects, Cost Predictability of Project, of Design, of Construction, and Time. Second, the **Respect for People KPIs** comprise: Employee Satisfaction, Qualifications and Skills, Staff Turnover, Equality and Diversity, Sick Absence, Training, Safety, Pay, Working hours, and Investors in People. Lastly, **Environment KPIs** include: Impact on the environment – Product and Construction process, Energy use (Designed) – Product, Energy use – Construction process, Main water use (Designed) – Product, Main water use – Construction Process, Waste – Construction process, Commercial vehicle movements – Construction Process, Impact on Biodiversity – Product and Construction process, Area of habitat Created/Retained – Product, and Whole Life Performance – Product.

In addition, Huyssteen et al., (2010) established two groups of indicators : **Economic indicators** include Contribution to GDP, Growth, Investment, Production prices, Building

plans passed and Buildings completed; and **Project indicators** are Site safety, Participation of previously disadvantaged individuals, Defects, Non-price-only tenders, Training, Cost Predictability, Time Predictability, Use of modern forms of contract, and Client satisfaction. Besides, Hoover and Schubert (2007) have established 9 KPIs that successful construction firms should monitor. These are: Liquidity, Cash flow, Labor productivity, Schedule variance, Margin variance, Unapproved change orders, Committed cost, Backlog, Customer satisfaction/scorecard. From the foregoing list, it appears clear that most indicators are developed from construction companies' perspectives, the public administration and other stakeholders of the industry are not well considered. On the contrary, the long list of KPIs further indicates the complexity of performance measurement employing both leading and lagging balanced indicators in construction sector. The next section reviews various effectiveness assessment tools used in public procurement.

4.6 EFFECTIVENESS ASSESSMENT IN PUBLIC PROCUREMENT

According to Patrick (2010), procurement performance in construction sector has been attracting great attention from practitioners, academicians and researchers since 1930. As a result, many instruments were developed including Prior-approval or Non-objection mechanisms, Internal control, Independent or External audit, Pre-award risk analysis, Preaward survey, Pre-contract Effectiveness Audit, Public Procurement Model of Excellence (PPME), and Country Procurement Assessment Report (CPAR), (SIGMA, 2011; Mäki, 2012). As stipulated in many public procurement laws, documents like annual procurement plan, project brief, project design and budget, tender documents, tender evaluation report and provisional tender award are all subjected to prior approvals by entitled authorities before

publication or implementation (see PPAs of Senegal, Cameroun, Chad, Ghana, Rwanda, Uganda, and Kenya). Although approval mechanisms are put in place in these countries, they do not function as they ought to as far as the public funds are concerned except where non-objections are mandatory (Jones, 2002). As results, many governments have to recourse to independent firms to audit public procurement operations (RPPA, 2010); yet any tangible improvement has been observed (Cornela et al., 2011). Thus, for the purpose of the present study, three groups of the above instruments are briefly reviewed below to demonstrate the need for the study.

4.6.1 Pre-award risks analysis or survey or Pre-award Effectiveness Audit

According to the Construction Industry Development Board – CIDB (2006), Pre-award risks analysis is a means of assessing all risks involved in awarding the contract to a particular bid winner. Then, risks analysis“ conclusions are inserted in the evaluation report to inform the final decision. However, Pre-award survey is required only when information on hand or readily available to the contracting authority including information from commercial sources, is not sufficient to make a beneficial decision or when a contract administration office becomes aware of a prospective award to a contractor about which unfavorable information exists or when the prospective contractor is debarred, suspended, or ineligible (US/GAO, 1987; RPPA, 2010). Pre-award survey is also used casually as a verification means whose output can disgrace or credit a contractor alone and fails to assess the procurement institutions and processes. Pre-contract Effectiveness Audit is another means for evaluating a prospective contractor“s proposed rates and related internal cost structure before actually agreeing and signing the subsequent contract (Moro, 2011; US/GAO, 2009; Matthew, 2012). Its implementation in USA and Ghana has saved about 20% of initial bid price (Moro, 2011;

Agbesi, 2009). But like an audit, it is solely focused on cost criterion and the output may disgrace or credit a contractor alone. Also, pre-contract effectiveness audit fails to assess the procurement institutions and processes. Therefore, it does not fit for assessing the effectiveness as proposed by the present study.

4.6.2 Public Procurement Model of Excellence (PPME)

PPME is software developed by OECD since 2002 to facilitate the collection of data in order to measure the quality of procurement system at the level of procurement entity. Its objectives are: (i) to help in the implementation of a change process to improve procurement at entity, regional and national levels; (ii) to provide objective information for assessing the conformity of the procurement process to the requirements; (iii) to evaluate performance of procurement at various levels and provide recommendations to improve the process; (iv) to lead to the certification of the procurement entities within the country. The PPME uses 80 key performance criteria and provides two reports: an assessment report on the performance of a particular entity and a comparative assessment results reports Adjei, (2005). According to Agbesi, (2009) the software was piloted in Ghana in 2006 and has been used to assess more than 200 entities. And so far, results show significant progress in the performance of public procurement as well as the impact of the Ghanaian Public Procurement Act 663 (2003) admitted Adjei, (2012) and Frimpong et al., (2013). Besides that, it has the merits of achieving the assigned objectives by providing managers at all levels with both an analytical tool to compare results and a list of recommendations to improve performance asserted

Adjei, (2012). Though PPME exhibits features that comply with the concept of performance measurement system and even covers tendering processes at pre and post-contract stage, it however fails to tell the level of Effectiveness attained by a particular contract even if it is

effectively processed. Another weakness is that PPME uses results measures and therefore lagging indicators. Not only that, it is goal centred (focus on entities) rather than process centred. Therefore, it is significantly different from the framework under study.

4.6.3 Country Procurement Assessment Report (CPAR)

CPAR is an analytical tool designed under the auspices of WB and OECD in 1990s and is used to diagnose a particular country's procurement system in order to generate a dialogue with the government. The CPAR stands on four pillars: legal framework, institutional framework and capacity, procurement operations and practices, and integrity of the procurement system (OECD, 2004). It uses 12 indicators and 54 sub-indicators distributed into two main components: Base-Line Indicators (BLIs) and Compliance and Performance Indicators (CPIs). The outputs of CPAR are essentially two tables and the adopted scoring system uses a scale of 0 to 3. With time, CPAR has become an important requirement before committing to lending and it has the merits of being worldwide accepted and applied (Rogati, 2004). Its methodology is regularly reviewed and complies perfectly with the performance measurement concept and principles. However, as there are no agreed International Procurement Performance System that can be applied equally to all countries, the CPAR is limited to a short term objective that is to find out the degree to which the country procurement system is following its own regulations. Besides, the perception of compliance (especially where the indicator cannot be measured quantitatively) differs from one country to another as demonstrated by Sanchez et al. (2009), who also assert that indicators alone cannot give a full picture of a whole procurement system that is by its nature complex. Indeed, some indicators are not amenable to hard measurement in terms of facts and figures and assessing their performance is better accomplished through surveys or interviews with participants in the

systems such as professional associations, civil society representatives, independent experts, and government officials (Sanchez et al., 2009). Another issue is that reliable data may not be available in public administrations to the extent asked for in order to satisfy all the 54 compliance and performance indicators. Again, after data collection, validating the results to arrive at the “right score” remains another problem to solve. Worse, the implementation of a CPAR demands a lot of financial and human resources and more often, it is undertaken with external financial and capacity supports. Lastly, recommendations made are rarely implemented and always every CPAR implementation is like a re-starting exercise. Once again, CPAR is different from the proposed framework which is fully described thereafter.

4.6.4 Concluding remarks

In conclusion, the review above has shown that governments are using various but sectorial assessment tools with more or less satisfactory results. Although, it has been proven that some tools are yielding financial benefits despite some weaknesses or limitations; yet some shortcomings have been identified. In addition, the plethoric number of indicators and subindicators does not facilitate their understanding and adoption in the field. Furthermore, there is still a constant need for more effective control instruments, reporting mechanisms, investigation methods and best practices as far as PP is concerned argued Patrick, (2010) and Cornela et al., (2011). Lastly, none of these tools is formally adopted for assessing systematically the overall effectiveness of tendering operations at every procuring entity level for every individual construction project. Therefore, there is obviously a knowledge gap and the present study intends to bridge it.

4.7 RESEARCH CONCEPTUAL FRAMEWORK

According to Maxwell (2004), a research conceptual framework is a collection of interrelated concepts that guides research activities. Based on effectiveness assessment concepts and principles reviewed above and the findings of Douh et al. (2014), the current research conceptual framework is graphically represented in Figure 4.1.

From that diagram, to assess the effectiveness will necessitate the definition of a baseline of standard practices, the determination of relevant criteria and subsequent key measurable indicators including the setting of corresponding target values, and then, the collection of data to generate measures which will be compared to target values to get the actual effectiveness; the resulting aggregated value indicates the level of effectiveness. When the performance is high, the process is effective and continues whereas when performance is low, remedy actions have to be taken for improvement, and the process re-starts.

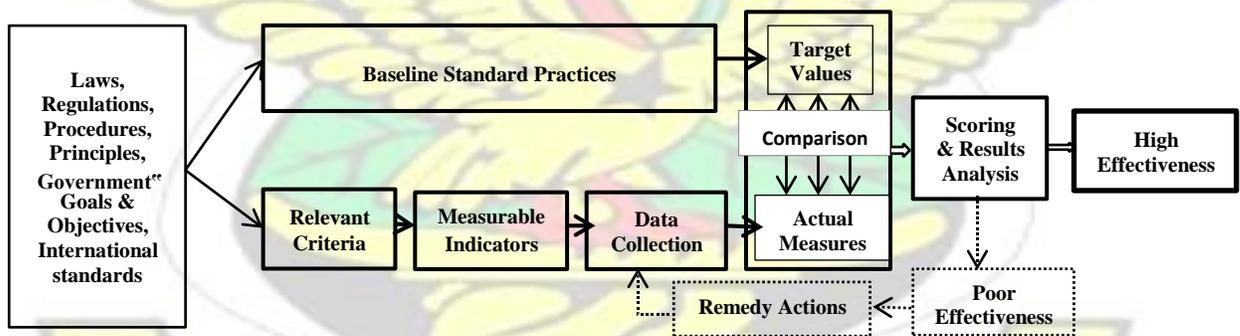


Figure 4.1: Research Graphical Conceptual Framework

Source : Author's construct

4.7.1 Baseline of Standard Practices and Target Values

As shown in the figure, standard practices as well as effectiveness criteria are extracted from public procurement laws, regulations, manuals and procedures, goals and objectives, and

international standards. The identified common practices along with the critical phases of the process are fully described later on in section 6.6. However, the following section reviews criteria that are relevant in characterizing specifically the effectiveness in public procurement before returning to the identified measurable indicators.

4.7.2 Relevant Effectiveness Criteria for CTP

According to Williams-Elegbe (2009), the goals of public procurement may be listed as competition, transparency, integrity, best value and efficiency. ISO 10845 (2000) lists the primary objectives of a procurement system as fairness, equity, transparency, competition and cost-effectiveness. According to the World Bank (2003), a public procurement system can be said to be well functioning if it achieves the objectives of compliance, transparency, competition, economy and efficiency, fairness and accountability. It has also to demonstrate efficiency and economy in cost and time added Oladepo (2000). In order to achieve all these goals and objectives, procurement system must be well organized, carried out correctly with regard to quantity, quality and timeliness, and at the optimum price; above all in accordance with the appropriate guidelines, principles and regulations (Dikko, 2000). In an analysis of public procurement system in South Africa, Pauw et al., (2009) have established five following criteria: fairness, equitableness, transparency, competitiveness and costeffectiveness. Strand et al., (2011) also identified three main criteria: total costs of public procurement processes, competitiveness, and time efficiency. Further in Uganda, Public Procurement and Disposal (PPDA) of Public Assets Authority (PAA) has used four following criteria to assess the public procurement: procurement planning, procurement records, procurement cycle time and compliance to laws and regulations (PPDA/PAA, 2007).

From the above assertions and considering PP objectives established by many developing countries, following criteria are identified as relevant contributors to the performance of procurement system: Ethics, Openness or Competitiveness, Compliance to laws and regulations and Conformity to rules and procedures, Transparency and public Accountability, Fairness and Equity, Time Effectiveness, and Cost Effectiveness. However, these criteria are interrelated and interdependent such that it is not possible to achieve high performance with each of them isolated; rather their combination gives best performance. The influence of each of these criteria on the overall performance can be conceptualised as follows in Figure 4.2.

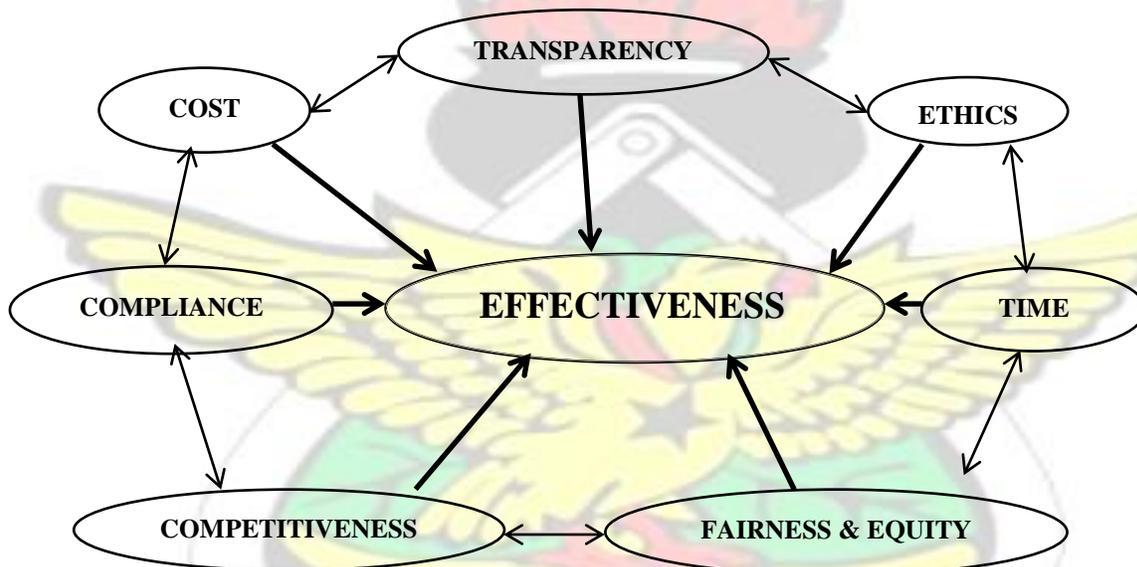


Figure 4.2: Relationships of Criteria and Overall Effectiveness

Source: Author's construct

4.7.3 Key Measurable Indicators (KMI)

Though the selection of KMIs remains an issue, however according to Neely et al., (1997), the main characteristics of Effectiveness Indicator are following: derived from strategy and ultimate goal, clearly defined and explicit purpose, relevant and easy to maintain, simple to understand and to use, provide fast and accurate feedback, link operations to strategic goals, and stimulate continuous improvement. In line with this, Matthews and Gibson (2009) state

that a good performance measure or indicator has to satisfy following criteria: Organisationally acceptable, Timely Compatible, Comparable, Simple, Responsibility linked, Cost effective, Balanced Customer focused, Meaningful. Also, an indicator needs to be aligned to strategic objectives of the organisation and easy to administer. Most important, it is recommended to select few indicators because too many can lead to high associated cost for little results. Based on these requirements and in connection with the criteria identified above and listed in the first column of the Table 4.3 below, related measurable indicators are drawn and listed in the second column. In fact, these indicators are the quantifiable measures that qualify, interpret or represent the most these criteria. In total, thirteen (13) indicators were identified among which some are merely retrieved from the Chadian Public Procurement Act (PPA 503, 2003) and related manuals of procedures. These indicators are fully described in section 6.4.2.

Table 4.3: Summary of Criteria and related Key Measureable Indicators

Criteria	Measurable Indicator
1. Fairness and Equity	1. Time for tender preparation
	2. Applied Rate of Margin of Preference
2. Competitiveness	3. Number and Nationalities of Bidders
	4. Degree of Competitiveness
3. Transparency	5. Advertisement total duration
	6. Publicity frequency
	7. Publicity extent
4. Time Effectiveness	8. Time Performance Index
5. Cost Effectiveness	9. Cost Estimate Accuracy
6. Compliance	10. Approvals Compliance Rate
	11. Documentation Compliance Rate
	12. Capacity Qualification Ratio
7. Ethics	13. Number of complaints or requests generated

Source: Author's construct

CHAPTER FIVE

RESEARCH METHODOLOGY

5.1 INTRODUCTION

Any research methodology has to be in accordance with the aim and objectives of the study while, at the same time, ensuring an original contribution to an existing body of knowledge (Hughes, (1994) cited in Flowers, 2009; Walker, 1997). Again, irrespective of the adopted approach and the innovative characteristics, every scholarly endeavour must be conducted within a framework which is directed towards the achievement of validity and reliability for the results and conclusions emerging from the study. Lastly, conducting a research is a process of combining a set of principles, outlooks and ideas with a collection of specific practices, techniques and strategies to produce and legitimise knowledge (Owusu-Manu, 2008). Based on these considerations, the chapter five is devoted to the methodology adopted for the present work and comprises following sections: research paradigm including philosophical position, approach and strategy, and method; data collection instruments, ethical considerations, targeted population and sample, and data treatment and analysis tools adopted.

5.2 RESEARCH PARADIGM

According to Crossan (2002) and Flowers (2009), Paradigm refers to a set of philosophical assumptions about the nature of the world (*ontology*) and how we can understand it (*epistemology*); assumptions that tend to be shared by researchers working in a specific discipline, field or tradition. Interestingly, all paradigms are valuable if used appropriately and therefore no research paradigm is intrinsically better than the other asserted Flowers (2009).

Before constructing a suitable methodology, it is important to adopt a philosophical stance because each paradigm has its own way to validate knowledge as stated by Crossan (2001) and Walker (1997). In short, the paradigm adopted for the present research is made of Positivist philosophy using deductive approach with a mixed method. The study is designed as a survey with the intention of solving a problem.

5.2.1 Research Philosophy

Research philosophy is a belief about the way in which data about a phenomenon should be gathered, analysed and used (Crossan, 2002). According to Galliers (1991) cited in Clarke (2005), among existing philosophies like Positivism, Constructivism, Interpretivism, Modernism, Feminism, Ethnography, and so on; two major ones have emerged: Positivist and Interpretivist. However the present work adopted Positivist position because Positivists believe that reality is stable and can be observed and described from an objective viewpoint without interfering with the phenomena being studied (Levin, 1987). Also, they contend that phenomena should be isolated and observations should be repeatable. This position presumes that the social world exists objectively and externally; and is based upon values of reason, truth and validity (Coutts, 1997). In positivism, the focus is purely on facts gathered through direct observation or experience and measured empirically using quantitative methods (surveys and experiments) and statistical analysis (Saunders et al., 2007; Eriksson and Kovalainen, 2008; Easterby-Smith et al., 2008; Hatch and Cunliffe, 2006). That is why Positivism is predominant in physical and natural sciences and adopts mostly quantitative approach to investigating phenomena.

On the other hand, Interpretivism aims to describe and explore in depth phenomena and affirms that scientists cannot avoid affecting any phenomena they study (Easterby-Smith et

al., 2008). This philosophy admits that there may be many interpretations of reality, but also maintains that these interpretations are in themselves a part of the scientific knowledge they are pursuing. Besides, Interpretivists think that there is a fundamental difference between the subject matters of natural and social sciences. In the social world, they opine that individuals and groups make sense of situations based upon their individual experience, memories and expectations (Sagaut, 2008). Because of this subjective nature, anti-positivism is mostly associated with qualitative approaches (Eriksson and Kovalainen, 2008).

Though all paradigms are valuable, the present work adopted the positivists' position rather than interpretivists' because of the following reasons. First, regarding the on-going debate concerning which paradigm is suitable for the research in Construction Management; the literature review has revealed that though Construction Management field is classified under the category of social studies, it is tossed among Positivism and Constructivism with the dominance for the first paradigm (Tero, 2006; De-graft, 2008; Pana et al. 2010; etc..). Second, regarding the issue of which paradigm is entirely suitable for the social sciences; some authors are calling for a more pluralistic attitude towards Construction Management research methodologies (Flowers, 2005; Mohamed, 2007; Pana et al., 2010). Third, the current research trend seems to extend beyond this debate and encourages multiple theoretical models and mixed-methods to be employed in Construction Management research (Dainty, 2008). Fourth, given the richness and complexity of the real world, as well as the questions posed which are mainly of the type of what?, a methodology best suited to the problem under consideration is the positivist philosophy. Finally, we believe that there is a lack of objectivity associated with interpretivist research methodologies. Therefore, the study is clearly positioned in positivist philosophy, using deductive approach and descriptive strategy with a mixed-method for the

development of our key research instruments. These various elements are further discussed in the following sections.

5.2.2 Research Approach

Burns (2000) recommends that doctoral candidates use the term **deductive and inductive approaches** to describe their research methodological approach. In fact, deductive reasoning is a theory testing process which starts with an established theory or generalisation and seeks to see if the theory applies to specific instances (Hyde, 2000). Otherwise, deductive reasoning starts out with a general statement or hypothesis and examines the possibilities to reach a specific and logical conclusion. On the other hand, Inductive reasoning is the opposite of deductive reasoning. It is a theory building process, starting with observations of specific instances, and seeking to establish the generalisation about the phenomenon under investigation (Hyde, 2000). For illustration, if something is true of a class of things in general, it is also true for all members of that class; what is not always true.

According to Walliman (2005), scientific method uses deduction to test hypotheses and theories. However, considering the nature of the problem to solve on one hand and having adopted Positivist position on the other hand, the deductive approach is the most suitable. Indeed, from the axiological assumption, Deductive approach offers an appropriate avenue for an objective or unbiased results because it is value-free. In value-free research, the study would be examined by objective criteria whilst value-laden is driven by subjective criteria (Easterby-Smith et al., 2003 and Pathirage et al., 2005). As a matter of facts, all human beings have a number of ontological assumptions (realism or idealism) which will necessarily affect our view on what is real and whether we attribute existence to one set of things over another. Consequently, if these ontological assumptions are not identified and considered carefully,

the researcher may end up with subjective findings because different views exist regarding what constitutes reality (Ahadzie, 2007). For instance, if the researcher holds certain ontological positions, these may influence the epistemological choices and hence conclusions drawn. Undoubtedly, there is a relationship between epistemology and ontology, and how one informs or/and depends upon the other. According to Eriksson and Kovalainen (2008), Epistemology deals with what is knowledge and what are the sources and limits of knowledge. Blaikie (2003) describes epistemology as a set of claims about the ways of gaining knowledge of reality; otherwise, what criteria must be satisfied before being described as knowledge. In addition, Chia (2002) describes epistemology as how and what it is possible to know and the need to reflect on methods and standards through which reliable and verifiable knowledge is produced. Then, Hatch and Cunliffe (2006) summarise epistemology as „knowing how you can know“. In other words how is knowledge generated, what criteria differentiate good knowledge from bad knowledge, and how should reality be represented or described? From the foregoing, both objective and subjective epistemological views exist. Subjective epistemology presumes that it is not possible to access to the external world beyond our own observations and interpretations. Whereas, Objective epistemology presumes that a world exists that is external and theory neutral. This implies that data collected from objects that exist separate and external to the researcher is less open to bias and therefore more objective. Therefore, the deductive approach fits perfectly the positivist position.

5.2.3 Research Design

Considering the nature of the problem to solve on one hand and having adopted Positivist position with deductive approach on the other hand, survey emerges as the more appropriate research strategy. In fact, survey enables the researcher to obtain data about practices,

situations or views at one point in time through questionnaires. Also, it permits a researcher to study more variables at one time and allows the use of quantitative analytical techniques to draw conclusions. Moreover, Survey is the strategy that responds suitably to all the current research questions.

