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Doubts raised on the validity of construction and payment guarantees

Peer reviewed

Abstract

It has become common practice in the building industry for contractors to provide employers with a construction guarantee. These guarantees, which are defined as being on call or on demand, usually provide that a certificate issued by the agent or the principal agent will provide conclusive proof that the employer is entitled to call in the guarantee (Fenster, 1998). In a number of recent decisions, such a conclusive proof provision has been the subject of judicial scrutiny, and there is now an ever-increasing doubt as to the validity of these guarantees.

The Joint Building Contracts Committee (JBCC) 1991 suite of contracts was the first in South Africa to introduce the concept of construction and payment guarantees that provided the requisite cover available on call from approved financial institutions. In the process the construction guarantee replaced the performance guarantee (surety) that prevailed in addition to the retention fund in construction contracts. Various standard forms, which embodied the terms and conditions of the guarantees, were prepared for this purpose by the JBCC. These terms and conditions had been negotiated by the JBCC with the legal/technical committees of the banking and insurance institutions and were fully approved by them. However, for some time now concerns have been raised regarding the difficulties experienced in getting all banks and/or their property finance divisions to comply with the JBCC guarantees. Because the construction and payment guarantees are so closely linked to the terms and conditions of the JBCC principal and nominated/selected subcontract agreements, changes made to the *pro forma* guarantees or agreements, which disturb the risk of the guarantor, could very well render the guarantee null and void.

This article will report the interpretation of construction and payment guarantees as held in recent court decisions, the findings of an investigation conducted on perceived problems being experienced by the South African construction industry with regard to these guarantees, and will present what is considered to be best practice to ensuring the continued effective use thereof.

Keywords: Building industry, guarantees, performance, risk management, securities

Abstrak

Deesdae is dit algemene praktyk vir aannemers in die boubedryf om aan bouhere 'n konstruksiewaorborg te voorsien. Hierdie waarborge, wat gedefinieer word as beskikbaar op aanvraag of oproep, voorsien gewoonlik dat 'n sertifikaat wat deur die agent of die hoofagent uitgereik word afdoende bewys sal wees dat die bouheer geregtig is om die waarborg op te roep (Fenster, 1998). In 'n aantal onlangse hofuitsprake het hierdie ongekwalifiseerde toepassing van oproepbaarheid in gedrang gekom weens regterlike ondersoek en daar bestaan nou 'n groterwordende twyfel oor die geldigheid van hierdie waarborge.

Die Gesamentlike Boukontraktekomitee (GBK) se 1991-kontraktetestel was die eerste in Suid-Afrika om die konsep van konstruksie- en betalingswaarborge in te stel. Hierdie waarborge verskaf die vereiste dekking wat, wanneer dit benodig sou word, deur goedgekeurde finansiële instellings beskikbaar gestel word. Hiermee is die prestasiewaorborg (borgakte), wat naas die retensiefonds algemeen in konstruksiekontrakte in gebruik was, deur die konstruksiewaorborg vervang. Die GBK het verskeie standaardvorms, wat die terme en voorwaardes van die waarborge omvat het, vir hierdie doel voorberei. Die GBK het op 'n deurlopende grondslag met die regs- of tegniese komitees van die bank- en versekeringsinstansies oor gemelde terme en voorwaardes onderhandelinge gevoer ten einde hulle volle goedkeuring en die ongekwalifiseerde toepassing daarvan te verseker. Daar word egter reeds vir 'n geruime tyd kommer uitgespreek oor die probleme wat ondervind word om te verseker dat al die banke en/of hul eiendomfinansieringsafdelings die terme en voorwaardes van die GBK-waarborge nakom. Omdat die terme en voorwaardes van die konstruksie- en betalingswaarborge ten nouste verbind is met dié van GBK se hoof boukontrakoooreenkomste en genomineerde of geselekteerde subkontrakoooreenkomste, mag wysigings aan die *pro forma*-waarborge en -ooreenkomste – wat verband hou met die risiko van die waarborggewer – daartoe lei dat hierdie waarborge van nul en gener waarde is.

Onlangse hofbeslissings met betrekking tot die interpretasie van konstruksie- en betalingswaarborge en bevindinge van 'n ondersoek na beweerde probleme wat deur die Suid-Afrikaanse konstruksiebedryf ondervind word met betrekking tot die waarborge word in hierdie artikel rapporteer, en 'n beste praktyk riglyn om te verseker dat hierdie waarborge steeds effektief gebruik word, word voorgestel.

Sleutelwoorde: Boubedryf, waarborge, prestasie, risikobestuur, sekuriteit

1. Introduction

Uncertainty about future events creates the potential of losses occurring, because available security often does not completely liquidate the exposure, and inevitable losses are accepted as part of property finance. Efforts to reduce the severity and variability of such losses are an ongoing risk management function requiring the constant monitoring, developing and refining of policies, procedures, skills and knowledge (Wight & Ghyoot, 2008).

In an effort to reduce risks and to protect the interests of the contracting parties, various types of securities have over the years

been introduced into standard building agreements. As the contents of agreements became more sophisticated and included new provisions, inventive ways are continuously being developed to protect the risks and interests of the parties with greater certainty. Therefore, when the JBCC's new parcel of contract documents was introduced to the South African building industry in 1991, Brink & Botha (1991: 2) pointed out that the aims of the JBCC, *inter alia*, were to:

- Review the areas of uncertainty that exist in the documents then in use;
- Re-examine the distribution of risks;
- Find a way of improving cash flow to the contractor and his subcontractors;
- Provide better and more cost-effective security to the employer, and
- Encourage better and greater discipline in the industry.

It is essential that the project team establishes and understands clients' requirements as accurately and as quickly as is appropriate and possible, and these requirements must reflect their needs and objectives. The Latham Report (1994) suggested that the project needs of a client are:

- Obtaining value for money;
- Ensuring the project is delivered on time;
- Having satisfactory durability;
- Incurring durable running costs;
- Being fit for its purpose;
- Being free from defects on completion;
- Having an aesthetically pleasing appearance, and
- **Being supported by meaningful guarantees** (author's emphasis).

A number of standard contracts are currently being used in South Africa. According to the South African Construction Industry Status Report, prepared by the Construction Industry Development Board (CIDB 2004: 50), the following forms of contract were considered to be meeting the principles of modern contracting if utilised unaltered:

- *Fédération Internationale des Ingénieurs-Conseils* (FIDIC – French acronym for International Federation of Consulting Engineers);

- General Conditions of Contract for Construction Works (GCC 2010);
- New Engineering Contract (NEC – now referred to as the Engineering and Construction Contract, ECC), and
- The Joint Building Contracts Committee (JBCC Series 2000).

These modern forms of contracts are supposed to appropriately allocate risks, responsibilities and obligations and contain administrative procedures that enable proactive management of the delivery process. As part of their supplementary documents these contracts offer *pro forma* deed of suretyship and guarantee forms. Informal observation that will be evaluated in this article has indicated that these forms are regularly changed leading to poor interpretation and increased risk to the contracting parties.

This article focuses primarily on the guarantees incorporated into the JBCC Series 2000 suite and more specifically on its variable construction guarantee, which must be provided by the contractor/subcontractor, and its payment guarantee, which must be provided by the employer/contractor.

In the absence of a specific agreement, the contractor is generally not obliged to provide any form of security for the due fulfilment of his obligations. Loots (1995: 647) stated, however, that it is customary to require the contractor to furnish a security of the contractor's performance of the contract with an undertaking to be bound in a specified sum until (and unless) such performance is achieved. The security may either be in the form of a suretyship or a performance (or "on-demand") guarantee or indemnity. Forsyth & Pretorius (1992: 26) defined suretyship as:

an accessory contract by which a person (the surety) undertakes to the creditor of another (the principal debtor), primarily that the principal debtor, who remains bound, will perform his obligation to the creditor, and secondarily, that if and so far as the principal debtor fails to do so, the surety will perform it or, failing that, indemnify the creditor.

The performance (or "on-demand") guarantee, on the other hand, is usually an undertaking whereby the guarantor unconditionally and irrevocably undertakes to pay certain amounts (as may be specified in the agreement) on demand and without proof of any breach of contract. According to Uff (2009: 345) the notice usually requires no more than an assertion of default on behalf of the contractor and the money will be paid irrespective of any disputes that may exist, either in relation to the underlying contract, generally, or in relation to the purported reason for calling the security, in particular.

It is also the opinion of Uff (2009: 346) that the demand for this type of security has increased as international trade and construction in particular have grown.

2. JBCC construction guarantees

The 1991 edition of the JBCC suite of documents was the first in South Africa to introduce the concept of a construction guarantee aimed at replacing the retention fund. In the process the construction guarantee also replaced the performance guarantee that, at that time, prevailed in addition to the retention guarantee in construction contracts (Finsen, 2005: 100). Both performance guarantees and retention guarantees were initially drafted in the form of a suretyship, which – after the guarantor had been made a co-principal debtor and had renounced his benefits of excussion and division – still had the defence in law of challenging the right of the employer to call up the guarantee and to challenge the quantum of the guarantee before paying over the money. In short, a suretyship is not tangible money. It has to be earned, often by taking recourse to the courts (Uff, 2009: 344).

The standard guarantee forms, which were prepared by the JBCC in their earlier editions, did not guarantee payment of loss once established. According to McDonald (2002), problems initially existed in the wording. In the matter of *Basil Read (Pty) Ltd v Beta Hotels (Pty) Ltd and Others* 2001, Judge Van Reenen stripped the JBCC 1991 construction guarantee of all its guarantee status and dignity, exposing it for what it really was, namely a simple suretyship. The current JBCC Series 2000 guarantees have rid themselves of the words “in respect of expense and loss”, and the destroyer of all guarantees, “by virtue of non-performance”, in an effort to provide the market with a “true blue” guarantee, without the cumbersome obligations of a suretyship.

The wording of the construction guarantee (JBCC Code 2122, 2007c), relevant part quoted below for ease of reference, now makes it explicitly clear that the guarantor undertakes to pay the employer the certified amount upon receipt of the following three prescribed documents, which will serve as conclusive proof that the employer is entitled to call up the guarantee:

1. A copy of a first written demand issued by the employer to the contractor stating that payment of an amount certified by the principal agent in an interim or final payment certificate has not been made in terms of the agreement and, failing such

payment within seven (7) calendar days, the employer intends to call upon the guarantor to make payment.

2. A first written demand issued by the employer to the guarantor at the guarantor's physical address with a copy to the contractor stating that the period of seven (7) calendar days has elapsed since the first written demand, and that the amount certified has still not been paid, therefore the employer calls up the construction guarantee and demands payment from the guarantor.
3. A copy of the said payment certificate which entitles the employer to receive payment in terms of the agreement.

Understandably employers prefer to receive 'on-demand' guarantees because these guarantees can be called up without having to first prove the contractor's default in arbitration or litigation, which can be costly and time consuming. Guarantors likewise prefer 'on-demand' guarantees because in this instance they do not need to read the building agreement, investigate the contractor's alleged default and assess the employer's entitlement to compensation (Uff, 2009: 345).

The current JBCC construction guarantee provides, in clauses 4 and 5, for specific JB events that would trigger an obligation on the guarantor to make payment in terms of the guarantee. Clause 4 deals with those circumstances where the principal agent issued a certificate certifying a balance due by the contractor to the employer. There is no concomitant duty on the employer to account to the guarantor as the statement by the principal agent already justifies the amount due and payable by the contractor to the employer. Clause 5 contemplates two different trigger events, namely:

1. Cancellation of the contract by the employer, due to the default by the contractor, or
2. Sequestration/liquidation of the contractor.

Clause 5 reads as follows:

Subject to the Guarantor's maximum liability referred to in 1.0 or 2.0, the Guarantor undertakes to pay the Employer the guaranteed sum or the full outstanding balance upon receipt of a written demand from the Employer to the Guarantor at the Guarantor's physical address calling up this Construction Guarantee stating that:

- 5.1 The agreement has been cancelled due to the Contractor's default and that the Construction Guarantee is called up in

terms of 5.0. The demand shall enclose a copy of the notice of cancellation; or

- 5.2 A provisional sequestration or liquidation order has been granted against the Contractor and that the Construction Guarantee is called up in terms of 5.0. The demand shall enclose a copy of the Court order.

In the event where the guarantor receives a demand under 5.1 or 5.2 of the guarantee, it is obliged to pay the full amount for which it is liable in terms of the guarantee. Clause 7 provides that where a claim is made by the employer he shall, after completion of the works, account to the guarantor and shall submit an expense account showing how all monies received have been expended and shall refund to the guarantor any resulting surplus.

The JBCC construction guarantee constitutes a principal obligation on the part of the guarantor and is an independent contract between the guarantor and the employer, totally separate from the principal agreement. This fact is reiterated by clause 3 of the guarantee which states that any reference in the guarantee to the agreement is for purposes of convenience only and shall not be construed to create any accessory obligation. See JBCC Code 2201, 2007e for a summary of all the available construction guarantees (security) to be provided by the contractor.

3. JBCC payment guarantees

Relevant to the South African construction industry, a payment guarantee could be defined as a contractual undertaking by a third party, the guarantor, towards the contractor, that the guarantor will pay to the contractor the amount of works done under the construction contract, up to the guaranteed amount or a percentage of the price of the works done, in case the employer defaults in its payment obligations.

Of the four CIDB endorsed contract documents (*supra*), only the FIDIC Redbook and the JBCC PBA contracts expressly provide for the use of payment guarantees. (See clause 3.1, JBCC Principal Building Agreement, Code 2101, PBA 2007a and the example clause on page 17 of the guidance notes of the FIDIC Redbook). Both contracts have *pro forma* payment guarantee forms that could be used by the parties.

In terms of the JBCC Agreement the employer is obliged to provide a payment guarantee (JBCC Code 2124, 2007d) if he requires the

contractor to waive his lien, and likewise if the contractor states in his tender that he requires such guarantee. The onus is on the contractor to specify the amount of the guarantee required in his tender as there are no specific percentages provided in the principal agreement as is the case with the construction guarantee. Finsen (2005: 106) remarks that little guidance can be offered to a tenderer as to what would be an appropriate amount, and if the tenderer should stipulate for an amount disproportionately higher than his competitors, he runs the risk of the rejection of his tender.

In the nominated/selected subcontract agreement (JBCC N/SA Code 2102, 2007b) the quantum, however, is given and a payment guarantee shall be provided by the contractor for an amount equal to 10% of the subcontract sum.

4. General

The JBCC's *pro forma* construction and payment guarantees are simple documents that make no attempt to describe in detail the specific liabilities of the guarantor and its obligation is restricted to the payment of the guaranteed sum. The guarantees do not impose on the guarantor any obligations that are separate from, or in addition to, those assumed by the contractor/employer. By the same token, by being bonded, the parties assume no additional obligation that they have not already assumed by their agreement or by operation of the law. The guarantee can be invoked only if the defaulting party is in breach of contract and the guarantee must be in writing and signed to be enforceable.

5. Recent court decisions summarised

5.1 *Sasfin (Pty) Ltd v Beukes*¹

This case arose after Sasfin, a financier, agreed to loan money to Beukes, a doctor. A number of the provisions in their written contract were attacked as being unconscionable and therefore against public policy and unenforceable.

The Appellate Division focussed on two clauses, in particular. The first provided that the amount owing by Beukes would be determined and proved by a certificate issued by a director of Sasfin, and the second that such certificate would constitute conclusive proof of the amount owing. The effect of these two clauses was therefore that Sasfin would determine how much was owed and once it had

¹ *Sasfin (Pty) Ltd v Beukes* 1989 (1) SA 1 (A).

issued the certificate Beukes would be obliged to pay the amount certified.

The matter went to the courts and the Appellate Division found that the contract was unconscionable, against public policy and therefore illegal. The question which then arose was whether these certificates would always be invalid or whether they were invalid in certain citations only. Two subsequent decisions were obliged to interpret *Sasfin v Beukes* and they came to conflicting decisions on this point. In the first, *Nedbank Ltd v Abstein Distributors (Pty) Ltd*, the court held that a conclusive proof certificate will always be invalid. In the second decision, *Donnelly v Barclays National Bank Ltd*, the court found that the effect of the *Sasfin* case was not to render all conclusive proof certificates invalid.

The Appellate Division was approached for a ruling and asked to assess whether conclusive proof certificates are always invalid or whether they will be invalid under prescribed circumstances only. It found that conclusive proof certificates will be valid, legal and enforceable when the author of the certificate is someone who has some measure of independence from the creditor.

The important question is, therefore, whether the agent in a construction contract is sufficiently independent of the employer. One would argue that the agent is sufficiently distant in most cases, especially when appointed under the JBCC Agreement, but if the agent is a permanent employee of the employer, then he may not be sufficiently distanced and the guarantee will therefore be invalid and unenforceable.

5.2 AB Construction v Furstenburg Property Development & Others (2009)²

AB Construction (contractor) concluded a standard JBCC building contract in connection with the construction of a residential development in East London. The contractor arranged for Constantia Insurance Company (guarantor) to provide for the requisite construction guarantee in favour of Furstenburg Property Developments (employer). During the course of the contract various disputes arose between the contractor and employer, which resulted in the employer, after issuing an appropriate breach notice, cancelling the agreement.

2 *Petric Construction CC t/a AB Construction v Toasty Trading t/a Furstenburg Property Development and Others 2009(5) SA 550 ECG*

Foreseeing the probability that the employer would try and call in the construction guarantee, the contractor requested the guarantor not to accede to any demand under the guarantee, but the guarantor explained that it was bound to honour the guarantee unless the contractor was able to obtain a court interdict prohibiting payment under the guarantee. The court agreed that the construction guarantee is analogous to a letter of credit and held further that the disputes between the contracting parties had nothing to do with the obligations of the guarantor to honour the guarantee. The fact that the employer's cancellation was disputed by the contractor or whether or not the employer was in material breach at the time of its purported cancellation were considered to be wholly irrelevant to the guarantor's liability to pay.

As a result the court found that the employer, having complied with the requirements of the guarantee and there being no evidence of any fraud, the guarantor was obliged to make payment in terms of the guarantee.

5.3 *Lombard Insurance Co Ltd v Landmark Holdings (Pty) Ltd and Others (2010)*³

A construction company had been liquidated and the employer had called up the guarantee in terms of the conditions specified in the document. Lombard (guarantor) paid the amount demanded, thereafter seeking reimbursement from Landmark (Landmark having agreed to indemnify the guarantor in the event that it had to meet its obligations under the guarantee). Landmark refused to indemnify the guarantor on the basis that the principal agent, in terms of the underlying construction agreement, had perpetrated a fraud in order to obtain the benefits of the guarantee.

The lower court, finding in favour of Landmark, dealt with the matter on the basis that the guarantee had to be considered in conjunction with the underlying construction contract. On appeal, the Supreme Court of Appeal (SCA) ruled that as the guarantor had undertaken to pay, upon liquidation of the construction company, and the guarantee having been called up in accordance with its conditions, the guarantee was payable. As the guarantee had to be construed independently of the underlying construction contract, and as there was no obligation on the guarantor to investigate the propriety of the claim, payment by the guarantor was validly made.

