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Using a Situation Analysis to Identify the Construction Industry Deficiencies in Botswana

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Abstract: This paper reports the results of a multi-phase study aimed at identifying ways of transforming the construction industry in Botswana into an efficient, effective and sustainable sector. The study examined a number of reports indicating that public construction projects were not delivered as contractually expected. The first phase of the study, a situation analysis, was divided into two stages, with the first validating the claims that projects perform poorly in terms of both time and cost. Project data were compiled and analysed by computing the cost and time variances. The second stage solicited the opinions of various industry stakeholders regarding the deficiencies in the industry that led to poor project performance. Based on 323 sampled public construction projects, the results indicated that 13% had been abandoned and retendered. For those projects not abandoned, 52% and 75% had cost and time overruns, respectively. On average, the amount of cost overruns was 15% while the amount of time overruns was 75%. This level of performance is considered worrisome if allowed to continue. Causes of the overruns were identified as emanating from the decisions and actions of clients, suppliers, and regulators as well as the lack of a coherent facilitation of the construction business environment. The latter was singled out as an urgent challenge that needs addressing if the construction industry is to exist as a sustainable sector in Botswana. Though the concept of construction industry development is not new, this paper underscores that situations for each country are different and models that aim to transform an industry must look at the underlying context of the sector. With the exception of one study, no other extensive empirical study has been conducted in Botswana to identify and document deficiencies leading to the poor delivery of public construction projects. These findings also provide a generic approach to transforming the construction industry.

Keywords: Situation analysis, Construction industry, Development, Transformation, Botswana

INTRODUCTION

The construction industry is responsible for the development and sustenance of the infrastructural base of any nation through the efficient and effective delivery of projects (Turin, 1978; Giang and Pheng, 2011). The infrastructural base provides a vital function for fulfilling human needs and activities such as housing, communications, defence, water and power. However, to increase the utility of infrastructure, projects must be delivered within contracted times and specifications (Sambasivan and Soon, 2007). The economic difficulties facing the world today make it imperative that projects are delivered within cost to optimise resource allocation and utilisation (Wong, Ng and Chan, 2010).

Unfortunately, for most construction industries, including that in Botswana, the attributes of cost, time and quality are often elusive. While the construction industry in Botswana has been commended for developing the infrastructural landscape of the country, recent reports indicate a sub-optimal project delivery

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process. Studies (e.g., Sentongo, 2005) and media reports (e.g., Malema, 2000; Ramadibu, 2010) have indicated that the industry exhibits various deficiencies, especially in the public sector. Much as an organisation goes through what Greiner (1972) described as a "crisis of development", the industry is experiencing an emerging crisis of performance. Serious reforms are needed to create a viable sector that is in step with the economic, industrial and social developmental demands of the country, particularly in delivering a reliable and sustainable infrastructure.

The multi-phase study was motivated by the need to find means of transforming the construction industry to deliver and maintain the public infrastructural base as an efficient, effective and sustainable sector. The study was divided into two phases: the first phase aims at conducting a situation analysis to identify the performance levels and deficiencies of the industry, and the second phase aims to develop a model for providing a transforming mechanism for the sector.

While the findings of phase two of the study will be reported elsewhere, this paper reports the results of the first phase, which was guided by two key research questions: RQ1 – What is the extent of the effects of deficiencies of the construction industry on the delivery of public projects in Botswana? and RQ2 – What are the causes of the deficiencies in the construction industry that lead to the poor performance of public construction projects in Botswana? The paper is divided into four major sections. The first section provides a brief background of the problem, and the second describes the research approach used to answer the two questions. The third and fourth sections discuss the research findings and their implications for the industry, respectively. The paper ends with conclusions and some recommendations.

BACKGROUND

The Concept of Transformation

The transformation process of an industry has four major components namely situation analysis, vision crafting, policy formulation and the establishment of a monitoring and evaluation (M&E) mechanism as illustrated in Figure 1.

A situation analysis, as the first component of the process, provides a contextual perspective on the needed change (Orbeta, 1994), which is achieved at first by defining the problem and determining its severity (Australian Agency for International Development [AUSAID], 2006). Second, the causes and the effects of the problem are identified, including those who are affected (AUSAID, 2006). Third, a situation analysis facilitates the identification of stakeholders who have the influence, power, capacity, resources and support network to facilitate change (Meredith and Mantel, 2003). Fourth, situation analysis process allows those pursuing change to assess their chances of success by assessing their capabilities (strengths and weaknesses) and any risks (threats and opportunities).