Finally, a graphical illustration is proposed below to summarise the research philosophies dimensions and highlight the paradigm adopted for the present research.

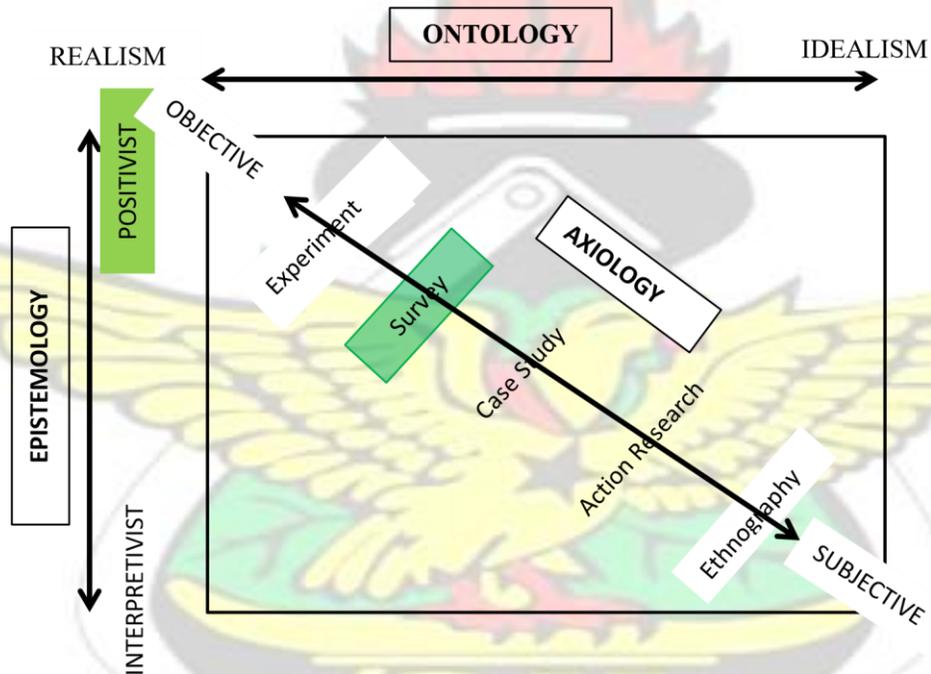


Figure 5.1: Research Philosophies dimensions and Paradigm adopted
Source: Adopted from Pathirage (2005)

5.2.4 Research Method

As mentioned above, the study adopted a **mixed-method (qualitative + quantitative)** because a combination of research methods could improve the quality, and an effective use of

multi-method approach can produce superior results quality than mono-method. Indeed, in Construction Management discipline, Fellows and Liu (2003), Flowers (2005), Mohamed (2007) and Panas et al. (2010) among others advocate for a more pluralistic approach. Furthermore, current research trend encourages clearly multiple theoretical models and methods in doctoral studies (Mohamed, 2007). First of all, there is a need to understand qualitative and quantitative research methods in order to select the most suitable strategy for the work. In effect, the key difference between quantitative and qualitative methods is that quantitative methods are fairly inflexible whereas qualitative are typically flexible.

Qualitative research has its roots in social sciences and is more concerned with understanding why people behave as they do: their knowledge, attitudes, beliefs, fears, and the like. According to Coutts (1997), it involves the analysis of complex descriptive data in which the researcher may increase his or her involvement and probe to obtain additional information. Qualitative methods test the existence of variables rather than their frequency, and normally yield rich data from a limited number of individuals (Mason, 1996); because it allows the subjects being studied to give much „richer“ answers to questions and may give valuable insights which might have been missed by any other method (Mohamed, 2007). Besides, it can be used to complement quantitative research methods. For example, if the area of interest has not been previously investigated then qualitative research may be a vital forerunner to conducting any quantitative research. At the other extreme, qualitative research may also help understand the findings of quantitative research. Qualitative research employs a variety of data collection instruments including interviews, focus groups, questionnaire, journals, diaries or essays, stories, case studies, participant observations, field notes, and so on.

Quantitative strategy is based on the idea that social phenomena can be quantified, measured and expressed numerically (Tero, 2006). In other words, the information about a social phenomenon is expressed in numeric terms that can be analysed by statistical methods to deduct facts based on past realities and established truths. In addition, Easterby-Smith et al., (2003) and Pathirage et al., (2005) argue that quantitative approach offers the possibility to limit personal feeling and perceptions reflecting on results. Moreover, quantitative analysis has the advantage of higher construct and internal validity as the experiment may be repeated with similar results experienced (Tero, 2006; Blaikie, 2003). Thus, structured, concise and explicit data are subjected to statistical analysis and clear statements may be made concerning causal and inter-dependent relationships between variables. The main forms of quantitative data collection are experimentation and survey. As compared to the qualitative, quantitative methods are easy to administer and widely accepted as a form of evidence, even if it may not provide all the information needed for interpretations of findings or require more sophisticated analysis techniques when the large amounts of data are collected (Blaikie, 2003).

While quantitative and qualitative are seen as opposing approaches, they can be used in conjunction with one another to overcome certain situations as suggested Flowers, (2009). In fact, Burns (2000) states that no one methodology can answer all questions and provide insights on all issues, and there is more than one gate to the kingdom of knowledge. Though each gate offers a different perspective, yet no one perspective exhausts the realm of reality, whatever that may be as stated by Dawson (2002). In support of that, Blaikie, (2003) affirms that research approaches should be mixed in ways that offer the best opportunities for answering important research questions. Furthermore, a mixed-mode approach offers a practical and outcome-oriented method of inquiry and leads to the elimination of doubt

(Johnson and Onwuegbuzie, 2004). Finally, all these reasons have favoured the adoption of mixed-method for the present study.

5.3 RESEARCH ADOPTED METHODOLOGY

Research methodologies differ on the goals and the way to achieve them, the aim and objectives of the study, the nature of research questions, and the type and availability of the data required (Johnson and Turner, 2003; Kumar, 2005). In accordance with the aim and specific objectives, the present work is designed as a descriptive survey using mixed-method where quantitative is dominant as illustrated in the Table 5.1 in which data collection instruments as well as data processing tools are presented. Quantitative method using questionnaires were employed for objectives 1, 3, 4, and 5 and framework validation as well; whereas for objectives 2 and 6, desk study was used.

Table 5.1: Methods and strategies Adopted with respect to specific objectives of the research

Specific Objectives of the research	Methods	Techniques, Approaches & data collection Instruments	Data processing
1. To appraise Major Challenges facing the implementation of CT Process in Chad	Quantitative approach	Literature Review Questionnaire using 5 points Likert scale	Descriptive Statistic (frequencies, Means, %) Severity Indices, COV
2. To define a Baseline of Standard Practices for an effective CT Process	Qualitative approach	Literature review Desktop Study	Frequencies
3. To identify relevant Effectiveness Criteria of CT Process	Quantitative approach	Literature Review AHP approach Questionnaire using a simplified AHP scale of 5 points	Consistency test, Geometric Means, Priority Vector (weight), CI & CR
4. To establish Key Measurable Indicators for assessing the Effectiveness of CT Process	Quantitative approach	Literature Review AHP approach Questionnaire using a simplified AHP scale of 5 points	Consistency test, Geometric Means, Priority Vector (weight), CI & CR

5. To determine the contributions of critical Phases of the CT Process	Quantitative approach	Literature Review AHP approach Questionnaire using a simplified AHP scale of 5 points	Consistency test, Geometric Means, Priority Vector (weight), CI & CR
6. To develop a Framework for assessing the Effectiveness	Mixed approach	AHP Method	Adapted AHP Methodology of nine steps

Source: Author's construct

5.4 DATA COLLECTION

5.4.1 Literature review and documents study

The sources of secondary data are mainly text books, magazines, professional and academic journals, published and unpublished theses, dissertations, papers, reports and other documents treating the topic. Recent researches in the area of interest, current assessment tools in use in PP processes, and specific measures seeking effectiveness were analysed to situate within the peculiarities of the study and develop the research conceptual framework.

Besides, salient and recurrent issues revealed by literature review have informed the research proposal and guided the desk study as well as questionnaires design and development.

5.4.2 Desk study

Desk study consisted in searching available secondary data directed towards the definition of a baseline of standard practices. Principal sources include PP laws, regulations and associated manuals, bulletins, periodic reports, and reports on procurement practices, etc. from developing countries. Also, manuals, guidelines, CPARs reports, country review reports, published and unpublished documents from UNCITRAL, UNDP, OECD, WB, EU, and various other materials were compiled.

5.4.3 Questionnaire design and administration

The developed questionnaire has two different parts apart from general data on respondents. The first part targeted objective 1 that is the appraisal of major challenges facing the implementation of CT in Chad. It was designed using a 5 points Likert scale with 1 = Not Important, 2 = Moderately Important, 3 = Important, 4 = Very Important, and 5 = Extremely Important. The five points Likert scale is very common in the field of Construction Management and has been used by authors like Elhag and Boussabaine (2002) and Haruna (2010). On the other hand, the second part have used the 5 points simplified AHP scale with 1 = Equal importance, 3 = Moderate importance, 5 = Strong importance, 7 = Very strong, and 9 = Extreme importance. The AHP's scale is not common as that of Likert but was successfully used by Triantaphyllou and Mann (1995), Yang and Shi (2002), Forman and Gass (2003), and Bruno et al., (2009) in the construction area either for the overall performance or alternative's and option's selection. The questionnaire is made up of close ended questions and the final draft was submitted to the supervision team to seek permission for the actual field work to commence. The questionnaires were accompanied by a covering letter explaining the purpose of the study. Subsequently, the respondents were asked to assess the variables using the scale accordingly.

5.5 ETHICAL CONSIDERATIONS

To ensure validity and reliability on one hand and to avoid biases and other ethical issues on the other hand, the following strategies were used: pilot study, respondents' status and profile, and anonymity. It is worth noting that, the first draft of the questionnaire was analysed by supervisors and also submitted to two mathematicians at Maths' Department of the University before the pilot study.

5.5.1 Pilot study

Prior to the major survey, a pilot survey was undertaken in Chad with the aim of testing the wording of the questionnaire, identify ambiguous questions, test the intended technique for data collection and measure the effectiveness of the potential response. Using purposive sampling technique, 7 public works procurement entities and structures were selected including 3 Contracting Authorities, 1 Project Manager, 1 Contractor, 1 Consulting Firm and 1 International sponsor. All of them were first contacted on their willingness to participate in the pilot survey. The participants identified for the pilot study were thereafter not included in the main survey. The pilot questionnaires, accompanied by a covering letter explaining the purpose of the pilot study, were delivered to participants' offices through the ENSTP service. A brief explanation with an example was provided in this letter to guide respondents in pair-wise comparison including other requirements for respondents. Subsequently, the respondents were asked to critically appraise the questions and provide feedback as to the relevance and sensitivity of the questions, length and time for completing and suggestions for improvement. Within a period of ten days, all 7 completed questionnaires were returned. A careful scrutiny of the completed questionnaires indicated that questions were all answered by the respondents, suggesting that they were clearly formulated and easy to respond. But a concern related to the disposition of variables in two opposite columns arose. To address this, the first structure of ranging item for pair-wise comparison was simplified by removing of the second column to give the final structure. A preliminary analysis of the data also gave the opportunity to test the intended technique for data analysis. As a result, the consistency test step prior to the computation of geometric mean was added in the adapted data analysis process. In short,

the feedback was very helpful and suggested that the survey instrument was likely to work in the manner intended.

5.5.2 Respondent's status and profile

To gain a meaningful and consistent data to ensure reliability, three criteria were used in the selection of structures: involvement, experience and qualification in public works procurement. Besides, representative who is qualified to complete the questionnaire is only managers or senior staffs that are either Contracting Authority or Tender Committee Chairman or Construction Professional managing the project.

5.5.3 Other considerations

To avoid subjectivity, questionnaires were anonymous and personal bio data of participants are not requested. Neither the name of the researcher, nor those of respondents are disclosed. Cover letters were issued by the General Director of ENSTP and completed questionnaires were collected by him. Of course, the final version was translated into French before administration. A total number of 60 questionnaires were sent out. A final questionnaire sample is attached in Appendix 1.

5.6 TARGETED POPULATION AND SAMPLE SIZE

The targeted population comprises structures involved in public works procurement. These are public procurement bodies, entities and units, contracting authorities, tender committees, control and inspection units, consulting firms, contractors, sponsors and experts.

The study adopted a non-probability technique specifically the Census Sampling Technique which is suitable for small samples from a population that is well understood and when there is a clear method for picking the sample. Though, some units of the population have no chance of selection; that means therefore the sampling error cannot be estimated, making it difficult

to infer population estimates from the sample; it does not affect at all the procedure of framework development as well as the expected outcomes. A census thus realised by the author in June 2012 identified 30 public entities procuring works at the national level. In addition to these 30 structures from public sector, 30 other structures were purposively selected from private sector and donors using the following criteria:

- Five (5) international donors funding major construction projects namely : European Union, African Bank of Development, Islamic Bank of Development, World Bank, and French Development Agency.
- Ten (10) out of 80 contractors of Category A operating for more than five years in public contracts bidding; have won three contracts through competitive tendering during the last five years; having in management team an experienced construction professional; are willing to fill the questionnaire.
- Fifteen (15) out of 30 consulting firms that satisfy the following criteria: More than five years of experience in public contracts bidding; have won two contracts through competitive bidding during the last five years; are interested and willing to fill the questionnaire.

In total, the population size is 60 institutions and the whole population was considered as sample and distributed in Table 5.2.

Table 5.2. Distribution of the sample

Category	Sample size
Public works procurement structures	30
Contractors	10
Consulting firms	15
Sponsors (international donors)	05
Total =	60

5.7 DATA ANALYSIS

Two methods were employed to analyse collected data: descriptive statistics for the objective 1 and Analytic Hierarchy Process (AHP) for objectives 3, 4 and 5. For data processing, mainly Microsoft Excel sheets were used. For objective 2, Frequencies were used.

5.7.1 Statistical tools

The following descriptive statistics were used for the analysis of the first series of data: Frequencies (F), Mean Weighted Rating (M), Severity Index (SI), Standard deviation (Std) and Coefficient of Variation (COV).

i). Frequencies

By means of frequency occurrence, each common practice is assessed. The variable that has occurred 5 times over the 8 sources will attract 5/8 (i.e. 62.5%) and therefore, a practice having a score $\geq 5/8$ is considered as most common and relevant, and is qualified for standardisation.

ii). Mean Weighted Rating (M)

Using equation 1 below, a mean weighted rating (M) for each variable is computed to give a numerical indication of the importance and the number 3 is considered as the neutral point.

Mean weighted rating = $M = (\sum_{i=1}^5 ri * fi) / n$ ----- (1) where

- ri = rating of each factor (1,2,3,4,5)
- fi = frequency of responses
- n = total number of responses

iii). Severity Index (SI)

Severity Index (SI) computation is used to rank the variables according to their importance.

This is illustrated in equation (2).

Severity Index = $SI = (\sum_{i=1}^5 wi * fi) * 100\% / n$ ----- (2) where

- i = represents the ratings (1,2,3,4,5) ;

- f_i = frequency of responses ;
- n = total number of responses; w_i = weight for each rating.

It follows therefore that: $w_1 = 1/5$; $w_2 = 2/5$; $w_3 = 3/5$; $w_4 = 4/5$; and $w_5 = 5/5$.

After computation of M and SI , a variable having a $SI \geq 70\%$ is considered as important (Elhag and Boussabaine, 2002 and Francis, 2004).

iv). Coefficient of Variation (COV)

COV expresses the standard deviation as a percentage of the mean, and is useful in comparing relative variability of different responses. Its value is computed after equation 3 below:

$$COV = \left(\frac{S}{X}\right) * 100 \% \text{ ----- (3)}$$

Where S = Standard deviation and X = weighted mean of sample.

When a relative COV is less than 10%, this means that there is a high agreement among respondents.

5.7.2 Analytic Hierarchy Process (AHP)

5.7.2.1 Reasons for selecting AHP approach

There are many Multiple Criteria Decision Analysis (MCDA) methods for the calculation of factors' weights. The most popular in industrial Performance Measurement Systems are MACBETH (Measuring Attractiveness by a Categorical Based Evaluation (Technique), Fuzzy Logic (FL), and AHP (Clivillé, 2004; Berrah et al., 2004; Zeng et al., 2007; Tavakkoli-Moghaddam et al., 2012).

MACBETH, developed in 1990 by Bana et al., permits the evaluation of options against multiple criteria. This approach needs only qualitative judgments about differences of attractiveness between 2 elements at a time, in order to generate numerical scores for each criterion and to weight them. It uses seven semantic categories that are: No, Very Weak, Weak, Moderate, Strong, Very strong and Extreme difference of attractiveness. Whereas

Fuzzy Logic (FL), initiated in 1965 by Lotfi A. Zadeh, is basically a multivalued logic that allows linguistic evaluations like true/false, yes/no, high/low, and the like to be formulated mathematically and processed by computers (Amrahov and Askerzade, 2010). In other words, it translates subjective judgment given in linguistic expressions (i.e., “low,” “high,” etc.) into mathematical measures. It provides a different way to approach a control or classification of a problem and focuses on what the system should do rather than trying to model how it works (Hellmann, 2002). On the other hand, Fuzzy approach requires a sufficient expert knowledge for the formulation of the rule base, the combination of the sets and the defuzzification (Zeng et al., 2007). According to Amrahov and Askerzade (2010), the use of FL is helpful when there is no simple mathematical model, specifically for highly nonlinear processes or when the processing of linguistically formulated expert knowledge is to be performed. Not only that, FL is not recommendable where the conventional approach yields a satisfying result or where adequate mathematical model already exists (TavakkoliMoghaddam, 2012).

AHP designed by Saaty in 1980, is an emerging method to evaluate performance because an earlier survey provided over 200 known applications in the evaluation of the overall performance (Triantaphyllou and Mann, 1995; Bruno et al., 2009; Forman and Gass, 2003; Zahedi, 1986). Since the research aims at assessing the overall effectiveness of CTP using seven criteria and thirteen indicators, AHP is found to be the suitable method. Moreover, it is selected for other following reasons: (1) It uses hierarchy with many levels and permits to calculate mathematically „Priority Vectors“ or Weights“ at different levels of the hierarchy; that fits perfectly the nature of the problem under study (criteria and related indicators). (2) Rather than qualitative judgments like MACBETH and FL, AHP uses scales of figures that are directly computed without transformation; that can reduce subjectivity at the same time

increase objectivity. (3) It uses the weighted mean as aggregation operator at the top level of the hierarchy. (4) Calculations can be done by Excel without a specific software package. (5) AHP is open for adaptation and has many modified versions, and still gives reliable results. (6) It is very popular and commonly adopted for the overall performance assessment in industrial sector. (7) It has been subjected to many criticisms, but it still gives absolute satisfaction in many areas of multi-criteria decision making.

Of course, some concerns have been raised regarding AHP for the arbitrary ranking occurred when two or more alternatives have similar or quasi-similar characteristics, or the rank reversal caused by the addition or deletion of alternatives (Dyer, 1990; Perez, 1995;

Tversky and Simonson, 1993). These undesirable effects, however, do not invalidate the AHP method, argued Harker and Vargas (1987) and Saaty and Vargas (1993). In fact, ordinal aggregation methods exhibit rank reversal and it has been shown that the rank reversal will not be a problem in real world applications because it is very rare to encounter two alternatives with very similar or same characteristics. In such case, special precautions (e.g., grouping similar alternatives) can easily be taken to avoid any rank reversal (Saaty, 1990a and 1990b). Meanwhile, it is noted that the current study cannot be affected by this problem because it does not focus on alternatives selection but on the assessment of an overall performance.

5.7.2.2 AHP scale of nine numbers

According to Yang and Shi (2002), AHP provides a comprehensive and rational framework for structuring a decision problem, representing and quantifying its elements, and relating those elements to overall goal. As mentioned above, AHP uses a scale of nine numbers that indicates how many times more dominant one element is over another. Table 5.3 presents the

scale and it is important to note that these nine numbers can be reduced just to five numbers (1, 3, 5, 7 and 9) as adopted by Saaty and Vargas (2000) and other authors.

Table 5.3: The AHP fundamental scale of absolute numbers

Intensity of Importance	Intensity of Importance	Intensity of Importance
1	Equal Importance	Two activities contribute equally to the objective
2	Weak or slight	
3	Moderate importance	Experience and judgment slightly favour one activity over another
4	Moderate plus	
5	Strong importance	Experience and judgment strongly favour one activity over another
6	Strong plus	
7	Very strong or importance demonstrated	An activity is favoured very strongly over another; its dominance demonstrated in practice
8	Very, very strong	
9	Extreme importance	The evidence favouring one activity over another is of the highest possible order of affirmation
Reciprocals of above	If activity i has one of the above non-zero numbers assigned to it when compared with activity j, then j has the reciprocal value when compared with i	A reasonable assumption
1.1–1.9	If the activities are very close	May be difficult to assign the best value but when compared with other contrasting activities the size of the small numbers would not be too noticeable, yet they can still indicate the relative importance of the activities.

Source: From Thomas L. Saaty (2008)

5.7.2.3 Saaty Hierarchy

According to Saaty (2008), to make a decision in an organised way to generate weights, we need to decompose the decision into the following steps: (i) Define the problem and determine the kind of knowledge sought, (ii) Structure the decision hierarchy from the top to the lowest level through intermediate levels, (iii) Construct a set of pairwise comparison matrices, (iv) Use the priorities obtained from the comparisons to weight the variable in the level

immediately below. In effect, Saaty hierarchy serves two purposes: it provides an overall view of the complex relationships among variables under evaluation and helps decision makers assessing whether the issues in each level are of the same order of magnitude. So, homogeneity in comparisons is preserved. Figure 5.2 shows the combined Hierarchy for Phases, Criteria and Indicators.

