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SUSTAINABLE CONSTRUCTION: EXPLORING THE CAPABILITIES OF NIGERIAN CONSTRUCTION FIRMS

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As the built environment accounts for much of the world's emissions, resource consumption and waste, concerns remain as to how sustainable the sector is. Understanding how such concerns can be better managed is complex, with a range of competing agendas and institutional forces at play. This is especially the case in Nigeria where there are often differing priorities, weak regulations and institutions to deal with this challenge. Construction firms are in competition with each other in a market that is growing in size and sophistication yearly. The business case for sustainability has been argued severally in literature. However, the capability of construction firms with respect to sustainability in Nigeria has not been studied. This paper presents the preliminary findings of an exploratory multi-case study carried out to understand the firm's views on sustainability as a source of competitive advantage. A 'mega-international firm' and a 'lower medium-sized indigenous firm' were selected for this purpose. Qualitative interviews were conducted with top-level management of both firms, with key themes from the sustainable construction and dynamic capabilities literature informing the case study protocol. The interviews were transcribed and analysed with the use of NVivo software. The findings suggest that the multinational firm is better grounded in sustainability knowledge. Although the level of awareness and demand for sustainable construction is generally very poor, few international clients are beginning to stimulate interest in sustainable buildings. This has triggered both firms to build their capabilities in that regard, albeit in an unhurried manner. Both firms agree on the potentials of market-driven sustainability in the long term. Nonetheless, more drastic actions are required to accelerate the sustainable construction agenda in Nigeria.

Keywords: competitiveness, developing countries, dynamic capabilities, sustainable construction.

INTRODUCTION

The sustainable construction (SC) agenda requires far reaching changes to the design, construction and operations of buildings. The Agenda 21 for sustainable construction document laid down an early marker for the construction sector at national to local levels (CIB, 1999). Many other strategies for dealing with the requirements of SC have evolved over the years. In developing countries, the increasing relevance of the building sector justifies the need for greater attention towards sustainable buildings (Berardi, 2013). However, questions arise as to if and how the SC agenda can be pursued in developing countries, particularly by those on the African continent.

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Many of the challenges of construction in developing countries have been documented by several researchers (Ofori, 2000, Reffat, 2004, Wells, 2007, Ofori, 1984). These challenges negatively impact on the abilities of these countries to learn from past examples of developed countries while addressing problems of rapid urbanisation and inadequate housing and infrastructure (du Plessis, 2007). As attention gradually shifts to the African continent as the next possible region for rapid economic growth and development, conscious efforts have to be made to ensure that this projected development is 'sustainable' (Luciana, 2007). The construction sector is likely to be the focal point of this development as the continent rises to meet its deficiencies in housing and infrastructure. However, there is little or no evidence that the construction sector in these countries are in a position to take on these challenges head-on.

Nigeria exemplifies an interesting context to study how these developments are taking shape and what improvements can be recommended. The country has recently been adjudged to be the largest African economy by GDP, and has attracted the largest Foreign Direct Investment (FDI) on the continent in the past few years (National Bureau of Statistics, 2014). It has an active and vibrant construction sector catering for the needs of its diverse 170million people. This paper discusses the on-going role construction firms are playing in advancing the sustainability agenda.

LITERATURE REVIEW

Sustainable Construction

SC is the construction sector's response to the sustainable development agenda which came to global focus through the publication of 'Our Common Future' (World Commission on Environment and Development., 1987). The report emphasized three fundamental components of sustainable development: environmental protection, social equity and economic growth. For these three dimensions to be captured in the built environment, SC should address the concerns of water usage, energy consumption, biodiversity, waste, construction materials and quality (Kibert, 2013). The literature on SC and appropriate strategies and technologies that deal with these concerns is growing. Environmental assessment tools such as LEED, BREEAM and Greenstar (Cole, 2005, Ding, 2008) have been developed, in addition to many 'off-the-shelf' sustainable technologies that could readily be incorporated into buildings (Pinkse and Dommissie, 2009). Ethical sourcing (Glass *et al.*, 2011) of construction materials is encouraged, while the business case for corporate sustainability has been discussed severally (Dyllick and Hockerts, 2002, Salzmann *et al.*, 2005)

The pursuit of SC is not without its challenges. The level of awareness is usually a critical factor in the early stages of diffusion (Herremans and Reid, 2002, Zainul Abidin, 2010). The concept has various definitions which are vague and subjected to a variety of interpretations making it difficult to comprehend (Murray and Cotgrave, 2007, Berardi, 2013). It calls for new sources of knowledge and technology which may be costly to implement in the short run (Häkkinen and Belloni, 2011, Serpell *et al.*, 2013). It also requires input from individual stakeholders to ensure a holistic approach in changing the way the construction sector carries out its activities.