A situation analysis also provides a basis for formulating a vision of the desired change, based on the adage "knowing where you are facilitates charting where you want to be". This is the second component of the transformation process, in which the overall goal to produce the required change is articulated

and a target date for achieving it is set (Aune, 2000). The goal is then broken down into manageable and measurable objectives (Cleland and Ireland, 2007).

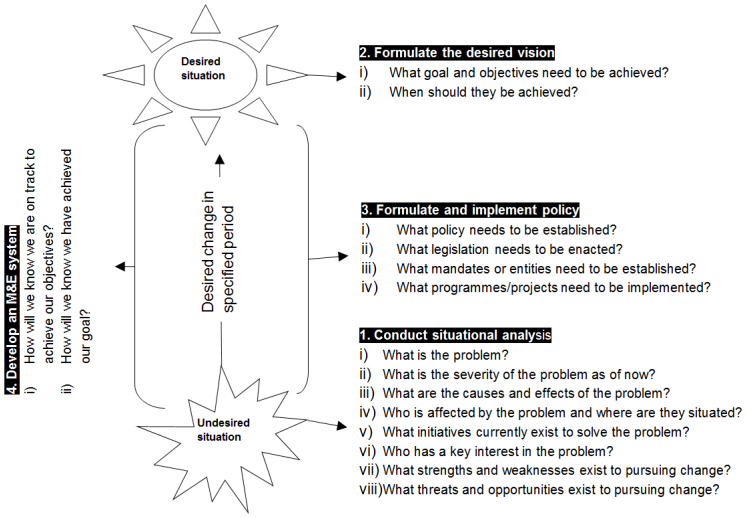


Figure 1. Components of the Transformation Process

Having defined the two end points (the undesired and desired state) in the transformation process, the third component is the formulation of appropriate policies to broadly guide the change and bridge the development gap (Orbeta, 1994). Most often, a policy is followed by legislation that provides an empowering legal framework to enable the required change. Programmes and projects are then planned and implemented to act as vehicles for achieving the desired change.

The last component of the transformation process is the development of an M&E system to measure progress and achievement. Monitoring ensures that projects are on track to achieve the desired objectives, while evaluation ascertains whether the desired vision is achieved at the targeted date (Crawford and Bryce, 2003).

This paper focuses on the first component (situation analysis) of the transformation process (the other components will be the subject of another phase of study).

The Construction Industry of Botswana

Botswana is located in the southern part of Africa. It is a relatively large country covering an area of 582,000 km^2 with a small population of 1.92 million inhabitants. It is therefore a sparsely populated country with approximately three inhabitants per km^2. In 2009, its workforce was estimated at 361,956 employees, of which approximately 45% worked in the public sector (Central Statistics Organisation [CSO], 2010). During the same period, the construction industry constituted 6.3% of the workforce. The gross domestic product (GDP) contribution of the construction

industry was estimated in 2009 at P350 (US$ 52) million, constituting 4.2% of total GDP (CSO, 2010).

While in previous decades the construction industry in Botswana recorded high growth rates, ranging from 5% to 8%, surpassing most industries in sub-Saharan Africa (Ssegawa, 2008), performance in recent years has shown a decline, as illustrated in Figure 2. The downturn of the global economy, the impact of reduced diamond sales and the inefficiencies of the construction industry itself, are some of the factors contributing to this trend.

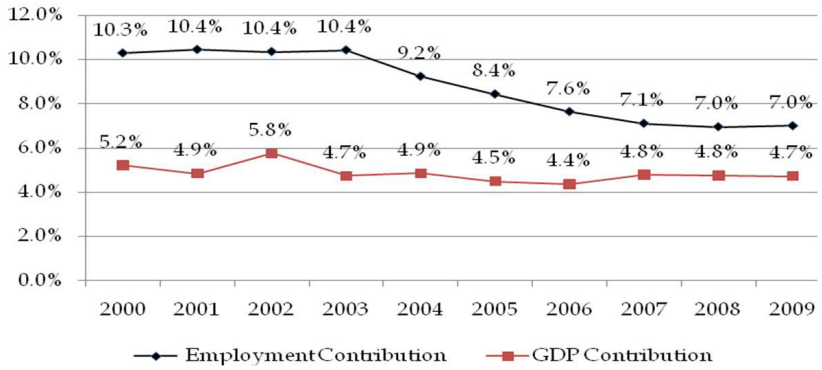


Figure 2. The contribution of Botswana's Construction Industry to Employment and GDP (CSO, 2010)