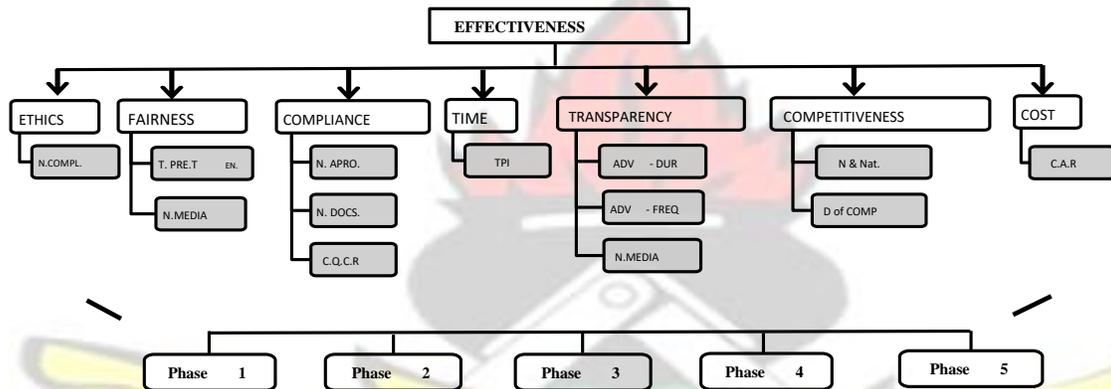


Figure 5.2: Saaty Combined Hierarchy for Criteria, Indicators and phases
Source : Author's construct

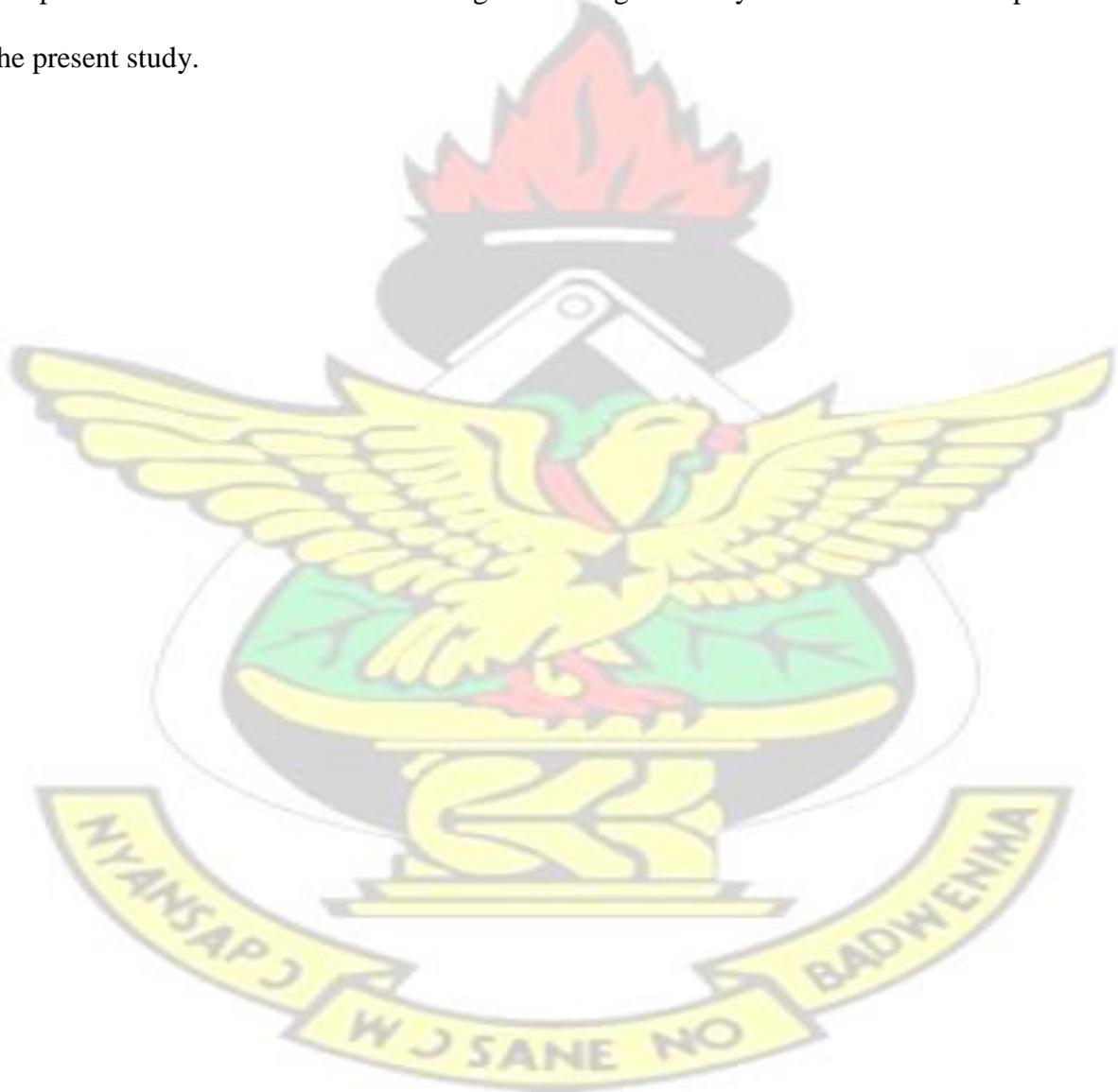
5.7.2.4 Adapted AHP Process for Overall Effectiveness Assessment of CTP

To develop the intended framework, an adapted AHP process involving nine steps is proposed in Figure 5.3.

5.7.2.5 Consistency tests of respondents

When multiple decision makers are involved in developing priority weights, achieving consensus may be difficult. Not surprisingly, the weights may vary from one person to another. There are two ways to solve this problem suggested Saaty (2008). First, weight analysis can then be used to assess the extent of differences and the potential impact on final decision. For instance, the means and variances can be calculated and the significance of the

differences among sets of weights can be statistically tested. In the final step, variables which have the relative higher overall scores are established as the most important. Second, the consistency ratio of every respondent is checked first when three or more variable are compared. Therefore, only respondents that have gained $CR \leq 0.1$ are selected. Then, their data are computed to get the Geometric Mean that will form the aggregated final pair wise comparison matrix. This has the advantage of dealing with only one matrix and is adopted for the present study.



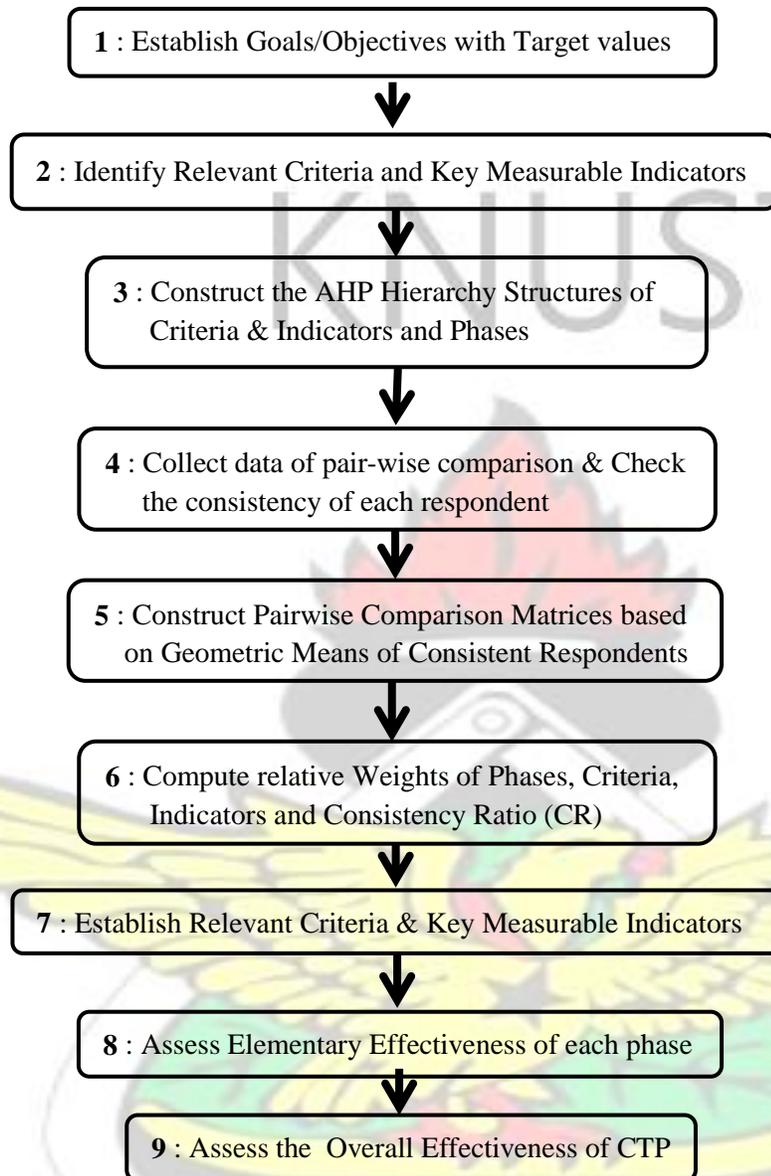


Figure 5.3: Adapted AHP Model for assessing the Overall Effectiveness of CTP

Source: Adapted from Yang and Shi (2002)

5.7.2.6 Construction of pair-wise comparison matrices

Pair-wise comparison is a key step in an AHP model to determine priority weights. The procedure focuses on two items at a time and their relation to each other; so decision makers will be more comfortable to offer relative (rather than absolute) preference information. The relative importance of each item is rated by a measurement scale to provide numerical

judgments corresponding to verbal judgments. The reduced AHP discrete scale of 5 points is as follows: 1, 3, 5, 7 and 9. For example, Rating **5** for [Fairness, Transparency] means that the importance of Fairness is **5 times** the importance of Transparency or rating **9** for [Phase1, Phase2] means that Phase1 is **9 times** important than Phase2. The resulting ratings are used to construct a half of the corresponding comparison matrix, the second half is completed by the reciprocals, and the diagonal is always one.

5.7.2.7 Determination of Weights

After the construction of the single pair-wise matrix, comes the determination of weights of every item. Three ways have been suggested in the literature to calculate the weights including normalised eigenvalues (EM), logarithmic least squares, and least squares methods. All these methods do give identical solutions in terms of final results consistency. The EM is recommended when the data are not entirely consistent by Saaty (2006). The last step in the weights determination is the verification of the CR which must be below 0.10 (Saaty, 2008). The process of calculating weights is fully described in the demonstrative example given below.

5.7.3 Demonstrative Example of Weights Determination

Three criteria A, B and C are pair-wise compared using the Saaty 9 points scale. In comparing them, a particular expert gave the following ratings.

- A = 3 as compared to B → B = 1/3 as compared to A (i.e. reciprocity) ;
- A = 6 as compared to C → C = 1/6 as compared to A (i.e. reciprocity) ;
- To be logic or consistent, B = 6/3 = 2 as compared to C → C = 1/2 as compared to B and A = 1 as compared to itself.

1). Developing a single pair-wise comparison matrix

The resulting matrix below is 3 x 3 because the criteria to be compared are 3 (A, B, & C).

Table 5.4 presents the results and the values in *Italic* ($1/3$, $1/6$, $1/2$) shown in the matrix represent the reciprocals as explained above.

Table 5.4: A single Pair-wise comparison matrix

Criteria	A	B	C
A	1	3	6
B	<i>1/3</i>	1	2
C	<i>1/6</i>	<i>1/2</i>	1

2). Calculation of the Weights

The calculation of weights involves the computation of “nth-root-of-product” and the “priority vector” or weights. The column labelled “nth-root-of-product” is the nth root of the product of all the values in the row. Each of the aforementioned third-root-of-product values are then added together to equal the Sum in the last row. Then, the nth-root-of-product values from the previous step will be normalised to get the appropriate weight for each criterion. The weight is the ratio of nth-root-of-product over the Sum as shown in the Table 4 below. Note that when calculated correctly, the total sum of weights of all criteria must equal to one.

Table 5.5: Calculation of the Weights or Priority Vectors

Items	A	B	C	Nth Root of the Product	Weights
1 A	3	6	$(1*3*6)^{(1/3)} = 2.621$	$2.621/3.455 = 0.759$	

	1/3 B	1	2	$(1/3 * 1 * 2)^{(1/3)} = 0.667$	$0.667/3.455 = 0.193$
	1/6 C	1/2	1	$(1/6 * 1/2 * 2)^{(1/3)} = 0.167$	$0.167/3.455 = 0.048$
Sum =	$1+1/3+1/6$ = 1.50	$3+1+1/2$ = 4.50	$6+2+2$ = 9.00	$2.621+0.667+0.167 =$ 3.455	$0.759+0.193+0.048$ = 1

3). Verification of the Consistency Ratio (CR)

Calculating the CR is a four-step process.

- i. First, the pair-wise comparison values in each column are added to get the “Sum” values which are then multiplied by the respective weights. Note that the row labelled “Sum*PV” shown in the matrix below is the result of multiplying the respective sum (shown in the row immediately above) by the respective weight for that criterion (shown in the column labelled “Weights”).
- ii. Second, the aforementioned values (shown in the row labelled “Sum*PV”) are summed up to get Lambda-max. Unlike the weights which must sum up to one, Lambda-max will not necessarily equal one.
- iii. Third, the Consistency Index (CI) equals to $(\text{Lambda-max} - n) / (n-1)$ where $\langle n \rangle$ is the number of criteria being compared.
- iv. Lastly, the Consistency Ratio (CR) is calculated by dividing the Consistency Index (CI) (from the previous step) by a Random Index (RI), which is determined from a lookup Table 5.6. The Random Index (RI) is a direct function of the number of criteria or factor being considered (Kunz, 2010).

Table 5.6: Random Indices (RI)

N (number of items)	1	2	3	4	5	6	7	8	9
Random Index (RI)	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45

Source: Render and Stair, 2000

The Consistency Ratio (CR) informs the decision-maker how consistent he/she has been when making the pair-wise comparisons. A higher number means the decision-maker has been less consistent, whereas a lower number means the decision-maker has been more consistent. If the Consistency Ratio (CR) < 0.10 , the decision-maker's pair-wise comparisons are relatively consistent and no corrective action is necessary. If the Consistency Ratio (CR) > 0.10 , the decision-maker should seriously consider re-evaluating his/her pair-wise comparisons – the source(s) of inconsistency must be identified and resolved and the analysis re-done. The final results are presented in Table 5.7. The ranking of criteria gives A first with a weight of 0.759, B second with 0.193 and C last with 0.048.

Table 5.7: Synthesis of Weights

Criteria	A	B	C	Nth R of Pr	Weights
A	1	3	6	2.621	0.759
B	1/3	1	2	0.667	0.193
C	1/6	½	1	0.167	0.048
Sum of columns =	1.50	4.50	9.00	3.455	1
Sum*Weights =	1.1385	0.8685	0.4800		
Lambda Max =	2.487				
Consistency Index (CI) =	-0.513				
Random Index (RI) =	0.58				
Consistency Ratio (CR) =	-0.088				

4). Calculation of Composite Weights

To get the composite weight of an indicator, the relative weight of indicator under a specific criterion is multiplied by the corresponding criterion's weight to give the composite weight.

For example, assuming that the weights of two sub-criteria of criterion A (with a weight of 0.759 in Table 5.7) are $a_1 = 0.6$ and $a_2 = 0.4$ (the sum of weights must always equal to 1); the composite weight of a_1 is $0.60 \times 0.759 = 0.455$ and that of a_2 is $0.40 \times 0.759 = 0.303$.



CHAPTER SIX

RESULTS, ANALYSIS AND DISCUSSIONS

6.1 INTRODUCTION

The chapter six presents the survey results, data analysis, interpretation and discussions. The general data are presented first followed by the appraisal of major challenges facing the implementation of Competitive Tendering (CT) in Chad. The next section records the relevant criteria and related key indicators, and the critical phases of the process. The last section gives the list of standard practices forming the baseline.

6.2 GENERAL DATA

6.2.1 Responses Rates

Out of the 60 questionnaires issued, 38 valid questionnaires representing 63.32 % were returned as shown in Table 6.1a below.

Table 6.1a : Global Responses Rates

Classes of structures		Questionnaires issued	Questionnaires returned	% Over total
Public Works procurement structures and entities		30	17	28.33
Contractors		10	05	08.33
Consulting Firms		15	11	18.33
Sponsors or International donors		05	05	08.33
Total =		60	38	63.32

The global responses rate of 63.32 % is high as compared to similar studies undertaken by other authors in the field like Agbesi, (2009) with 48.25%, Ameyaw, (2011) with 57.50% and

Douh, (2009) with 51.67%. However, there are some disproportions in the classes of respondents as shown in Table 6.1b where it can be seen that contractors contributed the lowest score of 50%. The reason is that most of construction firms' managers, even though they were interested in the study, had difficulty in correctly filling in the questionnaires. On the other hand, the consulting firms contributed the highest score of 73.33 % because they were more conversant with such questionnaires.

Table 6.1b : Responses Rates per class of Respondents

Classes	Questionnaires issued	Questionnaires returned	% over classes
Public Works procurement structures and entities	30	17	56.67
Contractors	10	05	50.00
Consulting Firms	15	11	73.33
Sponsors or International donors	5	05	100.00

6.2.2 Profile and level of qualification of respondents

The majority of respondents (60.52 %) are construction professionals and all of them are holding either Bachelor of Science degree (15.80%) or Master of Science degree (84.20%). This means that the results obtained represent the perception of highly qualified construction professionals. Details are presented in Tables 6.2a and 6.2b below.

Table 6.2a : Profile of Respondents

Professions	Total Number	Actual number	%
Construction professionals	38	23	60.53
Project Managers	38	10	26.32
Procurement Specialists	38	05	13.15
Others	38	00	0.00
	Total =	38	100.00

Table 6.2b : Qualification of Respondents

Qualifications	Total Number	Respondents	%
High National Diploma (Bac + 2years)	38	00	00.00
Bachelor in Sciences (Bac + 3 years)	38	06	15.80
Master in Sciences (Bac + 4 and more years)	38	32	84.20
	Total =	38	100.00

6.2.3 Experience of respondents

The majority of the respondents (71.06%) has more than 10 years of experience indicating that results represent the perception of experienced people. Details are shown in Table 6.3.

Table 6.3. : Experience of Respondents

Professions	Total Number	Respondents	%
Less than 5 years	38	02	05.26
5 to 10 years	38	09	23.68
More than 10 years	38	27	71.06
	Total =	38	100.00

6.2.4 Consistency Test of respondents

The consistency test of every respondent for every question was run and has revealed that an average of 16 representing 42.11% of the 38 respondents were consistent with the pair-wise comparisons. Results are tabulated below in Table 6.4. This rate of 42.11% of consistency test is slightly better than that of Yang and Shi (2002) which was 41.65%.

Table 6.4 : Results of the Consistency test of Respondents

Key variables rated	Total Respondents	Consistent Respondents	%
Criteria rating	38	17	44.74
Indicators under Transparency rating	38	12	31.58
Indicators under Compliance rating	38	19	50.00
Phases rating	38	16	42.11
Average =	-	16	42.11

In short, out of the 60 questionnaires administered, 38 valid completed questionnaires were returned representing 63.32%. The majority of respondents (60.52 %) are construction professionals, highly qualified and very experienced. Moreover, the Consistency Ratios (CR) varying from 0.00 to 0.055 (< to 0.10) are indicating that respondents were very consistent. Therefore, it can be concluded that results represent the point of view of qualified and experienced construction professionals and are considered valid and reliable.

6.3 MAJOR CHALLENGES FACING THE IMPLEMENTATION OF CTP

Out of fifteen potential challenges identified, thirteen have scored Severity Indices (SI) more than 70%. Delay is first with SI equals to 80.67% followed by the No respect for laws and regulations (78.00%), and Corruption (76.67%). Other variables like the Lack of transparency and public accountability, Poor capacity and Length of the process, have identical score of 76%. The maximum relative COV for all the variables is 9.83 % which is very low. Therefore, there is relatively high agreement among the respondents. Table 6.5 presents the results that are briefly discussed.

Table 6.5: Ranking of Major Challenges

Code	Major Challenges	Severity Indices	COV in %	Overall Ranking	
1	Delay in the processing of CT document	80,67	2,390	1st	
2	No respect for regulations and legal time-limits	78,00	1,589	2nd	
3	Complexity of laws and regulations of CT	62,00	4,664	14 th	
4	Length or duration of CT procedures	76,00	0,951	4th	
5	Poor capacity of personnel in charge of the 4th implementation of CT	76,00	0,951		
6	Poor performance of structures in charge of the 13 rd implementation of CT	72,00	0,430		
7	Generalized and systematic overprice of bids	73,33	0,047	10 th	
8	Lack of transparency and public accountability	76,00	0,951	4th	
9	Poor openness of the competition in CT	72,67	0,190	12 th	
10	Absence of Equity and Fairness in the award of contracts		74,67	0,507	7 th
11	Corruption in the acquisition of contracts	76,67	1,168	3rd	
12	Political interferences in the award of contracts		74,67	0,507	7 th
13	Abuse of power in the award of contracts	73,33	0,047	10 th	
14	Fraudulent practices (swindling)	74,67	0,507	7 th	
	15 Absence of Regulation body				
			58,00	6,767	15 th
Average =		73,24	1,44		

6.3.1 Delay

Delay is ranked first (with SI of 80.67 and COV of 2.39) confirming that delays on construction projects are as a chronic challenge (Syed et al., 2004). This is in line with many other authors who acknowledge delay as a major challenge because it is rare for a construction project which begins on time to be completed within the time allocated in the contract (John, 2001; Aibinu, 2002). Also, the study reveals that delay is very severe at the contract approval process level (93%) and tender evaluation process level (77%). Based on PPA Act 503 (2003), Patrice (2008) estimated that tendering process could be successfully performed in Chad within 120 days. But, the actual average duration of the process is over six (6) months according to OCMP (2006 and 2007) and CCSRP (2009). Interestingly, 80% of respondents agree on a period of four (4) weeks as optimum duration of both tender evaluation and contract

approval processes; and twelve (12) weeks for the whole tendering process. In Europe for instance, an average duration for tendering process is found to be 108 days for major projects (Strand et al. 2011). Rwanda's Government has also limited to 120 days the maximum duration of tendering process irrespective of the nature of the project (RPPA, 2010).

6.3.2 Laws and regulations' violations

No respect for laws and regulations constitutes the second challenge with a SI equals to 78% and the COV equals to 1.589. In connection with this, the study also reveals that ignorance (SI = 78.00%), obsolescence (SI = 65.33%), and complexity (SI = 65%) are the main causes as displayed in Table 6.6.

Table 6.6: Issues related to laws and regulations

Code	Issues related to laws and regulations	Severity Indices	COV in %	Overall Ranking
1	Ignorance of the texts (laws, regulations, etc.)	78,00	6,595	1 st
2	Maladjustment of the texts to the current context of the country (obsolescence)	65,33	0,042	2 nd
3	Complexity (difficult to understand) of the texts	65,00	0,251	3 rd
Average =		65,47		

According to David (2007), a major impediment in achieving effective public procurement in most developing countries has been the fragmentation, ambiguities and limited scope of laws and implementing regulations and procedures. Furthermore, the lack of proper enforcement of laws has been the root cause of violations of texts and causes also poor performance of institutions and staff, lack of transparency and public accountability, fraud and corruption (Jones, 2009). Consequently, the non-compliance to laws and regulations is generalised at all levels of the PP institutions in Chad.

6.3.3 Corruption

Not surprisingly, corruption is the third major challenge in Chad. In fact, its high score of 76.67% (with a COV of 1.168) confirms the Transparency International 2011 report where Chad is reported to be among the most corrupt countries in the world. Corruption is a global concern considering the wide and diverse legal and regulatory arsenals put in place in the world for fighting it (Arnaiz, 2009; UNDP, 2011; OECD, 2009, Williams, 2006). Despite political willingness and joint effort of the international community, failure to eliminate significantly corruption in developing countries shows rather the complexity of the phenomenon and the limitations of proposed solutions. In its effort to address corruption, Chad government is implementing many measures but results remain unsatisfactory due to the weak enforcement of laws and regulations as mentioned above.

6.3.4 Lack of transparency and public accountability

The lack of Transparency and public accountability is the fourth challenge with a SI = 76% and COV = 0.951. This is characterized by an excessive utilisation of negotiation options than competitive tendering, absence of official publication of tender results and audits' conclusions, and no development and publication of annual procurement plans. Though, transparency and public accountability is a fundamental driver of the PP reforms (Osei-Tutu, 2004), yet it is the most difficult to observe. Therefore, this challenge has a long way if serious steps are not taken to address it now.

6.3.5 Poor performance of procurement institutions

The poor performance of procurement institutions is characterized by the fact that out of the eleven institutions assessed, only one (i.e. OCMP) has gained a SI of 72.27%; all the rest are

below the minimum of 70%. It was also found that factors reducing the performance of institutions are the lack of qualified staff, and funds (see Table 6.7).

Table 6.7: Performance of different entities / structures

Code	Performance of different entities / structures	Severity Indices	COV in %	Overall Ranking
1	Public Procurement Board (OCMP)	72,67	5,773	1st
2	Contracting Authority (some ministries & institutions)	68,67	4,268	2nd
3	Technical units in charge of tender documents	65,33	2,872	
4	Procurement Unit of Ministries	62,67	1,648	
5	Tender Committee (COJO) of Ministries	65,33	2,872	
6	Tender Evaluation Panel (SCTE)	68,00	3,999	3rd
7	Commission of Qualification/Selection of contractors	54,67	2,738	
8	Commission of Pre-qualification of bidders	54,00	3,162	
9	Procurement Appeal Board (CRRRA)	45,33	9,812	
10	State General Inspectors body	51,33	4,969	
11	Chamber of counts of the Supreme Court	46,00	9,212	
Average =		59,45	4,666	

6.3.6 Personnel issues

Another major challenge revealed by the study points to **Personnel issues**. From Table 6.8, Poor qualification (SI = 80%), Deficiency in ethics and deontology (SI = 78.67%), and Complaisance in the recruitment (SI = 74.67%) are the important factors undermining personnel performance. Though capacity building has been a recurrent preoccupation of reforms, it is still not properly addressed in developing countries (Agoba and Shipman, 2009). As a result, there are real differences in the staffing from one ministry to another and in level of understanding of the procurement function between procurement officials and users.

