HIGH COST OF MATERIALS AND LAND ACQUISITION PROBLEMS IN THE CONSTRUCTION INDUSTRY IN GHANA

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ABSTRACT

The main purpose of the study was to investigate the major causes of high cost of building materials and land acquisition problem which was part of a larger study that assessed the problems in the construction industry in Ghana. Data were collected from 16 contractors, 36 engineers/architects and 16 consultants through self-completion questionnaire. The findings reported were based on five-point Likert-type items relating to causes of land acquisition problem and high cost of building materials problem. Descriptive statistics, one-way analysis of variance at 0.05 level of significance and Gabriel's post hoc test were used to analyse the data. The results indicated that the highest ranked item of cause of land acquisition problem was sale of land to multiple users, and the highest ranked cause of high cost of building materials was high cost of manufacturing of materials in the construction industry in Ghana. Recommendations for Government and Authorities in the construction industry have been discussed. The study contributes to the literature on construction management in the context of developing countries.

__Keywords:__ construction industry, land acquisition, cost of building materials, contractors, consultants

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INTRODUCTION

Construction is a critical sector of economies because it builds and maintains the infrastructure on which almost every other industry depends. The construction sector is responsible for building new houses, apartments, factories, offices and schools. It also builds roads, bridges, ports, railroads, sewers and tunnels, among many other things. In addition, it maintains and repairs all of those structures mentioned above and produces the basic building materials. It makes a significant contribution to the national economy and provides employment to large number of people. According to report of Ghana National Commission for UNESCO (2010, p.183), from a low point in the 1970s and 1980s the share of construction in the Gross Domestic Product (GDP) has moved up from 4.5% in 1975 to 8.5% by the turn of the century and has been moving about the same levels since. The sector grew by 10% in 2008 but registered a negative growth rate of 1% in 2009 due to the global economic recession. Housing has been a concern of individuals, families, groups and governments since the dawn of urban civilization. This issue has often been attributed to land acquisition problem and high cost of building materials among others (Aliyu, Kasim & Martin, 2011).

The complexity of the construction operations and the subsequent problem solving capability needed is perceived formidable (Dubois & Gadde, 2001). Gidado (1996) argues that complexity in construction originates from a number of sources: the resources that are employed, the environment in which construction takes place, the level of scientific knowledge required, and the number and interaction of different parts in the workflow.

Land as a resource constitutes part of the environment where construction takes place and is of crucial importance to the economies and societies of the sub-Sahara Africa. It contributes a major share of GDP, and employment in most countries, and constitutes the main livelihood for a large portion of the population. In many areas, however, land is becoming increasingly scarce due to a variety of pressures, including demographic growth (Cotula, Toulmin & Hesse, 2004). These pressures have resulted in increased competition for land between different groups, such as multiple land users, urban elites and foreign investors.

The high rate of urbanization in China has led to great demand for land for infrastructure and property developments, and in order to obtain more land to meet demand, the government has implemented various measures, including compulsory land acquisitions (Chan, 2003). He further stated that in countries that allow private land ownership, compulsory land acquisition is the right and action of the government to take property not owned by it for public use. In

the United States, this right is known as 'eminent domain', the action is known as 'condemnation' (Eaton, 1995). In Canada, the United Kingdom, and Australia, the right and action are known as 'expropriation' (Boyce, 1984), 'compulsory purchase' (Denyer-Green, 1994), and 'compulsory acquisition or resumption' (Brown, 1996), respectively. In each of these countries, compulsory acquisition of private property by the government is authorized by legislation.

In Ghana, 'eminent domain' refers to the power possessed by the state over all property within the state, specifically its power to appropriate private property for public use (Larbi, 2008). Governments therefore have the right of compulsory land acquisition, with compensation, for the broader public service (Deininger, 2003). However, the exercise of such power is not without controversy (Kotey, 2002). The way in which many developing country governments exercise this right, especially for urban expansion, it undermines tenure security, and because often little or no compensation is paid, it also has negative impacts on equity and transparency (Deininger, 2003). One of the effects is that it causes a great problem for the construction industry in its effort in acquiring land for development and urbanization of the country, amidst other challenges in the industry such as high cost of building materials leading to high rate of housing deficit.