Corporate sustainability

The corporate sustainability literature explores the integration of sustainability into the core business goals and operations of the firm. Corporate entities are increasingly under pressure to demonstrate how they contribute to sustainability goals (Dunphy *et al.*, 2007). Perhaps more than any other sector, the construction sector is very central to the sustainability debate. This is due to the quantum of energy, water and materials

consumed, and the wastes generated during its construction and operative phase (Pearce *et al.*, 2012). Construction firms appear to be the melting pot of the activities of all other stakeholders in the sector as they interact with all other stakeholders' output. This places them delicately in the spotlight of the sustainability agenda. This study draws upon the strategic management literature in understanding strategic change within organizations. The resource base view (RBV) (Barney, 1991) and its more recent extension, the Dynamic Capabilities View (DCV) dominates this area.

The Nigerian construction context

The Nigerian government has taken little steps in promoting sustainable development. It participated in the Rio summit (1992), Johannesburg summit (2002) and the Rio+20 summit (2012). It is a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) and is also committed to the millennium development goals (Government of the Federal Republic of Nigeria., 2010). In 2008, it set up a stakeholder's conference on sustainable development. Since then, there has been little evidence of any significant momentum on sustainable development.

The Nigeria construction sector is projected to be the fastest growing (9.4%) in the world up to 2020 (Oxford Business Group, 2011, Mitchell, 2013). This is in part due the sector's low contribution to the macro-economy of Nigeria (1.3% as against 10% for similar countries). Recent surges in commercial and private developments, complementing Government's massive patronage of the sector (up to 90%), is expected to account for much of this growth (Coffey International Development Ltd, 2014). Four distinct firm types were identified by Coffey International (2014): Mega international firms, medium sized foreign controlled firms, lower medium-sized indigenous firms and the micro, small and medium indigenous (MSME) firms. Market share is skewed in favour of the largest firms (estimated 60-70%), with the MSMEs accounting for only 10 percent of output. While foreign firms dominate the market, a positive of this is the potential for technology transfer (Ofori, 1994, Carrillo, 1996).

Majority of the researches on the Nigerian construction sector addresses its historic problems: low skills levels and productivity (Olomolaiye *et al.*, 1987), nature of construction businesses (Aniekwu, 1995), time and cost overruns (Mansfield *et al.*, 1994, Aibinu and Jagboro, 2002), housing (Awotona, 1990) and risks (Adedokun *et al.*, 2013). The subject of SC is still relatively new in the research agenda and not much is known about it in the Nigerian context. The Agenda 21 for SC in developing countries sets a research agenda for developing countries like Nigeria (du Plessis *et al.*, 2001). Du Plessis (2007) hinges the success of any sustainability initiative in Africa on a 'capable' and 'viable' construction sector. The research focused on framing SC as a possible source of competitive advantage (Tan *et al.*, 2011) and explores how firms seek to develop their capabilities (Teece *et al.*, 1997) in this regard.

STRATEGIC MANAGEMENT

Resource Based View

In the Nigerian construction sector, distinctions are made between foreign owned firms and their indigenous counterparts (Ngoka, 1979), their market positions (Coffey International Development Ltd, 2014), and the implications as a result. The RBV (Wernerfelt, 1984, Barney, 1991) focuses on strategies for exploiting existing firm-specific assets that are valuable, rare, inimitable and non-substitutable (VRIN attributes). However, the RBV has been criticised as being static and that firms run the risk of neglecting the influence of market dynamism (Eisenhardt and Martin, 2000).

