



The magnitude of barriers facing the development of the construction and building materials industries in developing countries, with special reference to Sudan in Africa



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ABSTRACT

The aim of this paper is to examine, comprehensively, the factors which affect the performance and development of the construction industry (CI) and the building materials industry (BMI) in developing countries (DCs) with special focus on Sudan. This paper investigates the perception of the Sudanese construction industry (SCI) and the Sudanese building materials industry (SBMI) stakeholders towards the importance of factors which negatively influence the performance of both industries. It examines the interrelationship between factors influencing the performance of the SCI and the SBMI. The collected data is derived from a questionnaire which was circulated to different stakeholders of the SCI including consultants, contractors, real estate investors, clients, researchers, academicians, materials manufacturers and suppliers, financial institutions and non-governmental organizations (NGOs).

The results indicate that the socio-economic and political factors are of great importance to the performance of both industries. Therefore, the paper recommends that the government should lay the ground for the development of the construction sector through strategic planning and policy formulation. It also recommends establishing a central agency (Construction Industry Development Board) to be responsible for the development of the industry.

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1. Introduction

The construction industry (CI) in the majority of developing countries (DCs) is believed to lag behind from fulfilling its potential role in the socio-economic development process. The difficulties confronting the CIs of DCs and impeding their development have been extensively investigated by international organizations (UNCHS, 1981; 1984; World Bank, 1984; ILO, 1987), as well as by researchers, academicians and professionals (Moavenzadeh, 1978; Ofori, 1993b; 1994b; Turin, 1973; Wells, 1986). Some of these studies are region-specific (Ofori, 2001b) while some are country-specific (Elkhailifa, 2012; Sultan & Kajewski, 2003; 2004). The literature enumerates long lists of problems that hamper the development of the CI and contribute to its inefficiency. Unfortunately, many DCs have not reviewed the quality and quantity of their construction industries (Gueli, 2007), therefore these industries remain undeveloped. Ofori (1993b) argues that many DCs fail to develop their CIs because these problems are not prioritized.

Similar to many DCs, Sudan faces severe problems in its construction sector including: high construction costs; costs overrun; delays; lack of skilled labour; reliance on imports and low quality of construction work. The relative importance of these problems and the interrelation among them has never been examined in depth. No doubt, prioritizing these problems and understanding the interaction between them is crucial for the development of the CI.

In general, the SCI and the SBMI lack comprehensive and documented researches in this regard. The research efforts are limited to very few pioneer Sudanese researchers who tried to investigate the SCI in very broad terms (Bannaga, 2010; Elkhailifa, 2012; Elkhailifa & Balila, 2010; Elkhailifa & Shaddad, 2008; 2010). The only comprehensive research on the SBMI carried by Battelle Institut (1979) has never been updated and has become obsolete. It is believed that both the SCI and the SBMI are confronted by many problems that hinder their development in sustainable manner. The severities of these difficulties vary considerably in their magnitude and causality. The level of influence that these problems may impose on the performance of the SCI and the SBMI has not been researched. Additionally, lack of documentation of the SCI and the SBMI performance along with the lack of performance

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measurement indicators and tools make it impossible to identify the main causes of the deficiencies in both industries.

Therefore, the purpose of this paper is to review the *status quo* of the Sudanese Construction Industry (SCI) and the Sudanese Building Materials Industry (SBMI). It investigates the challenges facing the SCI and the SBMI. It aims to identify the factors influencing the performance of the SCI and the SBMI and measure their relative importance.

2. Categorizing the problems of the construction and building materials industries in developing countries

The CI covers a wide spectrum of activities and is known to be complex and multidimensional. Therefore, the magnitude of performance and the level of development of the CI cast shadows on the entire country rather than few sectors of the socio-economic system solely. Hence, the factors that impact on the industry's performance and development are believed to be multi-faceted, and are thus difficult to identify (Fox, Hills, Fong, Hon, & Skitmore, 2006). Attempts to categorize the problems of the CI in DCs have been made by many researchers who have enumerated the impediments to the development of the CI in DCs (Al-Omari, 1992; Elkhalfifa, 2012; Fox et al., 2006; Ofori, 1980). Difficulties in categorizing the factors influencing the construction industry development (CID) are represented in the complex nature of these factors and the interrelation between them (Ofori, 1993b).

Ofori (1980) has identified eight main factors influencing the CID in DCs, namely: economic growth and stability; government recognition; planning and resources; codes and procedures; use of local materials; education and training; appropriate technologies; and incentives for local contractors (Table 1). Al-Omari (1992) has shortened these factors into six, including: external environment;

indigenous environment; development planning and policies; planning prerequisites and measurement tools; implementation strategies; and working environment (Table 1). Fox and Scott (1999), using a grounded theory approach, captured a set of 42 factors that influence the CID in DCs. These factors have been categorized into three main groups which have been further broken down into six subcategories (Table 1). Fox (2006) has developed a six-factor generic model by incorporating his previous results of research on the CID "cultural factors" (Fox & Skitmore, 2002) into Ofori's model "traditional factors" (Ofori, 1980). Fox's six-factors model comprises of: (a) traditional factors, including (i) basic resources and infrastructure (physical and institutional, (ii) financial and human resources and (iii) techniques supporting high production performance and (b) cultural factors, including (iv) long term vision and policy for the industry, (v) thinking the best and behaving the best (best practice culture) and (vi) a learning culture.

Elkhalfifa (2012) proposes a model for categorizing the problems facing the CI and the BMI in Sudan. The model is based on the literature and what is believed to impact on the Sudanese Construction Industry (SCI) and the Sudanese Building Materials Industry (SBMI). This paper reviews the problems of the CI in DCs in accordance to the categorization frame work (Table 1 and Fig. 2) developed by Elkhalfifa (2012). This framework is believed to suit countries like Sudan wherein the industry is poorly organized and integration between stakeholders is absent. It is important to note that there is much overlapping and interrelationship between different groups of categorization. Thus, the categorization and subdivisions are only for convenience.

Ofori's model concentrates on the Ghanaian CI while Al-Omari's model is based on a case study in United Arab Emirates. Fox's model is probably the first model developed from multi-type and multi-country sources. It is developed to fit the international context,

Table 1

Categorization of factors affecting the development of the construction industry in developing countries.

Ofori's eight factors (1980)	Al-Omari's six factors (1992)
1 Economic growth and stability	1 External environment
2 Government recognition	2 Indigenous environment
3 Planning and resources	3 Development planning and policies
4 Codes and procedures	4 Planning prerequisites & measurement tools
5 Use of local materials	5 Implementation strategies
6 Education and training	6 Working environment
7 Appropriate technologies	
8 Incentives for local contractors	
Fox (1999)	Fox (2006)
1 Government Role	1 Traditional Factors
1-1 General Environment	1-1 Basic resources and institutional infrastructure
1-2 Task Environment	1-2 Financial and human resources
1-3 Client	1-3 Techniques and technologies supporting high production
2 Behavioural Factors	2 Cultural Factors
3 Key Resources	2-1 Long-term vision and policy for industry
3-1 physical Resources	2-2 Thinking the best and behaving the best
3-2 Human Resources	2-3 A Learning culture
Elkhalfifa (2012)	
1 Socio-Economic and Political Environment	
2 Construction Industry Environment	
2-1 Construction Industry Structure and Capacity	
2-2 Working Environment and Behavioural Factors	
3 Resources	
3-1 Financial Resources	
3-2 Physical Resources	
3-3 Human Resources	
4 Supporting Systems	
4-1 Regulatory System and Institutional Framework	
4-2 Research and Development	

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