Another important resource in the construction industry which is engulfed in complexity is material. The high-cost of building materials in many developing countries, including Ghana, has resulted in the overall high-cost of construction; hence, having a 'satisfactory shelter' has been made beyond the reach of some of the population. It is, therefore, no surprise that the current housing deficit in Ghana is around 1.6 million housing units. High cost of building materials has been identified as one of the major problems militating against the construction industry in most developing countries. Generally, the problems have included that of scarcity and high cost of imported building materials or those with foreign components (Aliyu, Kasim & Martin, 2011). There are many constraints facing real estate development investment in Nigeria ranging from shortage of finance, institutional factors such as the effect of the land use decree and rent control edicts, shortage and high cost of building materials, manpower and management problems (Emoh & Nwachukwu, 2011). They further explained that high cost of building materials is not conducive to the growth of the affordability of the low and moderate income groups.

STATEMENT OF THE PROBLEM

The construction industry contributes immensely to the growth and expansion of a nation's economy, especially in the infrastructural development such as building of houses and roads. In spite of its contribution, it is bedeviled with many challenges depending on the individual country, which Ghana is no exception. Destination Ghana (2008) refers to Ghana as one of the fastest and most profitable places for Real Estate Investment in Africa. It identified the metropolises of Accra, Kumasi and Tamale as areas which offer investors reasonable prices and purchasers an affordable lifestyle. However, acquisition of land and high cost of building materials are major headaches to property buyers and the construction industry as a whole.

The land sector in Ghana has continued to be beset by major problems and constraints involving the current spate of land encroachments, multiple sales of residential parcels, high cost of land, and complex land tenure system leading to land acquisition problems, disputes, conflicts and endless litigation. Another worrying situation is the rising cost of building materials. The cost of building materials constitutes about 60 to 70 percent of the cost of building, therefore as the materials cost rises, the entire project cost increases. There is therefore, the need to find out the major causes of land acquisition problem and high cost of building materials problem in relation to the construction industry in order to take the appropriate steps to curb the problems.

OBJECTIVES

The aim of this study is to investigate the major causes of land acquisition and high cost of building materials problems in the construction industry in Ghana and make recommendations to remedy them. In order to achieve this purpose, the following objectives will be pursued:

1. To determine the major causes of land acquisition problem in the construction industry in Ghana

2. To determine the major causes of high cost of building materials in the construction industry in Ghana

SIGNIFICANCE OF THE STUDY

The results of this study will help policy makers and regulators in the construction industry in Ghana to formulate and enforce laws that will help grow the industry. Again, it will provide a literature as a reference for practitioners and teachers in the construction field. Finally, it will become the basis for future research works.

LAND ACQUISITION PROBLEMS IN GHANA

Ghana is a country which is richly endowed with natural resources including land and human. Land is very important in every country's development and wealth creation. The Land area of Ghana is approximately 238,539 Km^2 (92,100 square miles) which is permanently fixed in supply and therefore needs to be utilized judiciously. This is because population keeps on increasing but the land is static. There are many types of land ownership in Ghana but the major one's which are acknowledged by the legal framework are identified as public or state/government lands, vested stool lands and stool lands. In Ghana, land is owned predominantly by customary authorities (stools, skins, clans and families). Together they own about 78% of all lands, the State owns 20% and the remaining 2% is owned by the state and customary authorities in a form of partnership (split ownership) (Larbi, 2008).

In the view of Oduro-Kwarteng (2007), the land market in Ghana is being characterized by many problems and constraints. He identified one of the problems being general indiscipline, which have led to land conflicts, litigations and other negative effects particularly on the environment. He attributed the indiscipline in the land market to the misconduct of stakeholders who are the sellers (Traditional Authorities, family heads, Government agencies on vested lands), and buyers (Estate Developers and Agents) as well as those who play the role of referees to regulate the market (surveyors, planners, lawyers, Land Commission officials, Survey Department, Town & Country Planning Department, Metropolitan/Municipal and District Assemblies, Environmental Protection Agencies, Land Economist).