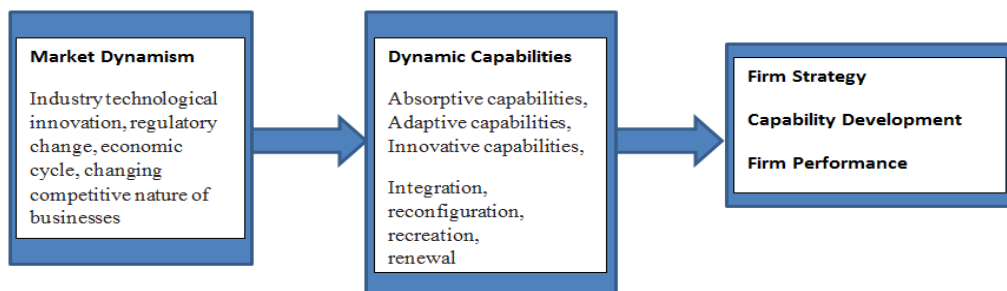
As a result, a previous dominant market position may become obsolete due to innovations from competitors or changing market demand. Thus, firms must seek to renew these VRIN attributes in order to gain or maintain market position (Helfat, 2007). This apparent weakness led to the development of the Dynamic capabilities View of the firm.

Dynamic Capabilities View

The DCV (Teece *et al.*, 1997) has its roots in evolutionary economics and was developed to address the weaknesses of the RBV. It is a firm-level framework which adds the dimension of ‘capabilities’ in rapidly changing environments to the RBV. The DCV seeks to explain how firms enter or maintain competitiveness in a more hostile, dynamic and global world (Bowman and Carter, 1995). It encompasses skill acquisition, learning and accumulation of organizational and intangible assets in which lies great potential for contribution to strategy. The DCV lens distinguishes the ‘difficult-to-replicate’, ordinary, zero level (technical) capabilities of firms from those higher level capabilities that are required to respond to fast moving business environments ‘open to global competition and characterized by dispersion’ marked by customer relevance and competitive considerations (Winter, 2003, Teece, 2009).

This framework resonates with competing firms seeking to engage new knowledge streams within the dynamic Nigerian construction sector. The DCV can be seen as a potentially integrative approach to understanding newer sources of competitive advantage (Teece *et al.*, 1997) especially in response to a changing environment such as the movement toward a sustainable construction sector. However, the DCV is not without its criticisms. It has often been labelled as inconsistent in definition and lacking theoretical foundations (Arend and Bromiley, 2009). This has been attributed to the DCV being relatively new (Green *et al.*, 2008). It still provides a good framework for this research compared to the RBV. A research model by Wang and Ahmed (2007) is adopted for this study (Figure 1).

Figure 1: Research Model for Dynamic Capabilities (Wang and Ahmed, 2007)



RESEARCH DESIGN

The research adopted a qualitative (Creswell, 2009), interpretivist approach in studying how firms integrate, build and reconfigure its competencies to address the rapid changing environments and global requirements for sustainability. A multi-case study (Eisenhardt, 1989) methodology was adopted for this study. The suitability of a case-study research design is that it investigates social life within the parameters of openness, communicativity, naturalism and interpretivity (Sarantakos, 2005). “*The concept of Dynamic capability includes the capacity with which to identify the need or opportunity for change, formulate a response to such a need or opportunity and implement a course of action*” (Helfat, 2007pg 2). As a result, themes from the

Dynamic capability framework and the Agenda 21 informed the development of the case study protocol.

Data Collection

Using the firm classification by Coffey International (2014) two firms were selected: one mega international firm (Multibrix Ltd) and one lower medium-sized indigenous firm (Dynamix Nig). Both names are fictitious for confidentiality purposes. The two firms have regional operations in Abuja, the capital city, Lagos the Commercial capital and Port Harcourt where most Oil and Gas operations take place. They have been in operation for upwards of 20 years, which anecdotally, suggests they are well established in the Nigerian context as most firms have a very short lifespan.

Interviews

The interviews focused on the firms' operating history in Nigeria, firm strategy, organizational structure and challenges faced in operation. Of particular importance were the firms' grasp of sustainability issues, its learning processes and absorption capacity. The interviews were directed at top level management, each being in depth and a little over one hour long. They were recorded, subsequently transcribed and anonymised. A total of ten interviews were conducted across both firms.