Table 6.8 : Issues of Personnel in charge of Competitive Tendering

Code	Issues of Personnel in charge of Competitive Tendering	Severity Indices	COV in %	Overall Ranking
1	Poor qualification of personnel	80,00	3,780	1st
2	Lack of experience in works procurement of the personnel	72,00	0,000	4 th
3	Overload of work on the personnel	64,67	4,286	
4	Lack of motivation of the personnel	72,00	0,000	4 th
5	Complaisance in the recruitment of the personnel	74,67	1,350	3rd
6	Deficiency in ethics and deontology of the personnel	78,67	3,203	2nd
7	Shortage of personnel	62,00	6,096	
Average =		70,67	3,742	

6.3.7 Length of the process

The last but not the least is the Length of the process itself that can be considered as an internal challenge. Indeed, Patrice (2008) has identified 49 steps in CTP from planning up to contract execution, and as remedy, he recommended the cancellation of some. But the idea of shortening the process alone stands as another challenge because it implies amendment of laws and regulations which are rather long term solutions leaving inadequate processes and procedures to continue to severely damage the procurement system in Chad.

As in many developing countries, despite the reforms undertaken for years, even when accompanied by the necessary institutional mechanisms, there is insufficient improvement in the day to day transactions of works procurement through CT (Basheka, 2009). For instance, reformed procedures laid down are either ignored or put aside or deliberately violated. Therefore, it can be concluded that the implementation of CT Method in Chad is facing many challenges that are more or less very acute including delay, no respect for laws and regulations, corruption, lack of transparency and public accountability, poor capacity and length of the process. In Chad, delay is observed at all levels in addition to a very long process which is

difficult to be reduced, and laws and regulations that are not respected and inevitable corruption is everywhere. Moreover, the performance of procurement institutions and personnel is very poor. From the preceding, it is clear that all issues stated above have to be addressed properly and urgently. To this end, the study recommends a re-assessment of the procurement system and the development of well-articulated long-term strategies among which is a thorough review of the processes and procedures to mitigate delays and corruption.

6.4 RELEVANT CRITERIA AND RELATED KEY INDICATORS

6.4.1 Results presentation

After the collection of pair-wise comparisons from respondents and verification of the consistency of respondents and computation of geometric means, single pair-wise comparison matrices were constructed and relative weight of every criterion and every indicator were computed as displayed below in following sections.

6.4.1.1 Weights of Criteria

The computed weights of criteria are presented in Table 6.9. With a Consistency Ratio (CR) equal to 0.024 which is $\ll 0.10$ (i.e. the maximum), results are consistent.

6.4.1.2 Relative Weights of Measurable Indicators

In the same way, relative weights of indicators were computed under separate criterion and results are as follows:

a. Indicators under Transparency

The three indicators related to Transparency are *Advertisement total duration*, *Publicity frequency*, and *Publicity extent*. The Table 6.10a shows that the Indicator 1 is the most important with 0.507 followed by the Indicator 2 with 0.292 and Indicator 3 with 0.201.

Based on this result, it is found that *Advertisement total duration* alone can ensure more than 50% of transparency of the process. Indeed, longer period is essential in advertising for it favours the participation of potential tenderers by reaching out to more contractors.

Table 6.9 : Relative Weights of Criteria

Criteria	Trans.	Comp.	Fairn.	Compl	Time	Cost	Ethics	Nth Root	Weights	Rank
Transparency	1.000	2.843	1.251	2.746	4.537	5.163	1.900	2.382	0.292	1
Competitiveness	0.352	1.000	1.900	2.306	3.005	2.121	2.185	1.550	0.190	3
Fairness	0.799	0.526	1.000	3.609	3.093	4.191	1.781	1.662	0.203	2
Compliance	0.364	0.434	0.277	1.000	1.872	2.173	1.424	0.822	0.101	4
Time	0.220	0.333	0.323	0.534	1.000	1.891	1.662	0.631	0.077	5
Cos	0.194	0.471	0.239	0.460	0.529	1.000	2.142	0.527	0.065	6
Ethics	0.526	0.458	0.561		0.602	0.467	1.000	0.596	0.073	7
Sum =	3.456	6.065	5.551		10.101	17.006	12.094		8.170	1.000
Sum*Weights =	1.007	1.150	1.129	1.143	0.780		1.098	0.882		
λ max =	7.190									
C.I. =	0.032									
R.I. =	1.320									
C.R. =	0.024									

Table 6.10a : Relative Weights of Indicators under Transparency

Indicators	Ind. 1	Ind. 2	Ind. 3	Nth Root	Weights
Indicator 1	1.000	2.067	2.112	1.634	0.507
Indicator 2	0.484	1.000	1.732	0.943	0.292
Indicator 3	0.473	0.577	1.000	0.649	0.201
Sum =	1.957	3.644	4.844	3.226	1.000
Sum*Weights =	0.992	1.065	0.974		
λ max =	3.031				
C.I. =	0.016				
RI =	0.58				
CR =	0.027				

b. Indicators under Competitiveness

The relative weights of indicators related to Competitiveness are given in Table 6.10b below.

The Indicator 1 (*Number and Nationalities of Bidders*) has scored 0.766 indicating that the number and nationalities of bidders is a very important sign of competitiveness.

Whereas, the Indicator 2 that is *Degree of Competitiveness* represents only 0.234, indicating that the cost factor is less relevant at this stage.

c. Indicators under Fairness & Equity

The two indicators related to Fairness and Equity are *Time for tender preparation* and *Applied Rate of Margin of Preference* and their relative weights are given in Table 6.10c below.

Table 6.10b: Relative Weights of Indicators under Competitiveness

Indicators	Ind. 1	Ind. 2	Nth Root	Weights
Indicator 1	1.000	3.270	<i>1.808</i>	0.766
Indicator 2	0.306	1.000	<i>0.553</i>	0.234
Sum =	1.306	4.270	2.361	1.000
Sum*Weights =	1.000	1.000		
λ max =	2.000			
C.I. =	0.000			
RI =	0.000			
CR =	0.000			

Table 6.10c: Relative Weights of Indicators under Fairness & Equity

Indicators	Ind. 1	Ind. 2	Nth Root	Weights
Indicator 1	1.000	5.030	<i>2.243</i>	0.834
Indicator 2	0.199	1.000	<i>0.446</i>	0.166
Sum =	1.199	6.030	2.689	1.000
Sum*Weights =	1.000	1.000		
λ max =	2.000			
C.I. =	0.000			
RI =	0.000			
CR =	0.000			

Time for tender preparation has attracted 0.834 indicating that sufficient time allows both timely and late bidders to prepare quality tender. Indicator 2 that is *Applied Rate of Margin of Preference* represents only 0.166, indicating that in a fair environment, competitors do not need any preference that can limit competition.

d. Indicators under Compliance

Relative weights of indicators under Compliance are given in Table 6.10d and the three are ranked in order of importance as follows: *Approvals' Compliance Rate* with a weight of 0.504; *Documentation Compliance Rate* with 0.363; and *Capacity Qualification Ratio* with 0.133.

Table 6.10d: Relative Weights of Indicators under Compliance

Indicators	Ind. 1	Ind. 2	Ind. 3	Nth Root	Weights
Indicator 1	1.000	1.625	3.240	<i>1.740</i>	0.504
Indicator 2	0.615	1.000	3.183	<i>1.251</i>	0.363
Indicator 3	0.309	0.314	1.000	<i>0.459</i>	0.133
Sum =	1.924	2.939	7.423	3.450	1.000
Sum*Weights =	0.970	1.066	0.988		
λ max =	3.024				
C.I. =	0.012				
RI =	0.58				
CR =	0.021				

6.4.1.3 Composite Weights of Criteria and Indicators

As indicated earlier, the relative weight of indicator is weighted by the corresponding criterion weight to give the composite weight. The obtained results are summarised in Table 6.11 that shows that all indicators weights exceed zero indicating their importance in characterising the effectiveness of CTP. In addition, Table 6.12 ranks the 13 indicators according to their respective weights. To avoid repetition, detailed descriptions and expressions of indicators including the corresponding target values are provided in Table 7.2 in section 7.2.3.

Table 6.11: Composite weights of relevant Criteria with measurable Indicators

Criteria / Indicators	Trans.	Compt.	Fairn.	Compl.	Time	Cost	Ethics	λ max	CR	Comp. Weights
Transparency	(0.292)							3.031	0.027	
- Indicator 1	0.507								0.148	
- Indicator 2	0.292								0.085	
- Indicator 3	0.201								0.059	
Competitiveness		(0.190)						2.000	0.000	
- Indicator 1	0.766								0.145	
- Indicator 2	0.234								0.044	
Fairness			(0.203)					2.000	0.000	
- Indicator 1		0.834							0.169	
- Indicator 2		0.166							0.034	
Compliance				(0.101)				3.024	0.021	
- Indicator 1			0.504						0.051	
- Indicator 2			0.363						0.037	
- Indicator 3			0.133						0.013	
Time					0.077			1.000	0.000	0.077
Cos						0.065		1.000	0.000	0.065
Ethics							0.073	1.000	0.000	0.073
Total =										1.000

Table 6.12 : Ranking of Measurable Indicators w.r.t. composite weights

Measurable Indicators	Weights	Rank
Time for tender preparation	0.169	1
Advertisement total duration	0.148	2
Number & Nationalities of Bidders	0.145	3
Publicity frequency	0.085	4
Time Performance Index	0.077	5
Number of complaints or requests generated	0.073	6
Cost Estimate Accuracy	0.065	7
Publicity extent	0.059	8
Approvals Compliance Rate	0.051	9

Degree of Competitiveness	0.044	10
Documentation Compliance Rate	0.037	11
Applied Rate of Margin of Preference	0.034	12
Capacity Qualification Ratio	0.013	13

6.4.2 Discussions of Relevant Criteria and Key Measurable Indicators

Considering Table 6.9, the high ranked criterion is **Transparency** with 0.292 of weight followed by **Fairness** and **Competitiveness** with 0.203 and 0.190 respectively. These three criteria put together weighted about 0.685 being almost 70% of the performance. **Compliance** has gained 0.101 and occupies the fourth rank. The scores of **Time** and **Ethics** are 0.077 and 0.073 respectively whereas **Cost** is the last with only 0.065 indicating probably that cost factor is of less relevance at pre-contract stage. However, assuming that all the identified criteria were of equal weight, that means each would have $1/7 = 0.1428$. Based on the above scores as compared to the assumed average weight, it can be concluded that the most relevant criteria are in order of importance transparency, fairness and competitiveness. Applying the same rule to indicators, the assumed average weight would be $1/13 = 0.077$ and from Table 6.12, key measurable indicators are in following order of importance *Time for tender preparation, Advertisement total duration, Number and Nationalities of Bidders, Publicity frequency, Time Performance Index*. The above relevant criteria as well as the related indicators are simultaneously discussed below.

6.4.2.1 Transparency and public accountability

The high ranking of Transparency (including public accountability) with 0.292, means that it contributes almost 30% to the achievement of contract award process performance. This is perfectly in line with the core principles of PP Acts where transparency and fairness are always listed first. This is also corroborated by Dos Santos et al., (1998) who stated that transparency and public accountability are foundations of excellence and pillars of competitive construction

companies. Another explanation of this high score is that public accountability and transparency help to detect early any deviation from fair and equal treatment, and make such deviation less likely to occur hence protecting the public interest

(Appiah and Moro, 2011). Moreover, transparency prevents fraud and corruption as stated Steven and Patrick (2006) and, hence improves performance of PP.

Not surprisingly, among the three indicators related to transparency, two occupy the second and fourth positions respectively (i.e. *Advertisement total duration* with a weight of 0.148 and *Publicity frequency* with 0.085). Even the last indicator (i.e. *Publicity extent*) holds the eighth position supporting the high position of transparency and public accountability. From the foregoing, it can be concluded that transparency is the most relevant criterion in improving the performance of public contract award process in Chad. However, although transparency has been revealed as the most relevant criterion, it has also been the most difficult to practice on the ground as far as public procurement is concerned. For instance, it is consistently reported that tendering processes lack transparency due to the fact that procurement information are often hidden and difficult to access by the public (OECD/DAC, 2005; CCSRP, 2010). The worse is that even when the process seems transparent, its effectiveness and efficiency do remain questionable because it is not easy to access the genuine data to form a basis for challenging or protesting results because procurement officers hardly disclose actual information. Concerning public accountability, it is rare that the public is informed except when some deficiencies in transparency are disclosed and this is always too late to remedy. Therefore, owing to the prominent role transparency plays in CTP, it is recommended to pay a special attention to it if governments are willing to achieve success with good performance in PP.

6.4.2.2 Fairness and Equity

Having won the second place with 0.203, Fairness and Equity couple confirms their privileged position in procurement laws like transparency. First of all, fairness suggests that the procurement procedure is conducted in an open and impartial manner and is consistent and therefore reliable (WB, 2003). Then fairness is closely related to justice or getting what you deserve; otherwise contracts are awarded mainly on merit (John, 2001). Whereas Equity means equal access, equal opportunities, and equal treatment to all potential contractors and also focuses on the promotion of secondary objectives (David, 2007; Shakeel, 2010). Most often, equity is applied when equal shares are not fair and allows a special allocation of opportunities to qualified but disadvantaged contractors (Watermeyer, 2012). For instance, Equity can be used to generate business and employment opportunities for indigenous firms, women or youth through construction projects (e.g. in South Africa during the postapartheid period). Moreover, Fairness in addition to Equity deserves this high score and not only that, the first established key Indicator (i.e. *Time for tender preparation*) is found under this criterion supporting its importance. Finally, it appears clear that „Fairness and Equity“ is a second relevant criterion in influencing positively the performance of public contract award process in Chad. However, like transparency, „Fairness and Equity“ is another problematic issue in PP. According to Strand et al. (2011), fairness implies total absence of bias, what is undoubtedly very difficult to achieve in Chad where fraud and corruption have invaded the procurement systems at all levels. Worse of all, these malpractices are rather reducing fairness and transparency. As result, many complaints are still on the rise aggravating the loss of trust in the public procurement system in Chad.

6.4.2.3 Competitiveness

According to GOJ (2012), competition is the cornerstone of public sector procurement and the primary driver of Value for Money. In addition, competition has many other benefits including hampering corruption (Steven and Patrick, 2006), reducing cost by broadly 20% (Simon et al., 2005) and providing the enabling environment for effective utilisation of scarce resources in the economy (Dikko, 2000). Furthermore, it gives a good image of the public governance (David, 2007) and underpins fairness and transparency. Based on that, the third position occupied by Competitiveness with a weight of 0.190 is certainly an additional proof of its relevance. Consistently enough, one of the related indicators namely *Number and Nationalities of Bidders* has gained the third rank with 0.145 confirming the opinion of Arrowsmith (2011). According to him a project that receives a large number of bids will result in selecting a capable contractor at more competitive price. Besides, a tender that attracts a significant number of foreign bids indicates that the process is reliable and worthy to be trusted stated Williams-Elegbe (2007). For all these reasons, it is simply logical that competitiveness deserves its rank and considered as a relevant performance criterion as far as PP is concerned in Chad.

6.4.2.4 Compliance

Compliance is the fourth relevant criterion with a score of 0.101 ahead of Time, Cost and Ethics. This good position is comforted on one hand by the lack of law enforcement that has been one of the weaknesses of the national PPAs in developing countries (Banfo-Agyei et al., 2013), and on the other hand by the fact that a related Indicator (i.e. *Approvals Compliance Rate*) is among the key ones. Besides, in a previous study, Douh et al. (2013) have identified the lack of compliance to laws and regulations as second major challenge facing the

implementation of CTP in Chad. As matter of fact, most of developing countries have put in place good laws and regulations but are incapable of ensuring proper enforcement and full application. It is frequent that procurement officers do disrespect laws and rules in procurement operations without punishment in Chad (CCSRP, 2009 and 2010). Yet, be compliant with time limits offers double advantages: tenderers are satisfied when they receive tender results on time, what enables those who failed to go for other opportunities and the successful to start business; and procurement officers also are satisfied of being effective in their mandate improving surely the image of public service (Appiah and Adam, 2013). Obviously, full compliance to procurement laws and regulations is a relevant criterion despite weaknesses mentioned above.

6.4.2.5 Other criteria

Other criteria are **Time**, **Ethics** and **Cost** in order of importance. Although these criteria do not gain high scores, their related indicators are critical to some extent to the achievement of a high level of performance. For example, time related indicator like „*Time Performance Index*“ occupies the fifth rank with 0.077 immediately followed by the Ethics“ related indicator (i.e. *Number of complaints or requests generated*) with 0.073.

Another finding that comes to light is the predominance of indicators involving time that are ranked high [*Time for tender preparation (1st)*, *Advertisement total duration (2nd)*, and *Time Index Performance (5th)*] indicating that timeliness is an important effectiveness indicator as far as CTP is concerned in Chad. For instance, public administration is well known for its bureaucracy and most often, procurement officers do delay expressly tender announcements to favour their candidates to the detriment of others of good standing. Moreover, timely performance of tendering activities indicates time effectiveness and demonstrates compliance

at the same time. Therefore, time indicators are key contributors to high performance with a total weight of 0.394.

The last but not the least is Ethics criterion that does not receive the expected attention from respondents. Indeed, one of the ills of the procurement officers is the lack of ethical conduct especially when it comes to integrity and confidentiality in PP transactions. Finally, regarding Cost criterion, the study found that respondents do not consider cost effectiveness as a real preoccupation at pre-contract stage even though cost has always been an important criterion in construction industry (EU/ECORYS, 2011). This revelation has to be investigated in further study.

In the light of the above, it can be concluded that the most relevant criterion is Transparency followed by Fairness and Competitiveness. This order agrees perfectly with the position of Appiah and Moro (2011). Therefore, an effective CTP has to be transparent, fair and competitive to achieve at least 70% of the expected level of Effectiveness. When, the whole process complies perfectly with rules and procedures, the likelihood of high performance is above 80%. In other words, a transparent process will surely enhance competitiveness, fairness and equity. Thereby when transparency, fairness and equity are secured, competition is inevitably promoted. As a matter of fact, competition enables economy in cost and time and hampers corruption as well. That can be achieved if and only if the process is conducted by people with high ethical behaviour. Hence, it appears clear that all these criteria are interrelated and interdependent as demonstrated by the ranking of related indicators that do not follow the same pattern like criteria. Besides, in the effort of establishing balanced and leading performance indicators specific to the PP in Chad, the following key indicators are established:

i. Time for tender preparation, ii. Advertisement total duration, iii. Number and Nationalities of Bidders, iv. Publicity frequency, v. Time Performance Index, vi. Number of complaints or requests generated, vii. Cost Estimate Accuracy, viii. Publicity extent, and ix. Approvals Compliance Rate.

The characteristics of indicators (number, simplicity, cost and timely effectiveness, easiness of application and data gathering, etc...) are perfectly in line with the performance indicators established by Neely et al. (1997) and Matthews and Gibson (2009). Additionally, the study reveals that indicators involving time are ranked high indicating that time management has to be addressed properly during the tendering process whereas cost was of little interest at this stage. Full description and mathematical expression of each indicator are given in Table 7.2 in the next chapter.

6.5 RELATIVE WEIGHTS OF CRITICAL PHASES OF THE PROCESS

The determination of relative weights of critical phases of CTP gives results tabulated below in Table 6.13 where Tender Planning phase is first with 0.363 followed by Tender Documentation and Tender Solicitation with 0.261 and 0.161 respectively. Tender Award is the last with only 0.079.

Table 6.13 : Relative Weights of Critical Phases of CTP

Phases	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Nth Root	Weights	Rank
Tender Planning	1.000	2.020	2.118	2.925	3.051	2.072	0.363	1
Tender Documentation	0.495	1.000	2.700	2.233	2.470	1.491	0.261	2
Tender Solicitation	0.472	0.370	1.000	1.817	2.053	0.918	0.161	3
Tender Evaluation	0.342	0.448	0.550	1.000	3.483	0.783	0.137	4
Tender Pre-Award	0.328	0.405	0.487	0.287	1.000	0.451	0.079	5
Sum =	2.637	4.243	6.855	8.262	12.057	5.714	1.000	
Sum*Weights =	0.956	1.107	1.101	1.131	0.951			
λ max =	5.247							
C.I. =	0.062							
RI =	1.12							
CR =	0.055							

Indeed, *Tender Planning* is perceived as very important because it is the original source of all corrupt activities such as budget inflation; collusive skewing of technical criteria and specifications to favour certain products or bidders; project packages to favour certain entities and to bypass or manipulate legal thresholds (UNCITRAL, 2011). In addition, *Tender Planning* and *Tender Documentation* are intimately linked and constitute together a total weight of 0.624. With such a weight, the success of any CTP relies heavily on them.

Therefore, these two phases are the most critical. According to Omole, (2000), *Tender Solicitation* phase becomes very sensitive when „Cartel problem“ prevails. Undeniably, cartel problem is capable of nullifying competitiveness and preventing governments of benefiting from competitive market. To reduce the effect of this problem, *Tender Evaluation* must be conducted timely and in a manner that aids to detect and manage collusive practices (Appiah and Adam, 2013). Although *Tender Evaluation* did not receive a very high score, all endeavours are to be directed towards an irreproachable evaluation process to meet the foreseen expectations. Of course, *Tender Award* is the last because it is the accomplishment of all prior steps. In other words, if earlier phases are well executed, the effectiveness is

guaranteed and it becomes objectively easy to award the resulting contract to the recommended winner.

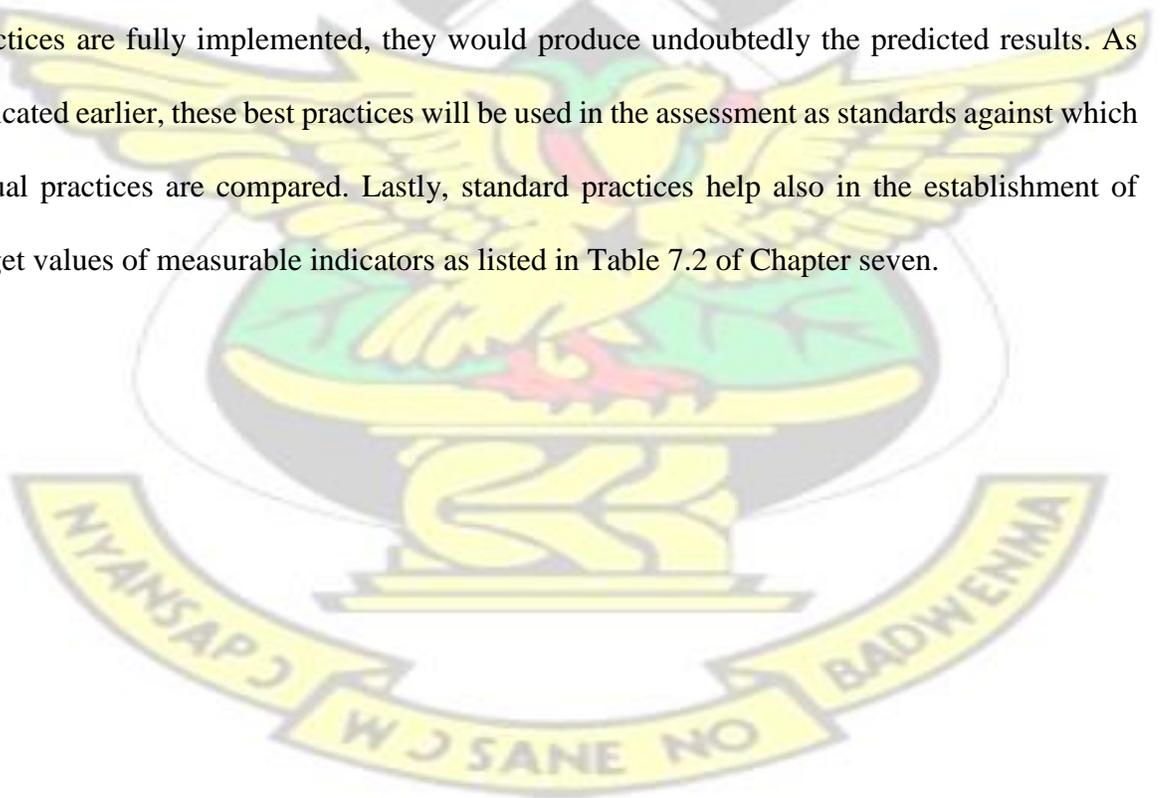
6.6 BASELINE OF STANDARD PRACTICES

The results of the analysis of the 38 common practices identified along the five phases are presented in Table 6.14.