Kasanga (1998) defined the land tenure system as the various Laws, rules and obligations governing the holding and/or ownership rights and interest in land. The system provides a structure within which the rights and interests are exercised or left dormant in the use of development and transference of land. Land law in Ghana has grown from a complex mix of constitutional and legislative sources, judicial decisions, and customary and Islamic laws (Sarpong, 2006). Ghana's land rights and tenure systems result from the coexistence of these different systems in the regulation of such rights (Sarpong, 1999). Managing these systems to ensure tenure security for all levels of society has been a formidable challenge to Ghana's legal system. Kotey (2002) argues that acquisition of land in the public interest could mean acquisition by government for public bodies and statutory corporations, and also for private companies and individuals for purposes which although they may contribute to public welfare, confer a direct benefit, including profit, on the user.

HIGH COST OF BUILDING MATERIALS IN GHANA

Building and Road Research Institute (BRRI) of the Centre for Scientific and Industrial Research (CSIR) Ghana (2012) explained that the use of local materials could save the country at least $80 million annually. Currently, Ghana imports over $200 million worth of clinker, yearly for production of cement, which could have been invested in other sectors of the economy, particularly the housing sector. The provision of infrastructure and affordable housing for the citizens is constrained by high cost of building materials, especially Portland cement (BRRI, 2012). It further explained that the total monetary value of cement used in Ghana annually was estimated at Gh¢ 1.2 billion, and over 80 per cent of cement used in Ghana are imported, costing huge sums of foreign exchange.

METHODOLOGY

Research design

The study employed survey method with researcher-designed questionnaire for data collection to achieve the research objectives. Since the study sought to find out the major causes of land acquisition and high cost of building materials problems in the construction industry, the survey research method was deemed appropriate.

Population and sampling

The population for the study comprised of building and road contractors, civil engineering consultants and building engineers/architects in Kumasi Metropolis, Ghana. The researchers adopted purposive sampling technique for data collection because according to Bernard (2002) and Lewis and Sheppard (2006) the researchers decide what needs to be known and sets out to find people who can and are willing to provide the information by virtue of knowledge or experience. The sample for the study was 86 professionals in the construction industry, consisted of 20 contractors, 22 consultants and 44 engineers and architects.

Instrument

Questionnaire was deemed most appropriate for the study although a number of instruments for data collection could have been used. The questionnaire consisted of items for demographic data, and data on causes of high cost of building materials and land acquisition problems. Three (3) items each on high cost of building materials and land acquisition problems formed the basis of the findings reported in this paper. The questionnaire consisting of 12 Likert type and open-ended items were employed for the study. Five-point scale was used for the study, the response for the study were: strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5).

The instrument was pilot-tested and the reliability co-efficient (Cronbach's alpha) determined to be 0.78, which was above the recommended value of 0.7 (Jonson & Christensen, 2008; Straub, Boudreau & Gefen, 2004).

The questionnaire were personally administered by the researchers that gave them the opportunity to interact with the respondents, explained in details the rationale for the research and gave explanation where necessary. Enough time was given to the respondents to answer the questionnaire of which some were collected on the same day and others after a few days. 68 questionnaires were returned out of the 86 representing 79% response rate.

Method of Data Analysis

The mean rating of each of the three sub-groups for each item and the corresponding resultant mean rating were computed with version 16 of SPSS. Thereafter, the computed mean ratings were compared with the theoretical mean rating (assuming normal distribution of responses above neutral) of 4.0 to determine the causes of land acquisition problems and high cost of building materials in the construction industry. Any computed mean of an item relating to the causes of land acquisition problem and high cost of building materials exceeding 4.0 indicated expression of major cause of the problem, while values below 4.0 indicated expression of minor cause of problem with land acquisition and high cost of materials

The computed mean ratings for the three sub-groups were compared using one-way analysis of variance (ANOVA) at 0.05 level of significance. Where significant differences were established, the Gabriel's post hoc test was used to make multiple comparisons of means to determine differences in the ratings of consultants, engineers/architects and contractors on the causes of some problems in the construction industry. ANOVA assumes that the data are normally distributed and that there is homogeneity of variances. Ofori and Dampson (2011) strongly advise for the prior verification of the homogeneity assumption and further suggest the use of non-parametric tests when there is marked heterogeneity of variances. Owing to the disparity in the sample sizes of the three sub-groups ($n_1 = 16$, $n_2 = 36$, $n_3 = 16$), the ANOVA was preceded by a test of homogeneity of variances to verify the homogeneity assumption.

RESULTS AND DISCUSSION

The research findings are presented into three sections, according to the respondents' demographics and the two research objectives posed above.