3 *Lombard Insurance Co Ltd v Landmark Holdings (Pty) Ltd and Others (2010)* (2) SA 86 SCA

5.4 Kwikspace Modular Buildings Ltd v Sabadala Mining Company Sarl and Nedbank Ltd (2010)⁴

The SCA was called again to determine whether the contractor could rely on a term in the building contract to interdict the employer from presenting the guarantee to the bank for payment. The courts regard on-demand bonds independently of the underlying contract (*supra*); a guarantor is therefore obliged to make payment in terms of an on-demand bond presented to it provided only that the conditions specified in the bond are met. This is clearly confirmed by the following quote from the judgment of the SCA, in the recent *Lombard* decision.

The guarantee by Lombard is not unlike irrevocable letters of credit issued by banks and used in international trade, the essential feature of which is the establishment of a contractual obligation on the part of a bank to pay the beneficiary (seller). This obligation is wholly independent of the underlying contract of sale and assures the seller of payment of the purchase price before he or she parts with the goods being sold. Whatever disputes may subsequently arise between buyer and seller is of no moment insofar as the bank's obligation is concerned. The bank's liability to the seller is to honour the credit. The bank undertakes to pay provided only that the conditions specified in the credit are met. The only basis on which the bank can escape liability is proof of fraud on the part of the beneficiary.

The underlying contract in this matter provided that it was subject to Australian law and Kwikspace (contractor) argued that, because of this fact, the contract contains a clause qualifying the right of the employer to present the guarantee. The lower court had found that the building contract did not contain a clause qualifying the right of the employer to present the guarantee, and on that basis the contractor's application to interdict the employer from presenting the guarantee failed. The SCA expressly refrained from considering whether there was any room for a contention that the position in South Africa should be the same as in Australia, i.e. that an underlying building contract between the contractor and employer could, as a matter of law, qualify the right of the employer to present an unconditional guarantee for payment to a guarantor. The decision of the lower court was upheld.

⁴ *Kwikspace Modular Buildings Ltd v Sabadala Mining Company Sarl and Nedbank Ltd* (2010) SCA

5.5 *Dormell Properties v Renasa Insurance Company and Others (2010)*⁵

Synthesis Projects Cape (Pty) Ltd (contractor) entered into an agreement with Dormell Properties 282 CC (employer) for the construction of a shopping centre. It became apparent at the beginning of February 2008 that practical completion would not be achieved before the expiry date of the guarantee, namely 28 February 2008. In light of this the principal agent demanded that the contractor arrange for the construction guarantee to be extended until 15 April 2008, failing which the employer would cancel the contract.

The contractor refused to extend the guarantee and the employer then cancelled the contract on the 28th of February 2008. A demand was submitted on the same day to Renasa Insurance Company (guarantor) for payment of the amount available under the guarantee on the basis that the contract was cancelled by the employer, which is one of the grounds for calling up the guarantee. The contractor disputed the employer's right to cancel the contract which was treated as a repudiation of the contract. The dispute was referred to arbitration and the arbitrator found that the termination of the contract by the employer was invalid as he had no right to do so.

The issue initially came before the Johannesburg High Court and it held that the employer was not entitled to the rectification of the guarantee and that in any event the guarantee had expired at midnight on 27 February 2008 before it had been called up. The employer appealed this decision to the SCA.

On the issue of the expiry of the guarantee the SCA held that where time has to be computed in accordance with a contract, one looks first at the terms of the contract. In this case the contract clearly expressed the expiry date of the guarantee being 28 February 2008 and there was accordingly no warrant for construing the guarantee as having expired prior to that date.

On the issue of rectification, the SCA held that it was obvious to all the parties that the beneficiary of the guarantee was intended to be the employer under the contract. The SCA, however, held that the effect of the arbitrator's award in favour of the contractor was to destroy the basis upon which the employer had called up the guarantee, namely the employer's cancellation of the contract, and as such the employer has lost the right to enforce the guarantee.

⁵ *Dormell Properties 282 CC v Renasa Insurance Company Ltd and Others (491/09) SCA*

The SCA accordingly ruled that the guarantor was not obliged to pay out under the guarantee and dismissed the employer's appeal. The SCA nonetheless affirmed the nature of the JBCC guarantee as being a demand guarantee akin to a letter of credit. In other words all that is required ordinarily to obtain payment is compliance with the formalities specified in the guarantee.

5.6 Minister of Transport and Public Works, Western Cape v Zanbuild Construction (2011)⁶

The SCA was once again called upon to consider the legal nature of construction guarantees in South African law. The facts of the matter, briefly stated, were as follows. Two independent, but substantially similar, guarantees were issued by ABSA Bank Ltd (Absa) in favour of the Western Cape Department of Transport and Public Works (Department), as security for the obligations of Zanbuild Construction (Pty) Ltd (Zanbuild) under two separate construction contracts. The guarantees provided *inter alia* that, "... the bank been given 30 (thirty) days written notice of its intention to do so, provided the employer shall have the right to recover from the bank the amount owing and due to the employer by the contractor on the date the notice period expires."

Absa notified the Department in writing that it wished to withdraw the guarantees, and that each of the guarantees would be cancelled thirty days from the date of the written notice, whereafter no further claims or payments would be considered by Absa. Upon receipt of Absa's notice, the Department demanded immediate payment of the full amount of both guarantees citing, as its basis for such demand, that Zanbuild was in default under both contracts.

Zanbuild, in the Western Cape High Court, applied for an interdict preventing the Department from claiming, and Absa from paying, the amounts claimed under the guarantees. The interdict was granted with leave to appeal to the SCA.

On appeal, Zanbuild's contention was the guarantees were not "on-demand guarantees" but rather "conditional guarantees" and argued that Absa's liability under the guarantees was akin to a suretyship relationship in that the guarantees were inextricably linked to the contracts. As such, Zanbuild argued, Absa's liability under the guarantees was limited to the extent that the Department can demonstrate a monetary claim against Zanbuild under the contracts

⁶ *The Minister of Transport and Public Works, Western Cape v Zanbuild Construction* 2011 SCA 10

prior to the withdrawal of the guarantees. The Department, on the other hand, argued that the guarantees were in fact on-demand guarantees and that all that was required from the Department in order to obtain payment of the full amount of the guarantees, was to demand payment under the guarantee and provide a statement to Absa that Zanbuild was in default under the contracts.

The Court remarked that the question as to whether or not a guarantee is conditional or on demand is dependent on the interpretation of the terms of the guarantee concerned, and found that, on its interpretation of the terms of the guarantees, the guarantees were not on-demand but rather conditional guarantees. The reasons for the Court's finding were *inter alia* as follows: first, the Court held that the language and content of the guarantees were akin to suretyships in that the guarantees provided that they were provided as "security for the compliance of the contractor's performance of obligations in accordance with the contract" and the "due and faithful performance by the contractor" and, secondly, the guarantees provided that "with each payment under this guarantee the bank's obligation shall be reduced pro rata". As such, the Court held, this was a clear indication that the Department's interpretation of the guarantee (i.e. that any default of Zanbuild under the contracts irrespective of liability on the part of Zanbuild would render the full amount of the guarantees payable) was clearly incorrect, and if this interpretation were correct, there would be no need for multiple draw downs on the guarantees.

The Court consequently held that, as the Department had failed to establish that, prior to the withdrawal of the guarantees by Absa, the amounts claimed by the Department from Absa were due to it by Zanbuild, the Department was not entitled to demand payment under the guarantees from Absa and dismissed the Department's appeal.

6. Investigation into perceived problems being experienced with regard to construction and payment guarantees

6.1 Research methodology

To establish quantitative criteria whereby the effectiveness of the guarantees could be evaluated, a questionnaire was circulated via email to a target population of randomly selected contractors and employers in the Gauteng province in order to capture the requisite data. The target population was divided into the following two categories:

1. Contractors – A selection of main contractors in the building industry that are registered with the Construction Industry Development Board (CIDB) with a Grading Designation of at least 7.
2. Employers – A selection of clients or developers undertaking and being responsible for the funding of larger building projects (the party engaging in contract with the contractor).

Respondents were requested to respond to nine statements dealing with the application and effectiveness of the JBCC construction and payment guarantees on condition that the following instances were present, namely:

- A recognised bank or insurance company provides the guarantees;
- JBCC construction and payment guarantees are utilised;
- JBCC terms and conditions are applicable, and
- Work to be executed is building-related.

A 5-point Likert scale ranging from "strongly agree (SA)" to "strongly disagree (SD)", where SA represented 5 and SD 1, respectively in the frequency tables hereinafter, was deemed appropriate for all statements. One hundred and six questionnaires were emailed to the target population of which 31 emails failed to deliver (user unknown) and a further three emails were returned with the comment that the questionnaire was not applicable to their knowledge field. Of the 72 emails read, 18 responses were obtained, 11 of which were from contractors and the balance from developers, which represented a 25% response rate (see Table 1).

A qualitative approach that utilised personal interviews was adopted to obtain the requisite data from the banking sector which underwrites construction and payment guarantees for the South African building industry. The target population was made up of representatives from the legal departments of the selected five 'mainstream' banks, who were deemed-to-be knowledgeable on the application of the JBCC guarantees. The content and purpose of the study were first explained to these representatives, whereafter structured interviews (see Table 2) were conducted in order to ascertain perceptions and viewpoints on the importance, application and effectiveness of the JBCC guarantees.

Due to the small size of the target populations in both the quantitative and qualitative approaches the surveys did not require sampling. Every effort to eliminate the likelihood of biased data was made,

but should such data be identified, it is acknowledged. Buys (cited in Buys & Tonono, 2007: 80) defines bias as “any influence, condition, or set of conditions that may singly or together distort the data from what may have been obtained under the conditions of pure chance”.

Subsequent to these methods of data-gathering, three selected deemed-to-be knowledgeable individuals on the application of the JBCC guarantees (D'Arcy-Donnelly, Spence & Fourie, 2008) were contacted via email, two of whom were employed in the legal departments of corporate financial property divisions acting as separate divisions from their main banks, and the other the CEO of the Master Builders South Africa (MBSA). This was done to obtain a more complete picture of the sourced data. These three individuals were asked to respond to only one question; i.e. what the impact is should a guarantor tamper with the wording of the guarantees as has been agreed between the JBCC and the banking sector. The results of these communications are included in the comments following Table 2.

6.2 Trends indicated by the data collected

Table 1: Application of the JBCC construction and payment guarantees as viewed by contractors and developers

<i>Statement</i>			SA 5	A 4	N 3	D 2	SD 1	Mean
1	The introduction of construction guarantees provided by financial institutions in place of the retention fund and performance surety has been well accepted by all stakeholders in the building industry	No	5	10	3	0	0	4.1
		%	28%	56%	17%	0	0	
2	The obligation on the parties to furnish construction and payment guarantees is so fundamental that failure to do so by the start of the construction period is sufficient grounds for cancellation of the agreement	No	7	5	1	3	2	3.7
			39%	28%	6%	17%	11%	

Statement			SA 5	A 4	N 3	D 2	SD 1	Mean
3	The reduced cover in the 5 th edition of the JBCC construction guarantees remains adequate to protect the interests of the employer	No	5	9	4	0	0	4.1
		%	28%	50%	22%	0	0	
4	Lack of uniformity in the wording of construction and payment guarantees often results in inadequate or defective protection	No	4	10	3	1	0	3.9
		%	22%	56%	17%	6%	0	
5	The construction and payment guarantees are truly 'on-demand' guarantees	No	0	5	11	1	1	3.1
		%	0	28%	61%	6%	6%	
6	Construction guarantees curtail the liquidity of established contractors	No	2	9	2	4	1	3.4
		%	11%	50%	11%	22%	6%	
7	Construction guarantees are available to emerging contractors	No	5	10	2	0	1	4.0
		%	28%	56%	11%	0	6%	
8	The lapsing of the construction guarantee after its expiry date leaves the employer with little recourse against the contractor	No	5	2	2	6	3	3.0
		%	28%	11%	11%	33%	17%	
9	Employers are often caught unawares in that the construction guarantee lapses because the expiry date on the guarantee is generally set too early	No	3	4	6	3	2	3.2
		%	17%	22%	33%	17%	11%	

The responses to the statements in Table 1 are reported in the order corresponding with the statements in the table, together with the respective mean.

1) The respondents indicated that the introduction of on-demand guarantees has been well accepted by the industry (mean = 4.1)

and 2) that it is an obligation on the parties to furnish such guarantees at the commencement of the project (mean = 3.7). 3) The reduced cover currently available to employers should the contractor default was regarded as still adequate (mean = 4.1). 4) The respondents indicated a concern that amendments to the *pro forma* wording of the guarantees may result in inadequate or defective protection (mean = 3.9). 5) The respondents were undecided whether banks will make payment forthwith when called upon. This can possibly be attributed to the fact that they may not have had any experience in this regard as no demands for payment had previously been lodged by them (mean = 3.1). 6) The respondents generally were in agreement that liquidity of established contractors is curtailed by having to provide guarantees (mean = 3.4) and 7) that this is more prevalent in the case of emerging contractors when considering the respective percentages in the Table (mean = 4.0). 8) The respondents were not overly concerned that the lapsing of the construction guarantee might leave the employer with little recourse against the contractor for rectification of latent defects (mean = 3.0) nor 9) that employers might be unaware that the expiry date on construction guarantees might be set too early that may leave them without protection (mean = 3.2).

Table 2: Application of the JBCC construction and payment guarantees as viewed by the banking sector

Statement			SA 5	A 4	N 3	D 2	SD 1	Mean
1	Underwriting JBCC guarantees is an important commercial business for banks	No	5	0	0	0	0	5.0
		%	100%	0	0	0	0	
2	JBCC guarantees are regarded as "true blue" guarantees on-demand	No	5	0	0	0	0	5.0
		%	100%	0	0	0	0	
3	Banks do not get involved in the dispute between contracting parties	No	5	0	0	0	0	5.0
		%	100%	0	0	0	0	

<i>Statement</i>			SA 5	A 4	N 3	D 2	SD 1	Mean
4	Banks are kept informed on the latest revisions of the guarantee forms as and when published by the JBCC	No	0	1	0	4	0	2.4
		%	0	20%	0	80%	0	
5	The standard JBCC guarantee forms are available on banks' electronic server system and the wording is not tampered with	No	1	3	0	1	0	3.8
		%	20%	60%	0	20%	0	
6	Except for what is referred to in the guarantee form banks do not require any additional documentation to be submitted when a guarantee is called up	No	0	4	1	0	0	3.8
		%	0	80%	20%	0	0	
7	Data on turnover and number of guarantees called up are annually collected and made available	No	0	0	0	5	0	2.0
		%	0	0	0	100%	0	

The findings in Table 2 are based on the responses provided by the selected representatives of the five 'mainstream' banks in South Africa (ABSA, FirstRand Bank, Nedbank, Rand Merchant Bank and Standard Bank) and are reported in the order corresponding with the statements in the table together with the respective mean.

1) All the interviewees regarded the underwriting of JBCC guarantees as an important part of the banks' day-to-day business (mean = 5.0). 2) There was consensus among the interviewees regarding the undertaking by banks to pay out the amount available on call or on demand without getting involved in the dispute (mean = 5.0), and 3) that banks do not unilaterally amend the wording of the guarantees (mean = 5.0). 4) The interviewees, however, acknowledged that they are not always informed about the revised wording of new editions as and when issued by the JBCC (mean = 2.4). 5) They agreed that the forms are readily available on their systems and that the wording is not tampered with (mean = 3.8) and 6) that they would adhere to the conditions in the guarantee when a guarantee is called up (mean = 3.8). 7) No statistics on the application of the

guarantees are kept by banks although all interviewees agreed after being confronted by the interviewer that such information will have significant value (mean = 2.0).

The statements dealing with uniformity in the wording of the guarantees in Table 1 (statement 4) and Table 2 (statement 5) did not clearly correspond with each other and the responses received were not entirely helpful when attempting to interpret the impact that tampering with the wording of the guarantees has had on the industry, and also with what the industry has experienced in this regard through casual observation by the author. Further investigation was deemed necessary and the author proceeded to contact specific deemed to be knowledgeable individuals for further information. This investigation revealed that the responses would have been significantly different in Table 2 if responses were based on the policies adopted by the mainstream banks' corporate property finance divisions, particularly those of Nedbank Corporate Property Finance and FNB Corporate Property Finance, the institutions that were contacted. This was especially the case when a payment guarantee forms part of the development loan finance structure between the property finance institution and the client/borrower.

According to these interviewees, the wording of the payment guarantee the bank would give to the contractor (normally in exchange for a waiver of the builder's lien from the contractor) has to incorporate the following additional aspects that the JBCC payment guarantee does not provide for:

- The JBCC payment guarantee is for a fixed amount and usually equivalent to three months projected payments at any one time. A property development loan is approved on the basis of a defined expenditure amount. In the event of valid variations issued in terms of the JBCC contract between the employer and the contractor, the bank's guaranteed amount would, in terms of the wording of the guarantee, inherently guarantee these additional amounts occasioned by the variations, notwithstanding that the bank has not agreed to the variations (there is no mechanism for this). The net effect by the end of the project is that the bank's total loan exposure could be substantially higher than the total amount originally approved.
- Property finance institutions generally have a standard requirement that the work, while signed off by the relevant professional, must be vetted by the bank's agent before

payment is made. It is not always possible for the bank to rely solely on the professional's sign-off, as they do not owe the bank a duty of care, nor does the bank obtain cession of their professional indemnity cover, nor can the bank always ensure that the cover is up to date and valid. The fact that the bank utilises its agent to verify the works is not uncommon and, in fact, prudent.

- Banks issue a guarantee which indicates the full facility available to the contractor. This amount does not always constitute the full contract amount and the employer may be required to initially pay a portion from his/her own resources. The JBCC guarantee does not provide a mechanism where banks do not guarantee the full contract amount.
- The guarantees by property finance institutions provide for payments to be made on a balance to complete. In other words, upon payment of a draw, the bank must have a sufficient facility to fund the completion of the work. A typical example of such an amendment is the insertion of the following subclause in the payment guarantee:

The Guaranteed Amount shall be reduced automatically to the extent that the value of the remaining portion of the Works is less than the value of the Guaranteed Sum. Accordingly, on final completion of the Works, as contemplated in the original scope of the works, the Guaranteed Sum shall be nil

- Inherent in the above is the fact that banks do not automatically assume full liability for all and any overruns. In the event that a "buffer" facility is required by the contractor over and above the agreed contingency amount provided, this would need to be a defined amount and the borrower/ employer would need to furnish the bank with appropriate security for this additional facility. This is an additional credit risk which banks do not automatically assume as is envisaged by the JBCC payment guarantee, but if banks were required to assume it, it would need to be quantified and secured.
- The expiry date in the JBCC payment guarantee does not necessarily coincide with the bank's facility. If a loan is settled from the proceeds of the units as they are transferred, the contingent liability that remains in terms of the guarantee would necessitate banks holding back the proceeds from the transfers pending finalisation of the accounts which may take some time. This would clearly not be acceptable to the employer/borrower.

- As the JBCC payment guarantee is normally a standard annexure to the JBCC contract, it is usually the employers who find themselves in a difficult position. This is due to the fact that they are legally required to procure the financial guarantee in accordance with the annexure, which they may be unable to do under certain of the above circumstances.