Table 6.14 : List and Frequencies of relevant standard practices

Relevant Standard practices	Mark (over 8)
1. Tender Planning Phase	
1. Publication of approved Annual Procurement Plan	7
2. Needs assessment and formulation of project initial brief	5
3. Provision of an adopted accurate estimate in the national budget	5
4. Appointment of an Independent and Free Tender Committee	5
2. Tender Document Development Phase	
5. Use of neutral & standard Technical specifications	7
6. Setting of Non-discriminatory Eligibility/Participation conditions	6
7. Use of Standard Tender Documents	5
3. Solicitation of Tenders Phase	
8. Reception/Submission of Tenders and Public Opening of Bids	8
9. Allocation of sufficient time to Advertisement of tender proposals	7
10. Use of multiple and/or dedicated media for Tender Advertisement	7
11. Grant of enough time for preparation of Tender Bids	5
12. Reception and response to Requests for Clarifications	5
4. Evaluation of Bids Phase	
13. Requiring of tender security covering the Validity Period	7
14. Constitution of qualified and ethical Tender Evaluation Panel	6
15. Evaluation of tenders using Points system of scoring	6
16. Requiring of necessary clarification of bids	6
17. Appropriate use of Margin of Preference	5
5. Pre-Award Phase	
18. Provision of Complete recordkeeping of procurement proceedings	6
19. Publication of tender results including successful & Unsuccessful	6
20. Provisional award of contract	5

From that table, the standard practices selected are as follows : Develop a realistic procurement plan including an accurate budget, get the required approvals, publish the approved procurement plan on time, appoint a suitable project design team, obtain a complete project design, and select an appropriate tendering option; secure project design quality, use standard documents, and review and approve tender documents before publication; wide and long advertisement of tender proposals, proper handling of requests for clarification, and publicly opening session; appoint a suitable evaluation panel team, use of points scoring system, drafting the report on time using standard format, and include a clear recommendation for the award; review and adoption of tenders evaluation report, publication of tender results, resolution of eventual complaints / disputes before final award. In conclusion, when these practices are fully implemented, they would produce undoubtedly the predicted results. As indicated earlier, these best practices will be used in the assessment as standards against which actual practices are compared. Lastly, standard practices help also in the establishment of target values of measurable indicators as listed in Table 7.2 of Chapter seven.



CHAPTER SEVEN

DEVELOPED FRAMEWORK FOR ASSESSING THE EFFECTIVENESS OF CTP

7.1 INTRODUCTION

Chapter seven concentrates on the description of the developed framework. It also includes the following sections: the conceptual graphical model, the assessment procedure and scoring system, the elementary effectiveness assessment sheets, the overall effectiveness assessment sheet, the summary and synthesis sheet, and the validation of the proposed framework with an application example.

7.2 NEED FOR THE FRAMEWORK

The implementation of Competitive Tendering in Chad is confronted by many challenges fully explained in previous section 6.3. Despite reforms put in place in 2003, the performance of PP is still very poor. For instance, many contracts fail to meet government expectations (abandoned sites or doubtful works quality) due to poor performance of tendering procedures (CCSRP, 2009). As a result, more than 70% of time lost and cost incurred during construction phase were attributed to biased award of contracts (CCSRP, 2009). In addition, when analysing the causes of delay in construction project delivery through open CT in Chad, Patrice (2008) identified the lack of effectiveness assessment and management of tendering processes as one of the root causes of ineffectiveness. However, effectiveness assessment of tendering process prior to the approval of contract will certainly mitigate negative effects and abuses mentioned above. Moreover, effectiveness assessment provides decision makers feedback on the impact of deliberate actions and affect critical issues such as allocation of

scarce resources, as well as whether to maintain or change existing strategy. Above all, there is a knowledge gap on how the procurement process can improve the performance of the procurement function in developing countries (Patrick, 2010). From the foregoing, developing an appropriate tool that helps public contracting authorities to assess the effectiveness of every project at pre-contract stage will result in a substantial improvement of the performance of CTP leading to further benefit to local construction industry. In the light of the above exposition, it is indisputable that there is a need for developing appropriate framework for assessing the effectiveness of CTP in public works procurement in Chad.

7.3 OVERVIEW OF THE DEVELOPED FRAMEWORK

As described in chapter 2, the quantification of the performance expression can be viewed as a procedure which, in a first step quantifies the elementary performances, the second step then consists in their synthesis in an overall performance, thanks to aggregation operator (Berrah et al., 2004 and Clivillé, 2004). Based on that, a graphical conceptual model of the developed framework is proposed in Figure 7.1. This model consists of a systematic sequence of six (6) steps involving assessment of elementary effectiveness of the five phases, one after another as stairs, and the overall effectiveness for the whole process. With respect to specifics of every phase, Key Measurable Indicators (KMIs) are distributed as follows per phase: Phase 1 six indicators, Phase 2 five indicators, Phase 3 six indicators, Phase 4 seven indicators, and Phase 5 seven indicators.

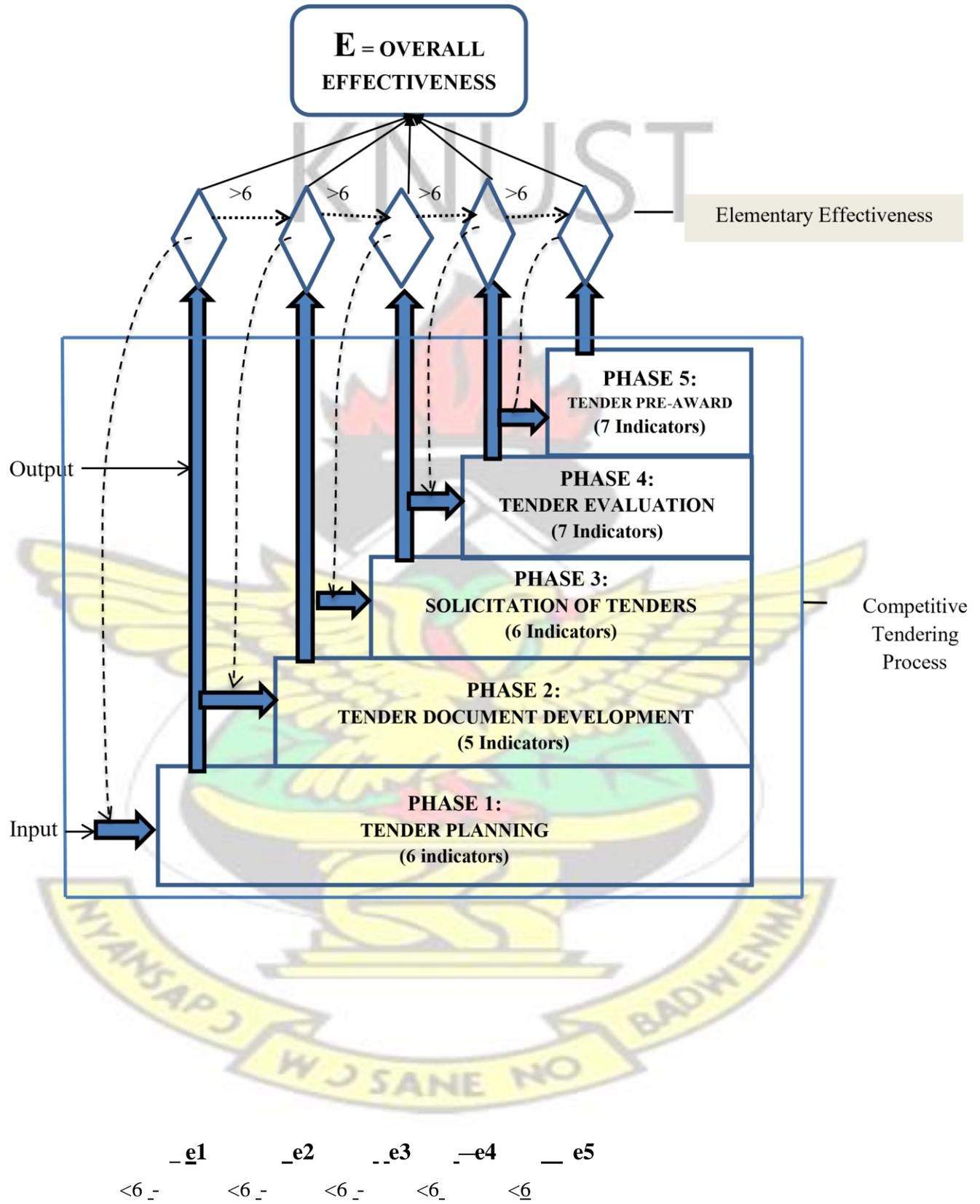


Figure 7.1 : Conceptual Graphical Model of the developed Framework

Source: Author's construct

KNUST

The different components of the framework are presented below in seven separated sheets:

- ✓ One sheet for project identification that gives general data on the individual project under assessment involving title, brief, location, client, beneficiaries, objectives, budget, etc.;
- ✓ Five similar distinct sheets corresponding to the five phases including each of the following elements:
 - input and expected output,
 - critical points and issues to look at,
 - standard practices to follow,
 - useful data and documents to provide,
 - specific key indicators to use ; and finally
 - the assessment of Elementary Effectiveness (ei);
- ✓ One summary and synthesis sheet for the overall effectiveness assessment including the final decision of the contracting authority.

The full and detailed description of all these sheets is presented in Appendix 3. However, their summaries are presented in different frames in the following pages.

Sheet 1 : Project Identification

PROJECT IDENTIFICATION

Title :

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Brief :

Budget :

Sector : Transport, Education, Health, etc..... :

Primary Objectives :

Secondary Objectives :

Localisation :

Source of Funds :

Client Name :

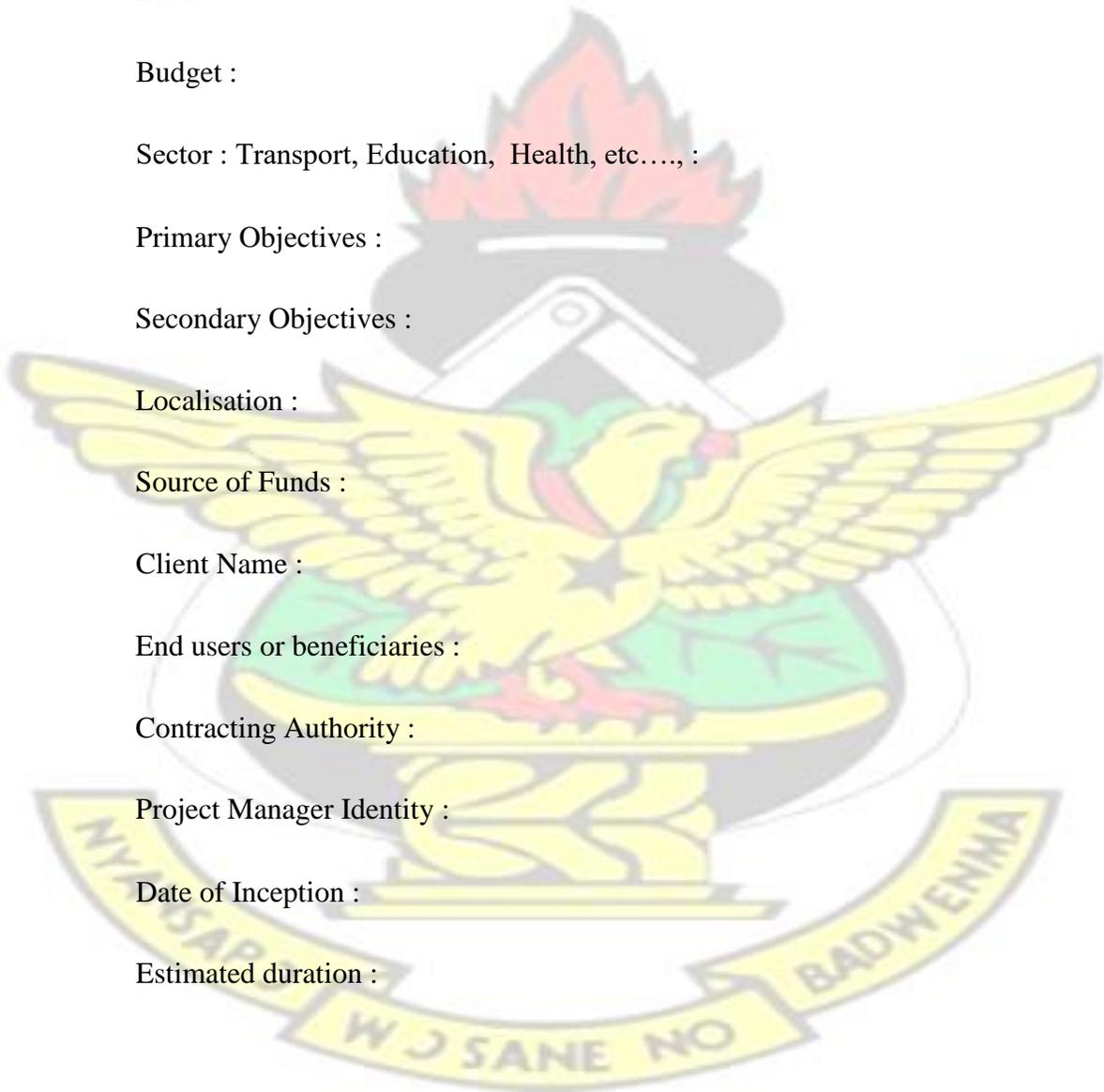
End users or beneficiaries :

Contracting Authority :

Project Manager Identity :

Date of Inception :

Estimated duration :



Sheet 2 : Tender Planning assessment frame

- 
- 1. Input / Expected Output** - Project brief / - Project sketch & feasibility study
- 2. Critical points and issues to look at**
- Project definition or formulation
 - Project primary objectives
 - Project secondary objectives
 - Procurement strategy proposed
 - Tendering option
 - Initial Budget
 - Compliance with procedures
- 3. Standard Practices to be used**
- Development of Procurement Plan
 - Adoption of a realistic Procurement Plan
 - Wide Publication of the adopted Procurement Plan
 - Appointment of a suitable Project Manager
 - Implementation & adoption of Feasibility study
 - Estimation of accurate budget
 - Privilege to Competitive Tendering method
 - Appointment of appropriate Tender Committee
 - Adequate & complete proceedings documentation
- 4. Documents and data to be collected**
- Client official representative identity
 - End users actual needs
 - Approved Procurement Plan
 - Approved Budget
 - Approved Project design sketch
 - Definite project objectives
 - Tender Committee members list + CVs
 - Project Manager's contract + Terms of reference
 - Different correspondences
- 5. Specific Indicators to be used**
- Time Performance Index
 - Publicity Extent of Procurement Plan
 - Cost Estimate Accuracy w.r.t. to initial budget
 - Approvals Compliance Rate
 - Documentation Compliance Rate
 - Capacity Qualification Ratio (Project team)

6.Elementary Effectiveness assessment See application example in next pages

Sheet 3 : Tender Documentation assessment frame

- 1. Input / Expected Output** - Approved Project Sketch & Feasibility study / Tender Documents final draft
- 2. Critical points and issues to look at**
- Eligibility conditions
 - Evaluation criteria and scoring system
 - Award criteria
 - Tender presentation & submission conditions
 - Tender opening conditions
 - Time frames of tendering process
 - Usage of standard documents
 - Drawings quality and completeness
 - Bill of quantities quality and completeness
 - Estimate accuracy
 - Dispute resolution mechanism
 - Technical specifications
 - Contract type & format
 - Different standard forms to be completed
 - Compliance with procedures
- 3. Standard Practices to be used**
- Prior Approval of Project Complete Design
 - Non-discriminatory Eligibility conditions
 - Open Participation
 - Alignment with primary & secondary objectives
 - Neutral & standard Technical specifications
 - Standard Contract draft
 - Adoption of Tender documents
- 4. Documents and data to be collected**
- Approved Feasibility Study
 - Approved Project Complete Design - Tender Documents final draft
 - Non-objection or approval's notices
 - Official prices list
 - Detailed Estimate Cost (confidential)
 - Restricted list / Potential Contractors list
 - Total duration of tender documents development
 - Date of Tender launching
 - Date of Tender submission

5. Specific Indicators to be used

- Time Performance Index
- Cost Estimate Accuracy w.r.t. Engineer Estimate
- Approvals Compliance Rate
- Documentation Compliance Rate
- Capacity Qualification Ratio (Tender Committee)

6.Elementary Effectiveness assessment

- See application example in next pages

Sheet 4 : Tender Solicitation assessment frame

1. Input / Expected Output

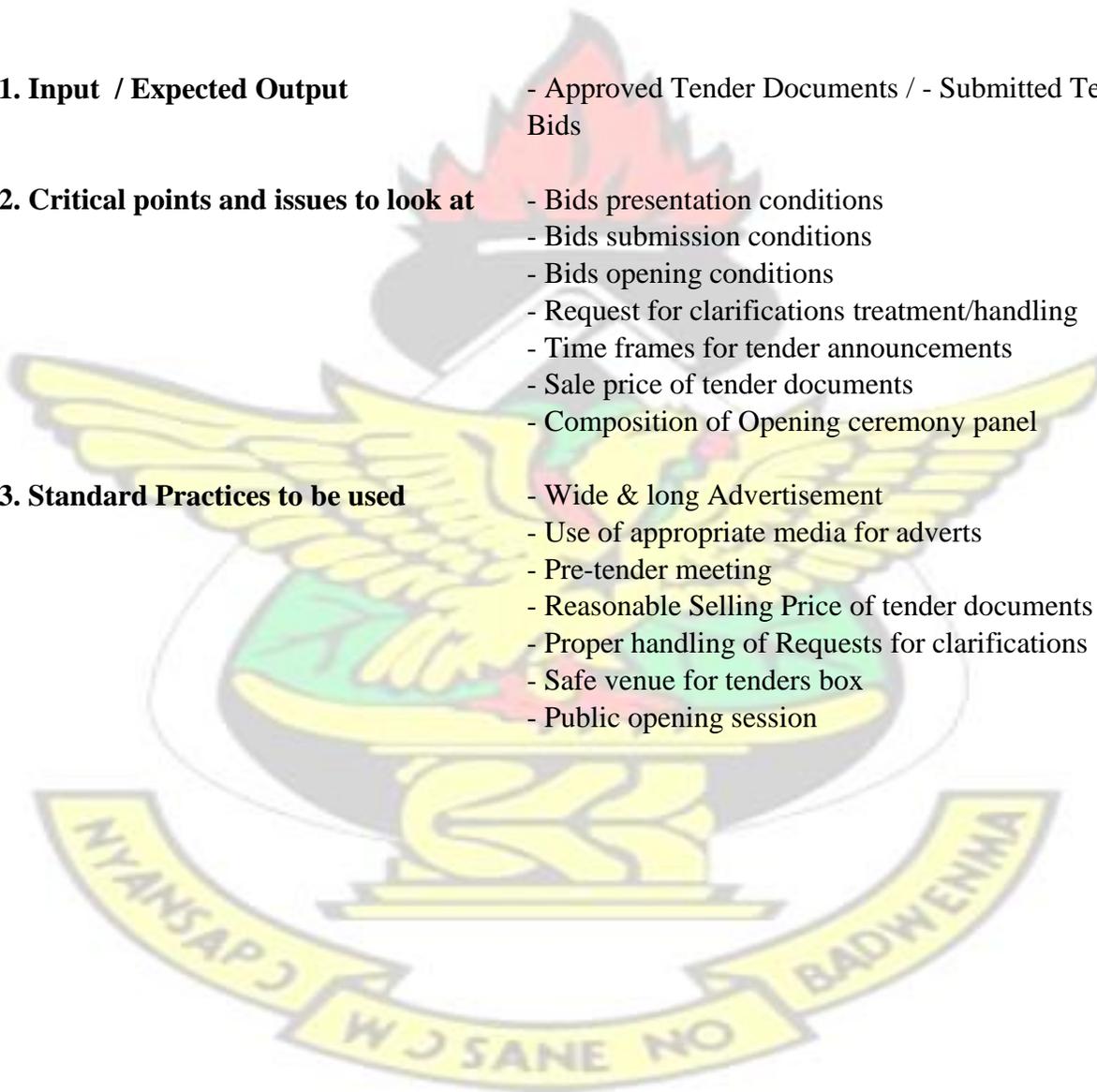
- Approved Tender Documents / - Submitted Tender Bids

2. Critical points and issues to look at

- Bids presentation conditions
- Bids submission conditions
- Bids opening conditions
- Request for clarifications treatment/handling
- Time frames for tender announcements
- Sale price of tender documents
- Composition of Opening ceremony panel

3. Standard Practices to be used

- Wide & long Advertisement
- Use of appropriate media for adverts
- Pre-tender meeting
- Reasonable Selling Price of tender documents
- Proper handling of Requests for clarifications
- Safe venue for tenders box
- Public opening session



- 4. Documents and data to be collected**
- Prospective tenderers' complaints
 - Requests for clarifications received
 - Responses to requests for clarifications issued
 - Advertisement total duration
 - Media used for advertisement
 - Advertisement frequency
 - Number of Tender documents sold
 - Price of Tender documents
 - List of buyers of tender documents with receipts
 - List of tenders submitted and received
 - List of tenders submitted and rejected
 - List of Opening session panel
 - List of attendance of opening session
- 5. Specific Indicators to be used**
- Advertisement total duration
 - Time for tender preparation
 - Time Performance Index
 - Publicity extent for tender advertisement
 - Publicity frequency for tender advertisement
 - Number of Requests for clarifications
- 6. Elementary Effectiveness**
- See application example in next pages

Sheet 5 : Tender Evaluation assessment frame

- 1. Input / Expected Output**
- Submitted Tender Bids / Tender Evaluation Report
- 2. Critical points and issues to look at**
- Composition of the Evaluation Panel
 - Quality of the Panel Chairperson
 - Evaluation method used
 - Responsiveness conditions adopted
 - Scoring system used
 - Bids prices and rates
 - Time frames for tender evaluation
 - Ethics issues on Evaluation Panel members

3. Standard Practices to be used

- Confidential Evaluation meetings
- Use of Points system for scoring
- Use of pair or triple evaluation method
- Adequate use of Margin of Preference
- Separation of technical, financial & legal evaluations
- No informal communication with tenderers
- Formal requests for clarification from tenderers
- Formal tender evaluation report
- Involvement of a neutral observer

4. Documents and data to be collected

- Pre-tender meeting minutes - Opening session minutes - List of Panel's members + CVs
- Tender Bids original copies
- Non-objection or approval notices
- Duration of tender evaluation
- Name and quality of tender evaluation process observer
- Applied rate of margin of preference
- Tender Evaluation Report final draft

5. Specific Indicators to be used

- Number & Nationalities of tenderers
- Degree of Competitiveness
- Applied rate of Margin of Preference
- Time Performance Index
- Cost Estimate Accuracy w.r.t. bids' prices
- Documentation Compliance Rate
- Capacity Qualification Ratio (Tender Evaluation Panel)

6. Elementary Effectiveness assessment

- See application example in next pages

Sheet 6 : Tender Pre-Award assessment frame

1. Input / Expected Output

- Tender Evaluation Report / - Contract Award

- 2. Critical points and issues to look at**
- Evaluation Report recommendations
 - Risks Analysis results
 - Pre-award survey results
 - Claims and Complaints or Protests
 - Results disclosure conditions
 - Pre-award meeting conditions
 - Evaluation Report approval process
 - Availability of funds
- 3. Standard Practices to be used**
- Pre-award meeting
 - Publication of tender results
 - Debriefing meeting
 - Commit and secure funds
 - Resolution of disputes (if any) before final award
 - Adoption of Evaluation Report
- 4. Documents and data to be collected**
- Non-objection notice for evaluation report
 - Pre-award meeting minutes
 - Debriefing meeting minutes - Results disclosure duration - Winner's complete data and bid
 - Dispute resolution reports (if any)
 - Funds Availability Attestation
- 5. Relevant Indicators to be used**
- Time Performance Index
 - Publicity extent of the whole process
 - Cost Estimate Accuracy w.r.t. to contract amount
 - Number of Complaints or Requests registered
 - Approvals Compliance Rate (global)
 - Documentation Compliance Rate (global)
 - Capacity Qualification Ratio (Award panel)
- 6. Elementary Effectiveness**
- See application example in next pages

Sheet 7 : Summary and synthesis sheet

1. TENDER PLANNING

Name of Assessor
 Date of Assessment
 Score of Elementary Effectiveness
 Summary of comments

Signature

2. TENDER DOCUMENTATION

Name of Assessor

Date of Assessment

Score of Elementary Effectiveness

Summary of comments

Signature

3. TENDER SOLICITATION

Name of Assessor

Date of Assessment

Score of Elementary Effectiveness

Summary of comments

Signature

4. TENDER EVALUATION

Name of Assessor

Date of Assessment

Score of Elementary Effectiveness

Summary of comments

Signature

5. TENDER PRE-AWARD

Name of Assessor

Date of Assessment

Score of Elementary Effectiveness

Summary of comments

Signature

6. SYNTHESIS FOR OVERALL EFFECTIVENESS ASSESSMENT

Code	Main Phases	Elementary Effectiveness	Weights (Coef.)	Actual Values	Remarks
1	Tender Planning				
2	Tender Documentation				
3	Tender Solicitation				
4	Tender Evaluation				
5	Tender Pre-Award				
	Overall Effectiveness E =				

7. CONTRACTING AUTHORITY DECISION

Title of Contracting Authority	
Name of the Authority	
Score of Overall Effectiveness	
Summary of comments	
Final decision	
Date	
Signature	

ASSESSMENT PROCEDURE AND SCORING SYSTEM

7.4.1 Assessment procedure

The assessment procedure involves following steps:

- 1) Examine the quality of the input under assessment,
- 2) Find out if the critical points and issues are properly addressed,
- 3) Check the conformity of performed practices to standard practices required,
- 4) Get the actual measures through analysis of collected documents and data on the process,
- 5) Compare actual measures to target values and use the differences to score the performance of each indicator using the scoring system below.
- 6) Get the actual weighted effectiveness value by multiplying the performance value by the weight of the indicator,
- 7) Get the elementary effectiveness (e_i) by summing up the individual indicators weighted values and divide it by the sum of their weights,
- 8) Get the Overall Effectiveness (E) by summing up the five elementary effectiveness values.