Respondents' demographics

The characteristics of the respondents are presented in Table 1. In terms of gender, 58 (85.3%) of

Table 1: Demographic profile of respondents (n = 68)

Category	Number of respondents	Percentage (%)
Gender		
Male	58	85.3
Female	10	14.7
Age		
21 – 30 years	16	23.5
31 – 40 years	30	44.1
41 – 50 years	22	32.4
Academic Qualification		
Diploma/HND	38	55.9
Bachelor	28	41.2
Masters	2	2.9
Work Position		
Contractor	16	23.5
Engineer/Architect	36	52.9
Consultant	16	23.5
Working Experience		
< 5 years	8	11.8
5-9 years	34	50.0
10-14 years	26	38.2

the respondents were males and 10 (14.7%) were females. The result indicates that majority of the respondents were males. This shows the male's dominant of the professionals in the construction industry. For work position, 16 (23.5%) each were contractors and consultants while 36 (52.9%) were engineers and architects. This result is true reflection of the high numbers of engineers and architects than that of contractors and consultants in the construction industry. A total of 52 (76.5%) were between the ages of 31 and 50 years, indicating that majority of the professionals are in their middle age. In terms of academic qualification, 38 (55.9%) of the respondents were diploma and high national diploma (HND) holders while 28 (41.2%) were bachelor degree holders. These levels of education are the basic qualification for middle-level manpower to management level in the construction industry. For work experience, a total of 60 (88.2%) have worked for between 5 to 14 years in the industry. They therefore deserve to work at the positions of consultant, contractor, engineer and architect due to the length of time they have practiced in the construction industry.

Major causes of land acquisition problem in the construction industry in Ghana

The mean rating of each of the three sub-groups for each item and the corresponding resultant mean rating were computed. The computed means were then compared with the theoretical mean rating (assuming normal distribution of responses above neutral) of 4.0 to determine the problem of land acquisition in the construction industry. Two of the items (e.i. sale of land to multiple users and high cost of land) had mean ratings and resultant mean ratings that exceeded the theoretical mean. However, one of the items (e.i. complex land tenure system) had mean ratings and resultant mean ratting less than the theoretical means. As indicated in Table 2, the sale of land to multiple users had the highest resultant mean rating of 4.495. The lowest resultant mean rating of 3.838 was for complex land tenure system given as the causes of land acquisition problem by the professionals in the construction industry in Ghana. This indicates that sale of land by the owners to multiple users is a major problem of land acquisition for construction purpose. This really needs to be addressed in order to reduce the problems affecting the construction industry.

Table 2: Professionals' ratings of the problem of land acquisition in the construction industry

Cause	Consultant Ratings ($n_1 = 16$)		Engineer/Archit ect Ratings ($n_2 = 36$)		Contractor Ratings ($n_3 = 16$)		Resultant Mean	F-Value
	Mean	SD	Mean	SD	Mean	SD		
1. Sale of land to multiple users	4.125	0.9574	4.611	0.4944	4.750	0.4472	4.495	2.757
2. High cost of land	4.125	0.3416	4.222	0.9292	4.250	1.0000	4.196	3.634[*]
3. Complex land tenure system	3.875	1.2042	3.389	1.3154	4.250	1.0000	3.838	2.943

*Significant at 0.05 level, df = 2 for numerator and 122 for denominator (computed F -value > $F_{0.05 (2, 122)}$ = 3.07).

Non-significant at 0.05 level, df = 2 for numerator and 122 for denominator (computed F value < $F_{0.05 (2, 122)}$ = 3.07).

Notwithstanding the high level and closeness of the mean ratings of the three causes of land acquisition problems among the three sub-groups, it was deemed appropriate to determine whether there were any statistically significant differences among the respondents in their ratings using ANOVA at the 0.05 level of significance. Due to the disparity in the sample sizes of the three sub-groups ($n_1 = 16$, $n_2 = 36$, $n_3 = 16$), the ANOVA was preceded by a test of homogeneity of variances. The results indicated that the variances of the three sub-groups

for each item were homogeneous. Thus, all the three items met the requirements that the three sub-groups were from a homogenous population.