Corporate Reports

Archival records are standard sources of data on firm level change (Bryman, 2008) as they reveal the image the firm wants to create of itself. Only Multibrix Ltd produced corporate annual reports of which reports for years 2008-2012 were analysed. As for Dynamix Nig, a long term corporate strategic plan commemorating the 20th anniversary of the firm was obtained and analysed. None of the two firms had specific sustainability reports.

Data Analysis

The interviews were transcribed into Microsoft Word and NVivo 10 software was used to analyse the interviews against a set of categories that emerged from the responses of the interviewees. These include: understanding of the SC concept, ownership structure, corporate social responsibility, clients, reliability, policy and organisational culture. These were used to make sense of the firms' understanding of its strengths, market position, the prospects of sustainable construction and possible advantages from its enactment.

FINDINGS

The interviews sought to gain insight into how the firms understand and engage SC and if they saw any potential competitive advantage therein. On the other hand, in the event that they did not engage with SC, it sought to understand why and what other concepts the firms thought of as being important to their strategic development. The DCV research model by Wang and Ahmed was adopted and has the following themes: market dynamism, internal processes and configurations and capability development. The general profile of the firms is presented in Table 1 and the findings are as follows:

1. Understanding of Sustainability: this is drawn from the SC literature. A proper grasp of the principles of SC is required to mobilise for change within the organisation. The analyses of the interviews showed a very broad contrast with both firms' understanding of the concept. In Multibrix Ltd, all the respondents had a strong grasp of SC and its principles. The firm's respondents equally talked about drivers and barriers of SC both in the foreign and Nigerian context. The key drivers identified for foreign markets were legislation and long-term cost reduction. With respect to the local Nigerian market, the driver identified was

'international clients'. It was identified that both foreign and local markets shared common barriers such as high initial cost, low awareness and client demand. Some peculiar local challenges stand out though: cultural inertia resisting change, absence of legislation and incentive schemes, and inadequate systems to deal with change (see discussion section). The firm had gradually started to incorporate sustainable thinking and environmental consciousness into its operations since 2007. On the other hand, the Dynamix Nig staff had no understanding of SC as a concept as it exists in literature. However, while responding to questions on specific SC themes, they showed some level of comprehension, even though they did not previously link them to the SC concept. They had only recently encountered the concept while bidding for construction project in 2013.

Table 1: Profile of Both Case Study Firms

	Multibrix Ltd	Dynamix Nig
Type	Engineering, Procurement and Construction Firm (Vertically integrated)	Construction and Engineering Consultancy
Turnover (£)*	815,384,615	38,461,540
Staff Strength	Over 18000	Over 200
Ownership Structure	Public Liability Company	Privately owned
Geographical Spread**	3 regions	3 regions
Organizational Units	4 divisions, 3 service units, hierarchical organisation	4 subsidiary companies, flat organisation
Interviewees	Operational Director, service unit head, design head and LEED champion	Vice Chairman, 3 subsidiary head, one director of operations
Clients	Largely government, increasing number of corporate and private clients	Strictly private and corporate clients by unwritten policy

*Exchange rate £1= 260 Nigerian Naira ** Within Nigeria

2. Market Dynamism: Both firms' views on market dynamism appear predicated on the nature of clients each firm possesses. Multibrix Ltd appeal to a wider spectrum of high value clients in Nigeria's booming economy compared to Dynamix Nig. So while both firms alluded to the fact that they implement client's requirements and thus, Multibrix Ltd's higher profile clients appeared to account for its more robust mechanisms for dealing with change. They both sense the prospects for market driven sustainability.
3. Internal Processes and Capability Development: Multibrix Ltd claim to have put in place measures of sustainability since 2007. These include internal training sessions and appointment of a 'LEED champion' in this regard. It has also commissioned a flagship LEED standard project for one of its subsidiaries to showcase this capability to potential clients. This project, in addition to creating awareness is a way of diffusing knowledge within Multibrix Ltd. Dynamix Nig on the other hand claims to be in the process of learning about sustainability and have this as a clear objective in its short term strategic plan.