7.4.2 Scoring system

According to Bourne et al. (2003), Effectiveness measures can be defined in a binary manner (e.g. goal achieved or not achieved) or by specifying a percentage by which the goal has been achieved (e.g. 82% in an assessment). However, there are a variety of scoring systems adopted for the assessment of performance. For instance, the CPAR adopted a scale of 0 to 3 by plotting graph. Others use 1 to 5 or 0 to 10, and so forth. But, to be aligned with the spirit of the AHP developers", the present framework adopted a scale of 0 to 9 corresponding to the following qualitative appreciations in Table 7.1.

7.4

Table 7.1: Indication of scoring or marking system

Qualitative	Marks appreciation
Perfect	8.0 – 9.0
Excellent	7.0 – 7.9
Very good	6.0 – 6.9
Good or acceptable	5.0 – 5.9
Fair	4.5 – 4.9
Not acceptable	2.5 – 4.4
Nil or worthless	0.0 – 2.4

Source : Author's construct

Important note: Figures above are indicative and therefore must be handled with flexibility.

i. For example, when the actual measure of an indicator equals to or better than the target value, the score is 9. When the actual measure is less than the target value, the proportionate scale or „pro rata“ needs to be applied to achieve the mark. Ultimately, latitude is given to the assessor to appreciate and mark according to his conviction. ii. The value **nine (9)** may be considered as target value that has to be attained by every project through a functional and effective tendering process. In the scale of marks proposed above, the figure **six (6)** corresponds to very good; that is why,

- a. When elementary effectiveness (e_i) is < 6 , the process has to be re-done; if $e_i \geq 6$, the process continues to the next phase.
- b. When overall effectiveness E is < 6 , the whole CTP process is to be cancelled; if $E \geq 6$ the contract is awarded to the recommended winner.

iii. When data are not available or missed or even unreliable, the assessor has to judge and score based on his experience.

.3 Target values

Target values are most often provided in laws and regulations of every country. Thus, they may vary strongly with the nature and the surrounding context in which the project is planned as well as objectives to achieve. Some target values are explicit (e.g. time) whereas others are implicit or interpreted or simply inferred (e.g. % of savings). Target values displayed in Table 7.2 are extracted from Chadian context. Also, this table gives full description of established Key Measurable Indicators and their expressions as well as corresponding target values.



Table 7.2 : Key Measurable Indicators with Target values

Rank	Indicator's designation	Brief description of Indicator	Formula / Expression Unit	Target values
1	Time for tender preparation	Is the actual time the last tenderer get for bid preparation	(Date of bids submission – Date of last tender documents sold) ; In days	≥ 45 days
2	Advertisement total duration	Actual duration of the tender announcements	(Date of last announcement –Date of first announcement); In days	≥ 15 days
3	Number and Nationalities of Bidders	Combined Number of national bidders and Foreign bidders	(National Bidders + Foreign Bidders) / 2 ; Numerical number	≥ 5
4	Publicity frequency	Frequency of advert diffusions/publication in a week	How many times the advert was published in a week; Numerical number	≥ 2 times
5	Time Performance Index	Is the actual ratio of the time performance and time allocated for the phase	(Time performed / Time allocated) ; Numerical number	≤ 1
6	Number of complaints or requests generated	Expresses a sort of bidders' satisfaction	Number of formal complaints or requests for clarification registered; Numerical number	$= 0$
7	Cost Estimate Accuracy	Is the actual variations of estimates as compared to initial budget	[(Initial Budget – Actual Estimate)/Initial budget]x100; In percentage	> 0 and $< 15\%$
8	Publicity extent	Number of different media used for advertisement	Number of News-paper, radio, TV, Internet, Numerical number	≥ 3 media
9	Approvals Compliance Rate	Is the actual ratio of required approvals and performed approvals along the process	(Approvals performed / Approvals required) x 100; In percentage	$= 100\%$
10	Degree of Competitiveness	Expresses variations among of bids' prices	[(High bid - Low bid) / Winner Bid] x 100); In Percentage	$\leq 10\%$
11	Documentation Compliance Rate	Is the actual ratio of the total number of documents required & recorded and provided	(Recorded Proceedings provided / proceedings required) x 100 ; In Percentage	$= 100\%$

12	Applied Rate of Margin of Preference	Actual rate used for that particular project as compared to the prescribed	Applied fraction of the prescribed Margin of Preference; In Percentage	$\leq 10\%$
13	Capacity Qualification Ratio	The level of Capacity qualification (appropriate profiles via CVs)	(Qualified members / Non-qualified members) ; Numerical number	≥ 1

Source : Author's construct



7.4

7.4 Elementary Effectiveness Assessment

The elementary effectiveness assessment follows 3 steps. First, compare collected data to target value and score the actual measure of the Indicator accordingly. Second, the actual measure of an indicator is multiply by its weight to get a weighted value of the considered indicator. Third, the sum of weighted values is divided by the sum of indicator's weights to give the score of the elementary effectiveness. As explained earlier, if $ei < 6$, the process has to be re-done; if $ei \geq 6$, the process continues to the next phase.

7.4.5 Overall Effectiveness Assessment

The assessment of the overall effectiveness (E) follows also 2 steps. First, the actual measure of elementary effectiveness is multiplied by its weight to get a weighted value of the considered phase. Second, the sum of the weighted ei values gives the Overall Effectiveness. Again as explained earlier, if $E < 6$, the whole process is cancelled; if $E \geq 6$ the contract is awarded to the recommended winner.

7.5 VALIDATION OF THE PROPOSED FRAMEWORK

7.5.1. Concept of Validation of framework

The concept of validation has different meanings in the various stages of the research process. In principle, any attempt at validating a research process should reasonably aim at integrating the three domains especially the conceptual, methodological and empirical (Ahadzie, 2007). What matters after the development of a substantive framework is its generalisation and transferability that have to be validated to ensure that it represents the characteristics of the general population and that they are not specific to the samples used in the estimation. Therefore, it would be expected that the framework should be valid.

7.5.2 Objective of the framework validation

The validation of the proposed framework is important because it reflects its potential objectivity, reliability, and practicability (Mohamed, 2007). Also it is part of the development process because the reliability of the framework outputs is crucially dependent on the validity of the tool itself. Owing to the fact that the framework is intended to help contracting authorities to make better decisions, decisions that are informed by objective and quantifiable performance measures, it will be relevant to have their feedback on its utility and practicability. To that end, a synthesis of the framework including an implementation example and a one-page questionnaire was prepared. The purpose of the questionnaire is to test the understanding, the explicitness and simplicity, the usefulness, the practicability and the adoption of the framework with respect to its purpose (see questionnaire sample in Appendix 2).

7.5.3 Framework Validation Process

As validation method, we adopted approaching some experts to comment on relevant constituents of the framework through questionnaire. First, the questionnaire draft made up of seven (7) close ended questions and one open, was analysed by the supervision team before its administration. A group of fourteen (14) procurement structures and independent procurement experts is purposively selected in Ghana, Chad, and USA. These include Contracting Authorities, Procurement Officers, Project design team leaders, Construction Project Managers, Quantity Surveyors, and Sponsor (1). All questionnaires were sent through email and out of the 14 issued, 7 valid questionnaires were returned representing 50%. The summary of the feedback is given below.

7.5.4 Framework validation feedback

The first question is on the rating of agreement with the study key findings using the 3 points Likert scale where 1 = Don't agree, 2 = Fairly agree and 3 = Strongly agree. These findings are the seven criteria, thirteen measurable indicators, five critical phases and thirty eight standard practices that constituted the framework. Respondents' answers are presented in Table 7.3 which shows an average of 75% of respondents strongly do agree on the relevance of these findings. Therefore it can be concluded that all these constituents are relevant to the framework.

Table 7.3: Responses to question one

Code	Different Components of the framework	Frequency / Percentage of 1	Frequency / Percentage of 2	Frequency / Percentage of 3
1	Relevant Criteria	0 / 0%	2 / 28.57%	5 / 71.43%
2	Key Measurable Indicators	0 / 0%	3 / 42.86%	4 / 57.14%
3	Critical Phases	0 / 0%	1 / 14.29%	6 / 85.71%
4	Standard Practices	0 / 0%	1 / 14.29%	6 / 85.71%
Average of % =		-	25 %	75%

Concerning the other questions, responses are summarised in the Table 7.4.

The analysis of these results indicates that all respondents understand the framework which is explicit at 71.43%. A majority of 57.14% found it simple. Interestingly enough is that 85.71% of respondents found the framework practical and are ready to use it. As a result of that, 100% agree that this framework can be further developed into a management tool. However, following suggestions for improvement are formulated by respondents: the production of a user's guidelines and the computerisation to make it friendly to end-users.

Other suggestions are related to the emphasis that has to be put on feasibility study at the planning phase and the involvement of sustainability criteria. The framework validation process was very helpful in the sense that it has positively contributed to the improvement of the final structure in Appendix 3.

Table 7.4: Responses to questions 2 to 7

Code	Different Criteria	Frequency	Percentage
2 Understanding of fundamental components of the Framework			
2.a	No Understandable	0	0
2.b	Understandable	4	57.14
2.c	Well understandable	3	42.86
3 Explicitness of the proposed Framework			
3.a	No Explicit	0	0
3.b	Explicit	5	71.43
3.c	Very Explicit	2	28.57
4 Simplicity or Complexity of the proposed Framework			
4.a	Complex	3	42.86
4.b	Simple	4	57.14
4.c	Very Simple	0	0
5 Practical tool for assessment			
5.a	Yes	6	85.71
5.b	No	1	14.29
5.c	Need more development	0	0
6 Readiness to use the proposed Framework			
6.a	Yes	6	85.71
6.b	No	1	14.29
7 Agreement for development into a management tool			
7.a	Yes	7	100

7.b	No	0	0
7.c	Don't know	0	0

Globally the feedback was favourable and suggested that the framework is likely to achieve the intended purpose. However, following limitations have to be acknowledged: the small size of the group of participants that can limit the generalisation of the results and the lack of the proper implementation may be another limitation. Finally, a demonstrative example of application is provided below for further understanding of the implementation procedure.

7.6. EXAMPLE OF APPLICATION

This full application example is provided to demonstrate how the developed framework works. Data used in this example are merely proposed by the author to help understanding the scoring system and the assessment process at all levels.

Table 7.5 : Elementary Effectiveness at Tender Planning

Measurable Indicators	Target Values	Actual measures	Assess. Score (X)	Weights (Ki)	Actual Values (X*Ki)
1.Time Performance Index	≤ 100%	120%	5	0.077	0.385
2. Cost Estimate Accuracy	≤ 100%	90%	8	0.065	0.520
3. Publicity extent	≥ 3	2	7	0.059	0.413
4. Number of approvals and controls performed	= 100%	100%	9	0.051	0.459
5. Documentation Rate	= 100%	50%	4	0.037	0.148
6.Capacity Qualification ratio (Project team)	= 100%	30%	3	0.013	0.039
Sum =				0.302	1.964
Elementary Effectiveness at phase 1 (e1) = 1.964 / 0.302 =					6.503

Table 7.6 : Elementary Effectiveness at Tender Documents

Measurable Indicators	Target Values	Actual measures	Assess. Score (X)	Weights (Ki)	Actual Values (X*Ki)
1.Time Performance Index	≤ 100%	90%	9	0.077	0.693

2. Cost Estimate Accuracy	≤ 100%	80%	6	0.065	0.390
3. Number of approvals and controls performed	= 100%	100%	9	0.051	0.459
4. Documentation Rate	= 100%	80%	7	0.037	0.259
5. Capacity Qualification ratio (Tender commit.)	= 100%	25%	3	0.013	0.039
Sum =				0.243	1.840
Elementary Effectiveness at phase 2 (e2) = 1.840 / 0.243 =					7.572

Table 7.7 : Elementary Effectiveness at Tender Solicitation

Measurable Indicators	Target Values	Actual measures	Assess. Score (X)	Weights (Ki)	Actual Values (X*Ki)
1. Time Performance Index	≤ 100%	115%	6	0.077	0.462
2. Advertisement total duration	≥ 21 days	22 days	9	0.148	1.332
3. Publicity Extent	≥ 3	4	9	0.059	0.531
4. Publicity frequency	≥ 3	2	7	0.085	0.595
5. Number of requests of clarifications	= 0	2	7.5	0.073	0.548
6. Time allocated for tender preparation	≥ 60 days	75 days	9	0.169	1.521
Sum =				0.611	3.468
Elementary Effectiveness at phase 3 (e3) = 3.468 / 0.611 =					8.165

Table 7.8 : Elementary Effectiveness at Tender Evaluation

Measurable Indicators	Target Values	Actual measures	Assess. Score (X)	Weights (Ki)	Actual Values (X*Ki)
1. Number and Nationalities of Bidders	≥ 5	4	8	0.145	1.160
2. Time Performance Index	≤ 100%	75%	9	0.077	0.693
3. Cost Estimate Accuracy	≤ 100%	95%	8.5	0.065	0.552
4. Degree of Competitiveness	= 100%	96%	8	0.044	0.352
5. Applied Rate of Margin of Preference	≤ 10%	0%	9	0.034	0.306
6. Capacity Qualification Ratio	= 100%	15%	2	0.013	0.026
7. Documentation Rate	= 100%	100%	9	0.037	0.333
Sum =				0.415	3.422
Elementary Effectiveness at phase 4 (e4) = 3.422 / 0.415 =					8.246

Table 7.9 : Elementary Effectiveness at Tender Pre-Award

Measurable Indicators	Target Values	Actual measures	Assess. Score (X)	Weights (Ki)	Actual Values (X*Ki)
1.Time Performance Index	≤ 100%	98%	7.5	0.077	0.578
2.Number of complaints or litigations generated	= 0	2	7.5	0.073	0.548
3.Cost Estimate Accuracy	≤ 100%	90%	8	0.065	0.520
4. Publicity extent	≥ 3	2	7.5	0.059	0.442
5. Approvals Compliance Rate	= 100%	75%	7	0.051	0.357
6. Documentation Compliance Rate	= 100%	75%	6	0.037	0.222
7. Capacity Qualification Ratio (Award commi.)	≥ 100%	50%	6	0.013	0.078
Sum =				0.316	2.745
Elementary Effectiveness at phase 5 (e5) = 2.745 / 0.316 =					8.687

Table 7.10 : Overall Effectiveness Assessment

Main Phases	Elementary Effectivenesses (X)	Weights (Kp)	Actual Values (X*Kp)
1. Tender Planning	6.503	0.363	2.360
2. Tender Documentation	7.572	0.261	1.976
3. Tender Solicitation	8.165	0.161	1.314
4. Tender Evaluation	8.246	0.137	1.130
5. Tender Pre-Award	8.687	0.079	0.686
Sum =		1.000	7.466
Overall Effectiveness E = 7.466 / 1.000 =			7.466

According to the adopted scoring system, all the calculated **e_i** are over 6; hence they are very good and E is equal to 7.466 meaning that the Effectiveness level is $7.466 / 9 = 0.823$ or 82.3 % which is Excellent. So, the contract is awarded to the recommended winner. To have the framework working perfectly, the assessment at all phases of the process must be performed by independent experts or bodies trained and set for this task.

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CHAPTER EIGHT

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

8.1 INTRODUCTION

This chapter presents the summary of findings followed by the conclusions and major contributions of the study. Then, limitations are briefly recognized and recommendations are made. Finally, a short summary ends the thesis report.

8.2 SUMMARY OF FINDINGS

With the aim of developing a framework for assessing the effectiveness of CTP of public works procurement at pre-contract stage in Chad, the study has set six specific objectives to achieve it. So, from the analysis of collected data, following findings were revealed and presented below with respect to objectives.

Objective 1: Appraisal of major challenges facing the implementation of CT in Chad

The study has revealed following major challenges confronting CT in Chad: delay, no respect to laws and regulations, corruption, lack of transparency and public accountability, poor performance of structures and staff, very long process, etc. Unfortunately, as in many developing countries, despite reforms undertaken for years, even when necessary legal and institutional frames are in place, there is no sufficient improvement in the day to day transactions of public works procurement through Competitive Tendering.

Objective 2: Definition of a baseline of standard practices

A thorough compilation of PP laws, regulations, procedure manuals, and other related documents from seven developing countries resulted in defining 20 standard practices along the five critical phases and the complete list is given in Table 6.14 of section 6.6.

Objective 3: Identification of relevant effectiveness criteria of CTP

Study results show that the most relevant effectiveness criteria are in order of importance Transparency and public accountability, Fairness and Equity, Competitiveness, and Compliance. Consequently, to be effective, a CTP has to be transparent, fair and competitive to achieve at least 70% of the expected performance and could even reach 80% when the process complies perfectly with rules and procedures. Also, it appears clear that all these criteria are interrelated and interdependent as demonstrated by the ranking of their related indicators.

Objective 4: Establishment of Key Measurable Indicators (KMI)

Based on the results obtained and analysed, none of the 13 identified indicators has scored zero weight meaning that each of them contributes to the achievement of the overall effectiveness of CTP in Chad. However, the KMIs are in order of importance Time for tender preparation, Advertisement total duration, Number and Nationalities of Bidders, Publicity frequency, Time Performance Index, Number of complaints or requests generated, Cost Estimate Accuracy, Publicity extent, and Approvals Compliance Rate.

Objective 5: Determination of the Contributions of critical phases of CTP

From data analysis, Planning phase is the first with 0.363 followed by Tender Documentation and Tender Solicitation with 0.261 and 0.161 respectively. Interestingly, the first two phases contribute up to 0.624 or 62.40% in the accomplishment of the overall effectiveness.

Objective 6: Development of a Framework for assessing the effectiveness of CTP With the above findings, a framework was developed consisting of a systematic sequence of six (6) steps involving assessment of elementary effectiveness of the five phases (one after another as stairs) and the overall effectiveness for the whole process. With respect to the specifics of every phase, KMIs are distributed as follows per phase:

- Phase 1 : six (6) indicators,
- Phase 2 : five (5) indicators,
- Phase 3 : six (6) indicators, - Phase 4 : seven (7) indicators, and
- Phase 5 : seven (7) indicators.

Then, an assessment procedure and a scoring system are proposed and used in an illustrative example. Finally, referring to the foregoing and for an easy exploitation, main findings are summarized below in the Table 8.1 with respect to the six specific objectives.

Table 8.1: Summary of findings with respect to specific objectives

Item	Specific Objectives	Responses to Objectives
1	To appraise Major Challenges facing the implementation of CT in Chad	13 Major Challenges are identified and ranked according to their importance (see section 6.3)
2	To define a Baseline of Standard Practices for an effective CT Process	20 Standard Practices are defined along with the five critical phases of the process (see section 6.6)
3	To identify relevant Effectiveness Criteria of CT Process	7 Relevant Criteria are determined and ranked according to their weights (see section 6.4)
4	To establish Key Measurable Indicators for assessing the Effectiveness of CT Process	13 Key Measurable Indicators are established and rank according to their weights (see section 6.4)
5	To determine the Contributions of critical Phases of the CT Process	The contributions of phases in order of importance are: planning (0.292), Documentation (0.190), Solicitation (0.203), Evaluation (0.101), Pre-award (0.085). (see section 6.5)
6	To propose and validate a Framework for assessing the Effectiveness	A framework is developed with six assessment sheets and a graphical model is provided. (see chapter 7).

8.3 MAIN CONCLUSIONS OF THE STUDY

In the light of all what precedes, following points are the salient conclusions of the study.

- ✓ CT offers several benefits provided it is implemented effectively. But in Chad, many challenges are confronting this. For instance, delay is observed at all levels, lengthy process difficult to perform, laws and regulations are frequently violated, and inevitable corruption is everywhere. Moreover, performance of procurement institutions and personnel are very poor.
- ✓ For a CTP to be effective in Chad, it has to be transparent, fair, competitive, compliant with laws and regulations, and above all, conducted by people with high ethical behaviour. Surely, a transparent process enhances competitiveness, fairness and equity, and when transparency, fairness and equity are secured, competition is inevitably promoted leading naturally to an economy in cost and time; hence hampers corruption.
- ✓ The established KMIs are not only smart but straightforward, easy to understand, to assess and to interpret. Especially, time indicators are predominant indicating that time has to be managed rationally during the tendering process.
- ✓ Though various effectiveness assessment tools are in use but none is able to assess systematically the overall Effectiveness of tendering operations at every procuring entity level for every individual project by every procuring authority.
- ✓ The study provides a practical demonstration of a successful application of AHP method in the Construction Project Management in assessing the overall performance of CTP.
- ✓ The developed framework is an effective tool for Contracting Authorities to support objective decision making. Also, it has the potential to improve substantially the

effectiveness of Public Procurement and when fully implemented, will surely produce the predicted results.