The item-by-item ANOVA results which appear in Table 2 (F-Value), show that for two of the items (e.i. sale of land to multiple users and complex land tenure system), there was a uniform agreement in the responses of the respondents as there were no significant differences in the ratings of consultants, engineers/architects and contractors. However, for one of the items, the ratings of the respondents significantly differed. The respondents differed in their ratings regarding high cost of land as a cause of land acquisition problem in the construction industry. To determine which sub-groups significantly differed in their ratings of the one item, Gabriel′s post hoc test at 0.05 level of significance was used to make multiple comparisons of the mean ratings of the three professionals in the construction industry.

The multiple comparisons revealed that the ratings of contractors were significantly higher than those of engineers/architects and consultants. The differences perhaps laid in the fact that the contractors had relatively high conviction that the problems in the acquisition of land is mainly caused by the rampant rate at which the cost of land keeps rising in the country. On the other hand, the consultants and engineers/architects who are directly involved in the execution of the projects rated the high cost as the cause of land acquisition problems significantly lower than the rating of contractors, the reason may be that, the consultants and engineers/architects due to their direct involvement of the construction activities have realised that there is more challenging causes than the cost of land.

Acquisition of land for construction of buildings and roads is vital to the growth of the construction industry. Problems in land acquisition have existed many years in most developing countries. According to National Land Policy Act 1999, the land sector in Ghana has continued to be beset by major problems and constraints involving the current spate of land encroachments and multiple sales of residential parcels of land. The result of the presents study is in line with the above problem identified by the National Land Policy Act 1999. The sale of land to multiple users which had the highest resultant mean rating of the respondents indicates a major problem in the land acquisition for construction purposes in Ghana.

This is indisputably, a serious problem confronting the construction industry due to the fact that it has lead to a conflict situation in Ghana which is called 'land guard' incidence. The land guard is an incidence where armed and well-built men (macho-men) are engage by some

of the multiple buyers of a piece of land to prevent the other buyers of the same land from developing it. This sometime result in fatal crashes and even lead to the death of people over the piece of land which has being sold to multiple buyers. Similarly, Danso and Barry (2012), in their study 'land tenure administration in peri-urban Accra: a study of Bortianor' recommended Ga traditional council who have oversight over land allocation to manage commonage and reduce the incidence of disputes and multiple sales of the same piece of land. Their study explained that multiple sale of land could be intentional or non-intentional in the sense that, poor record keeping; a new chief, for example, might be unaware that the previous chief had already sold a piece of land

Major causes of high cost of building materials in the construction industry in Ghana

The result of professionals' ratings of the problem of high cost of materials in the construction industry as presented in Table 3 indicates that one of the items (e.i. high cost of manufacturing) had mean ratings and resultant mean ratings that exceeded the theoretical mean. Two of the items (over-reliance of imported materials and cost of transporting materials) had mean ratings and resultant mean rating less than the theoretical means. High cost of manufacturing had the highest resultant mean rating of 4.370. Whereas cost of transporting materials had the lowest resultant mean rating of 3.819 as the causes of high cost of materials in the construction industry by the ratings of the professionals in the construction industry in Ghana. This result indicates that high cost of manufacturing is a major cause of high cost of materials in the construction industry in Ghana. There is therefore the need to find appropriate means to curb the problem in the construction industry.

Table 3: Professionals' ratings of the problem of high cost of materials in the construction industry

Cause	Consultant Ratings ($n_1 = 16$)		Engineer/Architect Ratings ($n_2 = 36$)		Contractor Ratings ($n_3 = 16$)		Resultant Mean	F-Value
	Mean	SD	Mean	SD	Mean	SD		
1. High cost of manufacturing	4.375	0.500	4.111	0.667	4.316	0.074	4.370	4.316[*]
2. Over-reliance of imported materials	3.875	0.957	4.000	0.829	0.181	0.835	3.958	0.181
3. Cost of transporting materials	3.750	0.856	3.833	0.910	0.307	0.544	3.819	0.307

*Significant at 0.05 level, df = 2 for numerator and 122 for denominator (computed F value > $F_{0.05 (2, 122)}$ = 3.07).

 Non-significant at 0.05 level, df = 2 for numerator and 122 for denominator (computed F value < $F_{0.05 (2, 122)}$ = 3.07).