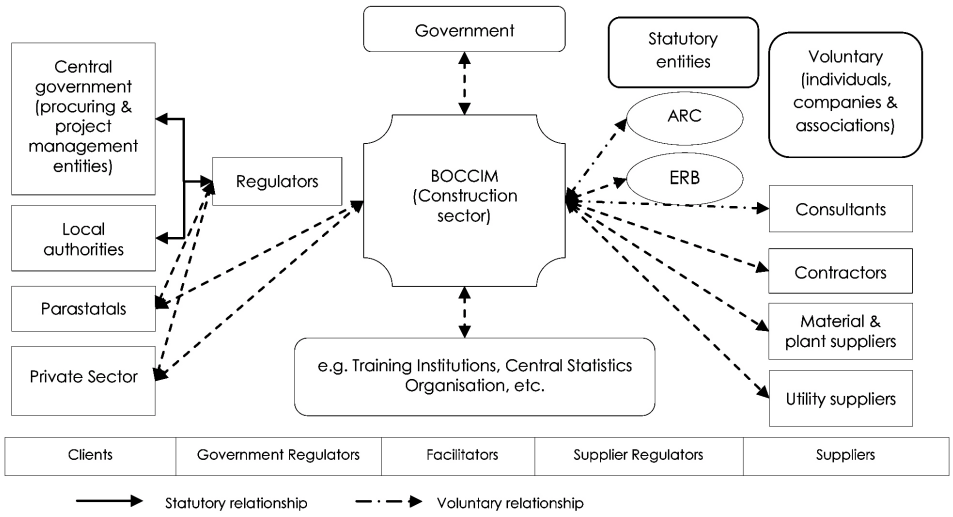
Current organisation of the industry

The construction industry of Botswana currently consists of several fragmented players who can be grouped into the four categories illustrated in Figure 3: suppliers i.e., those who provide services or supply materials and components to a project; clients (public and private); regulators (who regulate the project management process and the conduct of suppliers); and facilitators (those who facilitate the delivery of projects in various ways, but without having any contractual obligations on any aspect of the project) (see Figure 3).

Two observations can be made regarding the organisation of the industry. First, one may be tempted to think that the government occupies a separate category. However, careful examination reveals that it actually has influence in three of the mentioned categories. As a client, the government is represented by procuring and project management entities. As a regulator, it is represented by the miscellaneous entities that regulate the various processes related to construction. The government also acts as a facilitator, designing programs that aid the industry (e.g., preference, reservation and mobilisation schemes meant to bolster the competitiveness and cash flow profile of citizen-owned construction firms) (Gaolathe, 2000).

The second observation is that a description of the construction industry cannot be complete without mentioning the existing procurement systems. Scholars (e.g., Rwelamila and Hall, 1995) have intimated that, depending on the nature and context of the project, a procurement system may enhance or inhibit

the delivery process. The majority of public projects in Botswana are procured through a traditional procurement system (TPS), where the design and construction phases are separately contracted. In recent years, a few public projects have been delivered using Design and Build (D&B) and Private Public Partnership (PPP) procurement modes in both the private and public sector.



BOCCIM = Botswana Chamber of Commerce Industry and Manpower; ARC = Architect Registration Council; ERB = Engineering Registration Board

Figure 3. Schematic Representation of the Organisation of the Construction Industry in Botswana

Framework for Analysing Construction Industry Deficiencies

At a micro or project level, the effects of performance deficiencies of the construction industry are commonly narrowed down to three aspects, namely poor quality, cost and time overruns (Willis and Rankin, 2010). Over the years, there has been an accumulation of research findings (e.g., Ameh, Soyingbe and Odusami, 2010; Lo, Fung and Tung, 2006) listing several deficiencies in the construction industry. However, none of the studies provide an exhaustive list of deficiencies due to the context of each project and country. Therefore, this study aimed to construct an appropriate framework for categorising deficiencies. This was in the hope that a list of deficiencies would be provided by industry stakeholders and that each deficiency could then be slotted into its appropriate category in the framework.