7. Conclusion

The research has identified that the JBCC guarantees have largely met the aims set by the JBCC (*supra*), but that the following problem areas exist, which may have an influence on the effectiveness of the guarantees:

- The insistence by banks (more specifically their corporate property finance institutions) to amend or add special conditions to the wording of the *pro forma* JBCC guarantees.
- It is generally accepted that contractors are more exposed to risk of payment default towards the end of the contract and final account stage, and acceptance of the insertion of any additional subclauses (*supra*) would dilute the contractors' protection, as and when the guaranteed sum gets exhausted.
- Contractors require the payment guarantee to expire only on payment of the final payment certificate, which date cannot be accurately determined at the start of the construction period, but banks insist on an expiry date that is certain.
- The principal agent's certification is final and constitutes a liquid document, but often payment guarantees are subject to the bank's own quantity surveyor or valuer's approval, which is not acceptable to contractors as such a provision could be abused by the issuing financial institution.
- Banks are uncomfortable with their position where the employer and contractor have agreed to numerous variation orders, resulting in a substantial increase in the original contract amount, without notifying the bank and allowing the bank to participate in the discussions in order to protect its own interest. It appears that the bank may be at risk where no certificate is issued in circumstances where substantial variations to the original contract were agreed to.
- Regardless of whether or not the Courts' interpretations of the guarantees are correct, it is likely that the decision, *inter alia*,

in the *Zanbuild* case (*supra*), will cause some confusion as to the legal nature of construction and payment guarantees in South African law, and in light of this and other decisions, prudent developers and contractors should ensure that the language of the guarantees purporting to be on-demand construction and payment guarantees do in fact entitle them to claim amounts owing, on demand. A failure to do so could potentially result in them having no claim under the construction and payment guarantee concerned.

According to the SA Builder (2008), the national government, local government and private companies who award tenders to contractors are all too familiar with the dangers within the construction industry. Contractors likewise must ensure that their risks are covered as best it can be managed and not leave it to when the problem manifests. Those that will benefit most are those who can best decrease the damage caused by these inherent dangers by:

- Recognising the characteristics of problems so that they can be identified when they appear;
- Utilising techniques to manage risks when they appear;
- Applying methods to minimise losses that occur, and
- Profiting from these risks.

One of the tools available to manage risk includes the transfer of risk, but no company will be willing to accept such an agreement without careful analysis and taking due care. The next step is the credibility of the guarantee. The third party itself must be respected, so that an employer/contractor/subcontractor will accept the guarantee. It should, however, be appreciated that the JBCC construction and payment guarantees are 'stand alone' documents where the conditions are set by the bank or issuing institution, and that these conditions are not affected by a change in the wording of the building agreement which is to be signed.

8. Recommendation

The JBCC provides model forms of building agreements to the Southern African building industries including performance and payment guarantees, which are mostly issued by financial institutions such as banks and their respective property finance divisions. The wording, format, etc. have, from time to time, been discussed and agreed with some of the major banks through the legal commission of the Banking Council. In terms of recent developments, certain banks, and more specifically their property finance divisions, have

experienced problems in particular to payment guarantees. For this reason these banking and insurance institutions often wish to customise the wording of standard forms for their specific requirements. However, they should be made aware of the fact that such modifications could affect the validity of these guarantees, and that this practice could increase the risk of the parties concerned.

It is therefore recommended that the JBCC and the legal commission of the Banking Council, as well as other relevant stakeholders such as the MBSA and the South African Property Owners Association (SAPOA) should engage more regularly to discuss and find solutions for the problems that have been identified in this study including other concerns that may be voiced from time to time. The CEO of the JBCC (Bold, 2008) confirmed that regular meetings were held soon after the introduction in 1991 of the JBCC suite of contracts, but that it has for some time now largely been neglected, mainly because of the poor attendance by delegates from the Banking Council.

The demand of construction and payment guarantees that provide the requisite cover available on call from approved financial institutions has increased as international and construction work, in particular, have grown. Informal observation has indicated that frequent requests are being made by neighbouring countries for the use of the local developed standard forms of contract, more particularly the JBCC. This article has revealed that considerable problems remain in the application of the 'on-demand' guarantees as endorsed by the JBCC. It is therefore a matter of great importance that these issues be dealt with fully in the discussions between JBCC, the banks and other stakeholders, so that the industry can benefit as a result of better risk management by employers and contractors, which, in turn, should assist in the effective administration and the overall reduction of cost of construction projects.

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Exploring the People's Housing Process: An application of the 1986 Rhodes Policy Network model

Peer reviewed

Abstract

A formal policy supporting the People's Housing Process (PHP) was released in 1998. This policy and subsequent support measures in many ways mandates a policy implementation network. The South African Department of Housing's (DOH) interpretation of self-built housing as expressed in the PHP should, however, be regarded as a response to and reflection of survival strategies that had already been employed by communities prior to 1998. The researcher therefore turned to the policy network literature to explore PHP project characteristics. The central research question was whether the 1986 Rhodes Policy Network model is a useful heuristic device for exploring PHP project characteristics. This was done by first subsuming network characteristics as contained within the 1986 Rhodes model under appropriate network dimensions. Using case studies, indicators were then developed for the presence of various network characteristics.

Keywords: Policy networks, People's Housing Process, self-built housing, heuristic model

Abstrak

'n Formele beleid wat die People's Housing Process (PHP) ondersteun is in 1998 bekendgestel. Hierdie beleid en daaropvolgende ondersteuningsmaatreëls het op verskeie wyses 'n beleidsimplementeringnetwerk vereis. Die manier waarop die Suid-Afrikaanse Departement van Behuising selfboubehuising geïnterpreteer het, moet egter as 'n reaksie tot en weerspieëling van bestaande oorlewingstrategieë gesien word wat voor 1998 deur gemeenskappe gebruik was. Die navorser het dus beleidsnetwerkliteratuur bestudeer om PHP projekkenmerke te ondersoek. Die sentrale navorsingsvraag van die studie was om te bepaal of die 1986 Rhodes beleidsnetwerkmodel 'n toepaslike heuristiese model is om PHP projekkenmerke te ondersoek. Hierdie vraag was benader deur die netwerkenmerke wat binne die 1986 Rhodes beleidsnetwerkmodel voorkom onder toepaslike dimensies te plaas. Deur die gebruik van gevallestudies is aanwysers vir die teenwoordigheid van verskeie projekkenmerke ontwikkel.

Sleutelwoorde: Beleidsnetwerke, People's Housing Process, selfboubehuising, heuristiese model

1. Introduction

It has been argued that long-established institutions such as municipalities and housing development contractors find it difficult to respond to informality (Marais, Van Rensburg & Botes, 2003: 350). As noted by Jenkins, communities have therefore depended on the idea of "counting on one's own resources" since before 1998 when the PHP strategy was introduced (Jenkins, 1999: 444). In 1994, the newly democratically elected government had to develop policies that allowed the broader population access to services. The issue of 'housing for all' received particular attention for a number of reasons. One of these reasons was that historically the struggle for access to housing was a rallying point for a number of community protests. The second reason is related to the apartheid government's failure to appropriately address increasing urbanisation in South Africa. The choice of separate development as a reaction to this urbanisation process created a backlog of impoverished households seeking housing. The post-apartheid state would later introduce the PHP as a housing programme intended to make inroads into this backlog.

This article will explore the PHP as it was implemented by the DOH¹ before being replaced as a housing programme by the enhanced PHP in April 2009. The PHP "is a housing delivery mechanism whereby beneficiary households build, or organise between themselves, the building of their own homes" (DOH, 2005: 7). It will be argued that PHP projects are in many ways mandated policy networks, given that the network characteristics of these projects are derived from prescriptions contained within national policies and implementation guides. The researcher therefore turned to the policy network literature to explore PHP projects. There was a need to ensure that the study could achieve theoretical complementarity between PHP projects and what the literature refers to as networks. To this end, Borzel's definition of a policy network will be used as a generic definition of what a policy network is. Borzel's definition regards policy networks as 'a set of relatively stable relationships which are non-hierarchical and independent in nature linking a variety of actors who share common interests and who exchange resources to pursue shared interests acknowledging that co-operation is the best way to achieve common goals' (Borzel, 1998: 2). The policy network literature will therefore be reviewed to examine whether the literature can provide existing models for exploring PHP projects.

1 The Department of Housing was renamed the Department of Human Settlements in 2009. This article will, however, refer to the former, as was done in case studies on which the research draws.

The objective of the study is to contribute to the limited field of policy network literature in South Africa and to gain a better understanding of the implementation of the PHP. The 1986 Rhodes model was amongst other models developed during the inception of policy network literature. Such earlier models are not able to explain why certain network characteristics result in particular network outcomes and these models can at best identify the presence or absence of certain network characteristics. For the introduction of policy networks to the South African and PHP context, this descriptive ability is considered to be sufficient.

2. The People's Housing Process support measures

The purpose of this section is not to provide a critical analysis of PHP support measures; the intent is to highlight policy prescriptions that create network characteristics as defined by Borzel. The 1994 *White Paper: A New Housing Policy and Strategy for South Africa* recognised self-help processes but did not identify a self-build housing approach as an immediate housing strategy (Marais, Ntema & Venter, 2008: 7). In the years following the 1994 White Paper there appeared to be a growing realisation that the process of delivering 'housing for all' would not happen as fast as envisioned. This arguably contributed towards the development of the 1998 *National Policy: Supporting the People's Housing Process*. The PHP is intended for beneficiaries who already qualify to access the housing subsidy scheme (DOH, 2005: 20). This policy's intent is to support communities in need of housing by assisting them in accessing land, services and technical assistance (DOH, 1998: 1). This support was formalised into two programmes, the first of these being accessing housing subsidies and the second being accessing technical, financial, logistical and administrative support to ensure project sustainability (DOH, 1998: 1).

The 2004 *Comprehensive Plan for the Development of Sustainable Human Settlement*, commonly referred to as *Breaking New Ground (BNG)* is the DOH's delivery manifesto. This document deemed 'Supporting Urban Renewal and Inner City Regeneration' important in meeting housing objectives. As a starting point for such support, *BNG* highlighted the contradictory way in which the PHP was being implemented, especially during informal settlement upgrading. Rather than maximising on the benefits of beneficiary involvement throughout all the phases of the project, beneficiary involvement was often relegated to the final, construction phase (DOH, 2004: 17).

The 2000 *Housing Code* elaborates on the requirements set out in the 1998 *National Policy: Supporting the PHP*. Chapter 3.4 of the 2000 *Housing Code* introduced the 1998 *National Policy: Supporting the People's Housing Process* as one of seven housing strategies.² The prescriptions contained within the *Housing Code* emphasised self-built requirements above other requirements such as community participation. For this reason the PHP was regarded as a self-built strategy that focused on the completion of the top structure (PlanAct, 2009: 3). Beyond this emphasis, it has, however, been argued that the prescriptions contained within the code were too vague and consequently the original intent behind the policy was contradicted (DOH, 2005: 4). Consequently, in 2005 the DOH released the *Policy Framework and Implementation Guidelines for the Peoples Housing Process Delivery Mechanism* to provide the needed clarification. The years following the publication of the 2005 policy framework saw the continuation of advocacy from the Non-Governmental Organisation (NGO) sector. This advocacy was driven by arguments that the PHP should be about more than just the housing product being delivered (DOH, 2009: 3). This advocacy and other contributory factors led to the development of the Enhanced PHP as introduced in April 2009. The prescriptions contained within this Enhanced PHP are, however, beyond the scope of this article and focus will remain on the PHP as introduced in 1998.

The PHP can be used by already eligible beneficiaries to access a consolidation, project-linked, institutional or rural subsidy (individual subsidies may not be accessed via the PHP). Facilitation and establishment grants are made available over and above the capital subsidy which is reserved for services and the top structures. The facilitation grant is made available to initiate a new 'support organisation' or allow a current 'support organisation' to complete the project application process (DOH, 2000: 8.2.1.1). It may also be used for preparation work that forms part of the project application phase, culminating in the submission of a project proposal to the Provincial Housing Development Board (PHDB). It includes payment for the community workshops undertaken during this period. The establishment grant is used to enable the 'support organisation' to provide technical, financial, logistical and administrative support to the project. The approval of both the facilitation and establishment grants is at the discretion of the PHDB.

2 The remaining strategies are Stabilising the Housing Environment, Mobilising Housing Credit, Providing Subsidy Assistance, Rationalising Institutional Capacity, Facilitating Speedy Release and Servicing of Land, Co-ordinating State Investment in development.

The project-based requirements of the PHP make it clear that such an approach can only be considered for communities where at least a minimal level of trust and co-operation already exists or can be created between beneficiaries. The PHP can be considered an agreement between possible beneficiaries that they will pool their resources (including subsidies and labour) to create a housing project (CCT, 2006). PHP projects provide a network for linking households with a common interest that recognises that co-operation within a project (as opposed to an individual subsidy) is more beneficial. The facilitation and establishment grants, which allow capacity-building and empowerment, therefore contribute to creating an enabling environment.

One of the aims of the programme is to “foster partnerships between all levels of government, civil society, the private sector and other players” (DOH, 1998: 3). The inclusion of all levels of actors highlights the policy's intent to implement the PHP through non-hierarchical relationships. The focus on partnerships is also in recognition of the fact that co-operation between actors is the most beneficial approach to implementing the PHP. Support measures list the range of organisations allowed to provide assistance to projects. This includes provincial and local authorities, community-based organisations, non-governmental organisations, religious bodies, development corporations, private sector developers, employers, building-material corporations and private-sector developers (DOH, 2000). This is in recognition of all the actors who share a common interest in housing provision and the fact that the PHP can provide a network for linking these actors.

The options for the formation of 'support organisations' are set out in Section 8.2.1 of the *Housing Code*. A 'support organisation' has to be a legal entity such as a company incorporated in terms of the *Section 21 Companies Act 1972* (Act No. 16 of 1972), a trust, voluntary association or a co-operative under the *Co-operatives Act* (Act No. 91 of 1981) (DOH, 2000: 299). Setting the parameters for the legal status of the support organisation as well as the prescriptions for the contents of the project proposal and the subsidy agreement provides the basis for relatively stable relationships. All the benefits of a PHP approach would be difficult, if possible, to reach without the recognition that it requires an enabling environment that fosters partnerships built through co-operation. The main financial support mechanisms, namely the facilitation and establishment grants as well as the housing subsidies, recognise the necessity for resource exchanges between these actors. The state is willing to provide

these resources in anticipation of outcomes in which communities are more capacitated and therefore more resilient.

3. Policy network models

The development of the literature on policy networks was driven by political science scholars who wished to capture the realities of policy processes (Skogstad, 2005: 1). Initial work was a critique against pluralist and corporatist models of interest intermediation (Blom-Hansen, 1997: 670; Borzel, 1998: 4). These contributions arguably began with Freeman's work (cited in Homeshaw, 1995) in the 1950s which focused primarily on the main actors within formal and informal institutions to which he referred as subsystems. Also referring to subsystems during the same time period, Truman (1951) (cited in Almond, 1997: 222) mentioned dispersed leadership across and outside government spheres. In the absence of policy network literature, Truman's work, like other academic writing on a similar subject matter, was, however, categorised as pluralist. In critiquing his American counterparts, Lowi (1972) (cited in Besussi, 2006: 3) used the concept of iron triangles to challenge erstwhile dominant pluralist accounts of the policy process. His work emerged from his study on the relations between congress, administrative agencies and lobbying groups. The policy network literature would later go beyond the elitist iron triangle approach to include a broader range of actors and types of relationships between these actors. Heclo (1978) (cited in Kenis & Schneider, 1991: 29) was the first academic to refer to these broader relationships as issue networks.

British contributions to the policy network literature emerged shortly after Heclo's conceptualisation of issue networks. This occurred by way of Richardson & Jordon's (1979) (cited in Homeshaw, 1995) attempt to bring together pluralist theories with that of the roles of different actors in policy-making. These authors viewed the policy process as being more about co-option and consensus than about the enforcement of party lines through manifestos and parliamentary influences. These authors are credited with first introducing the idea of a policy community, defining it as "a relationship which involves a community of departments and groups" (Kaboyakgosi & Mpule, 2008: 305). This relationship was said to include co-operative and consensual forms of interest intermediation (Kaboyakgosi & Mpule, 2008: 305). Another British academic, Rhodes (1981), developed a power dependency model to explain the dependency different members have on each other. He subsequently built on this model of interest intermediation and developed a typology of networks that are on a continuum ranging from issue networks to policy

communities. According to this 1986 model, 'issue networks' are characterised by the absence of stability, a large number of members and limited vertical interdependence. Within such networks there are no central points around which actors bargain for resources. This is the least integrated of all the networks in the model (Rhodes, 1997: 38; Rhodes, 1991: 204).

The second type of network, 'producer networks', is characterised by the dominant role the economic interests of both the public and private sector play in policy-making. This network has fluctuating membership and exhibits dependence on industrial organisations for the delivery of desired goods and expertise. In addition, there is limited vertical interdependence among the network and others with economic interests (Rhodes, 1997: 38).

'Intergovernmental networks', the third type of network, is based on representative organisations of local authorities and explicitly excludes public sector unions (Rhodes, 1991: 205). This network has extensive horizontal articulation in that it is able to penetrate other networks of interest (Rhodes, 1991: 205). Dominant interests within this network are exclusively informed by those responsible for the provision of local authority services. This network is also characterised by limited vertical interdependence because the members have no shared service delivery responsibilities with members in other networks (Rhodes, 1997: 38).

'Professional networks' have a highly restricted membership and exhibit stability. The network is dominated by the interests of professionals over whom there are limited, if any, constraints. This network is characterised by vertical interdependence with other networks. Finally, the network exhibits limited horizontal articulation in that it is able to insulate itself from other networks (Rhodes, 1991: 204).

The final network is referred to as a 'Policy Community network' and is characterised by stability. It also exhibits vertical interdependence which is based on shared service delivery responsibilities. This network has a highly restricted membership and is based on the functional interests of government. Such networks are also tightly integrated but exhibit limited horizontal articulation as they are able to insulate themselves from both other networks and the public (Rhodes, 1991: 304; Rhodes, 1997: 38).

Subsequent models (e.g. Wright, 1988; Coleman & Skogstad, 1990; Rhodes & Marsh, 1992) were developed after the particular researchers found that existing models did not capture the reality of

policy processes within the contexts in which they were interested. Rhodes & Marsh (1992) have, for example, further developed the 1986 Rhodes model by developing network dimensions to differentiate between policy communities and issue networks (Rhodes & Marsh, 1992). By selecting the earlier model and developing network dimensions, the same approach was used for this study. The policy network literature, beyond descriptive models, has continued to endeavour to develop theories about how network characteristics influence policy outcomes. This included empirical studies using policy network models as analytical tools in analysing various networks (e.g. Daguerre, 1999; Kaboyakgosi & Mpule, 2008; Howlett, 2002).

4. Methodology and data analysis

The central research question was whether the 1986 Rhodes Policy Network model is a useful heuristic device for exploring PHP project characteristics. The reader has already been introduced to the 1986 Rhodes model and the characteristics assigned to each type of network. Each of these characteristics was subsumed under appropriate network dimensions to produce Table 1.