Irrespective of the closeness of the mean ratings of the three causes of high cost of materials in the construction industry among the three sub-groups, it was deemed appropriate to determine whether there were any statistically significant differences among the respondents in their ratings using ANOVA at the 0.05 level of significance. Due to the disparity in the sample sizes of the three sub-groups, the ANOVA was preceded by a test of homogeneity of variances. The results indicated that the variances of the three sub-groups for each item were homogeneous. Thus, all the three items met the requirements that the three sub-groups were from a homogenous population.

The result showed that there was a uniform agreement in the responses of the respondents on 'over-reliance of imported materials' and 'cost of transporting materials' as there were no significant differences in the ratings of consultants, engineers/architects and contractors. However, for the ratings of the respondents significantly differed on 'high cost of manufacturing'. To determine which sub-groups significantly differed in their ratings of the one item, Gabriel′s post hoc test at 0.05 level of significance was used to make multiple comparisons of the mean ratings of the three professionals in the construction industry.

The result revealed that the ratings of contractors for the one item were significantly lower than those of engineers/architects and consultants. On the other hand the consultants and engineers/architects rated 'high cost of manufacturing' as the cause of high cost of materials in the construction industry significantly higher than the rating of contractors. The reason might be that the consultants and engineers/architects might acknowledge the fact that the processes involved in manufacturing of the materials are capital intensive, thereby affecting prices of the materials for construction purpose.

Manufacturing of building materials such as cement, steel rods and roofing sheet requires intensive use of energy (electrical power) which is expensive in most developing countries including Ghana. Also, some of the raw materials used for the manufacturing of the building materials are imported (eg. clinker for making cement). This makes the manufacturing companies incur huge bills which are factored in the pricing of those materials and invariably increase their selling and buying costs. In the European Union, the construction and building sector is responsible for roughly 40% of the overall energy burden (United Nations Environment Programme 'UNEP', 2003). Homes in the UK (their construction and occupation) are responsible for the consumption of 40% of primary energy in the country (Department for Environment Food and Rural Affairs 'DEFRA', 2008).

In the present study, the respondents rated 'high cost of manufacturing' as the major cause of high cost of materials with a resultant mean of 4.370. This finding is consistent with the study of Eshofonie (2008), who found that the most important factor affecting construction cost in Nigeria as perceived by clients, consultants and contractors was the 'cost of manufacturing materials' which received the highest ranking. The result of the current study is also in consonance with the findings of the study by Bubshait and Al–Juwairah (2002), on the factors contributing to construction cost in Saudi Arabia. Their study found that 'cost of manufacturing construction materials' was the major factor contributing to construction cost in Saudi Arabia.

RECOMMENDATIONS

Since the sale of land to multiple users is a major problem of land acquisition in the construction industry, there is therefore the need to formulate laws to guide land acquisition in the country. Government and all authorities involved in land transfer should not only formulate laws to ensure sale of land to one user but also ensure the enforcement of such law to the latter.

High cost of manufacturing of materials is also a problem which needs attention. It is therefore recommended that Government should subsidise some of the services cost such as electricity tariff for the manufacturing companies to a level that will make them produce at a relatively low cost, so as to ensure the lowering of the materials cost in the construction industry. In addition, the Government and the Authorities in the construction industry should promote the use of locally available materials, due to the fact that their preparation require less and sometimes no electricity for construction of edifice.

Finally, it is recommended that future researchers should consider investigating the major causes of other problems such as poor workmanship, disputes and unrest, delays in completion of projects, unreliable supply of service and lack of equipment in the construction industry especially in the context of developing countries.

CONCLUSION

The growing need for construction of edifice with a tight monetary supply has provided the construction industry with numerous problems. This study investigated the major causes of high cost of materials and land acquisition problems in the construction industry in Ghana from the view of professionals such as contractors, consultants and engineers/architects. These professionals are at the unique position to examine the factors and give accurate information that exists in the industry. From the results, sale of land to multiple users and

high cost of land were identified as the major causes of land acquisition problems in the construction industry. Sale of land to multiple users which was rated highest is indeed a common problem in Ghana which has and continues to create conflicts in the construction industry and sometimes lead to death of parties involved.

In addition, the study identified high cost of manufacturing of materials as the major cause of the high cost of materials in the construction industry. This problem is critical because the cost of producing the materials in Ghana is high due to high cost of some services like electricity and transportation as well as importation of raw materials.

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