Existing literature provides numerous frameworks that scholars have proposed to categorise the deficiencies in the construction industry. The few that are relevant are worth mentioning. Antill and Woodhead (1989) divided the cause of time overruns into those which (1) neither party to the contract has any control; (2) the client (or representative) has control; and (3) the contractors (or sub-contractor) has control. This categorisation is in line with the work of others (e.g., Arditi, Akan and Gurdamar, 1985; Kraiem, 1987) who classified delays as (1)

excusable with compensation, (2) excusable without compensation and (3) non-excusable or contractor responsible. Another framework by Adams (1997) observed that the poor project performance is caused by factors due to (1) clients and their representatives, (2) contractor deficiencies and (3) the business environment. The Adams framework was found to be more appropriate for this study, as it matches the manner in which the construction industry is organised in Botswana. However, the framework was modified into a four-factor framework consisting of clients (and representatives), suppliers, regulators and facilitators. Nearly all of the construction industry deficiencies which cause quality issues, excessive costs and time overruns will fall into one of these categories.

RESEARCH APPROACH

The research approach centred on attempting to answer the two research questions (RQ1 and RQ2) posited earlier. The focus of the study was based on public construction projects for three reasons. First, there have been media (e.g., Kenosi, 2010) and anecdotal (e.g., Palalani, 2000) reports over the years indicating that public projects are not delivered efficiently and effectively. Second, public projects contribute the greatest number and value (45%) to Botswana's construction market; their impact on the overall performance of the industry is quite significant. Third, because the projects are publicly funded it is imperative to identify the root causes of deficiencies in the project delivery process and address them. The sources of the projects were the Department of Building and Engineering Services (DBES), the Roads Department, the Ministry of Local Government and the Department of Technical Services in the Ministry of Education. All of the projects completed their contractual durations as part of the National Development Plans 8 (2000–2004) and 9 (2005–2009). Project data were gathered from project documents under the custody of the aforementioned departments. Due to their proximity to the project operations, project managers were the key informants.

Investigating the Effects of the Deficiencies

The effects of the construction industry deficiencies are manifested in the three attributes of cost, time and quality. These attributes, therefore, provide the basis for measuring the effect of the deficiencies on the industry's performance (De Wit, 1988). However, the quality issue was excluded in the study because it required excessive time and resources to properly investigate several sites and conduct quality tests. Therefore, the severity of the industry deficiencies was investigated by computing the percentage variances of cost and time, as according to Equation 1. In the end, an average variance was computed for the sampled projects.

$$\text{Cost / Time variance} = \frac{\text{Cost / Time at contracting} - \text{Cost / Time at completion}}{\text{Cost / Time at contracting}} \qquad \text{Eq. 1}$$

To adjust for inflationary effects, all data at completion was adjusted to ensure cost homogeneity using the monthly consumer price index (CPI) provided by the CSO, as shown in Equation 2.

$$\text{Adjusted cost at completion} = \frac{\text{CPI at contracting}}{\text{CPI at completion}} \times \text{Cost at completion} \quad \text{Eq. 2}$$

The computing of the variances was done regardless of cause, whether the client, contractor or circumstances beyond the control of both parties. In addition, both positive (savings) and negative (overruns) factors were included in the computation to obtain an average variance.

Project data on the cost and time attributes were compiled for 323 completed projects consisting of buildings, roads and civil works, as shown in Table 1 (left column). The data were collected from five project management departments and eight local authorities using convenience sampling. Bryman and Emma (2003) noted that this technique is used when the study subjects are not conveniently available (e.g., access to data depends on the willingness of entities to divulge records relating to the projects and on the completeness of the project records). To minimise the impact of this factor, only projects completed in the last five years were considered. Third, it is also affected by the sensitivity of the project. A few projects had legal issues and were therefore considered inappropriate for study. The sampled projects reflected an appreciable amount of geographic dispersion and a wide range of implementing entities. These were considered important attributes in providing a fair picture of the challenges facing public sector projects.