Table 1: 1986 Rhodes model network characteristics subsumed under network dimensions

	Stability	Integration	Membership	Vertical interdependence	Dominant interest	Relationship with other networks
Issue networks	Absence of network stability	Limited integration	Large number of members	Limited vertical interdependence	Absence of bargaining platform at which dominant interests can be mediated	
Producer networks			Fluctuating membership	Limited vertical interdependence among network and other economic interests	Both public and private sectors play a dominant role in policy-making	
				Dependent on industrial organisations for delivery of desired goods and expertise		

	Stability	Integration	Membership	Vertical interdependence	Dominant interest	Relationship with other networks
Inter-governmental networks			Based on representative organisations of local authorities	Interdependence on account of the absence of shared service delivery responsibilities among members	Exclusively informed by those responsible for the provision of local authority services	Extensive ability to penetrate other networks
			Explicitly excludes public sector unions			
Professional networks	Presence of stability		Access to network is highly restricted	Network exhibits vertical interdependence	Informed by functional interest of government	Network possess the ability to insulate itself from other networks
Policy community networks	Presence of stability	Tightly integrated	Membership highly restricted	Network exhibits vertical interdependence	Informed by functional interest of government	Network possesses the ability to insulate itself from other networks
				Based on shared service delivery responsibilities		

To operationalise the amended model, the researcher drew on secondary data to seek indicators pointing to the presence of particular network characteristics. Convenience sampling was used in locating and selecting the case studies. Such a sampling method is appropriate for the motivations behind explorative studies (Johnson & Reynolds, 2005: 254). The case studies involve three organisations, namely the South African DOH, the Development Action Group³

3 The Development Action Group is a non-profit organisation which provides support to communities attempting to secure adequate housing. This support includes, among others, research, lobbying and assisting communities during People's Housing Process projects.

(DAG) and Impumelelo Social Innovations Centre.⁴ These institutions provided eleven case studies as the basis for selecting the possible indicators.

The selected case study projects are all located within lower income areas and involve communities who already had historical experiences of collective action aimed at securing shelter, before the PHP was initiated in that particular area. The historical experience of community action increased the prospects that trust and reciprocity, the basis for network structures, would most likely be present within the project case studies. A comprehensive project context for each case study is not warranted as the study does not aim to link project characteristics (which are related to project context) to project outcomes. Brief characteristics of the case study projects are, however, provided as examples of historical community action.

Table 2: Brief case study project characteristics

<i>Project area</i>	<i>Project characteristics</i>
Ocean View Cape Town, Western Cape	The Ocean View settlement was developed on a hillside on the South Peninsula region of Cape Town where forcibly removed Coloured households had to settle in homes and flats in the early 1960s. From this time until 1995 no further housing was provided and consequently an informal settlement, Atlantic Heights, was established by residents as a response to prevailing overcrowded conditions (Impulelelo, 2004b: 27).
Tintown Gamalakhe, Kwazulu-Natal	Gamalakhe is located 15km inland from the KwaZulu-Natal coast. Most residents who now live here were forcibly removed from the Margate area on the coast. Several thousands of these households had to settle in Gamalakhe. Approximately a thousand of these households were not accommodated in the formal rental houses provided. They were placed in what was then intended to be only an emergency transit camp. These households, however, remained on this un-serviced site from 1960 until 1992 (Impulelelo, 2004a: 18).
Kwanubuhle Uitenhage, Nelson Mandela Metropolitan Municipality	Kwanubuhle is a black township within the Uitenhage municipality (now part of the Nelson Mandela metropolitan area). In 1996 the Uitenhage Transitional Local Council (UTLC) was given the permission to develop and facilitate housing developments. As early as 1996 the UTLC requested the CSIR (Centre for Scientific and Industrial Research) to undertake research into a community-driven approach to housing delivery. Subsequently Kwanubuhle has been provided with standard township services including tarred roads, water and electricity points (DAG, 2003a: 3).

4 The Impumelelo Social Innovations Centre is a non-profit organisation that identifies, rewards and promotes innovative public private projects. These projects are assessed based on the extent to which they improve the quality of life of the poor in South Africa.

<i>Project area</i>	<i>Project characteristics</i>
Zola and Ivanlew Tsolwa Municipality, Tarkastad Administration Area	A PHP project was started in Tarkastad and included both Zola and Ivanlew which were created under the apartheid group areas act. This project was initiated by engineers in 1998 who were able to access project-linked subsidies to provide a housing development plan for Tarkastad (DAG, 2003b: 4). Since the initiation of the project there has, however, not been beneficiary involvement in the projects. Community involvement only happened by way of training local builders and interested persons through an artisan-training course (DAG, 2003b: 6).
Ivory Park Midrand, Gauteng	The PHP was developed for Masisizane which is located in one of three wards within Ivory Park. Before the PHP project was initiated this community built their shelter from poles and plastic sheeting. They chose these materials because it allowed them to quickly dismantle their shelters when they were threatened with eviction. The area's geo-technical condition makes it susceptible to floods and the drowning of one child created further impetus for the initiation of a PHP project (DAG, 2003c: 2).
Sebokeng Vereeniging, Gauteng	The Kanana PHP project is located in Sebokeng, Extension 12. In 1994 this land, which was earmarked for industrial development, was invaded by 1500 shack dwellers. These shack dwellers later joined the Homeless People's Federation and the construction of some houses started. As in Masizane in the previous project area, there are adverse geo-technical conditions which the project has had to overcome. At the time that the project was initiated the area contained 2570 sites which had been serviced with gravel roads, water, electricity and sanitation (DAG, 2003d: 2, 6).
Dukathole Aliwal North, Eastern Cape	The Dukathole township is situated adjacent to the Orange River in the Eastern Cape. The township came into existence in 1914 and since then both long-term and migrant residents from nearby farms have settled here. The housing stock in Dukathole included municipal stock houses and houses built by community members as part of job-creation programmes. At the time that the particular development was initiated the township included about 1 190 shacks (DOH, 2002: 2).
Duncan Village East London, EasternCape	Situated in Duncun Village, Mdantsane was established in 1964 where the area was earmarked as a relocation site for forcibly removed families. The area has already undergone various types and levels of housing development which started with the 1991-1992 proposal of the provision of 368 residential sites. The top structure provision was, however, delayed for five years even though infrastructure provision was completed (DOH, 2002: 2,4).
Smuts Nkonyama Village East London, Eastern Cape	The Smuts Nkonyama village is located within Mdantsane in the City of East London in the Eastern Cape province. Before the PHP process was started in the area, potential beneficiaries visited another PHP project in Uitenhage which convinced them that this was a desirable approach to securing housing for themselves (DOH, 2002: 2).
Alphendale East London, Eastern Cape	Alphendale informal settlement is located adjacent to an area which is occupied by prime residential houses. This settlement is home to 600 families who settled here towards the end of 1992. The development of affordable low-cost housing had already been in the planning phase since the early 1990s under the then East London Transitional Council. It was, however, only in 1996 that 356 project-linked subsidies were awarded to beneficiaries in this area (DOH, 2002: 2-6).

<i>Project area</i>	<i>Project characteristics</i>
Masithembane Cape Town, Western Cape	Masithembane is located within Site C of the Khayelitsha informal settlement in Cape Town. When the project started in 1997, a mass meeting was held during which community members were chosen who would act as a steering committee in mobilising the development. At the time of the study 200 beneficiaries had already completed the construction of their houses, with an additional 750 households to be included in phase two (DOH, 2002: 2, 4).

The 1986 Rhodes model provides network characteristics for each of the dimensions namely stability, integration, membership, vertical interdependence, dominant interest, and relationship with other networks. Using a split-half method more than one indicator was sought for each network dimension (Babbie & Mouton, 2005: 121). The amended model requires one to be able to differentiate between both the presence and the absence of the particular network characteristic. This study will, however, not be able to provide indicators for the absence of a particular characteristic. This is related to the shortcoming of using secondary data for analysis as researchers doing the initial research might not have captured other indicators of the presence of a particular network characteristic.

4.1 Stability

The characteristics within the amended model necessitate a differentiation between instability and stability. The first range of indicators for stability is related to membership stability. In one PHP project, peer pressure was identified as being important for membership stability. The project members stated that peer pressure guaranteed member buy-in from beneficiaries as it provided both a "carrot" and a "stick" for continued participation (DAG, 2003c: 7). It has also been said explicitly that a community that gives their buy-in to the project is more likely to agree to abide by the rules and regulations they "draw up" collectively as contained within non-legal documents (DAG, 2003c: 8). Such members are also more likely to attend a range of required meetings and workshops (DAG, 2003a: 7; DOH, 2002: 6).

Within stable networks, members are able to resolve dissatisfaction and continue to sign off on legally binding documents such as the constitution and the subsidy agreement signed with the support organisation (DOH, 2002: 6; DOH, 2002: 5). Stability is also indicated by members, specifically beneficiaries, who continue as network members even after the completion of their houses (DAG, 2003a: 8).

Another indicator of stability is that there is only one support organisation undertaking support activities. In some instances, more than one support organisation during a particular phase has, however, been cited as a strategic decision taken by the beneficiaries (DOH, 2002: 52). The Masithembane Housing Association, for example, used DAG during the initial mobilisation, preparation and approval phase but thought that an experienced developer would be more suitable for the implementation phase (DOH, 2002: 2). What this, however, meant for this particular project was that DAG was not part of the project during the time they would have provided home-owner education on issues such as dealing with patent defects, inspection and maintenance (DOH, 2002: 10).

The next range of indicators for stability is related to the availability of resources within the network. Within stable networks members have enough resources to complete the construction of their houses. This is in contrast to some projects where members have had to sell their building materials, and houses were left incomplete (DOH, 2002: 7; DAG, 2003a: 21). Also connected to the availability of resources is that compatible payment methods are evidence of stability within projects. This is in contrast to one project which had to deal with suppliers requiring up front or 'on delivery' payment while the DOH has to first be in possession of invoices before monies are released (DOH, 2002: 31; DOH, 2002: 55). This also results in delays in the construction phase which, in turn, demoralises members and leads to price increases (DOH, 2002: 56).

Within stable networks, members also honour verbal agreements. One such example is a project where there was an agreement that project workers would not receive a normal salary. One can therefore infer that when beneficiaries choose or are forced to renege on such agreements, it is also related to the non-availability of beneficiary resources (DOH, 2002: 48). Within stable networks sufficient resources (including information) are available to allow more or less accurate anticipation of the time lag between the project approval and construction phase as well as more or less accurate anticipation of the duration of the construction period (DAG, 2003b: 6). Where this has not happened projects have experienced deterioration of infrastructure (DOH, 2002: 43). Stability is also evidenced by the presence of quality control mechanisms such that mistakes are avoided and related material wastage is reduced (DOH, 2002: 9). Stability is also evidenced by the presence of formal handing over and induction procedures between old and new members of the network (DAG, 2003a: 10). Proper induction will assist in ensuring that

incoming members understand the principles of a PHP approach to housing delivery.

4.2 Integration

The characteristics contained within the amended model require one to be able to differentiate between when there is limited, as opposed to tight, integration. The case studies highlighted that joint decision-making, arranging regular meetings, and effective communication measures are indicators for integration. The first set of indicators for tight integration is related to joint decision-making. In case studies member involvement and transparency in decision-making processes have been cited by primarily beneficiaries as being important for member integration (DAG, 2003a: 8). In fact, project committees have explicitly raised a lack of transparency and consultation as a reason why support organisations are replaced (DOH, 2002: 52; DOH, 2002: 36; DOH, 2002: 43). Further research should consider whether the lack of transparency, consultation and joint decision-making is reserved for certain aspects of the project. Having members involved in choosing the colour of the houses, for example, might only be window dressing while more substantial decisions are taken by one cohort of people.

One of the case studies detailed how the beneficiaries in one project decided that they would install full in-house services (e.g. taps, higher voltage electricity), even if this meant less money for the top structure. This trade-off was, however, only made after the beneficiaries agreed that individuals could always make extensions to the starter house later (Impulelelo, 2004a: 19). Consequently, trade-offs are also regarded as a form of joint decision-making. Trade-offs enable members to make decisions which they might otherwise not have agreed to because they were not knowledgeable about the difficulties involved in providing government-subsidised housing (Impulelelo, 2004a: 18).

Regular report back, progress and monitoring meetings can be regarded as the second set of indicators related to integration. These meetings should not only be held in preparation for important events or during a crisis period. Further research should identify the range (one project had general, progress and site meetings) and the nature (e.g. bargaining as opposed to consultation) of meetings held by members (DOH, 2002: 35). Finally, research should be undertaken to assess the optimal frequency and length of meetings to balance joint decision-making and demands on the members' time.

The third set of indicators for integration is related to the presence of effective communication measures. In this regard a community liaison officer who effectively relays information between network members is evidence of integration (DOH, 2002: 4). An operational housing support centre should also be considered evidence of integration as all members may access information from these "one-stop" housing centres (Impulelelo, 2004b: 26).

4.3 Membership

The characteristics contained within the Rhodes model require one to be able to differentiate between when network membership is large, fluctuating and/or restricted. The membership dimensions with regard to stability have been explored in the previous section. There is subsequently a need to make a clear distinction between member instability and member fluctuation. The case studies highlighted the presence of members in networks who are not part of the project for the entire phase but whose presence should not be interpreted as evidence of instability but rather as evidence of fluctuating membership.

The case studies provide evidence of project members who work towards attaining the project outcomes but only for a specific aspect of the project. An example of this is demolition and building companies who provide beneficiaries with extra fill for construction (DAG, 2003a: 20). Another example is that of volunteers, with a number of these having only fluctuating membership to the housing projects. Some volunteers provide labour during the construction phase only while others provide child care for parents or guardians busy with the construction (DAG, 2003c:7; DOH, 2002:6). In addition, there are also Technicon students who volunteer on the project in order to complete internships and apprenticeships as required by the National Building Curriculum (DOH, 2002: 38). There is little expectation that these volunteers be included in substantive project decision-making while they are working there.

The range of actors involved is a good indicator of the size of the membership. Member types can be analysed by way of three important aspects: the project level at which they are present; which institutions or organisations they represent, and the nature of their linkage (e.g. voluntary, under mandate, or by contract) with the network. Consider, for example, a ward councillor who is a representative of both the local authority and a political party. As a representative of the local authority which is a support organisation, the nature of the linkage is contractual. As a representative of a

political party the nature of the linkage would be based on a mandate from a particular political party. Both entrance requirements and membership fluctuation are related to and influence the nature and form of linkages between members. The Gauteng Province, for example, had a directorate which dealt solely with PHP housing delivery (DAG, 2003c: 3). One can therefore expect their linkage with the project to be more sustained and valuable in gaining resources (including information). This is in contrast to one case study in which it was clearly stated that the material procurement and payment procedures of the local authority were not suitable for a PHP process (DAG, 2003c: 8). This is again an example of how the type of member influences membership linkage.

As far as the restriction placed on membership entry is concerned, there are three clear distinctions. Most importantly, beneficiary membership is based on their eligibility for housing subsidies. These restrictions, as contained within the national housing policy, form the basis on which the project proposal is submitted. In addition to the eligibility requirements, families are selected from the housing list based on need and family size (Impulelelo, 2004b: 26). A number of PHP projects are also connected to saving schemes which allow members to gather savings for the construction and extension of their houses. Consequently, one can argue that, in some instances, membership is indirectly restricted to those who have the capacity to save and become part of a savings club or scheme (DAG, 2003c: 2). The second distinction involves members on the various project committees, whose entrance and subsequent selection to serve on committees is dependent on them being known and active within the community. These members are also selected because they have already gained the trust and respect of community members (DAG, 2003a: 6). It has also been said that communities consider representation requirements when selecting committee members but this needs further research to uncover the community's understanding of representation (DOH, 2002:4). The third distinction concerns how suppliers are selected to provide services to the projects. Three aspects have been listed as deciding factors in this selection, namely whether the suppliers are known for quality materials, their track record in the provision of services, and their prices (DOH, 2002: 31).

4.4 Vertical Interdependence

The characteristics contained within the Rhodes model require one to be able to differentiate between strong and limited vertical interdependence. In the case studies, there was greater evidence

of the presence of dependence. The dependence of projects on the state is primarily related to subsidies, project approval and training. With regard to the state's dependence on other members within the network, it has been acknowledged that other members are able to augment the limited resources the state has at their disposal.

This limited interdependence can, however, not be explained by way of the 1986 Rhodes model which holds that limited vertical interdependence results from an absence of shared service delivery responsibilities between different networks. In South Africa the local authority can, as an agent of the national authority, undertake housing developments. In respect of project dependence on the different spheres of government, one can, however, infer that projects are more dependent on provincial authorities than on local authorities. This is illustrated by the fact that projects have been able to proceed despite not being approved by the local authority (DOH, 2002: 53; DOH, 2002: 41). The implication of this inference is that interdependence with local authorities will only occur when this authority has the capacity and/or political will to support the projects, either by giving their approval for the project application or as a support organisation (DOH, 2002: 37).

It was also found that projects display evidence of dependence on the Department of Labour, the PHP Trust (particularly as a funder for training) and the DOH for training (DOH, 2002: 54; DOH, 2002: 6). There is little evidence of interdependence in these relationships. Government's dependence on members within the networks is strongly related to the notion of social capital and sweat equity. This is acknowledged insofar as the DOH documents state that communities have access to resources (including social capital and sweat equity), without which housing development and PHP projects, in particular, would not be possible (DOH, 2000: 1).

In one case study the project displayed little if any dependence on state institutions. The Dukathole project had already built 300 houses depending only on their own resources and sweat equity, without having received a government subsidy. They operated on the basis of a revolving loan, supported by a local church, which allowed the community to build a limited number of houses each month (DOH, 2002: 17). It should, however, be pointed out that the fact that such achievements can be reached is in line with PHP support measure principles. According to these principles, the PHP has been put in place only to support communities when and where they are not able to complete a particular component of the project. This is

embodied in the phrase “minimum intervention, maximum support” (DOH, 2002: 3).

4.5 Dominant interest

The characteristics contained within the Rhodes model require one to be able to identify which member interests dominate the network. One should also be able to recognise if a platform exists at which these dominant interests could bargain. From the case studies one can discern dominant interests. It was noted, in particular, that at times the primary goals of delivering houses are either fast-tracked or postponed in order to accommodate dominant interests.

The first type of dominant interest is related to the scale of the project. In these instances, the delivery of a larger amount of houses is fast-tracked at the expense of attaining other policy outcomes. This refers to the fact that professional and local authority members seem to take on a ‘delivery-driven’ interest in larger scale projects (DAG, 2003a: 12). Other project outcomes such as community capacity-building through training and joint decision-making are consequently not attained (DAG, 2003a: 1, 6). One example given is where beneficiaries could not design their own housing plans as it was advised that this would make planning, approval, construction and technical supervision more difficult to manage (DAG, 2003a: 20). Some of the hesitation from the technical professional community is that the PHP lowers established housing construction standards (Impulelelo, 2004a: 19). This had, however, been overcome in one project where one of the professionals, a civil engineer who was in good standing with other professionals, acted as an advocate for the principles underlying the PHP (Impulelelo, 2004a: 20).

Within the case studies, members have stated that profit was not tolerated as a dominant interest. Beneficiaries stated that they sought to minimise professional, especially contracted involvement because these members are viewed as being driven by profit-seeking behaviour (DAG, 2003a: 4). One project, for example, started with a block-making facility in order to supply the project with blocks when there was a demand. This was part of the community’s approach to keep money within the project rather than losing it to outside developers who would make the profit (Impulelelo, 2004b: 27). A dominant economic interest was also curbed by the fact that many developers find housing projects to be unprofitable (Impulelelo, 2004a: 18). The absence of a discussion of corrupt practices in PHP projects relates to the fact that the selected case studies are presented as good practice case studies. It is suspected that

this absence is by no means representative of PHP projects. Even in the good practice case studies there is, however, an example of beneficiaries secretly moving surveyor's pegs to increase their plot boundary (Impulelelo, 2004a: 19). In this case, the individual interest of households took precedence over community buy-in and commitment to the project.