DISCUSSIONS

The research sought to explore the perspectives of two very different firms, one being multinational and the other strictly indigenous on the concept and practice of SC. In displaying their knowledge on SC, Multibrix Ltd personnel relayed a lot of personal experiences that were encountered outside of Nigeria. They displayed better understanding of a global context for change regarding SC and the roles of multiple stakeholders. Thus, specific advantage is derived from a diverse pool of staff with varied work experiences in both developed and developing countries. This knowledge is being enacted currently on three on-going projects which have been designed and are being constructed to LEED standards. They are however quick to point out 'ill-fitting' requirements of LEED to the Nigerian context as it is quite different from the market which it was designed for. This is indicative that a 'one-size-fits-all' solution is not feasible and there might be a need for a bespoke assessment methodology for

Nigeria. The choice of LEED is due to client requirement and the fact that the LEED is more widely used globally than any other environmental assessment tool.

With respect to the drivers of SC in the Nigerian context, the 'international client' refers to organisations typically based in developed countries that already have minimum benchmarks that are expected of their operations from a broader sustainable development point of view. An example was cited on how health and safety provisions became standard practice across most construction firms due to Oil and Gas clients' requirements. This resonates with the views of Ofori (1994) and Carrillo (1996) on technology transfer by multi-nationals in developing countries. Multibrix Ltd also made reference to the supporting systems for change being inadequate. For example, local materials manufacturers and suppliers did not have adequate product documentation or certification. As such, in the event where a locally manufactured product met certain criteria of quality, they were unable to use them.

The development of SC capabilities by Dynamix Nig. appears limited by absence of legislation (common to both firms) and client demand. The clients prominent for this class of firms are smaller scale commercial and residential clients. In the cases where an international client requested a LEED rated sustainable building, Dynamix Nig only then started to familiarize itself with the concept of SC and the criteria of LEED. Only then did they realize that there were certain aspects of their operations, notably community engagement and energy efficient lighting that were in line with SC. That tender has only been enough to trigger initial interest but not a full commitment to SC. In the absence of enabling legislation, it is likely that clients would continue to remain ignorant and/or indifferent to SC.

Many of the findings were consistent with the expectations of a developing country of Nigeria's statute. Differing priorities like those mentioned by du Plessis (2007) makes it no surprise that awareness and demand of sustainable buildings are very low. However, poor access and rising costs of water and energy supply is expected to have triggered demand for renewable sources of energy and smart water systems. Many sustainable construction materials are not locally manufactured and are relatively 'high end' for the average consumer and hence the poor demand once again. Overall, Multibrix Ltd fare much better in making sense and its engagement of the SC agenda. The reasons for this are quite clear: its large capital base, foreign networks, client base and a highly organised management structure. This competitive edge it has over its indigenous counterparts has been highlighted as far back as 1977 (Oladapo) and remains largely unchanged up till now.

The dynamic capabilities lens was used to explore the prospects of sustainable construction as a source of competitive advantage. The firms were able to state what they both perceived to be 'unique' and 'difficult to imitate' about them (their resource base). Multibrix Ltd has been in existence for over twice the time as Dynamix Nig. and its pattern of growth and survival matches the provisions of the DCV. Dynamix Nig. has grown in size and statute from its incorporation to fill up a gap where majority of the mega international firms and the medium sized foreign controlled firms are not interested (Coffey International Development Ltd, 2014).

CONCLUSIONS

From the analyses, it is apparent that the Nigerian construction sector is still in a very early phase of sustainable construction. Stakeholders are only just gaining awareness of the concept even though this seems to be happening at a very slow rate. However, there are prospects of market-led sustainability initiatives, largely driven by

international investors who seek to maintain standards identical to what they are used to in their previous places of operation. While the firms see the business case for sustainability, the pulse of their responses indicates that it would take a long time for this concept to diffuse through the sector. The study does little to assuage the criticisms of the dynamic capabilities view, but does not find anything to dispel them either. The provisions of the research model by Wang and Ahmed fits better with Multibrix Nig. due to its more formalised structures and processes. It is therefore concluded that to accelerate the uptake of sustainable construction, government intervention in terms of legislation and incentives is recommended.

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