Table 1. Projects Investigated and Interviews Held

Number of Projects Studied N = 323			**Number of Interviews Held N = 41 (Total Persons Interviewed = 208)**			
Roads	Civil works	Buildings	Clients	Suppliers	Regulators	Facilitators
54	48	221	15	13	8	5
17%	15%	68%	37%	32%	20%	12%

Investigating the Major Causes of Deficiencies of the Industry

To answer the second research question (RQ2), in-depth, face-to-face interviews were conducted. An in-depth interview was considered the most appropriate data collection technique because of its probing nature that permits the freedom to seek clarity and provides respondents critical reflection on the questions based on their profile (e.g., experience and profession) and context (e.g., project time and locality) (Burns and Bush, 2006). Our method thus avoided the restrictive and prescriptive mode typically found in a questionnaire survey (Bryman and Emma, 2003).

A semi-structured questionnaire was designed to guide the interviews and subsequent analysis (see Appendix A). The questionnaire essentially sought the

opinions, perceptions and experiences of respondents in terms of the most prevalent conditions, actions and decisions that led to deficiencies in the smooth delivery of public construction projects.

Participants in the study were selected from entities within the four groups previously identified in the construction industry, i.e., clients, suppliers, regulators and facilitators (see right column of Table 1). Leaders of the entities representing the four groups were requested to select five participants to attend the interviews. An interview schedule was drafted, appointments were made and interviews were conducted during a five month period beginning in February 2010. Each interview lasted from one to two hours, and 41 interviews were held in total, involving 208 participants as shown in Table 2. Judging from the professional/occupational composition and the average experience in the industry, the participants were deemed to be conversant with industry issues.

Three people conducted the interviews, with one person dedicated to interviewing, one to recording the proceedings and one for carrying out both tasks; the latter served as a quality assurance mechanism to ensure that the responses were effectively recorded. The transcript of each interview was electronically sent to the participants for correction and confirmation. After all interviews were completed, a content analysis was conducted to identify common themes of deficiencies in the construction industry in Botswana. Judging from previous literature (Sambasivan and Soon, 2007; Sweis et al., 2008; Elinwa and Buba, 1993; Aniekwu and Okpala, 1988), deficiencies can be numerous and ultimately not very useful unless they are ranked. A decision was thus made to only include for presentation the deficiencies mentioned in over half (over 21) of the interviews. In other words, a deficiency was deemed significant if it was identified by over 50% of the interviewees.

Table 2. Number and Experience of Participants in the Interviews

Occupation	% of Total (N = 208)	Average Experience in the Industry (Years)
Architects	20%	15.9
Engineers	25%	17.5
Quantity surveyors	19%	18.9
Economic planners	13%	20.1
Trainers	8%	22.5
Others (e.g. Regulators, facilitators, etc.)	16%	20.2
Total	100%	

SEVERITY OF DEFICIENCIES ON PROJECT DELIVERY

Of the 323 projects studied, 13% (42) had been abandoned by contractors and re-tendered for completion, resulting in both cost and time overruns. This is a high rate of abandonment that should not be allowed to exist in the industry. As will be discussed later, the primary cause of this problem was identified as an ineffective contractor registration system.

It was found that all sizes of projects experienced the same level of abandonment (small: 32%, medium: 34% and large: 34%). This result contradicts the anecdotal belief within and outside the industry that the "abandonment disease" is more likely to happen with small contractors. In fact, given the pyramidal feature of the "contractor class" (more at the bottom and fewer at the top) it would appear that there was less "abandonment per capita" occurring with small contractors.

Two analyses were conducted in computing cost and time variances; one which included all projects and another which excluded abandoned projects. The two analyses were deemed necessary because data for abandoned projects were considered extreme outliers (Neuman, 2006). The variations were computed in accordance with Equations 1 and 2, and a summary of the performance of the remaining sampled projects (N = 281) is shown in Table 3.

The shaded columns of Table 3 indicate the results with abandoned projects included. As expected, the results that include the abandoned projects (shaded column) are worse than those without because all of the abandoned projects had cost and time overruns. The table indicates that 72% and 52% (second column) of the projects experienced cost and time overruns, respectively. The majority (79%) of the projects experienced both cost and time overruns. When the abandoned projects are considered, the results show that 92% of the projects in the sample had both a cost and time overrun. Even though the project sample was not randomly obtained, the results indicate that the probability that a public construction project will not be completed within both the contracted time and projected cost is between 72% and 92%.This is a high probability for failure, and a great indication of the poor performance of projects in the public sector. However, one question that remains is "How severe were the overruns?".