It is not clear from the case studies whether the highest decision-making bodies also act as bargaining platforms. One case study did refer to the project implementation committee providing a networking platform (DAG, 2003a: 22). Another case study referred to a stakeholder's forum as the highest decision-making body. This forum provides for joint sessions that include, among others, the provincial DOH, the developer, the ward councillor, support organisation (including the manager, accounts administrator and certifier), the support committee (including two representatives from each area) and the Urban Upgrade and Renewal Programme representatives. Despite the absence of mention of bargaining platforms, there is evidence of bargaining as in the case where materials suppliers have agreed to fix prices for an agreed amount of time (DAG, 2003a: 20; DOH, 2002: 31). One can therefore infer that bargaining happens at a lower project level.

4.6 Relationship with other networks

The characteristics contained within the Rhodes model require one to be able to distinguish between network insulation and permeability. In the case studies only two other networks were identified in addition to the particular case study project. These two networks are other PHP projects and the Urban Development and Upgrade Programme. One particular project exhibited dependence on The Urban Development and Upgrade Programme (UDUP) for their "services and expertise" (DAG, 2003b: 13). This programme is funded by the state and provides basic level service to communities. The particular PHP project was very permeable to both resource linkages and influence from the UDUP programme (DOH, 2003b: 13). The relationship case study networks have with other PHP networks mainly included exchange visits to learn from successes and challenges of current projects (DOH, 2002:26; DAG, 2003a: 18). In one instance, the project committee has been approached to act as a support organisation to emerging projects (DOH, 2002: 37).

The case studies do not provide evidence of the extent to which PHP networks are able to insulate themselves from other networks. It would be of particular interest to explore the extent to which the

networks are able to insulate themselves from other networks, such as building suppliers in collusion or political formations that might have a negative impact on the project.

5. Conclusion

PHP support measures require PHP projects to follow prescribed steps and engage in specific relationships with prescribed partners. This mandated implementation of the PHP process lends itself to an exploration using a policy network approach. With this belief, the 1986 Rhodes policy network model was identified as being promising for exploring PHP project characteristics in South Africa. The 1986 Rhodes model was amended to provide greater conceptual clarity when undertaking data analysis. Each of the 1986 Rhodes model characteristics were subsumed under appropriate network dimensions. Using convenience sampling and secondary data collection, case studies were selected. These provided adequate, if limited indicators for the presence of network characteristics contained within the amended model. In doing so, the analysis also highlighted what the implications are for further studies wishing to refine the indicators presented. However, the qualitative sampling and data collection method creates a representation shortfall. Therefore, the finding of the study cannot be used to generalise about the broader population of PHP projects (Burnham, Gilland, Grant & Layton-Henry, 2004: 52). The research can, however, be used by other researchers interested in network characteristics as it provides them with indicators which can guide them in empirical research.

Acknowledgements

The research on which this article is based was undertaken while I was a student completing a MPhil in Urban Infrastructure: Design and Management in the Department of Civil Engineering at the University of Cape Town. I would like to acknowledge and thank Ms Mary Simons at the Department of Political Studies, University of Cape Town, for her supervision and mentorship during my MPhil research project.

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Causes of construction cost and time overruns: The 2010 FIFA World Cup stadia in South Africa

Peer reviewed

Abstract

The FIFA World Cup is the largest international sports event in the world. Hosting the FIFA World Cup remains a sought after goal for any country. Due to the magnitude of spectators and scale of participation the hosting of the event requires substantial investment in infrastructure, especially the stadia where the various football games will be played. The award of the 2010 FIFA World Cup to South Africa resulted in ten stadia to be either upgraded or newly constructed for the event in South Africa. Even though all the stadia were ready for the tournament, nearly all projects experienced time delays and cost overruns. This article investigates the reasons or causes of cost overruns and time delays during the upgrading and construction of the various stadia. A three-tier research approach covers a comprehensive literature review on the causes of cost overruns and time delays on construction-related projects globally as well as an investigation into the factors that caused cost overruns and time delays on six of the stadia. Finally, the results for the global and stadia projects are compared. The results indicate that the increase in material cost is the single largest contributor to cost overruns for both global and stadia projects. With respect to time delays the most significant contributing factor for global projects was late delay in payments while for the stadia projects design-related factors caused the most delays. The results provide valuable information on the unique challenges facing those who are interested in investing or managing construction projects in South Africa.

Keywords: Project cost performance, schedule delays, cost overruns, project construction

Abstrak

Die FIFA Wêreldbekersokkertoernooi is die grootste sportgebeurtenis in die wêreld. Dit is 'n groot eer en voorreg vir enige land om die toernooi aan te bied. Gegewe die magdom aantal toeskouers en vlak van deelname aan die toernooi word heelwat spandeer om die land se infrastruktuur, veral die stadions waar die wedstryde gespeel word, op te gradeer. Die toekenning van die 2010 FIFA Wêreldbekertoernooi aan Suid-Afrika het tot gevolg gehad dat

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tien stadions opgegradeer of nuut gebou moes word. Hoewel die tien stadions gereed was vir die toernooi het feitlik al die stadionprojekte skedulevertragings en oorspandering beleef. Hierdie studie het ten doel om die redes te ondersoek wat aanleiding gegee het tot skedulevertragings en oorspandering tydens die konstruksie van die nuwe, en opgradering van die ou stadions. 'n Driedelinge navorsingsbenadering het 'n volledige literatuurstudie ingesluit oor redes vir oorspandering en skedulevertragings op internasionale konstruksieprojekte, op ses van die stadionprojekte. Laastens word 'n vergelyking tussen die twee groepe projekte getref. Die resultate toon aan dat die toename in materiaal koste die grootste bydraende faktor is tot oorspandering vir beide internasionale- en stadionprojekte. Wat skedulevertragings betref, het vertraging in betalings die grootste impak op internasionale projekte gehad terwyl laat ontwerpveranderinge die grootste impak op stadionprojekte gehad het. Die resultate verskat waardevolle inligting rakende die unieke uitdagings wat in berekening gebring moet word deur beleggers in Suid-Afrikaanse konstruksieprojekte.

Sleutelwoorde: Projektkosteberekening, skedulevertragings, oorspandering, projektkonstruksie

1. Introduction

According to the South African Construction Industry Status Report, 2004 the construction industry accounts for more than 10% of the world's economy (CIDB, 2004: online). As a prime indicator of economic activity, the construction industry is often utilised by governments not only to stimulate growth but also to assist economic recoveries from recessions. Given the large capital amounts associated with construction projects, the performance in terms of cost and time are closely monitored, especially where tax payers' money is involved. With the third 'traditional' measurement criterion for project performance, namely 'quality', being a more subjective unit of measure, the quantitative results from measuring against original project duration estimates and approved budgets remain popular yardsticks for assessing overall project performance.

Even though South Africa completed numerous large construction projects over the years, the award of the FIFA Soccer World Cup in 2010 drew the attention to South Africa's ability to deliver large construction projects within time and budget. Burdened with the negative global view towards the "African project failure syndrome" (Rwelamila, Talukhaba & Ngowi, 1999) and "contingency venue" already identified (Dell'Apa, 2008), the South African construction industry started work under much doubt regarding its capability to complete the massive construction work on the ten stadia across South Africa (Panja, 2008; Corbett & Alderson-Smith, 2009).

Once the stadia were completed, no formal or final cost figure was released by government or any other public institution. However, the

Minister of Finance was quoted in *The Africa Report* (Ballong, 2010: online): “we have been confronted with an escalation of costs”, and the budget for all the stadia is USD 267 million in deficit. Hill (2008) reported that the stadia would require an additional R 2 billion to complete. Table 1 provides a summary of initial budgeted cost and indicated final cost of some of the stadia (eco-h2o, 2010: online).

Table 1: Budgeted versus indicated final costs of the ten FIFA 2010 stadia

<i>Stadium</i>	<i>Initial budgeted cost</i>	<i>Indicated final cost</i>
Soccer City – Johannesburg	R 2.2 billion	R 3.7 billion
Ellis Park – Johannesburg	R 240 million	R 253 million
Moses Mabida – Durban	R 1.6 billion	R 3.1 billion
Mombela – Nelspruit	R 600 million	R 1 billion
Green Point – Cape Town	R 2.9 billion	R 4 billion
Nelson Mandela Bay – Port Elizabeth	R 2.1 billion	Not known
Peter Mokaba – Polokwane	R 1.3 billion	Not known
Royal Bafokeng – Rustenburg	R 360 million	R 483 million
Mangaung – Bloemfontein	R 245 million	R 359 million
Loftus Versfeld – Pretoria	R 122 million	R 131 million

Although the stadia were completed in time for the FIFA World Cup, some were behind schedule and not ready for the Confederations Cup in 2009, the official ‘curtain raiser tournament’ and ‘testing tournament’ to assess the stadia’s readiness for the FIFA World Cup during 2010 (Dell’Apa, 2008).

Given the cost overruns and time delays on the stadia projects, this research aims to (i) investigate the general factors that cause cost overruns and time delays on global construction projects; (ii) determine which factors played a significant role during the upgrading and construction of the 2010 FIFA World Cup stadia, and (iii) compare the stadia factors with those identified on global construction projects.

2. The global construction industry

Project performance in the construction industry is well researched. A study completed by the International Program in the Management of Engineering and Construction (IMEC) in 2000 (Miller & Lessard, 2000: 14) revealed that 18% of 60 large engineering and construction projects, with an average capital value of \$ 1 billion undertaken between 1980 and 2000, incurred extensive cost overruns. Merrow, McDonnell & Argüden (1988) studied 47 “megaprojects” in the

construction environment and found that only four were on budget with an average cost overrun of 88%. Morris & Hough (1987: 7-15) also provide a comprehensive list of cost overruns on large projects. According to Flyvbjerg, Bruzelius & Rothengatter (2003), cost overruns are especially evident in infrastructure construction projects.

The relatively poor performance of construction projects prompted researchers to investigate and identify the factors that cause cost overruns and time delays. In the following paragraphs the results of related literature is summarised and concluded with the identification of the most important and dominant factors. Formulating solutions and remedies to the causes were not addressed and are considered to be beyond the scope of this paper.

3. Factors causing project cost overruns

Since the 1980s various studies have investigated the causes for project cost overruns on construction projects.

Kaming, Olomolaiye, Holt & Harris (1997: 87), who studied 31 construction projects in Indonesia, found that from a contractor's point of view, cost overruns were mainly caused by "inaccuracy of material take-off", "increase in material costs" and "cost increase due to environmental restrictions". Studying the cost overruns and delays on groundwater projects in Ghana, Frimpong, Oluwoye & Crawford (2003: 325) contractors found that "late monthly payments from clients" were the most important cost and time delay factors, with clients ranking "poor contractor performance" as the most important cost and time delay factor. Reviewing public sector construction projects in Nigeria, Dlakwa & Culpin (1990: 239) found that the three main reasons for cost overruns are "fluctuations in material, labour and plant costs", "construction delays" and "inadequate pre-planning".

In another study on construction projects in Nigeria, conducted by Okpala & Aniekwu (1988: 238), it was found that architects, consultants and clients agreed that 'shortage of materials', 'finance and payment of completed works' and 'poor contract management' were the most important causes of cost overruns. Mansfield, Ugwu & Doran (1994: 258) studied the performance of transportation infrastructure projects in Nigeria and concluded that 'material price fluctuations', 'inaccurate estimates', 'project delays' and 'additional work' contributed most to cost overruns. In a fourth study on construction projects in Nigeria by Elinwa & Buba (1994: 698), it was found that 'cost of materials', 'fraudulent practices' and 'fluctuations in materials prices'

had the most significant impact on project costs. During extensive studies on construction project performance in European countries, Morris & Hough (1987) as well as Flyvbjerg, Bruzelius & Rothengatter (2003) found that 'fluctuations in material cost' and 'additional work' contributed most to cost overruns.

In reviewing the literature an approach and trend towards the type of questions and results could be observed. In calculating the number of times specific types of causes for cost overruns under each category were observed, the following can be concluded:

- The most significant factor causing cost overruns due to client action is 'additional work or changes to work'. This cause was listed as a major factor in five of the seven (71%) reviewed articles.
- From a contractor's perspective the most significant contributor to cost overruns is 'time delays', listed in three of the seven (43%) reviewed articles.
- The most significant factor for cost overruns is evident from external factors and that is 'material price changes'. This factor was listed in six of the seven (86%) reviewed articles.

Other common factors listed among contractors, consultants and clients were 'poor estimates and material take-off' and 'delay in payments'.

It can be argued that the factors mentioned do not stand alone and that the ultimate cost overruns can be a result of multiple factors contributing to the final cause for cost overruns. For example, additional work requested by a client can result in a delay in ordering material which, in the mean time, was subject to price increases or shortages. The views of clients, contractors and consultants on reasons for cost overruns could also be conflicting with stakeholders defending their operating domain and 'shifting the blame'.

4. Factors causing time delays

Unfortunately, time delays on construction projects are more the norm than the exception. Supplementing their research on the causes for cost overruns, Kaming *et al.* (1997: 87) found that 'design changes', 'materials shortage' and 'inadequate planning' were the most significant contributors to time delays on construction projects. Similarly Sambasivan & Soon (2007: 521) categorised their findings into client, contractor and consultant categories, with all three categories listing 'poor site management', 'inadequate contractor

experience' and 'poor subcontractors' among the top five causes for time delays on construction projects.

Ogunlana, Promkuntong & Jearkjirm (1996: 44) investigated 12 high-rise buildings and categorised their findings into client/consultant-related, contractor-related and external causes for time delays. The weighted findings among these three categories indicated that 'material shortages', 'overstretching of technical personnel' and 'design changes' were the most important causes for project delays.

Assaf, Al-Khalil & Al-Hazmi (1995: 50) used 56 questions in three categories, namely owner, architects/engineers and contractors, to determine the main causes of delays on large building projects in Saudi Arabia. Their survey showed that contractors believed that 'preparation of shop drawings', 'delays in contractor's progress' and 'payment by owners' were the most important factors contributing to time delays. According to architects/engineers, 'cash flow', 'subcontractors' schedules' and 'slowness of owner decision-making' caused the most delays. Finally, owners were of the opinion that 'design errors', 'excessive bureaucracy in project-owner organisation' and 'labour shortages' contributed most to time delays.

Walker (1995: 269) surveyed Australian project representatives and found that the most important factors that affect time delays are 'the ability of the organisation to manage risk', 'planning capabilities' and 'effective resource coordination'. Kumaraswamy & Chan (1998: 25) studied time delays on Hong Kong projects and found that 'unforeseen ground conditions', 'poor site management' and 'slow speed of decision-making' were the most prominent causes of time delays. The results from a study of 130 public projects in Jordan by Al-Momani (2000: 58) indicated that 'poor design and negligence by the owner', 'change orders' and 'poor weather and site conditions' contributed most to delays. Al-Khalil & Al-Ghatly (1999: 654-655) studied public utility projects in Saudi Arabia and found that contractors considered 'delay in claim settlement', 'slow decision-making' and 'delays in progress payments' as the most important delay factors. Owners believed that 'poor early planning', 'scope changes' and 'financial difficulties by the contractors' were the major causes of delay. The consultants somehow supported the owners' views by indicating 'financial difficulties by the contractor', 'improper contract knowledge' and 'ineffective planning' as the most significant delay factors.

Odeh & Battaineh (2002: 70) used only two points of view, namely contractors and consultants, to determine the causes of project

delays in Jordan. The results showed that contractors believed that 'poor labour productivity', 'owner interference' and 'inadequate contractor experience' were the three most important causes of delays. The consultants, however, indicated 'inadequate contractor experience', 'late payment of completed work' and 'poor subcontracting' to be the main causes of delay. The inclusion of 'late payment of completed work' as a cause for delay referred to the result of late payment on continuing site activities and contractors halting work unless payment for completed work had been processed after the agreed date.

Studying the significant factors that cause delay of construction projects in Malaysia, Alaghbari, Kadir, Salim & Ernawati (2007: 199-200) used four categories for analysis, namely contractor, consultant, owner and external. As far as causes related to contractor actions are concerned, 'financial problems', 'shortage of materials' and 'poor site management' were ranked among the top three. Owner causes included 'delayed payments', 'slow decision-making' and 'contract scope changes'. The top three consultant causes were 'poor supervision', 'slowness to give instructions' and 'lack of experience'.

Finally, external causes of delay included 'shortage of materials', 'poor site conditions' and 'lack of equipment and tools in the market'. Faridi & El-Sayegh (2006: 1172) studied project delays in the United Arab Emirates and found that the three main causes of project delays were 'preparation and approval of drawings', 'inadequate early planning of the project' and 'slowness of owner's decision-making processes'.

The following can be concluded from the results published in the reviewed literature:

- The highest frequencies of time delay factors attributed to client actions were 'changes to design and drawings' (listed in six of thirteen, or 46% of the reviews) followed by 'slow decision-making' (listed in four of thirteen, or 31% of the reviews).
- The highest time delay factor attributed to contractor action was 'poor site management' (listed in six of thirteen, or 46% of the reviews), followed by 'poor planning' (listed in five of thirteen, or 39% of the reviews).
- As far as external factors are concerned, the overwhelming contributing factors to time delay were 'material shortages'

and 'late delivery of materials' (both listed in seven of thirteen or 54% of the reviews).

As with factors causing cost overruns, multiple factors could have an impact on a single, final cause for time delays. For example, slow decision-making by the client could lead to late design finalisation and subsequent late ordering of materials.

For the purpose of this research, the questions remain: Which factors caused time delays and cost overruns on the 2010 FIFA World Cup stadia projects, and How do these factors compare to those identified on global construction projects?

5. Research method

Construction projects entail the business engagement between two parties, namely the client or owner of the project and the contracting parties. The client is usually an institutional body such as a corporate company, governmental department, parastatal, financial institution or non-governmental institution. Contracting entities could be one or more main contractors, subcontractors and suppliers. This business engagement between the two parties occurs in an economic, socio-economic and environmentally sensitive business environment. This global environment consists of many external factors that could influence the progress and success of the project. Together with the client and contractors these external factors should be considered when exploring the causes for cost overruns and time delays on construction projects. With this in mind, the following basic categories developed by Antill & Woodhead (1990) were used:

- Client-related factors;
- Contractor- and supplier-related factors, and
- External factors.

Client-related factors include late payments, approval delays, changes to work and design, technical definition, client representation, design delays, decision-making and internal skills shortages. Contractor- and supplier-related factors include skills shortages, time and resource planning and coordination, subcontractors, site management, and labour productivity. External factors include delay in financing, statutory approvals, unpredictable site conditions, escalation and inflation, and shortages of material. Although it can be argued that 'shortages of material' could be a supplier-related factor, most of the literature categorised it under external factors,

the reason being that availability of material is mostly a function of economic conditions and subjected to supply and demand rather than supplier capabilities.