- ✓ The implementation of developed framework will offer the opportunity to Procurement Officers to have a clearer idea of what contracting authorities expect from them. In all probability, the full implementation of the developed framework, the monitoring of the most relevant criteria and the mandatory use of defined standard practices at all levels of public works procurement entities will certainly improve the effectiveness of CTP in Chad.

8.4 MAJOR CONTRIBUTIONS OF THE STUDY

According to Walker (1997) cited by Ahadzie (2007), an original contribution to knowledge is an important concern in any doctoral research and that can be demonstrated by a development of new methodologies, tools and techniques, new areas of research, new interpretation of existing material, new application of existing theories to new areas, or a new blend of ideas. Accordingly, major contributions to knowledge of this research are briefly presented below.

8.4.1 A new research approach

Researches in the field were mostly focused on the performance of the "hard" outcome (i.e. physical works) rather than the "soft" output (i.e. works contract). Thus, this research contributes to highlight the existence of direct relationships between "soft" and "hard" products. Further, the development of such framework is among the rare attempts to integrate multiple criteria into a synthetic practical tool for data generation and processing in order to evaluate numerically the effectiveness of tendering process in public works procurement. Moreover, it describes how abstract and concrete, newer and traditional performance criteria

interact to impact positively the achievement of an excellent level of tendering process effectiveness.

8.4.2 New Effectiveness Key Measurable Indicators (EKMI) for procurement performance

The established EKMI constitute another major contribution in the sense that they are not only smart as required of any performance measure (Clivilé, 2004), but they are also straightforward, easy to understand, to evaluate and interpret, and in a manageable number (only 13 in total) as compared to the tens KPIs of CPAR and PPME.

8.4.3 A Multipurpose Decision making support Tool for Contracting Authorities

Although, a variety of administrative and management tools have been used in audits or evaluations of performance of PP, the developed framework is a very simple tool that can serve multiple purposes: (1) It helps Contracting Authority to monitor the progress of the process at any time. (2) It allows an assessment of the productivity, competency, and ethical conduct of procurement officers. (3) It helps in collecting data and documents on a specific project to backup any critical decision. Besides the simplicity, the operation of the tool does not demand specific qualification or skills from Contracting Authority.

8.4.4 Improved understanding of Effectiveness Assessment Process

The elaboration of the research conceptual framework and the description of different components have improved the understanding of the concepts behind Effectiveness

Measurement and Management in general as well as their adaptation into Construction

Project Management especially in works procurement at pre-contract stage.

8.4.5 Another Methodology in Construction Management discipline

The development of the framework has given an occasion to develop a consistent methodology to determine the weights of criteria, indicators and critical phases and integrate

them in a logical procedure of assessing Overall Effectiveness. This adapted AHP methodology involving nine steps is described in section 5.6.2. Moreover, the framework is another successful application of AHP in overall performance measurement in Chad where reliable data are rather scarce.

In brief, the adoption of the Multi-criteria Performance Measurement Concept which has not previously been well explored in regard to the performance of tendering processes, but while widely used in other industrial sectors, can be noted as a contribution too. Furthermore, the concept of linking the project performance at pre and post contract stage can be viewed as a novel contribution in construction management research. That is why, owing to the relatively important knowledge gap in Performance Measurement in Construction Industry, any step toward its filling, whatever significant is it, has to be acknowledged and encouraged. Besides, as matter of fact, research in construction industry in general and in Construction Management field in particular, is very scarce in Chad. That is why, the present work may be considered as a pioneering academic endeavour in this direction. So, it is an additional relevant contribution to knowledge even with limitations.

8.5 LIMITATIONS OF THE RESEARCH

It would be pretentious to assert that findings are complete and finished. It is simply one block of the building of knowledge body or one representation of performance measurement reality, built to explain and solve a particular problem in Chad. Additionally, all survey researches are bound to limitations, and the present work cannot be an exception, so other limitations will eventually appear when practitioners will fully implement the framework in real world. Consequently, beyond limitations mentioned in the scope, other limitations of the framework are recognised below:

- ✓ The 13 KMIs established cannot represent the numerous dimensions of broad and complex concepts of transparency and public accountability, fairness and equity, competitiveness, compliance, timeliness, cost and ethics in public procurement. Thereby, some were certainly ignored.
- ✓ Only the traditional procurement system (i.e. Design, Bid and Build - DBB) is considered meaning that modern and other procurement systems are therefore excluded. Yet, it is a fact that DBB is no more the best way in works procurement (Watermeyer, 2013).
- ✓ The study did not consider external factors like the bidder supply market and economic global environment which may surely affect the success of a CTP.

Finally, the successful completion of this research provides an important stepping stone for further research as indicated in the following section.

8.6 RECOMMENDATIONS

Performance assessment is increasingly being recognised as a means for improving the managerial excellence in public governance in developing countries. Therefore, the successful development of the framework for assessing effectiveness at pre-contract stage suggests that there is a potential for the subsequent development at post-contract and post occupancy as well. Not only that, findings and limitations of this work point to potentially further investigations.

8.6.1 To Contracting Authorities and Procurement Professionals

- ✓ Contracting Authorities have to apply this effectiveness assessment tool before approving any contract award in order to improve the effectiveness of CTP.
- ✓ Procurement professionals will use findings as a guide in defining best practices and furthermore, they could be a foundation for reforming legal and institutional frameworks.

- ✓ As there is a need to match the skills of procurement officers to the core performance assessment competencies, Universities and other training institutions are to design and promote new modules for capacity building.

8.6.2 To the Government of Chad

In Chad where construction industry is gradually developing on one hand and given the prominent and strategic roles of a functional PP system in the economic development on the other hand, it is recommended:

- ✓ The full implementation of the developed framework to improve the effectiveness of PP function.
- ✓ The building of sufficient capacity to properly manage and conduct procurement processes,
- ✓ To insulate procurement officers from corruption and interference by high-ranking politicians, and
- ✓ To put in place an independent body of experts in charge of the mandatory implementation of this tool including the assessment itself.

However, as recommended by Watermeyer (2012), for procurement practices to change in Chad will require a change of mind-set amongst leaders and officials alike in which procurement rules are taken seriously at all levels and violations of these rules are not tolerated. Ultimately, the researcher believes that this framework will be adopted by the construction projects managers and recommend its computerisation for easy usage.

8.6.3 For further research

Following areas are proposed for further research :

- ✓ Development of a computer-based platform to run the developed framework ;

- ✓ Exploration of additional Effectiveness Key Measurable Indicators to cover all aspects ;
- ✓ Exploration of the impact of a high effectiveness on the final outcome (works realized);
- ✓ Use more statistical data to achieving meaningful weights of most relevant criteria, key measurable indicators and critical phases of CTP ;
- ✓ Assess the ability and applicability of the framework in the real world for its adoption;
- ✓ Extension of the framework boundary to include the whole project lifecycle as well as the external factors like the bidder supply market.

8.7 SUMMARY

This chapter has provided a review of the original research objectives and the extent to which they were achieved. The main conclusions have been presented and the limitations of the research findings have been acknowledged. Recommendations for further research and for Contracting Authorities as well as for Chadian Government have been made.

Undoubtedly, it is contended that the developed framework has the potential for improving the Effectiveness of CTP in developing countries that have similarities with Chad. Further, it is able and valid to fulfil its expected function in aiding Contracting Authorities to make objective decisions based on performance and also it contributes to personnel's capacity development in tendering process management. However, for procurement practices to change in Chad will require a lot of effort and political willingness.

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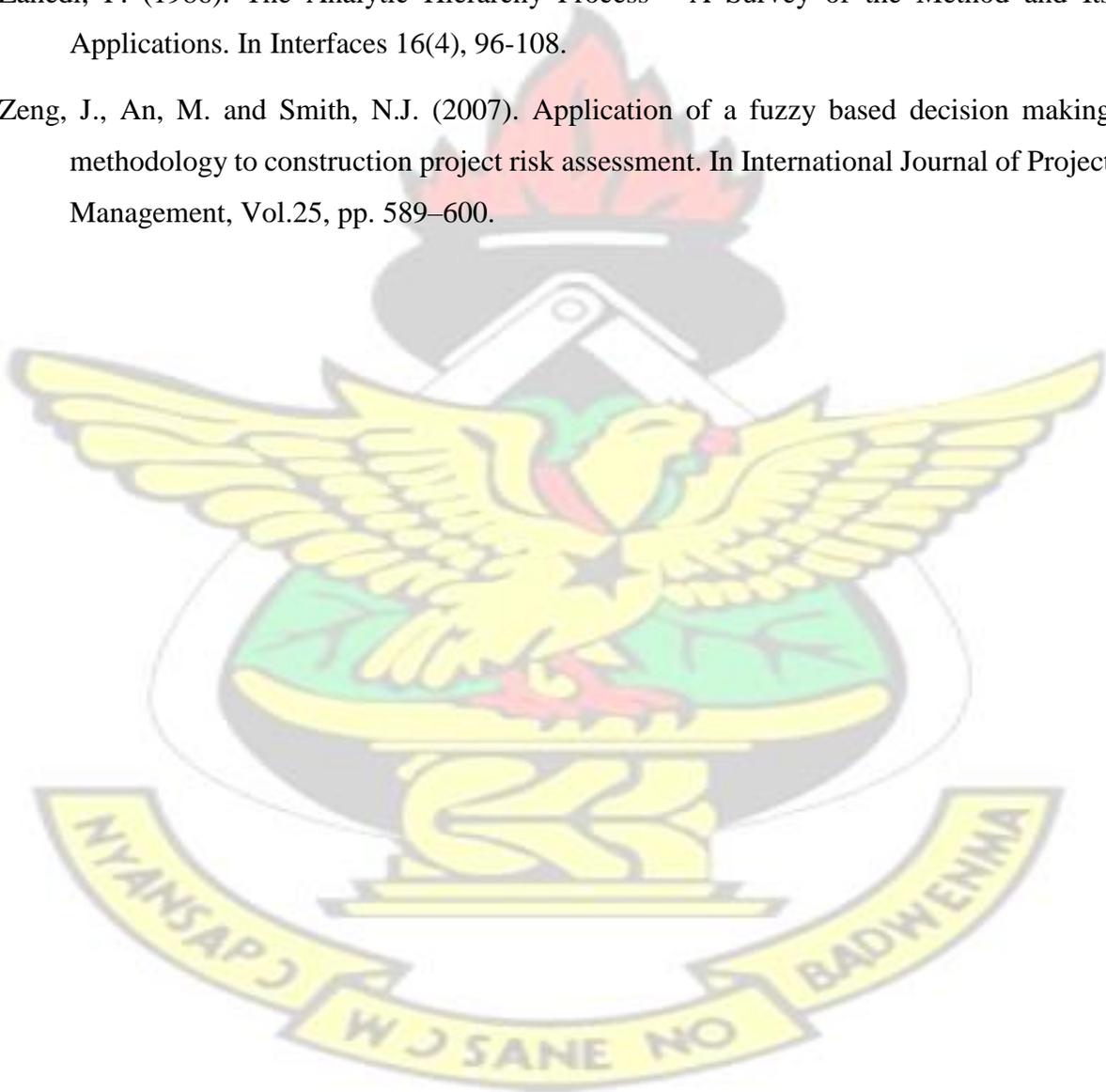
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APPENDIX 1:

RESEARCH QUESTIONNAIRE

Dear Madam / Sir

This questionnaire forms part of a research project on the development of a **Framework for Assessing the Effectiveness of Competitive Tendering Process in Public Works Procurement at Pre-Contract Stage in Chad** undertaken by a PhD student in Building Technology Department at KNUST - Ghana.

Your participation by rating these **Criteria and Indicators and Phases** using this scale will allows us to compute their respective weights on the overall Effectiveness.

A. GENERAL

A.1. Please, tick the appropriate category that best describes your organisation:

- Contracting Authority, Technical unit in charge of works procurement
- Procurement entities like OCMP, COJO, CRRA
- Consulting Firm
- Contractor
- Donor or Sponsor

A.2. Please, indicate your profession:

- Architect, Engineer or Building Technician
- Project Manager
- Procurement Specialist

A.3. Please, indicate your highest level of qualification:

- A level + 2 Years (BAC + 2)
- A level + 3 Years (BAC + 3)
- A level + 4 Years and more (BAC + 4 et plus)

A.4. Please, indicate your years of experience in works procurement:

- Less than 5 years
- Between 5 to 10 years
- More than 10 years

B. PART ONE**IDENTIFICATION AND RATING OF MAJOR CHALLENGES FACING THE IMPLEMENTATION OF COMPETITIVE TENDERING PROCESS IN CHAD**

B.1 Below are some major challenges that are facing the implementation of Competitive Tendering (CT) in Chad. Please assess them according to their importance by ticking the appropriate box below as

1 = Unimportant, 2 = Of little importance, 3 = Moderately important, 4 = Important, 5 = Very important

Code	Major Challenges	1	2	3	4	5
1	Delay in the processing of CT document					
2	No respect to regulations and prescribed time-limits					
3	Complexity of laws and regulations of CT					
4	Length or duration of CT procedures					
5	Poor capacity of personnel in charge of the implementation of CT					
6	Poor performance of structures in charge of the implementation of CT					
7	Generalized and systematic overprice of bids					
8	Lack of transparency and public accountability					
9	Poor openness of the competition in CT					
10	Absence of Equity and Fairness in the award of contracts					
11	Corruption in the acquisition of contracts					
12	Political interferences in the award of contracts					
13	Abuse of Power in the award of contracts					
14	Fraudulent practices (swindling)					
15	Absence of Regulation body					
16	Other to provide					

B.2. At what level of the process the delay is very severe? Please, tick the appropriate box below using Y = yes; N = no; DK = Do not know.

Code	Different phases of the process	Yes	No	Don't know
1	At the Tender Documents preparation level			
2	At the Tender Evaluation Process level			
3	At the Award of Contract Process level			
4	At the Contract Approval Process level			

B.3. Assess the main issues of laws and regulations governing CT according to their importance using the following scale:

1 = Unimportant, 2 = Of little importance, 3 = Moderately important, 4 = Important, 5 = Very important

Code	Issues of legal and regular texts governing CT	1	2	3	4	5
1	Complexity (difficult to understand) of the texts					
2	Rigidity (difficult to adapt) of the texts					
3	Flexibility (easy to bypass or manipulate) of the texts					
4	Maladjustment of the texts to the current context of the country (obsolescence)					
5	Absence of some implementation decrees					
6	Ignorance of the texts					

B.4. Assess the performance of the following structures and entities involved in the implementation of Competitive Tendering using the following scale:

1 = Nil, 2 = Fail, 3 = Pass, 4 = Good, 5 = Very Good

Code°	Different structures and entities	1	2	3	4	5
1	Public Procurement Board (OCMP)					
2	Contracting Authority (ministries, high state institutions)					
3	Technical units in charge of tender documents development					
4	Procurement Unit of Ministries					
5	Tender Committee (COJO) of Ministries					
6	Tender Evaluation Panel (SCTE)					
7	Commission of Qualification/Selection of contractors					
8	Commission of Pre-qualification of bidders					
9	Procurement Appeal Board (CRRRA)					
10	State General Inspectors" body					
11	Chamber of counts of the Supreme Court					
12	Other to provide					

B.5. Assess the main constraints that limit the smooth functioning of the procurement entities by using the following scale:

1 = Unimportant, 2 = Of little importance, 3 = Moderately important, 4 = Important, 5 = Very important

Code	Main constraints of procurement structures and entities	1	2	3	4	5
1	Lack of personnel in quantity and quality					
2	Lack of working means (equipment)					
3	Lack of adequate offices and premises					
4	Lack of financing					
5	Institutional and Administrative issues					
6	Deficiency of legal and regular framework					
7	Other to provide					

B.6. Identify and Assess the main issues of personnel in charge of the implementation of CT according to their importance using the following scale:

1 = Unimportant, 2 = Of little importance, 3 = Moderately important, 4 = Important, 5 = Very important

Code	Issues of Personnel in charge of CT	1	2	3	4	5
1	Poor qualification of personnel					
2	Lack of experience in works procurement of the personnel					
3	Overload of work on the personnel					
4	Lack of motivation of the personnel					
5	Complaisance in the recruitment of the personnel					
6	Deficiency in ethics and deontology of the personnel					
7	Shortage of personnel					
8	Other to provide.....					

B.7. Identify and assess the relevant factors that favouring the overpricing of bids by using the following scale:

1 = Unimportant, 2 = Of little importance, 3 = Moderately important, 4 = Important, 5 = Very important

Code	Factors favouring the overpricing of bids	1	2	3	4	5
1	Non implementation of the official price list					
2	Massive utilization of negotiation for award of contract					
3	Award of many contracts to few privileged contractors					
4	Cartel Problem (agreement between some bidders)					
5	Inflation of construction materials' costs					
6	Monopoly of some contractors in some domains					
7	Fraud and Corruption					

C. PART TWO:

DETERMINATION OF RELEVANT CRITERIA, ESTABLISHMENT OF KEY MEASURABLE INDICATORS AND CRITICAL PHASES

Literature review has identified 7 Criteria and 13 related Measurable Indicators that can influence the Effectiveness of Competitive Tendering Process at the 5 following different phases: Tender Planning, Tender Documentation, Tender Solicitation, Tender Evaluation and Tender Pre-Award. The specific objectives of the study are to determine the **weights of each Criterion and each Measurable Indicator as well as each Phase** for assessing the Effectiveness. To achieve this, the **Analytical Hierarchy Process (AHP)** method is adopted for data analysis. AHP is a structured technique for dealing with complex decisions based on mathematics and psychology developed by Thomas L. Saaty. It provides a comprehensive and rational framework for structuring a decision problem, for representing and quantifying its elements, for relating those elements to overall goals, and for evaluating alternative solutions. Its purpose is to assist people in organizing their thoughts and judgments and provide the objective mathematics to process the inescapably subjective and personal preferences of an individual or group in making decisions. So, AHP uses a scale of 9 numbers that indicates how many times more important or dominant one element is over another element with respect to the criterion to which it is compared. But in the current study, there are reduced to **5** numbers as follows: **1 = Equal Importance, 3 = Moderate importance, 5 = Strong importance, 7 = Very strong, and 9 = Extreme Importance.**

Example : Enter **5** for <Fairness, Transparency> means that the importance of Fairness is **5 times** the importance of Transparency. Or Enter **9** for <Phase1, Phase2> means that Phase1 is **9 times** important than Phase2 in competitive tendering process Effectiveness.

Please, you are requested to fill the questionnaire with respect to the instructions provided above. In addition, the suitable/appropriate respondents are the Chair of Tender Committee, The Procurement Officer, and the Construction Professional in charge of projects implementation at the Ministry level. Please, try to respond to all questions with care and professionalism for the benefit of the country and the science. We assure you that your participation is anonymous. Thank you.

C.1. DETERMINATION OF THE WEIGHTS OF RELEVANT CRITERIA

The weight of criteria varies from one to another in influencing the Effectiveness of Competitive Tendering Process. Please rate these criteria according to their importance on each other by using the following scale : 1 = Equal, 3 = Weak, 5 = Strong, 7 = Very Strong, 9 = Extremely Strong.

Note that you can tick only one box per row.

C.1.1. With respect to Effectiveness of CTP, how important is **TRANSPARENCY** as compared to the following other criteria?

Criteria	1	3	5	7	9
Competitiveness					
Fairness & Equity					
Compliance					
Time Effectiveness					
Cost Effectiveness					
Ethics					

C.1.2. With respect to Effectiveness of CTP, how important is **COMPETITIVENESS** as compared to the following other criteria?

Criteria	1	3	5	7	9
Fairness & Equity					
Compliance					
Time Effectiveness					
Cost Effectiveness					
Ethics					

C.1.3. With respect to Effectiveness of CTP, how important is **FAIRNESS & EQUITY** as compared to the following other criteria?

Criteria	1	3	5	7	9
Compliance					
Time Effectiveness					
Cost Effectiveness					
Ethics					

C.1.4. With respect to Effectiveness of CTP, how important is **COMPLIANCE** as compared to the following other criteria?

Criteria	1	3	5	7	9
Time Effectiveness					
Cost Effectiveness					
Ethics					

C.1.5. With respect to Effectiveness of CTP, how important is **TIME EFFECTIVENESS** as compared to the following other criteria?

Criteria	1	3	5	7	9

Cost Effectiveness					
Ethics					

C.1.6. With respect to Effectiveness of CTP, how important is **COST EFFECTIVENESS** as compared to the following other criteria?

Criteria	1	3	5	7	9
Ethics					

C.2 DETERMINATION OF THE WEIGHTS OF MEASURABLE INDICATORS

Related to each criterion, there are two or three measurable Indicators. The importance of each Indicator varies from one to another in measuring this criterion. Please rate these measurable Indicators according to their importance on each other by using the following scale: 1 = Equal, 3 = Weak, 5 = Strong, 7 = Very Strong, 9 = Extremely Strong.

Note that you can tick only one box per row.

C.2.1. With respect to **FAIRNESS & EQUITY**, how important is <Time allocated for the preparation of tender > as compared to <Applied rate of Margin of Preference>?

Measurable Indicator	1	3	5	7	9	Other Measurable Indicator
Time allocated for the preparation of tender						Applied Rate of Margin of Preference

C.2.2. With respect to **COMPETITIVENESS**, how important is <Number and Nationalities of tenderers> as compared to < Degree of Competitiveness > ?

Measurable Indicator	1	3	5	7	9	Other Measurable Indicator
Number and Nationalities of tenderers						Degree of Competitiveness

C.2.3. With respect to **TRANSPARENCY**, how important is <Publication of documents Effectiveness Index> as compared to <Publicity or Advertisement Duration> and <Publicity Extent (number of media)> and also <Publicity or Advertisement Duration as compared to <Publicity Extent (number of media) > ?

Measurable Indicator	1	3	5	7	9	Other Measurable Indicators
Publication of documents Effectiveness Index						Publicity or Advertisement Duration
Publication of documents Effectiveness Index						Publicity Extent (Number of media)
Publicity or Advertisement Duration						Publicity Extent (Number of media)

C.2.4. With respect to **COMPLIANCE**, how important is <Number of approvals/controls performed as compared to <Documentation rate (proceedings provided/proceedings required)> and < Capacity Compliance Ratio (Qualified members/ Total members)> and also < Capacity Compliance Ratio (Qualified members/ Total members)> as compared to <Documentation Rate (Proceedings provided / Proceedings required)>?

REFERENCES

Measurable Indicator	1	3	5	7	9	Other Measurable Indicators
Number of approvals/controls performed						Documentation Rate (Proceedings provided / Proceedings required)
Number of approvals/controls performed						Capacity Compliance Ratio (Qualified members/ Total members)
Documentation Rate (Proceedings provided / Proceedings required)						Capacity Compliance Ratio (Qualified members/ Total members)

C.3. DETERMINATION OF THE WEIGHTS OF DIFFERENT PHASES ON EFFECTIVENESS

The Competitive Tendering Process is divided into five following phases : Tender Planning, Tender Documentation, Tender Solicitation, Tender Evaluation and Tender Pre-Award. With respect to **EFFECTIVENESS**, the importance of each phase varies from one to another in impacting on the overall Effectiveness. Please rate each phase according to its importance on the another by using the following scale : 1 = Equal, 3 = Weak, 5 = Strong, 7 = Very Strong, 9 = Extremely Strong. **Note that you can tick only one box per row.**

C.3.1. With respect to **EFFECTIVENESS** of CTP, how important is **<TENDER PLANNING>** as compared to the following other Phases.

Criteria	1	3	5	7	9
Tender Documentation					
Tender Solicitation					
Tender Evaluation					
Tender Pre-Award					

C.3.2. With respect to **EFFECTIVENESS** of CTP, how important is **<TENDER DOCUMENTATION>** as compared to the following other Phases?

Criteria	1	3	5	7	9
Tender Solicitation					
Tender Evaluation					
Tender Pre-Award					

C.3.3. With respect to **EFFECTIVENESS** of CTP, how important is **<TENDER SOLICITATION>** as compared to the following other Phases.