According to Table 3 (column four), the average cost and time overruns were 15% and 75%, respectively. The maximum cost and time overruns were as high as 101% and 400% (column six), respectively. These results show that delays are a more severe problem in the industry. This not only indicates an inefficiency in the industry but also a laxity in the contract management system–how can a contractor be employed for this long without completing the contract, yet with a performance this dismal? While there were a large number of projects with cost overruns (72%), the actual cost overruns were not as significant (15%) (see second row of Table 3) compared to the time overruns, which were fewer (52%) but much more severe (75%).

Table 3. Cost and Time Variations of Projects (Excluding Abandoned Projects)

	Percentage of Total of Projects with Overrun		**Average Percentage Variance (Overrun)**		**Maximum Percentage Variance (Overrun)**	
	N = 281	N = 323	N = 281	N = 323	N = 281	N = 323
Cost overrun	72%	75%	(15%)	(21%)	(101%)	(131%)
Time overrun	52%	85%	(75%)	(80%)	(400%)	(600%)
Cost and time overrun	79%	92%				

DEFICIENCIES OF THE CONSTRUCTION INDUSTRY IN BOTSWANA

Respondents identified a number of deficiencies in the construction industry that cause poor performance in public projects, including faults of their own, those of others and the business environment. The frequency of mentioning each deficiency is summarised by group in Table 4. Deficiencies in regulation and of facilitators were mentioned more often than the deficiencies of suppliers and clients.

Deficiencies – Clients

The inadequacy of human resources, the lack of project management best practices and the inability to promptly pay suppliers were cited as the major deficiencies in the project delivery process by over half of the groups interviewed.

Lack of adequate and experienced human resources

Projects are fulfilled through the efforts and skills of people, with the help of systems. However, respondents identified a lack of appropriate, experienced and adequate human resources (on the client side) as leading to the poor delivery of public projects.

Table 4. The Frequency by Which Respondents Mentioned a Deficiency during the Study

Deficiency Factor	Frequency of Mention (N = 41 or 100%)
Deficiencies of clients	81%
Inadequate competent of human resource	87%
Inadequate project briefs	82%
Lack of project management approach	75%
Lack of effective project supervision	72%
Lack of a prompt payment system for suppliers	90%
Deficiency in the regulation of professionals, contractors and the procurement process	92%
Ineffective and inefficient regulation of projects procurement process	77%
Ineffective regulation of consultants	100%
Ineffective regulation of contractors	100%
Deficiencies of suppliers	86%
Incompetent consultants	87%
Inefficient and ineffective contractors	92%
Unreliable utility providers	80%
Deficiencies of facilitators	98%
e.g. provision and dissemination of information and in the provision of cross-cutting forum for strategising industry matters	

Lack of adequate project briefs

A client brief is the cradle of a project, as it captures the need to be fulfilled by a construction facility. Respondents indicated that in many cases the briefing process was often mishandled, leading to changes in scope during the design and/or construction phase.

Lack of project management approach

There was absolute agreement that sound project management practices are rarely applied in the public project delivery processes. This leads to a number of deficiencies; the project processes are often conducted as disjointed stages, most often overseen by different people. This results in a lack of coordination and a loss of continuity in information and enthusiasm.

Lack of effective project supervision

As a result of using a TPS, the design consultants (architects and engineer) are contracted to supervise the quality aspects of the construction phase of the project. It was noted that these consultants only visit the project sites during site meetings and are therefore not effective in the supervision process and ensuring the quality of the completed asset.

Lack of a prompt payment system for suppliers

Respondents bore testimony to the fact that all public projects have funds already committed for use. This means that, particularly in Botswana during the period prior to the recession, funds had been available for the execution of all planned projects. However, suppliers noted that they often received their progress payments beyond the contracted time, primarily because of bureaucratic inefficiencies.

Deficiency of Regulators

A few issues were raised about project process regulators; specifically, the lack of capacity to monitor and enforce anti-pollution regulations as well as health, safety and quality standards relating to construction issues. However, the discussion frequently centred on issues relating to the regulation of the procurement process and suppliers.