In order to conduct the survey, a detailed questionnaire was developed. The main purpose of the questionnaire was to assess the perception of respondents regarding the factors that cause project delays and cost overruns. The questionnaire consisted of 18 potential factors causing cost overruns and 34 potential factors causing delays, to be ranked by respondents. Although this research method of extended surveys or questionnaires has been proven for this type of application, the concern remains that there could be a certain degree of overlap between the various categories. In order to minimise potential overlaps, the 52 factors were carefully described.

In analysing and ranking the results, the Relative Importance Index (RII) was used (Kometa, Olomolaiye & Harris [1994]; Faridi & El-Sayegh [2006]; Aibinu & Odenyika [2006]).

$$RII = \sum W / (A \times N), (0 \leq \text{index} \leq 1),$$

where W = weight given to each factor by the respondents, and ranges from 1 to 5, (where "1" is "never" and "5" is "always"), A is the highest weight (that is 5 in this case) and N = total number of respondents.

A total of 60 questionnaires were distributed to consultants (24), contractors (20) and clients (16) involved in the ten 2010 World Cup construction sites. The sampling method used is commonly referred to as convenience or snowball sampling (Sambasivan & Soon, 2007). This type of sampling falls under the category of non-probability techniques and, as the name implies, sample elements are identified by convenience (friends, colleagues and professional contacts) and referral networks. This method of questionnaire distribution is preferred when it is difficult to obtain a response from participants selected at random. The ten stadia concerned were those listed in Table 1 (FIFA, 2010: online).

Although the stadia were on track to be completed for the FIFA World Cup tournament beginning in June 2010, not all were ready for the FIFA Confederations Cup held during June and July 2009. Although delays and cost overruns occurred on nearly all the projects, most were able to absorb the additional capital and time requirements in the contingencies allowed.

6. Results

Of the 60 questionnaires distributed, 22 (36%) responses were received. Responses were received for six stadia (see Table 2). Of the 22 returned questionnaires, 5 (22.7%) were from clients, 3 (13.6%) from contractors and 14 (63.6%) from consultants. Soccer City had the highest response rate (31.8%) and Loftus the lowest (9%).

Although the responses from clients and contractors were fairly low, the structuring of the questions minimised subjectivity. The low response rate made it impossible to conclude statistically significant findings. However, some indicative trends could be observed.

Table 2: Response from stadia

Stadium	Number of respondents				% of response
	Client	Contractors	Consultants	Total	
Ellis Park	1	1	2	4	18.2%
Loftus Versfeld	0	0	2	2	9%
Mbombela	1	0	2	3	13.6%
Polokwane	1	0	2	3	13.6%
Royal Bafokeng	1	1	1	3	13.6%
Soccer City	1	1	5	7	31.8%
Total	5	3	14	22	100%

In analysing the responses the mean and RII were calculated and ranked for each factor.

6.1 Factors causing cost overruns on the 2010 FIFA World Cup stadia

The results obtained from the responses to cost overruns are provided in Table 3. A total of 18 factors were analysed, with the top ten factors contributing to more than 85% of the cost overruns. Thus, for the purpose of this paper, only the top 10 ranked factors are listed.

Table 3: Ranking of factors causing cost overrun at stadia

Cost overrun factors	RII	Rank	Category
Increase in material cost	0.79	1	External
Inaccurate material estimates	0.60	2	Client
Shortage of skilled labour	0.58	3	Contractor
Client's late contract award	0.56	4	Client

<i>Cost overrun factors</i>	<i>RII</i>	<i>Rank</i>	<i>Category</i>
Project complexity	0.55	5	External
Increase in labour cost	0.54	6	External
Inaccurate quantity take-off	0.53	7	Client
Difference between selected bid and the consultants' estimate	0.52	8	Client
Change orders by client during construction	0.51	9	Client
Shortage of manpower	0.51	9	External

The ranking of the factors that caused cost overruns at the various stadia indicates that the most significant factor is the 'increase in material cost' under the category of external factors. The bills of quantities were supplied to the contractors as part of the tender process. The 'inaccuracy of material estimates' from the bills of quantities under the client category was the second highest ranked factor while the 'shortage of skilled labour' under the contractor category was ranked third.

6.2 Factors causing time delays on the 2010 FIFA World Cup stadia

The results obtained from the responses to time delays are provided in Table 4. In total 34 factors were analysed, with the top ten factors contributing to more than 80% of the causes for delay.

It must be noted that, for the purpose of this article, the factor 'incomplete drawings' is attributed to the 'client' category, the reason being that the majority of the consultants were appointed under a separate professional services contract by the client with the final product (drawings) handed to the construction contractors under a separate contract. Thus, as far as the contractor is concerned, the completeness of drawings remains the responsibility of the client.

Table 4: Ranking of factors causing time delays at stadia

<i>Delay factors</i>	<i>RII</i>	<i>Rank</i>	<i>Category</i>
Incomplete drawings	0.66	1	Client
Design changes	0.63	2	Client
Clients' slow decision-making	0.63	2	Client
Late issue of instructions	0.63	2	Client

<i>Delay factors</i>	<i>RII</i>	<i>Rank</i>	<i>Category</i>
Shortage of skilled labour	0.63	2	Contractor
Poor planning and scheduling	0.59	6	Contractor
Labour disputes and strikes	0.59	6	Contractor
Shortage of manpower	0.58	8	Contractor
Change orders by client during construction	0.55	9	Client
Poor information dissemination	0.55	9	Client
Delay in work approval	0.55	9	Client

The highest ranked contributors to time delays on projects are concentrated around client actions, namely 'incomplete designs', 'design changes', 'slow decision-making' and 'late issue of instructions'. For the contractor category the 'shortage of skills' proved to be the most significant delay factor, followed by 'poor planning' and 'labour problems'. The most significant external factor was 'unforeseen soil conditions', ranked eighth.

6.3 Comparing global and FIFA World Cup stadia construction performances

A key parameter for direct comparison is the use of common measurement criteria. In this research a common approach was followed in terms of categorisation of parameters, questionnaires and RII calculation. However, not all research conducted on global construction projects followed this route and therefore the final results should be viewed as indicative rather than absolute. Despite this shortcoming, the comparison indicates clear similarities and differences between global construction and FIFA World Cup stadia projects.

Comparing the causes of cost overruns with those found in literature and FIFA World Cup stadia, 'material cost' and 'price fluctuations' had a significant impact on both groups of projects. As an external factor the uncertainty regarding material cost is something the project manager and team have little control over and it remains a huge risk for any construction project. Other significant causes identified for global projects in literature were 'poor bills of quantity estimates and material take-off' and 'delays in payments' as opposed to 'inaccurate material estimates' and 'shortage of skilled labour' for FIFA World Cup stadia projects. Thus the main causes of cost overruns on projects studied in literature and FIFA World Cup stadia were very similar.

When comparing the causes for time delays between those found in literature and FIFA World Cup stadia, it was found that there are similarities between the top three causes. From literature 'slow decision-making by the client', 'design changes' and 'delay in payments' were found to be the most significant causes of project time delays. In comparison, FIFA World Cup stadia found that 'incomplete drawings', 'design changes' and 'clients' slow decision-making' were the main causes of time delays.

The observations made in comparing the results are important, especially those related to causes for time delays on the FIFA World Cup stadia projects. The mere fact that the causes are concentrated around the client's actions will have an impact on the allowances that contractors will need to make on the schedules. Similarly, clients will also be wary of the skills problems experienced by contractors since all three factors listed under the contractor category for FIFA World Cup stadia projects, namely shortage of skills, poor planning, and labour disputes and strikes are worker-related.

7. Summary and conclusion

The FIFA 2010 Soccer World Cup turned the world's attention to South Africa's ability to successfully complete major construction projects. With global construction projects generally late and over budget, this article investigated the factors causing cost overruns and time delays on these projects. The factors identified were categorised into three categories, namely external factor-related, client-related and contractor-related. Following the factors identified, a questionnaire was developed and distributed to potential participants working in various capacities on the various stadia projects. Results were received from respondents involved in six of the ten FIFA World Cup stadia.

Although the FIFA World Cup stadia had time delays on all the projects, they were completed in time for the tournament. The most significant contributor to cost overruns for the FIFA World Cup stadia was 'material cost and price fluctuations' which is also a factor experienced by numerous projects referred to in literature in other parts of the world. Factors causing delays on the FIFA World Cup stadia projects were client-related such as 'incomplete drawings', 'design changes' and 'slow decision-making'. Apart from a client-related cause, namely 'delay in payments', the main causes identified in literature on global projects corresponds with the top three causes found in literature.

From this research it can be concluded that the main factors causing cost overruns and time delays on global projects listed in literature are similar to those experienced on the FIFA World Cup stadia projects. South Africa does no longer finds itself isolated from global economic pressures. Local clients and contractors compete in a global economic environment where the availability of materials and skilled resources remains a challenge.

The importance of accurate design work and compilation of bills of quantities were highlighted. Although advanced software tools and techniques, such as three-dimensional modelling, automated material take-offs and change reference control had been developed to improve the productivity of design outputs, these aspects remain some of the most significant contributors to time delays on construction projects.

8. Recommendations for further research

This article investigated the factors causing cost overruns and time delays for both FIFA 2010 World Cup stadia and global construction projects. From the article it is clear that there is much scope for research in the following areas:

- The impact of interrelationships/causalities between two or more factors. Although listed as stand-alone factors in this research, some factors could be the result of another. For example, 'wrong material take-offs' could be the result of 'design changes'. 'Poor skills levels' could impact on 'site supervision', not to mention salient factors such as language and cultural differences.
- The skills level of global and South African construction labour and subsequent levels of productivity.
- The impact of architectural novelty on the design phase duration of projects. The new stadia included state-of-the-art, unique architectural designs. These designs posed major challenges regarding constructability which could have had an impact on the number of design changes.
- The impact of forward cover to hedge against extraordinary material price increases.
- The impact of geographical positioning on construction performance.

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Charles Chiocha, John Smallwood & Fidelis Emuze

Health and safety in the Malawian construction industry

*Peer reviewed***Abstract**

Construction Health and Safety (H&S) is of significant importance to the improvement and sustainability of the construction process. This is why at various levels of the construction process, clients, project managers, architects, engineers, contractors, subcontractors, suppliers, and manufacturers have endeavoured to improve H&S management practices in construction. However, the implementation of H&S in construction has not resulted in a commensurate improvement in the industry.

The thrust of the issue is the assessment of the level of knowledge of legislation through the devolution of responsibilities to stakeholders; and perceptions relative to H&S in Malawi. Therefore, for objectivity purposes, a quantitative survey was conducted among key construction industry stakeholders such as clients, architects, engineers, project managers, and contractors. Selected findings include that the status of H&S in Malawian construction is sub-optimal, and that the contributions of clients, project managers, architects, engineers, building and civil engineering contractors have been sporadic, rather than significant. Notably, poor H&S recurs in construction, and H&S is perceived to be the duty of site managers.

Keywords: Construction, health and safety, Malawi

Abstrak

Gesondheid en veiligheid binne die konstruksie-industrie is baie belangrik vir die verbetering en volhoubaarheid van die konstruksieproses. Dit is waarom daar by verskeie vlakke van die konstruksieproses, kliënte, projekbestuurders, argitekthe, ingenieurs, projekbestuurders, kontrakteurs, sub-kontrakteurs, verskaffers, en vervaardigers gepoog word om gesondheid- en veiligheidsbestuurspraktyke in konstruksie te verbeter. Nietemin, die implementering van veiligheid en gesondheid in konstruksie het nie eweredig verbeter in die industrie nie.

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Die kruks van die saak is die assessering van die vlak van kennis oor wetgewing deur die oorgang van verantwoordelikhede van aandeelhouers, en persepsies oor veiligheid en gesondheid in Malawi. Daarom, vir doeleindes om objektief te wees, is 'n kwantitatiewe opname gedoen onder sleutel konstruksie-aandeelhouers soos kliënte, argitekte, ingenieurs, projekbestuurders, en kontrakteurs. Bevindinge sluit in dat die status van veiligheid en gesondheid in die Malawiese konstruksie-industrie sub-optimaal is, en dat die bydrae van kliënte, projekbestuurders, argitekte, ingenieurs, bouers en siviele ingenieurskontrakteurs sporadies, eerder as merkwaardig is. Dit is belangrik om waar te neem dat daar swak veiligheid en gesondheid in konstruksie is, en dat veiligheid en gesondheid gesien word as die plig van terreinbestuurders.

Sleutelwoorde: Konstruksie, gesondheid en veiligheid, Malawi

1. Introduction

The H&S at Work Act for different countries realises responsibilities for employers, designers, principal contractors, and other construction project participants. Statutory responsibility for enforcing these regulations rests with governmental departments tasked with H&S monitoring and inspection. For instance, in the United Kingdom (UK), the Health and Safety Executive (HSE) exercises inspection and monitoring duties relative to H&S (HSE, 2004: 3).

However, inadequacies related to H&S legislation, and increased litigation in construction amplifies the need for collective effort and commitment in order to advance the level of H&S in construction. In addition, in order to eliminate injuries and fatalities on site, it is paramount to engender cost-effective H&S programmes that entail subcontractor selection and management (Hallowell, 2010a: 33).

Furthermore, there is a need to raise the level of H&S awareness in developing countries because recent findings suggest that in developing countries such as Botswana, construction H&S awareness is low. In addition, implementation of H&S is not only inadequate, but also top management commitment to H&S is lacking in spite of the fact that documented literature suggests that the level of H&S awareness needs to be improved relative to construction multi-stakeholders in order for the impact of H&S in construction to be appreciated (Musonda & Smallwood, 2008: 88). For example, in the case of Malawi, H&S lapses could be responsible for accidents such as the reported accident involving three workers at the Kayelekera mine construction site. The *Nyasa Times* of 18 March 2009 reported that three workers were severely burnt on 16 March 2009 while working at the mine construction site (*Nyasa Times*, 2009: online).

Although empirical research findings that focus on H&S in Malawian construction are presumably relatively non-existent and/or scarce,

findings emanating from countries sharing similar characteristics with Malawi in the region provide a pointer to what may be occurring in the Malawian construction. In particular, the disparity of construction H&S performance between developing and developed countries was ascertained in a comparative study undertaken in a developing country, South Africa, and a developed country, Singapore by Teo, Haupt & Feng (2008: 497). The study revealed that management commitment, supervisory environment, and training and competence level were identified as the major sources of the disparity of H&S performance in developing and developed countries. Although this finding is further supported by the difference in the incidence of different causes of accidents that resulted in injuries and fatalities on construction sites in South Africa and Singapore, the findings of the empirical study imply that construction H&S in a developing country such as South Africa lags behind that of a developed country such as Singapore in the three main areas mentioned above. Similarly, empirical findings emanating from Tanzania, another developing country in the region, suggest that the main reasons for the appalling situation of H&S on construction sites are due to the lack of the necessary commitment from key stakeholders that include the government (Mwombeki, 2006: 426). The study findings indicate that the government and its agencies have been weak in monitoring and enforcing the laws governing H&S on construction sites, while a general lack of human and financial resources has marginalised the ability of regulatory bodies to promote and enforce H&S on construction sites. In addition, it is notable that the study findings suggest that there has not been a commensurate improvement in H&S in spite of the availability of enabling legislation in Tanzania. Even in Ghana, another country in the region, an exploratory study revealed that, although the country has the necessary institutional infrastructure for effective management of H&S, the lack of government commitment that is exemplified by logistical constraints facing inspectorate departments limits the operational efficiency of these departments that are deemed to be responsible for H&S management in the country (Kheni, Gibb & Dainty, 2006: 281). Clearly, these findings indicate that construction H&S could be a cause for concern in sub-Saharan countries, and by implication H&S could be a problem in Malawi. Hence, there is a need to examine the state of H&S in the Malawian construction industry.

2. Literature survey

Clients, project managers, architects, engineers, contractors, subcontractors, manufacturers, professional and industry associations as well as other stakeholders in construction contribute and influence H&S in various forms (CIDB, 2009: 24). However, empirical findings suggest that built environment professionals are not adequately using their influence to reduce the rate of incidents and fatalities in construction (Geminiani, 2008: 226).

The uniqueness of the industry, which collectively poses a challenge in terms of construction H&S, may provide a platform for holistic improvement initiatives (Smallwood, 2000: 467-471). In addition, although comparatively the construction industry may have some similarities with other production-oriented industries, the uniqueness of construction tasks, environment, materials, equipment, and people necessitates addressing construction H&S in a construction context rather than in a general context (Geminiani, 2008: 215).

Nevertheless, the industry could improve how it engenders and sustains H&S culture on construction sites. Although in many cases top management's commitment to H&S may be lacking, the amplification of the importance of H&S with respect to future organisational profitability and sustainability may reorient priorities in the industry (Hallowell, 2010b: 412). For instance, when issues relative to H&S become business priorities for firms involved in construction, a platform for the improvement of H&S is thus enacted without the need for constant changing of laws and/or regulations (Dulaimi, Ling & Ofori, 2004: 709).

However, research undertaken in developing countries that included African countries such as Botswana, Egypt, Malawi, Nigeria, and South Africa revealed that (Gibb & Bust, 2006: 65-77):

- Clients are not supportive of H&S initiatives;
- H&S priorities are not the same as in developed countries;
- H&S regulations are inadequately enforced by authorities;
- Lifting operations are done in ways not consistent with practices in developed countries;
- Workers' use of power/hand tools is unsatisfactory;
- Women are not able to carry out work without increasing risk relative to their H&S, and
- Construction vehicles are used in an unsafe manner.

Therefore, the continuing poor H&S performance of the construction industry in the form of fatalities, injuries, and disease; the number of large-scale construction accidents, and the general 'non-participation' by key project stakeholders such as clients and designers provided the catalyst for a new approach to construction H&S (Smallwood & Haupt, 2005: 2). Reducing occupational diseases and accidents would not only improve and save people's lives, but also reduce the hundreds of millions of rand paid annually to victims of work-related accidents, and relieve the pressure placed on the country's financial situation (CIDB, 2009: 37-40).

2.1 Legislation

Just as the 2003 Construction Regulations in the Republic of South Africa (RSA) address H&S in South African construction, the National Construction Industry Act No. 19 of 1996 established the National Construction Industry Council of Malawi, and addresses H&S in the country. In particular, the Act provides, *inter alia*, for the establishment of the NCIC, for the promotion and development of the construction industry in Malawi, for the registration of persons engaged in the construction industry, and for the coordination of training of persons engaged in the construction industry (Brushett & Seth, 2005: 2). In fulfilment of its mandate, therefore, the NCIC has 1355 firms registered in its database as at 2010 (Salephera Consulting, 2010: 9). Of these firms, 80% are registered in the categories of civil and building contractors, 10% in the category of electrical contractors, while consultants constitute 4% of the population. Even so, regardless of geographical boundaries and industry structure, most H&S-related legislation spells out responsibilities of participants in the construction process in terms of written policy statements, noise and H&S in the workplace, equipment and machinery usage, control of dangerous substances, welfare facilities on site, risk assessment, first-aid facilities, and other legal requirements (HSE, 2004: 9; South Africa, 2003: 17).

Although the South African Construction Regulations are to a large extent performance-based, it is perceived that they had an impact among project managers and contractors, in particular. Although not statistically quantifiable, the regulations also seem to have had a positive impact on reducing H&S accidents (CIDB, 2009: 16). Therefore the significance of appropriate regulations cannot be over-emphasised. However, it is important to note that the enforcement of regulations poses another challenge to H&S. For example, Geminiani (2008: 225) discovered that the Department of Labour (DoL) inspectorate charged with enforcement responsibilities

in South Africa is perceived to be more ineffective than effective, and that its influence and role are reactive rather than proactive.