Criteria	1	3	5	7	9
Tender Evaluation					
Tender Pre-Award					

C.3.4. With respect to EFFECTIVENESS of CTP, how important is <TENDER EVALUATION> as compared to the following other Phases.

Criteria	1	3	5	7	9
Tender Pre-Award					

APPENDIX 2:

QUESTIONNAIRE FOR VALIDATION

Dear Madam / Sir

This questionnaire forms part of a research project on the development of a **Framework for Assessing the Effectiveness of Competitive Tendering Process in Public Works Procurement at Pre-Contract Stage** undertaken by a PhD student in Building Technology Department at KNUST - Ghana. The study reveals the following main findings:

- 38 Standard practices are defined along with the five main phases of the process;
- 7 Relevant Criteria are determined and ranked according to their weights;
- 13 Key Measurable Indicators are established and ranked according to their weights;
- The following are the Weights of critical phases in order of their importance: planning, 0.292; Documentation, 0.190; Solicitation, 0.203; Evaluation, 0.101; Preaward, 0.085.

Based on these results, a framework model is proposed in a graphical form for conceptual illustration and synthesized in a tabular form as assessment sheet. The main aim of the tool is to measure the effectiveness of any Competitive tendering Process in Procurement at the pre-contract stage **for the purpose of approval for contract award or otherwise.**

In view of the validation of this framework, we would be very grateful if you could please read carefully the few following pages and respond to the **only one-page questionnaire attached at the end**, to help establish the relevance of the findings and the explicitness, practicability and functionality of the proposed framework. The author has the intention of developing the framework into a workable computer model.

This questionnaire will take less than 10 mn of your time to be completed, so we count on your cooperation and thank you very much in advance.

Yours Sincerely,

PhD Candidate.

QUESTIONNAIRE FOR VALIDATION

1. Could you please rate your agreement with the following finding using the three points: 1 = Don't agree, 2 = Fairly agree and 3 = Strongly agree.

Code	Different phases of the process	1	2	3
1	Relevant Criteria			
2	Key Measurable Indicators			
3	Critical Phases			
4	Standard Practices			

2. Could you please rate your understanding of the fundamental components of the framework by ticking one of the following appreciations :

No understandable Understandable Very understandable

3. Could you please rate the Explicitness (fully clear, straightforward) of the proposed framework by ticking one of the following appreciations :

Not Explicit Explicit Very Explicit

4. Could you please rate the quality (simplicity or complexity) of the proposed framework by ticking one of the following appreciations :

Complex Simple Very Simple

5. Is this framework a practical tool for assessment?

Yes No Needs more development,
Specify which area (s)

6. Are you ready to use it?

Yes No

7. Do you agree that it is important to, further develop this tool into a management toolkit/checklist for practical application?

Yes No I don't know

8. Please can you give your own assessment of the intended application of the findings of the research and suggestions for any other future application

.....

Thank you very much.

APPENDIX 3:

FULL AND DETAILED STRUCTURE OF THE FRAMEWORK

EFFECTIVENESS ASSESSMENT FRAMEWORK

PROJECT IDENTIFICATION AND BRIEF DESCRIPTION	
CLIENT	
PROJECT TITLE	
PROJECT LOCALISATION	
SECTOR	
PROJECT OBJECTIVES	
CONTRACTING AUTHORITY	
END USERS/BENEFICIAIRES	
INITIAL BUDGET	
SOURCE OF FUNDS	
	GOVERNMENT
	DONOR
	BENEFICIARIES
DATE OF INCEPTION	
EXPECTED DURATION	
PROJECT MANAGEMENT	
PROJECT IDENTIFICATION	
TECHNICAL SERVICE / MINISTRY	
	NAME
	LOCALISATION
	OFFICER IN CHARGE
PROJECT TEAM	
	MANAGER'S NAME
	QUALIFICATION

REFERENCES

	GENERAL EXPERIENCE	
	EXPERIENCE IN THE POSITION	

KNUST

PHASE ONE : TENDER PLANNING

PROCUREMENT PLAN

REMARKS / COMMENTS

AUTHOR			
DATE OF SUBMISSION			
DATE OF APPROVAL			
APPROVED BUDGET			
QUALITY			
COMPLIANCE			
	WITH TIME LIMITS		
	WITH STANDARD FORMAT		
DATE OF PUBLICATION			
NUMBER OF MEDIA/CHANNELS			
INTERIM ASSESSMENT =			
PROJECT BRIEF / DEFINITION			
PROMOTER			
CLEARNESS			
COMPLIANCE			
	WITH STANDARD FORMAT		

REFERENCES

	WITH NATIONAL NEEDS		
PRIMARY OBJECTIVES			
	1		
	2		
SECONDARY OBJECTIVES			
	1		
	2		
INTERIM ASSESSMENT =			

PROJECT TEAM

INDIVIDUAL		
FIRM		
SELECTION CONDITIONS		
CONTRACT ARRANGEMENT		
CONTRACT AMOUNT		
CONTRACT DURATION		
INTERIM ASSESSMENT =		

PROJECT FEASIBILITY STUDY

DATE OF COMMENCEMENT		
DATE OF DRAFT SUBMISSION		
AUTHOR		
QUALITY		
COMPLIANCE		
CONCLUSIONS		
DATE OF APPROVAL		
APPROVED BUDGET		
INTERIM ASSESSMENT =		

TENDERING MODE

OPEN		
------	--	--

REFERENCES

RESTRICTED		
PRE-QUALIFICATION		
DIALOGUE		
NATIONAL		
INTERNATIONAL		
LOCAL		
INTERIM ASSESSMENT =		
TENDER COMMITTEE		
COMPOSITION		
QUALIFICATION OF MEMBERS		
COMPLIANCE WITH LAW		
DATE OF OFFICIAL NOTIFICATION		
INTERIM ASSESSMENT =		

ASSESSMENT OF INDICATORS

TIME PERFORMANCE INDEX

	FOR PROCUREMENT PLAN		
	FOR FEASIBILITY STUDY		
GLOBAL SCORE =			

COST ESTIMATE ACCURACY

	AT INITIAL LEVEL		
	AT FEASIBILITY LEVEL		
GLOBAL ACCURACY =			

PUBLICITY EXTENT

	MEDIA NATURE		
	MEDIA NUMBER		
GLOBAL PUBLICITY EXTENT =			

APPROVALS COMPLIANCE RATE

--	--	--

REFERENCES

	PROCUREMENT PLAN		
	INITIAL BUDGET		
	FEASIBILITY STUDY		
	ACTUAL RATE =		

DOCUMENTATION COMPLIANCE RATE

	PROJECT BRIEF		
	PROCUREMENT PLAN		
	APPROVAL NOTICES		
	FEASIBILITY STUDY REPORT		
	CONSULTANT'S CONTRACT		
	PUBLICATION NOTICES		
	TENDER COMMITTEE LIST + CVs		
	GLOBAL RATE =		

CAPACITY QUALIFICATION RATIO

	NON-QUALIFIED PEOPLE		
	QUALIFIED PEOPLE		
	GLOBAL PUBLICITY EXTENT =		

RECAPITULATIVE FOR ELEMENTARY EFFECTIVENESS ASSESSMENT

MEASURABLE INDICATORS	Target Value	Actual Measures	Score	Weight	Actual Value
TIME PERFORMANCE INDEX					
COST ESTIMATE ACCURACY					
PUBLICITY EXTENT					
APPROVALS COMPLIANCE RATE					
DOCUMENTATION RATE					
CAPACITY QUALIFICATION RATIO					
ELEMENTARY EFFECTIVENESS =					

ASSESSOR DATA

REFERENCES

EXPERT NAME OR FIRM	
TITLE	
COMPLETE ADDRESS	
PHONE NUMBER	
DATE OF ASSESSMENT	
DATE OF SUBMISSION	
GENERAL COMMENTS	
DISCLAIMER	
SIGNATURE	
AUTHORITY COMMENTS :	
DATE :	SIGNATURE :

PHASE TWO : TENDER DOCUMENTATION		
PROJECT COMPLETE DESIGN		REMARKS / COMMENTS
COMPLETENESS & QUALITY		
DATE OF SUBMISSION		
DATE OF APPROVAL		
ALIGNMENT WITH OBJECTIVES		
COMPLIANCE		
	WITH TIME LIMITS	
	WITH STANDARD FORMAT	

REFERENCES

	WITH PRIMARY OBJECTIVES		
	WITH SECONDARY OBJECTIVES		
APPROVED DETAILED ESTIMATE			
ASSESSMENT =			
ELIGIBILITY & PARTICIPATION CONDITIONS			
DISCRIMINATORY			
NON DISCRIMINATORY			
NEUTRAL			
INTERIM ASSESSMENT =			
INSTRUCTIONS TO TENDERERS			
COMPLIANCE WITH STANDARD			
EVALUATION CRITERIA			
AWARD CRITERIA			
MARGIN OF PREFERENCE			
SUBMISSION CONDITIONS			
SUBMISSION VENUE			
BID PRESENTATION			
BIDS OPPENNING CONDITIONS			
ASSESSMENT =			
STANDARD FORMS			
INCLUDED			
COMPLETE			
CONFORM TO STANDARD			
ASSESSMENT =			
TECHNICAL SPECIFICATIONS			
CONFORM TO STANDARD			
NEUTRAL			
ASSESSMENT =			
CONTRACT TYPE & FORMAT			
CONFORM TO STANDARD			

REFERENCES

ARBITRATION PROVISION		
RISKS MANAGEMENT		
APPROVAL AUTHORITY		
ASSESSMENT =		
BILL OF QUANTITY		
QUALITY		
COMPATIBILITY WITH DRAWINGS		
COMPLIANCE WITH STANDARD		
ASSESSMENT =		
DRAWINGS		
QUALITY		
COMPLIANCE WITH STANDARD		
ASSESSMENT =		
TIMES FRAMES		
DATE OF TENDER SUBMISSION		
DATE OF TENDER LAUNCHING		
TIME ALLOCATED FOR ADVERTISEMENT		
ASSESSMENT =		
ASSESSMENT OF INDICATORS		
TIME PERFORMANCE INDEX		
	FOR PROJECT DESIGN APPROVAL	
	FOR DOCUMENT DEVELOPMENT	
	FOR TENDER DOCUMENT APPROVAL	
	GLOBAL SCORE =	
COST ESTIMATE ACCURACY		

REFERENCES

	AT FINAL ESTIMATE					
		GLOBAL ACCURACY =				
APPROVALS COMPLIANCE RATE						
	PROJECT DESIGN					
	DETAILED ESTIMATE					
	TENDER DOCUMENTS					
		ACTUAL RATE =				
DOCUMENTATION COMPLIANCE RATE						
	APPROVAL NOTICES					
	PROJECT DESIGN REPORT					
	PUBLICATION NOTICES					
	OTHER CORRESPONDENCES					
	TENDER DOCUMENTS					
		GLOBAL RATE =				
CAPACITY QUALIFICATION RATIO						
	NON-QUALIFIED PEOPLE					
	QUALIFIED PEOPLE					
		GLOBAL PUBLICITY EXTENT =				
RECAPITULATIVE FOR ELEMENTARY EFFECTIVENESS ASSESSMENT						
	MEASURABLE INDICATORS	Target Value	Actual Measures	Score	Weight	Actual Value
	TIME PERFORMANCE INDEX					
	COST ESTIMATE ACCURACY					
	APPROVALS COMPLIANCE RATE					
	DOCUMENTATION COMPLIANCE RATE					
	CAPACITY QUALIFICATION RATIO					
		ELEMENTARY EFFECTIVENESS =				
ASSESSOR DATA						
	EXPERT NAME OR FIRM					
	TITLE					
	COMPLETE ADDRESS					
	PHONE NUMBER					
	DATE OF COMMENCEMENT					
	DATE OF REPORT SUBMISSION					
	GENERAL COMMENTS					
	DISCLAIMER					

REFERENCES

SIGNATURE	
ING AUTHORITY COMMENTS	
DATE :	SIGNATURE :

PHASE THREE : TENDER SOLLICITATION

TENDER DOCUMENTS	REMARKS / COMMENTS
COMPLETENESS + QUALITY	
DATE OF SUBMISSION	
DATE OF APPROVAL	
COMPLIANCE	
WITH TIME LIMITS	
WITH STANDARD FORMAT	
SALE PRICE	
NUMBER OF DOCUMENTS SOLD	
INTERIM ASSESSMENT =	
PRE-TENDER MEETING	
ATTENDANCE LIST	
MEETING MINUTE	
VENUE	
TIME & DURATION	
INTERIM ASSESSMENT =	
SUBMISSION CONDITIONS	
DATE	
VENUE	
BOX PROVISION & SAFETY	
INTERIM ASSESSMENT =	
OPENNING CONDITIONS	
OPENING PANEL MEMBERS	
OPENING SESSION VENUE	
ATTENDANCE LIST	
INTERIM ASSESSMENT =	

REFERENCES

ADVERTISEMENT CONDITIONS		
DURATION		
MEDIA USED		
ADVERT FREQUENCY		
INTERIM ASSESSMENT =		
REQUESTS FOR CLARIFICATIONS		
REQUESTS RECEIVED		
REQUESTS ANSWERED		
MODIFICATIONS		
INTERIM ASSESSMENT =		
TIMES FRAMES		
FOR ADVERTISEMENT		
FOR TENDER PREPARATION		
ASSESSMENT =		
ASSESSMENT OF INDICATORS		
TIME FOR TENDER PREPARATION		
	FOR NATIONAL TENDER	
	FOR INTERNATIONAL TENDER	
	FOR LOCAL TENDER	
GLOBAL SCORE =		
ADVERTISEMENT TOTAL DURATION		
	FOR NATIONAL TENDERING	
	FOR INTERNATIONAL TENDERING	
	FOR LOCAL TENDERING	
GLOBAL SCORE =		
TIME PERFORMANCE INDEX		
	FOR TENDER SUBMISSION	
	FOR TENDER OPENING	
GLOBAL SCORE =		
NUMBER OF REQUESTS OF CLARIFICATIONS		

REFERENCES

	REQUESTS RECEIVED		
	REQUESTS QNSWERED		
	GLOBAL ACCURACY =		
PUBLICITY EXTENT			
	MEDIA USED		
	NUMBER OF MEDIA		
	GLOBAL PUBLICITY EXTENT =		

PUBLICITY FREQUENCY			
	MEDIA USED		
	FREQUENCY OF ADVERT		
	GLOBAL PUBLICITY EXTENT =		
APPROVALS COMPLIANCE RATE			
	TENDER DOCUMENTS		
	TOTAL No OF APPROVALS =		

RECAPITULATIVE FOR ELEMENTARY EFFECTIVENESS ASSESSMENT

MEASURABLE INDICATORS	Target Value	Actual Measures	Score	Weight	Actual Value
TIME FOR TENDER PREPARATION					
ADVERTISEMENT TOTAL DURATION					
TIME PERFORMANCE INDEX					
PUBLICITY EXTENT					
PUBLICITY FREQUENCY					
APPROVALS COMPLIANCE RATE					
ELEMENTARY EFFECTIVENESS =					

ASSESSOR DATA

EXPERT NAME OR FIRM	
TITLE	
COMPLETE ADDRESS	
PHONE NUMBER	
DATE OF COMMENCEMENT	
DATE OF REPORT SUBMISSION	
GENERAL COMMENTS	
DISCLAIMER	
SIGNATURE	

IG AUTHORITY COMMENTS

DATE :	SIGNATURE :
--------	-------------

PHASE FOUR : TENDER EVALUATION

TENDER BIDS		REMARKS / COMMENTS
NUMBER OF BIDS SUBMITTED		
NUMBER OF VALID BIDS		
ORIGINAL COPIES		
NUMBER OF BIDS SOLD		
NUMBER OF BIDS REJECTED		
INTERIM ASSESSMENT =		
EVALUATION PANEL		
COMPOSITION		
QUALITY OF MEMBERS		
COMPLIANCE WITH STANDARD		
DATE OF CONSTITUTION		

REFERENCES

NEUTRAL OBSERVER		
INTERIM ASSESSMENT =		
EVALUATION PROCESS		
STEPS PERFORMED		
EVALUATION METHOD		
SCORING SYSTEM		
CONFORMITY TO EVAL. CRITERIA		
RISK ANALYSIS RESULTS		
OPENING SESSION MINUTE		
USE OF MARGIN OF PREFERENCE		
INTERIM ASSESSMENT =		
EVALUATION REPORT		
CONFORMITY TO STANDARD		
DATE OF SUBMISSION		
DATE OF APPROVAL		
INTERIM ASSESSMENT =		
ETHICS ISSUES		
CONFIDENTIALITY		
INTEGRITY		
FORMAL COMPLAINTS		
FORMAL LITIGATIONS		
INTERIM ASSESSMENT =		
TIMES FRAMES		
FOR EVALUATION		
FOR APPROVAL		
INTERIM ASSESSMENT =		
ASSESSMENT OF INDICATORS		
NUMBER AND NATIONALITY OF BIDDERS		
NATIONAL		
FOREIGNERS		
TOTAL		

REFERENCES

		GLOBAL SCORE =		
COST ESTIMATE ACCURACY				
	AT INITIAL LEVEL			
	AT FINAL ESTIMATE LEVEL			
	AT EVALUATION LEVEL			
		GLOBAL ACCURACY =		
TIME PERFORMANCE INDEX				
	FOR EVALUATION PROCESS			
	FOR APPROVAL PROCESS			
		GLOBAL SCORE =		
DEGREE OF COMPETITIVENESS				
	LOW BID			
	HIGH BID			
	INITIAL BUDGET			
		GLOBAL ACCURACY =		
APPLIED MARGIN OF PREFERENCE				
	PRESCRIBES STANDARD			
	APPLIED RATE			
		GLOBAL PUBLICITY EXTENT =		
CAPACITY QUALIFICATION RATIO				
	QUALIFIED PEOPLE			
	NON-QUALIFIED PEOPLE			
		GLOBAL PUBLICITY EXTENT =		
DOCUMENTATION RATE				
	APPROVAL NOTICES			
	TENDER DOCUMENTS			
	OFFICIAL PRICES LIST			
	BIDS ORIGINAL			
	OPENING SESSION MINUTES			
		GLOBAL RATE =		

RECAPITULATIVE FOR ELEMENTARY EFFECTIVENESS ASSESSMENT

MEASURABLE INDICATORS	Target Value	Actual Measures	Score	Weight	Actual Value
NUMBER & NATIONALITIES OF BIDDERS					
TIME PERFORMANCE INDEX					
COST ACCURACY INDEX					
DEGREE OF COMPETITIVENESS					
CAPACITY QUALIFICATION RATIO					
DOCUMENTATION COMPLIANCE RATE					
APPLIED MARGIN OF PREFERENCE					
ELEMENTARY EFFECTIVENESS =					

ASSESSOR DATA

EXPERT NAME OR FIRM	
TITLE	
COMPLETE ADDRESS	
PHONE NUMBER	
DATE OF COMMENCEMENT	
DATE OF REPORT SUBMISSION	
GENERAL COMMENTS	
DISCLAIMER	
SIGNATURE	

CONTRACTING AUTHORITY COMMENTS :

DATE :

SIGNATURE :

PHASE FIVE : TENDER PRE-AWARD		
TENDER EVALUATION REPORT		REMARKS / COMMENTS
DATE OF SUBMISSION		
DATE OF APPROVAL		
CONFORMITY TO STANDARD		
INTERIM ASSESSMENT =		
AWARD COMMITTEE		
COMPOSITION		
QUALITY OF MEMBERS		
DATE OF CONSTITUTION		
INTERIM ASSESSMENT =		
PRE-AWARD MEETING		
VENUE		
ATTENDANCE LIST		
FINAL DECISION		
MINUTES		
CONFORMITY TO RECOMMENDATIONS		
INTERIM ASSESSMENT =		
TENDER RESULTS DISCLOSURE		
DATE		
MEDIA		
FREQUENCY		
CONFORMITY TO STANDARD		
INTERIM ASSESSMENT =		
DEBRIEFING MEETING		
VENUE		
ATTENDANCE		
MINUTES		
INTERIM ASSESSMENT =		
ETHICS ISSUES		
CONFIDENTIALITY		
INTEGRITY		
FORMAL COMPLAINTS		

REFERENCES

FORMAL LITIGATIONS		
INTERIM ASSESSMENT =		

TIMES FRAMES

FOR EVALUATION REPORT		
FOR RESULTS CHALLENGE		
FOR FINAL DECISION		
INTERIM ASSESSMENT =		

ASSESSMENT OF INDICATORS

COST ACCURACY INDEX		
AFTER AWARD OF CONTRACT		
GLOBAL ACCURACY =		

TIME PERFORMANCE INDEX		
FOR REPORT APPROVAL		
FOR CONTRACT AWARD		
GLOBAL SCORE =		

CAPACITY QUALIFICATION RATIO		
QUALIFIED PEOPLE		
NON QUALIFIED PEOPLE		
GLOBAL PUBLICITY EXTENT =		

APPROVALS COMPLIANCE RATE		
ALL APPROVALS		
ACTUAL RATE =		

DOCUMENTATION COMPLIANCE RATE		
ALL DOCUMENTS		
GLOBAL RATE =		

PUBLICITY EXTENT		
MEDIA USED		
NUMBER OF MEDIA		
GLOBAL PUBLICITY EXTENT =		

NUMBER OF COMPLAINS/LITIGATIONS		
FORMAL COMPLAINTS		
LITIGATIONS RESOLVED		

GLOBAL PUBLICITY EXTENT =					
RECAPITULATIVE FOR ELEMENTARY EFFECTVENSNESS ASSESSMENT					
Measurable Indicators	Target Value	Actual Measures	Score	Weight	Actual Value
NUMBER OF COMPLAINTS					
TIME PERFORMANCE INDEX					
COST ACCURACY INDEX					
PUBLICITY EXTENT					
APPROVALS COMPLIANCE RATE					
DOCUMENTATION COMPLIANCE RATE					
CAPACITY QUALIFICATION RATIO					
ELEMENTARY EFFECTIVENESS =					
ASSESSOR DATA					
EXPERT NAME OR FIRM					
TITLE					
COMPLETE ADDRESS					
PHONE NUMBER					
DATE OF COMMENCEMENT					
DATE OF REPORT SUBMISSION					
GENERAL COMMENTS					
DISCLAIMER					
SIGNATURE					
ONTRACTING AUTHORITY COMMENTS :					
DATE :	SIGNATURE :				

RECAPITULATIVE SHEET

PHASE 1 : TENDER PLANNING

Name of Assessor	
Date of Assessment	
Score of Elementary Effectiveness	
Summary of comments	
Signature	

PHASE 2 : TENDER DOCUMENTTION

Name of Assessor	
Date of Assessment	
Score of Elementary Effectiveness	
Summary of comments	
Signature	

PHASE 3 : TENDER SOLLICITATION

Name of Assessor	
Date of Assessment	
Score of Elementary Effectiveness	
Summary of comments	
Signature	

PHASE 4 : EVALUATION

Name of Assessor	
Date of Assessment	
Score of Elementary Effectiveness	

REFERENCES

Summary of comments	
Signature	

KNUST

PHASE 5 : PRE-AWARD

Name of Assessor	
Date of Assessment	
Score of Elementary Effectiveness	
Summary of comments	
Signature	

SYNTHESIS FOR OVERALL EFFECTIVENESS ASSESSMENT

Code	Main Phases	Elementary Effectiveness	Weights (Coeff.)	Actual Values	Remarks
1	Tender Planning				
2	Tender Documentation				
3	Tender Solicitation				
4	Tender Evaluation				
5	Tender Pre-Award				
Overall Effectiveness E =					

CONTRACTING AUTHORITY DECISION

REFERENCES

Title of Contracting Authority	
Name of the authority	
Score of Overall Effectiveness	
Summary of comments	
Final decision	
Date	
Signature	