Procurement regulation

It was noted that ever since the Public Procurement and Asset Disposal Board (PPADB) and the Local Authority Procurement and Asset Disposal (LAPAD) were established, they have focused on the procurement mandate and "outsourced" the registration process to the project procurement entities. Often the latter do not have the resources, time and motivation to initiate a proper assessment and monitor contractor performance to provide up-to-date reviews of contractors.

Therefore, it is possible that a significant number of contractors are registered in a class that does not match their capability.

Due to the lack of monitoring by the awarding body, it was noted that past performance reports are never considered during the tendering process. This places projects at considerable risk of an incompetent contractor (who may have performed poorly in the past, and perhaps even abandoned projects) being awarded a tender without any scrutiny, sanctioning or rehabilitation. Wherever end-of-activity or determination reports are produced, they are never considered in the adjudication process.

Finally, it was noted that the public procurement regime does not expeditiously award the tenders, creating a challenge for suppliers. Public project procurement is a multi-stage process which includes evaluations by consultants and project managers resulting in a recommendation to the procurement regulators for adjudication. While it is important to resolve these issues before a bid is awarded, it was noted that in some cases the evaluation and adjudicating process took so long that the prices used to prepare the bid became irrelevant.

Regulators of suppliers

Two types of suppliers came into the spotlight – consultants and contractors. Consultants provide a range of professional services to projects, including engineering, architecture, landscaping, quantity surveying, and environmental impact assessment. Though there have been efforts by consultants to form professional societies for self-regulation and development, this has not been effective due to the voluntary nature of the affiliation. Therefore, their competence and conduct should be regulated by appropriate statutory professional bodies.

Although the construction phase consumes on average between 80–90% of the project development costs, there is no institution that develops and regulates the conduct of government suppliers. While procurement regulators have developed a code of conduct to regulate the conduct of contractors (Lionjanga, 2010), they have yet to enforce it.

Deficiencies of Suppliers

Contractor deficiencies

It was noted that contractor deficiencies encompassed a lack of competency and inappropriate behaviour. Respondents complained that most contractors, especially at lower levels, lack management skills that include an inability or unwillingness to employ sufficient and/or skilled personnel. Poor decision making, such as not knowing which equipment to purchase and which equipment to rent, was also cited. Such decisions can delay a project because the equipment is not on site or encumber capital if the equipment is not fully utilised. In addition, respondents noted that some contractors overstretch their organisational capacity and cash flow with multiple or distant jobs, leading to logistical challenges.

Furthermore, it was noted that contractors were often found to lack key skills in project management, including estimating and pricing, project planning,

site management and risk assessment. More importantly, they often lacked financial management skills and the proper understanding of project contractual documents and other related matters; in some cases, they could not properly meet their obligations or understand their rights.

Consultant deficiencies

In a TPS system, consultants offer three major services: design, construction supervision and cost management. The major deficiencies of consultants were identified in terms of incomplete designs at the tender stage and ineffective supervision during the construction phase.

Deficiencies of utility providers

Almost no project commences without the need for utilities in the form of water, electricity or telephone. Therefore, utilities must be promptly installed whenever they are requested. However, there was an overwhelming concern regarding the manner in which utility companies provide such services to projects. Most notably, there was a concern that, for building projects, utility companies are often late in connecting services, resulting in delayed testing and commissioning of building facilities.

For road construction projects, utility providers were blamed for some of the delays because of their failure to promptly relocate services in accordance with the construction programme. It was noted that this occurs despite the fact that representatives from utility companies are always invited to project planning meetings. This occurs even when utility companies are paid in advance for the installation or relocation of service lines and given a programme as to when they should carry out the work.

Deficiencies of Facilitators

Facilitating entities are supposed to aid the project delivery process by providing supportive services that are not necessarily contractual. In other words, they are supposed to create a conducive environment for the construction business. Though there are many facilitating entities, BOCCIM became the focus of discussion. Its role was viewed as falling short of stakeholder expectations.

Related to the issues of coordination and leadership is the lack of an industry-focused provision and dissemination of information for the industry. Industry stakeholders are desperate for information relating to cost/price indices, job markets and industry performance. In the current situation, information is either scant or requires excessive effort, time and expense.

Furthermore, the industry finds itself with no forum for discussing the multi-faceted issues in the industry. It was noted that lack of a forum often left the industry with little room to discuss and tackle the issues which occur from time to time, such as the increasing trend of corruption and the Chinese dominance of the industry.