2.2 Perceptions relative to H&S

Anecdotal evidence suggests that the dynamics of the construction process demand that effort devoted to H&S planning be proportionate to the risks and complexity inherent in projects. That is, when deciding what needs to be done in order to comply with H&S regulations, the focus should always be on action necessary to reduce and manage risks and eliminate hazards. In fact, Hare, Cameron & Duff (2006: 447) contend that integration of H&S plans with pre-construction planning processes may reduce H&S problems in the construction process.

Therefore, the dynamics related to construction activities/tasks that leads to changes during construction induces unsafe behaviours, and may also preclude the effectiveness of straightforward H&S defensive measures (Musonda & Smallwood, 2005: 58). These behaviours are mostly rooted in workplace culture, which is collectively made up of values, vision, goals, mission, assumptions, and purposes espoused in organisations (Hallowell, 2010b: 411). Accordingly, Smallwood & Haupt (2005: 3) suggest that top H&S performance must be accepted as an achievable goal to realise an optimum H&S culture. Goals must be set at a high level. If an organisation sets goals at a low level it will probably attain such goals. Improving the industry norm marginally relative to H&S is unlikely to be of much comfort. Therefore, 'Zero accidents' as an attainable goal is worth the collective commitments of project stakeholders.

2.3 H&S duties of clients, consultants, and contractors

The International Labour Office (ILO) (1992: 9) specifically states that designers should receive training in H&S; integrate the H&S of construction workers into the design and planning process; not include anything in a design which would necessitate the use of dangerous structural or other procedures or hazardous materials which could be avoided by design modifications or by substitute materials, and take into account the H&S of workers during subsequent maintenance.

Similarly, the HSE (2004: 17-20) suggests that it is pertinent for clients, architects, project managers and engineers to plan, manage and monitor construction phases in liaison with contractors; prepare, develop and implement a written plan and site rules; give contractors relevant parts of the plan; ensure that suitable welfare facilities are

provided from the start and maintained throughout the construction phase; check the competence of all appointees; ensure that all workers have site inductions and any further information and training needed for the work; consult with the workers and liaise with their co-ordinator regarding ongoing design, and secure the construction site. In addition, contractors are required to plan, manage and monitor their work and that of their subcontractors; check the competence of all their appointees and workers; train their employees; provide information to their workers; comply with the specific requirements in Part 4 of the Regulations; ensure that there are adequate welfare facilities for their workers; provide any information needed for the H&S file; inform clients and consultants of problems with the plan and of reportable accidents, diseases and dangerous occurrences on site.

3. Research methodology

The quantitative study addressed H&S management in terms of knowledge of legislation (its existence); perceptions relative to H&S; aspects of H&S culture, and management practices/interventions.

3.1 The data

The survey instrument was designed to capture stakeholders' actions or lack thereof, and their perceptions as they are the direct executors of project objectives. Because of the type of data that was required, the survey of concerned stakeholders on construction sites using questionnaires was deemed appropriate for the research. The research was limited to architects, clients, building and civil engineering contractors, engineers, and project managers operating in the Malawian construction industry. The sample stratum consisted of 5 per group – a total of 30.

3.2 Results

Out of the 30 questionnaires circulated to 5 of each of the architect, client, building and civil engineering contractor, engineer, and project manager groups, 21 responses were received, which were included in the analysis of the data. This equates to a response rate of 70%.

Tables 1, 2, and 3 indicate the respondents' degree of concurrence relative to 4 statements and 2 drivers that addressed the 'status quo' pertaining to H&S in the Malawian construction industry in terms of responses to a scale of 1 (never/strongly disagree/not important)

to 5 (always/strongly agree/very important), and a mean score (MS) ranging between 1.00 and 5.00.

Table 1: Status of H&S in Malawian construction

Statements	Response (%)					MS
	Never.....Always					
	1	2	3	4	5	
Reporting H&S lapses	0.0	4.8	14.3	19.0	61.9	4.38
Poor H&S recurs in construction	9.5	4.8	38.1	23.8	23.8	3.48

Table 1 indicates the frequency of reporting of H&S lapses in the Malawian construction industry. Of the respondents, 61.9% affirm that upon the discovery of H&S lapses, they always report such lapses/shortcomings. The MS of 4.38 effectively indicates that H&S lapses are often to always/always reported. This may be attributed to respondents' awareness of the consequences of poor H&S, since poor H&S appears to occur in the Malawian construction industry. In this context, poor H&S refers to the frequency of incidents and accidents that can be deemed to be detrimental to the wellbeing of construction workers and the general public. In addition, the MS of 3.48 indicates that there is considerable scope for the improvement of H&S in Malawi as its occurrence can be deemed to be between sometimes to often/often. The MS is deemed to be associated with respondents' perceptions of how often they encounter inadequacies relative to H&S in the Malawian construction industry.

Table 2 indicates the respondents' perceptions relative to H&S in Malawi relative to two statements. It is notable that 61.9% of the respondents strongly agree that 'H&S is the duty of site managers'. The resultant MS of 4.38 indicates that the concurrence can be deemed to be between agree to strongly agree/strongly agree. Although site managers are responsible for H&S and have substantial influence thereon, empirical research findings indicate that in order to realise substantive improvement in construction H&S, all stakeholders in the construction process need to be collectively responsible for H&S (CIDB, 2009: 1). More than 50% of the respondents agree and strongly agree that 'H&S is a good public relations tool'. The MS of 3.52 indicates that the concurrence can be deemed to be between neutral to agree/agree. Injuries and accidents have always resulted in a negative image of the industry, and organisations operating in the industry that do not recognise the importance of optimum H&S risk negative publicity.

Table 2: Perceptions relative H&S in Malawian construction

Statement	Response (%)					MS
	Strongly disagree.....Strongly agree					
	1	2	3	4	5	
H&S is the duty of site managers	4.8	0.0	9.5	23.8	61.9	4.38
H&S is a good public relations tool	14.3	4.8	23.8	28.6	28.6	3.52

Therefore, it is not surprising that 'negative publicity related to H&S lapses' is one of the drivers of organisational interest in H&S (Table 3). The MS of 3.43 relative to 'negative publicity related to H&S lapses' indicates that the importance can be deemed to be between important to more than important/more than important. It is notable that 'corporate H&S code of conduct' has a higher MS, namely 4.24, which indicates that the importance can be deemed to be between more than important to very important/very important, and therefore can be deemed to be a significant driver of H&S in Malawi. The reasons for this are that subscription to such a code reflects organisational commitment to H&S, and readiness to act in respect of failures relative to H&S.

Table 3: Drivers of H&S improvement

Drivers	Response (%)					MS
	Not important.....Very important					
	1	2	3	4	5	
Corporate H&S code of conduct	4.8	0.0	14.3	28.6	52.4	4.24
Negative publicity related to H&S lapses	14.3	9.5	23.8	23.8	28.6	3.43

Nevertheless, the inability, or rather the apparent reluctance of organisations to allocate adequate 'budget towards investigations relative to H&S issues' is notable (Table 4). Only 28.6% of the respondents responded in the affirmative. Furthermore, only 47.6% of the respondents have 'written construction site specific H&S policy statements' in their organisations. These findings do not constitute top management commitment to H&S, which is crucial for any H&S improvement initiative.

Table 4: Evidence of top management commitment to H&S

<i>Statements</i>	<i>Yes (%)</i>
Budget devoted to investigations relative to H&S issues	28.6
Written construction site specific H&S policy statements	47.6

4. Conclusions and recommendations

In spite of having the necessary legislation in place, the study confirmed that construction H&S could be a major issue in developing countries. Though findings emanating from the study are primarily related to the construction industry in Malawi, anecdotal evidence suggests that the situation is not significantly different in other developing countries.

However, there is significant scope for improving H&S in developing countries and, by implication, Malawi. The perception that H&S is the contractor's responsibility, the limited financial provision for H&S, and the limited availability of H&S policies does not reflect H&S leadership and management commitment to H&S in Malawi. However, it is acknowledged that H&S is a strategic issue, and that H&S failures negatively impact on organisational image. Optimum H&S leadership, management commitment to and management involvement in H&S, increasing awareness, and appropriate enforcement of legislation should therefore result in a decline in the number of construction-related fatalities and injuries. Accordingly, recommendations arising from the study include:

- Re-orientation and continuing professional development of built environment and construction industry practitioners in terms of their H&S responsibilities is necessary;
- Construction H&S should be included in the tertiary education curricula of all built environment stakeholders;
- All stakeholders should provide H&S leadership, be committed to H&S, and view H&S as a strategic issue, as opposed to an operational issue;
- All stakeholders should budget relative to H&S, and
- All construction workers should receive H&S training.

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Green buildings: A Mauritian built environment stakeholders' perspective

Peer reviewed

Abstract

The earth's health is deteriorating and will deteriorate even more rapidly unless people adopt eco-friendly policies. Green building has long been a concept but it has not yet been universally applied in practice. The concept of sustainability emerged in 1713 in Germany and was internationalised in the 1970s and can be associated with the energy crisis and environmental pollution concerns. This research is aimed at comparing 'green' buildings with 'non-green' (traditional) buildings in terms of cost and to determine contractors' and professionals' knowledge of green buildings and materials.

The literature reviewed and results of a survey among professionals and contractors from the island of Mauritius formed the basis of the study. The literature study on green buildings generally revealed that green buildings may be more costly at the outset, but they contribute to long-term savings. This was confirmed by the majority of the survey respondents who stated that green building materials are more durable than traditional materials, resulting in cost savings. Furthermore, the most emphasised advantage is reduced energy and water use. Contractors are more familiar with traditional materials than green materials and professionals do not have sufficient experience in green building materials/concepts, resulting in a low growth rate of green building construction.

The outcome of the study is very important for construction and design team members, clients and environmentalists.

Keywords: Building costs, built environment, green buildings, sustainability

Abstrak

Die toestand van die aarde neem gedurig af en die tempo daarvan sal nie afneem tensy die bevolking meer eko-vriendelike beginsels toepas nie. Die konsep van 'groen geboue' is reeds lank bekend alhoewel dit nog nie universeel toegepas word nie. Die konsep 'volhoubaarheid' het sy oorsprong in 1713 in Duitsland en internasionalisering in die 1970's toe die energiekrisis en kommer oor omgewingsbesoedeling ontstaan het. Navorsing is gedoen om vergelykings

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te tref tussen 'groen' en 'nie-groen' (tradisionele) geboue, in terme van kostes en kennis van kontrakteurs en ontwerpspanlede.

Die navorsing is op 'n literatuurstudie en resultate van 'n opname tussen verskillende professionele konsultante en kontrakteurs in Mauritius gebaseer. Die algemene literatuurstudie toon aan dat 'groen' geboue aanvanklik meer kos as tradisionele geboue, maar meer voordelig is in terme van langtermynbesparings. Dit is bevestig deur die navorsingsrespondente wat aangedui het dat 'groen' boumateriale meer duursaam as tradisionele materiale is met gevolglike vermindering in langtermynkoste. Verder is die laer energie- en waterverbruik van 'groen' geboue baie voordelig. Kontrakteurs is meer vertrouwd met tradisionele materiale as met 'groen' materiale en professionele konsultante het onvoldoende ondervinding in 'groen' geboue; dit alles lei daartoe dat die groeitempo van groen geboue nie na wense is nie.

Die resultate van die navorsing is van uiterste belang vir alle persone in die bou-omgewing, kliënte en omgewingbewustes.

Sleutelwoorde: Boukoste, bou-omgewing, groen geboue, volhoubaarheid

1. Introduction

For the purpose of this article, the following terminology applies:

Green materials – building materials that are environmentally friendly, renewable, biodegradable and recyclable, e.g. carbon, polyurethane.

Traditional/natural materials – materials that are found naturally in a specific place and used by inhabitants to build, e.g. grass, bamboo, thatch, straw bales, dry stone, mud (plaster).

Conventional materials – materials specified mostly by designers, e.g. brick, concrete, glass, steel.

The concept of green or sustainable buildings is not new, but the technologies associated with the concept have evolved and matured over time (Emmit & Gorse, 2006: 606). "Green building is the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle from siting to design, construction, operation, maintenance, renovation and deconstruction." This practice expands and complements the classical building design concerns of economy, utility, durability, and comfort. A 'green building' is defined by the Green Building Council of South Africa (GBCSA) as "a building which is energy-efficient, resource-efficient and environmentally responsible" (GBCSA, 2010). Green building is also known as "a sustainable or high performance building" (US Environmental Protection Agency, 2010: online). Van Wyk (n.d.) argues that green buildings are now a universally accepted principle that promotes the construction of environmentally friendly buildings; they can be

defined as buildings that minimise their impact on the environment while improving their indoor environmental quality.

Green buildings have been on the rise in the United States of America, Europe and Australia for a number of years (Department of Environmental Affairs and Tourism, 2009: online). However, in South Africa this is still a relatively new notion. In 2007 and 2008, consciousness of green buildings increased on account of the electricity and water shortages and a growing awareness of global climate changes. These issues all resulted in a demand for green building practice from international organisations.

The way construction is taking place is about to change radically; it "has" to (Freed, 2008: 9). Freed further explains that the majority of modern-day buildings waste energy, water and resources. According to Kennedy, Smith & Wanek (2002: 1, 2), our relationship to buildings began to change during the last few generations. The Industrial Revolution came like a big splash in a little pond. It started in Western Europe, then spread to other parts of the globe. With the industrialisation of buildings, an increase in the amount of construction took place. However, the consequences were not all positive. The effects of extraction, manufacture and the transportation of building materials have contributed to the global environmental problems currently being experienced.

Although not usually a high priority for investors, owners or even tenants, the energy used by buildings is significant and obviously a key concern with regard to global warming (Sayce, Ellison & Smith, 2004: 226). According to Nassen, Holmberg, Wadeskog & Nyman (2006: 1593), the building sector accounts for 40% of the primary energy use and 36% of the energy-related CO₂ emissions in the industrialised countries. These emissions are mainly related to the use phase of buildings, while emissions from the production of building materials, such as concrete and steel, are attributed to the manufacturing industry sector.

The objective of the research was to investigate the concept of green buildings with specific reference to the cost of green buildings, the scarcity of natural materials in the building industry, the use of green materials as opposed to traditional materials, and building professionals' knowledge of green-building practices. The purpose of the literature review was to describe green buildings in general, and the quantitative research was to ascertain the current position in Mauritius only.

2. Review of literature

2.1 The first green buildings

According to Freed (2008: 10), the first truly green buildings dated from AD 1. These were the stone dwellings of the Anasazi Indians (Meinhold, 2009: online). The best examples of these buildings appeared around the 700s and consisted of apartment-house-style villages which had beautiful stone masonry. Freed (2008: 10) mentioned that the reason for considering those buildings as green buildings was that the Anasazi understood the sun and heating, natural ventilation, how to capture water, while the only materials used were stone, mud and wood. It is important to note that the 'Anasazi buildings' were completely free of toxins and were healthy.

2.2 Advantages of green buildings

Srinivas (2009: 791) explains that green buildings have had numerous benefits in India. These benefits range from the tangible to the intangible. Tangible benefits include reduction of power consumption by 20%-40% and reduction of potable water consumption by between 30% and 40%. On the other hand, intangible benefits include the health and safety of the building's occupants, better comfort for the occupants, higher productivity for occupants, and better practices from day one, by having the latest techniques or technologies included.

Furr (2009: 104) states that the benefits of green buildings include reduced capital investments because of available incentives, reduced operating costs through reduced consumptions (energy and water use), reduced personnel costs related to increased productivity and worker health, and increased operating revenue (higher rentals, increased occupancy and net metering).

Green buildings have many advantages pertaining to the environment, as well as costs involved. The most emphasised advantage may be regarded as reduced energy and water use (Srinivas, 2009: 795), while Furr (2009: 104) emphasised the cost advantages.

2.3 Limitations and risks of green buildings

Anderson, Bidgood & Heady (2010: 35) suggest that green building construction is different from that of conventional buildings, but as with conventional construction, claims and disputes also accompany green projects. These authors also warn about possible

'green litigation' because of new inexperienced entrants into the green market and the unknown risks.

Project owners are also faced with risks; there may be a failure to meet the required level of certification (Hancock, n.d., online). This risk may be significant where a large number of projects need to meet sustainability standards. Hancock further explains that in the case where the completed project fails to be accredited as green, there is a further risk that the owner does not meet his loan or incentive programme; the economic implications may be substantial (Anderson *et al.*, 2010: 35).

Bowers & Cohen (2009: online) argue that while many risks of green building are identical to the risks of conventional construction, the addition of sustainability/efficiency benchmarks and the need to attain a certain level of certification change the playing field to some extent. They also emphasise the risks facing design professionals, namely, as Leadership in Energy and Environmental Design (LEED)-accredited professionals, designers are expected to show higher standards of care, while accepting the fact that design failures may result in non-compliance with LEED certification of the project. More importantly, liability may arise from the failure of systems or components to perform adequately over the structure's lifecycle.

Currently, nearly every European country, the United States of America, Canada, Australia, Japan, Hong Kong and South Africa have their own green building rating system/tool. In 2007 the South African Property Owners Association established a Green Building Council of South Africa (GBCSA) to promote environmentally sustainable practices. The GBCSA developed a rating system called the Sustainable Building Assessment Tool (SBAT). It was developed to support the development of a more sustainable built environment within South Africa's developing country context. The SBAT framework includes three sustainability aspects, namely economic (local economy, efficiency, adaptability and flexibility, ongoing costs, capital costs); environmental (water, energy, waste, site, materials and components), and social (occupant comfort, inclusive environments, access to facilities, participation and control, education, health and safety). Building environmental rating systems provide a way of showing a building owner to what extent a building has been successful in meeting an expected level of performance in various declared criteria (Sebake, n.d.: online).

2.4 Uncovering the meaning of sustainability

Sustainable construction, according to Kunszt (2003: 5), may be defined as “the creation and responsible management of a healthy built environment based on resource efficient and ecological principles”. Harrison (2000: 8) and the Environmental Stewardship Initiative (2002: online) define sustainability as “meeting the needs of the present without compromising the ability of future generations to meet their needs”. This definition can be accepted as the most widely used one, and is contained in the Brundtland Report – World Commission on Environment and Development 1987 (Munier, 2005: 10).

Very often the terms ‘green’ and ‘sustainable’ are used interchangeably. However, according to Kibert (2005: 9), the term ‘sustainability’ addresses the ecological, social and economic issues of a building. This author further relates that in 1994, the Conseil International du Bâtiment (CIB), an international construction research company networking organisation, defined the term ‘sustainable construction’ as the “creation and operation of a healthy built environment, based on resource efficiency and ecological design”. RICS (2010), on the other hand, provides a definition of ‘green building’ as

a sustainable building or green building is an outcome of a design philosophy which focuses on increasing the efficiency of resource use, including energy, water and materials, while reducing building impacts on human health and the environment during the building’s life cycle, through better siting, design, construction, operation, maintenance and removal.

Sustainable development is often confused by some people who think that concepts such as ‘sustainable’ and ‘development’ cannot co-exist, while others think that the words ‘sustainable’ and ‘development’ contradict each other (Munier, 2005: 16). Munier referred to the term ‘sustainable development’ as a qualitative change involving not only the economy, but also institutional, social and environmental changes. According to McIntyre, Ivanaj & Ivanaj (2009: 166), there are three pillars of sustainability, namely:

- Economic (growth, market expansion, externalisation of costs);
- Social (basic human needs, equity, participation, social accountability), and
- Ecological (carrying capacity, sustainable yield, resource conservation, biodiversity).

2.5 The issue of costs

There is a perception that green buildings are more expensive than conventional buildings (Kats, 2003: 12). In a report conducted by Berman (2001), it was found that among half a dozen Californian developers interviewed in 2001, green buildings cost 10-15% more than conventional buildings. Morris & Matthiesen (2007: 3) are of the opinion that "there is no significant difference in average costs of green buildings, as compared to non-green buildings".

Srinivas (2009: 795) postulates that the cost of green buildings can be slightly higher than that of conventional buildings. He also stresses that this should be considered by means of a different paradigm; therefore, the use of a baseline cost is required. However, green buildings can result in money savings for companies, developers and end-users – over and above their function in protecting the environment (Oxford Business Group, 2008: 137). The CEO of Emaar Dubai, Richard Rodriguez, corroborates that construction costs can be reduced considerably if best practices are employed.

When considering the cost of green buildings, both tangible and intangible benefits must be considered. The tangible benefits such as the economical advantages are not immediately visible. However, the lifetime payback is much higher compared with that of conventional buildings, which mainly accrues from operational cost savings, reduced carbon emission credits and potentially higher rental or capital values. The intangible benefits such as social advantages are due to the positive impact of green buildings on the neighbourhood environment. Moreover, due to better working conditions, the productivity of occupants increases and health problems decrease. Furthermore, green buildings create a green corporate image; several companies are now viewing Green Building Rating as a tool to enhance marketability (Roy & Gupta, n.d: 7).

2.6 Building materials

Resources, pollution and performance are the most general criteria of building materials (Berge, 2000: 3). Resources used by any construction material include all the raw materials and energy used from its extraction to its disposal. Pollution in the above context refers to all harmful emissions resulting from the production of the material, products used to clean and maintain the material, off-gassing from materials during their lifetime, and final incineration or landfilling. Performance is the criterion for how well the material does the job for which it was produced (Milani, 2005).

Natural materials and processed materials perform differently. Natural materials tend to be more complex and have different positive qualities and, if correctly utilised, can bring a plus to the building industry by enhancing the performance of buildings. When compared to traditional materials, methods and technologies, natural materials can provide energy efficiency in buildings. However, May (2006: online) maintains that not any kind of natural material will suit any situation. Suddell (2008) proclaims that the construction industry is the second largest sector that uses natural material.

According to Albino, Balice & Dangelio (2009: 85), a green material is one that minimizes environmental impact throughout the entire life cycle. However, although Baumann, Boons & Bragd (2002: 415) are of the opinion that there is still confusion on a definition of green materials, Attmann (2009: 118) states that green materials are:

- environmentally friendly;
- renewable;
- biodegradable, and
- recyclable.

Furthermore, Attmann (2009: 118) maintains that green materials can be categorised into:

- biomaterials (biotic materials), e.g. straw, carbon, polyurethane;
- composites, e.g. concrete, brass;
- smart materials, e.g. carbon-fibre, and
- nano-materials, e.g. nano-carbon tubing.

Kelly & Hunter (2009: online) propose the application of the three R's (reduce, re-use and recycle) as being helpful in selecting building materials.

2.7 Professionals and contractors involved in green buildings

Regarding sustainable development, Strong & Hemphill (2006: 6) comment that built environment professionals are faced with the challenge of meeting the needs of people and the growing economy, while simultaneously maintaining the nature, character and posterity of the natural environment. Furthermore, they stress that no one profession is more important than the other; instead, good teamwork is required.

According to the Associated General Contractors of America (2007: online), contractors are important for the success of green projects.

Some contractors may be involved in the design process; however, contractors' involvement in implementing a project is often limited by the project-delivery system and the contract specifications. The Association further stresses that contractors can add expertise if they are included in the design process. Among others, the contractor's role on a green project can be to:

- Recycle and re-use construction and demolition debris;
- Limit the use of hazardous materials on the jobsite;
- Protect existing vegetation, donate cleared trees or mulch for use on site;
- Make environmentally friendly purchasing decisions, and
- Procure and install more energy-efficient mechanical and electrical systems.

However, Braganca (2007: 14) indicates that designers and contractors tend to favour straightforward solutions. Despite the fact that construction has contributed to global environmental problems (Kennedy *et al.*, 2002: 1, 2), buildings are still being erected without taking the climatic consequences into account. This can possibly be attributed to a lack of knowledge or secondly, to satisfy the main human needs; people prefer simple and cheaper buildings.

2.8 Green-building trends

According to Kibert (2008: 12), the trend towards green buildings is as follows: there is rapid penetration of the LEED-green building rating system, as well as increased US Green Building Council (USGBC) membership, private and public incentives, strong federal leadership and an expansion of state and local green building programmes, thereby capitalising on green building benefits and achieving advances in green building technology. Furthermore, Kibert (2008: 12) explains that similar to trends in green building, there are also barriers such as financial discrepancies, insufficient research and the lack of awareness.

The company Frost and Sullivan's (2010: online) recent analysis of the South African green building market found that this market is still in its infancy, but it has great potential for growth. It states that the Green Building Council of South Africa (GBCSA) has experienced an average growth of 100% per annum in its membership subscription since 2008; this is significantly faster than the growth rates experienced at the inception of the Green Building Council of Australia, on which the GBCSA is modelled. In addition, to date the GBCSA has had over 2000 attendees (most of whom are built-environment professionals)

at their Green Star SA Accredited Professional course. Four buildings have achieved certification under the Green Star SA rating system, with another twenty-four registered for certification. Growth in membership and participation rates indicates that the South African market is responding well to green-building initiatives.

2.9 Green building in Mauritius

The Republic of Mauritius is a group of islands in the South West Indian Ocean, consisting of the main island of Mauritius, Rodrigues and several outer islands located at distances greater than 350km from the main island. The population, estimated at 1.3 million, comprises Indo-Mauritians, people of mixed European and African origin, and Sino-Mauritians. The islands of Mauritius and Rodrigues, with a total area of 1.969 square kilometres, have an overall population density of 652 persons per square kilometre. About 43% of the area is allocated to agriculture, 25% is occupied by built-up areas and 2% by public roads. The remaining area consists of abandoned cane fields, forests, scrubland, grasslands and grazing lands, reservoirs and ponds, swamps and rocks. The biggest greenhouse gas emission product is carbon dioxide from fossil fuels and in 2010 this amounted to 3365 gigagram (Gg), with a major impact on the environment. The energy industry (1997Gg), manufacturing (352Gg), transport (845Gg) and residential (123Gg) sectors are the main contributors to the carbon dioxide emission. This has led to greater emphasis on designing green buildings (Central Statistics Office, 2009: 2).

Building-construction methods for residential buildings include mainly buildings with concrete block walls and concrete roofs (86%), concrete block walls and iron/tin roofs (4%), iron/tin walls and roofs (8%), wood walls and iron/tin or shingle roofs (1%) or 'other' (1%). The following 'traditional' materials are still used to some extent: straw (used mostly in hotel roofs for aesthetics); stone (commonly used for aesthetics such as garden walls and balustrades of open terraces, and for hardcore filling); timber planks produced locally, and crushed stoned (as a replacement for sand because of environment protection laws).

The following 'conventional' materials are also used in the construction industry: blocks made of fine stone (instead of bricks), cement (imported) and imported iron sheets (called profilage). Most of the internal finishes consist of marble, vinyl flooring, parquet wood flooring (all imported) and locally produced paint.

Since Mauritius is a tropical island, even in winter it receives enough sunshine to favour the use of solar energy (e.g. solar water heaters instead of electrical geysers) as a form of 'green building' product.

3. Research methodology and findings

The research is descriptive in nature. A quantitative research method was employed, described by Borrego, Douglas & Amelink (2009: 54) as good for deductive approaches, in which a theory or hypothesis justifies the variables, the purpose statement, and the direction of the narrowly defined research questions. The hypothesis being tested and the phrasing of the research questions all govern how the data will be collected, as well as the method of statistical analysis used to examine the data.

The review of the literature resulted in the formulation of the following three main research questions, namely built environment stakeholders' (i) perception on whether green buildings are more expensive than conventional buildings; (ii) their familiarity with green concepts, and (iii) preference of green *versus* traditional building projects. The survey instrument used to obtain the primary data for addressing the research questions consisted of a structured questionnaire circulated to a randomly selected sample of fifty quantity surveyors, engineers, construction managers, architects and contractors in Mauritius. A response rate of 62% was achieved and this formed the basis for data analysis and the subsequent conclusions. Moyo & Crafford (2010: 68) state that contemporary built-environment survey response rates range from as little as 7% to as much as 40% in general. As such, the above response rate of 62% can be regarded as very high. The response group included quantity surveyors (23%), engineers (16%), construction managers (16%), architects (29%) and contractors (16%). Questionnaires were completed anonymously to ensure a true reflection of the respondents' views and to meet the ethical criterion of confidentiality. It was assumed that the respondents were sincere in their responses as they were assured of their anonymity.

Responses were evaluated on a perceived level of agreement with statements based on a 5-point Likert scale where 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree. Once the questionnaires were returned, the responses were electronically captured using a Microsoft Office Excel spreadsheet to calculate percentages and mean scores (MS); as indicated in the tables.

4. Results and findings

4.1 Built environment stakeholders' perception on whether green buildings are more expensive than conventional buildings

The questionnaire survey explored the perceptions of Mauritian built-environment stakeholders in terms of the cost of green buildings compared to that of traditional buildings.

The responses are summarised in Table 1.

Table 1: Cost of green buildings compared to that of conventional buildings

Statement	Response (%)					MS	
	Unsure	1=Fully disagree, 3=Neutral, 5=Fully agree					
		1	2	3	4		5
Green building design decreases operational and maintenance costs	3.2	6.5	35.5	25.8	29.0	0.0	2.83
Green building materials are more durable than conventional materials, resulting in cost savings	0.0	3.2	9.7	29.0	38.7	19.4	3.65
Green buildings use less energy, resulting in cost savings	3.2	0	9.7	25.8	41.9	19.4	3.77
Green buildings have less waste disposal, resulting in cost savings	6.5	3.2	12.9	35.5	32.3	9.6	3.38
Green buildings use less water, resulting in cost savings	6.5	0.0	9.7	29.0	38.7	16.1	3.69
Green buildings use technology that is cheaper than conventional buildings	0.0	6.5	38.7	22.6	29.0	3.2	2.87
Green buildings cost less than conventional buildings	0.0	12.9	32.3	29.0	22.6	3.2	2.74
Average							3.28

Although the majority of the respondents (35.5%) 'disagreed' on whether green-building design decreases operational and maintenance costs, the majority (38.7%) 'agreed' that green-building materials are more durable than conventional materials which should result in lower maintenance costs. Regarding the use

of energy, water and waste disposal, the majority of the respondents also 'agreed' that green buildings use less energy (41.9%) and water (38.7%) while the majority were 'neutral' (35.5%) on whether there is less waste disposal, resulting in cost savings. The Table also shows that respondents are not convinced that green buildings use cheaper technology than conventional buildings (MS=2.87).

The literature review indicated that the cost of green buildings can be slightly higher than that of conventional buildings. This was confirmed by the majority of the survey respondents (32.3%) as they 'disagreed' that green buildings cost less than conventional buildings.

Although the overall MS of all aspects indicates a higher 'neutral' MS of 3.28, leaning slightly more towards the 'agree' range, the outcome that green buildings cost less than conventional buildings can possibly be attributed to savings occurring during the project's life cycle.

Property developers are often more concerned with initial construction costs when deciding whether to continue with a construction project whereas the life-cycle cost of the development should be a more important factor in decision-making. When green buildings are constructed, the life-cycle cost of the building will result in bigger savings than when conventional materials are used.

4.2 Awareness of green-building concepts

The questionnaire survey also explored the awareness of built-environment stakeholders with respect to various aspects of green buildings. The responses are summarised in Table 2.

Table 2: Awareness of green building concepts

Statement	Response (%)					MS	
	Unsure	1=Fully disagree, 3=Neutral, 5=Fully agree					
		1	2	3	4		5
I am familiar with the Environment Conservation Act	0.0	0.0	9.7	38.7	48.4	3.2	3.48
I am familiar with the National Environment Management Act	0.0	0.0	12.9	38.7	38.7	9.7	3.48
I am aware that natural materials are scarce	0.0	0.0	0.0	9.7	74.2	16.1	4.10
I am aware that the environment is degenerating	0.0	0.0	0.0	0.0	70.9	29.1	4.32

Statement	Response (%)					MS	
	Unsure	1=Fully disagree, 3=Neutral, 5=Fully agree					
		1	2	3	4		5
I am aware of the benefits that green buildings have on the environment	0.0	0.0	0.0	9.7	83.9	6.4	4.00
The above benefits are substantial	0.0	0.0	0.0	6.5	54.8	38.7	4.35
I am aware of my firm's impact on the environment	0.0	0.0	9.7	38.7	48.4	3.2	3.48

The majority of the respondents (48.4%) 'agreed' that they are familiar with the Environment Conservation Act while the majority of the respondents were either 'neutral' or 'agreed' (38.7%) that they are familiar with the National Environmental Management Act.

The majority of the respondents also 'agreed' that they are aware:

- that natural materials are scarce (74.2%);
- that the environment is degenerating (70.9%);
- of the benefits of green buildings on the environment (83.9%);
- that the advantages are substantial (54.8%), and
- of their firm's impact on the environment (48.4%).

The above results are a clear indication that Mauritian built-environment stakeholders are fairly familiar with most green-building concepts and related Acts. It is thus important to determine why so few green buildings are being built, especially because the majority of the respondents indicated that they were aware of the benefits of green buildings (MS 4.0) and that these are 'substantial' (MS 4.35). The next section shows the results of respondents' views on their preference in using conventional versus green buildings.

Respondents were requested to state their views on the use of green versus conventional buildings by indicating to what extent they agreed with the following statements (Table 3):

4.3 Preference: Green versus conventional buildings

Table 3: Green versus conventional buildings

Statement	Response (%)					MS	
	Unsure	1=Fully disagree, 3=Neutral, 5=Fully agree					
		1	2	3	4		5
Professional firms prefer using conventional materials over green materials or products	0.0	3.2	19.4	25.8	45.2	6.4	3.35
Contractors prefer the use of conventional materials over green materials or products	0.0	6.4	12.9	25.8	48.4	6.5	3.39
Contractors are more familiar with conventional materials	0.0	3.2	12.9	19.4	54.8	9.7	3.58
Building professionals are experienced in green-building concepts	0.0	3.2	41.9	32.3	22.6	0.0	2.78
Contractors understand the nature of green materials or products	3.2	6.4	32.3	32.3	25.8	0.0	2.79
Green materials and methods are still new concepts in the construction industry	0.0	3.2	45.2	25.8	22.6	3.2	2.81

The results indicate that the majority of both professional teams (45.2%) and contractors (48.4%) 'agree' with the statement that they still prefer to use conventional materials over green materials or products. This may be because the majority of the respondents (54.8%) indicated that contractors are more familiar with conventional materials and therefore refrain from using green materials.

However, the majority of the respondents (41.9%) indicated that they 'disagree' with the statement that professionals are experienced in green-building concepts. This may be one of the reasons why there is not really a growth in green buildings being built. If professionals do not have sufficient experience in green-building materials/concepts, they may be hesitant to specify them. The majority of the respondents also indicated that they 'disagree' (32.3%) with the statement that contractors understand the nature of green materials or products, whereas 32.3% of the respondents were 'neutral' regarding this statement. From the results it is also clear that the majority of the respondents (45.2) do not believe that green materials and concepts are still new to the construction industry.

The above results indicate that there is still a tendency not to use green materials or products. This could be because professionals and contractors are not fully familiar with such materials and therefore are hesitant to specify or use them. Clients, however, are becoming more aware of green buildings and materials and may insist that professionals and contractors specify and use such materials. This is also obvious in the following results.

4.4 Prospects of green buildings

Table 4 summarises the respondents' views on the prospects of green-building construction in Mauritius.

Table 4: Prospects of green buildings in Mauritius

Statement	Response (%)					MS	
	Unsure	1=Fully disagree, 3=Neutral, 5=Fully agree					
		1	2	3	4		5
Green building construction is at its infancy	0.0	3.2	29.0	29.0	35.5	3.3	3.06
Green buildings have a high growth potential	0.0	0.0	6.5	19.4	64.5	9.6	3.77
Clients are interested in green buildings	0.0	0.0	3.2	25.8	67.7	3.3	3.71
I promote green-building practice among my colleagues	0.0	0.0	9.7	38.7	48.4	3.2	3.45

The results indicate that the majority of the respondents (35.5%) 'agree' that green building is still at its infancy, and 64.5% of the respondents 'agree' that green buildings have a high growth potential. The results also indicated that 67.7% of the respondents 'agree' that clients are interested in green buildings, and 48.4% of built-environment stakeholders promote green-building practice among their colleagues. These findings are similar to what was previously discussed in the literature review. It is thus clear that the prospects of green-building construction are very positive. All stakeholders should thus minimise any barriers to ensure growth in green-building developments.

5. Conclusions and recommendations

The characteristics of green buildings are energy-efficient, resource-efficient and environmentally responsible. The primary concern is to protect our planet with the aim of creating a better and healthier environment for people. The results of this research indicated that various authors pointed out that green buildings may be more costly at the outset, but they contribute to long-term savings. This was confirmed by the majority of the survey respondents who stated that green building materials are more durable than conventional materials, resulting in cost savings.

The literature pointed out that green buildings have many advantages pertaining to the environment, as well as costs involved; the most emphasised advantage may be regarded as reduced energy and water use – this was confirmed by the survey respondents. The survey results also showed that the prospects of green buildings are positive. Although green buildings are not regarded as a totally new concept in the construction industry, both contractors and professionals indicated that they still prefer conventional methods over green building materials.

Furthermore, although the survey results provided a clear indication that built-environment stakeholders are fairly familiar with most green-building concepts and related acts, the results showed that contractors are more familiar with conventional materials than green materials, and that professionals do not have sufficient experience in green-building materials/concepts. It is therefore recommended that:

- Contractors familiarise themselves better with green materials;
- Professionals gain more experience in green-building concepts;
- Tertiary institutions or other service providers provide green-building training opportunities for all built-environment stakeholders, and that
- Built-environment stakeholders familiarise themselves with the Building Sustainability Index (BASIX) introduced by the government of New South Wales, Australia, to regulate the energy efficiency of new buildings. It offers an online assessment tool for rating the expected performance of residential developments in terms of water efficiency, thermal comfort and energy usage. Furthermore, professionals and contractors should consider implementing the Sustainable

Building Assessment Tool (SBAT) rating system developed by GBCSA.

The results of this survey are based on perceptions of built-environment stakeholders in Mauritius and may differ somewhat from respondents elsewhere in the world. This creates an opportunity for further research to obtain a wider perspective on the issue of green buildings worldwide.

Global climate changes require that all people, especially built-environment stakeholders, become more aware of the benefits of green buildings to, among others, ease the burden on electricity and water shortages and thereby ensuring a better life for future generations.

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