IMPLICATION OF FINDINGS

The most desirable research outcome is the generalisability of the results in both a local and wider context (Leedy and Ormrod, 2005). The nature of the sampling used for both the project data and the selection of interviews in this study was not random, and could be viewed as limiting the generalisability of the results. Additionally, it would have been beneficial to include the third metric of quality in the investigation. The inability to use random sampling and the exclusion of the quality metric in the study has already been explained in the section on the research approach.

Despite the above limitations, the overall aim of the study – to develop an understanding of the context of the industry before recommending any transformation initiative – was achieved. The study required a participatory approach in order to involve the stakeholders of the industry, as opposed to the survey approach which only seek their unsubstantiated opinions. This attribute outweighs the need for a quantitative approach that merely aims at achieving generalisability. Furthermore, the results were in agreement with anecdotal reports written by industry stakeholders (e.g., Palalani, 2000), media sources (e.g., Ramadibu, 2010) and official government observers (e.g., Kenosi, 2010). Due to the brevity required for reporting in this article, only the significant deficiencies have been briefly mentioned, as identified by more than half of the interviewed groups. Because of this, the results are highly indicative of the prevailing situation in the construction industry in Botswana.

The results indicated that the chances that a government project will encounter both a cost and time overrun are very high (between 79% and 92%). The severity of the overruns may be as high as 15% for cost and 75% for time. The implications of the overruns at a micro (project) and macro (national) level have been articulated in many research reports (e.g., Elinwa and Joshua, 2001). It can be concluded, therefore, that the construction industry is inefficient and ineffective in delivering public projects, and if the situation is left unchecked, it could seriously hamper the development of Botswana. A further study to investigate the quality metric is highly recommended to provide the full picture of construction industry performance.

In answering the second research question (RQ2), the reasons for such overruns were found to be on both sides of a contract (clients and suppliers). Reducing the deficiencies on the client side requires the installation of efficient and effective "soft" and "hard" systems. This would entail, for example, hiring and retaining competent and adequate personnel and using the best practices in project management. This could be mirrored on the supplier side, alongside a fully instituted and enforced regulatory regime. In addition, CPD should be promoted and conducted on both sides to develop and sustain skills.

Moreover, a wide gap was discovered in the construction business environment in the form of inadequate facilitation to ensure a smooth operating environment. Although this study concentrated on public projects, the participant responses often cast a wider net to include issues of the entire construction industry of Botswana. It is therefore highly recommended that the industry undergoes significant reform with the goal of creating a clear vision, a forum for discussion, a centre for collecting and disseminating information and, above all, providing leadership that galvanises the currently fragmented industry stakeholders.

CONCLUSION

The paper confirms anecdotal reports that the development of the infrastructural asset base in Botswana is inefficiently and ineffectively delivered. The main deficiencies in the industry that lead to this problem have also been identified. Through collecting and analysing data on cost and time for projects completed in a five year period, results indicated that there were serious performance problems. From a total of the 323 sampled projects, only 8% had been completed on time and within cost, while 21% of the projects had been abandoned. The causes of this dismal performance on public projects were identified as the decisions and actions taken by key stakeholders, namely clients, suppliers and regulators across the project spectrum. The deficiencies of each were identified, primarily arising from the inadequacy and ineffectiveness of the client personnel and the utilised systems; for the professions, it was the lack of an effective regulatory regime that created a myriad of sub-problems. The fourth factor was identified as the lack of an effective facilitative environment for the industry.

Although the solutions to the above problems are beyond the scope of this paper, a few are highlighted. First, the public client must ensure that there are adequate, well trained, experienced and motivated personnel who are able to deploy contemporary project management skills and systems. Second, all professions involved in the construction industry must have statutory regulatory bodies to oversee the development and conduct of the professionals (a few have been established but are not fully operational). Finally, some type of sector reform is needed to create a conducive climate in which projects are delivered in an efficient and effective manner. This may, for example, entail establishing an overarching body to galvanise the strategic efforts of the sector.

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APPENDIX

A Questionnaire for Soliciting Opinions on the Deficiencies of the Construction Industry in Botswana

1. In your opinion, how do the following affect the effective delivery of public construction projects?

i) Clients and their representatives
ii) Suppliers
iii) Regulators
iv) Facilitators in the business environment

2. What can be done to improve the situation?

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