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'Factors That Influence the High Rise in Cost of Residential Buildings in the Sekondi-Takoradi Metropolis'

by

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MASTER OF SCIENCE

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CERTIFICATION

I hereby declare that this submission is my own work towards the MSc Construction Management and that, to the best of my knowledge, it contains no materials previously published by another person, nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made the text.

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ABSTRACT

This research was conducted with a population of 37 dealers in building materials, 70 contractors and 180 building owners (clients). Purposive and quantitative data gathering procedures were used. Statistical package for the social sciences (SPSS), Likert and Microsoft Excel 2013 methods were used to analyze the quantitative data. The analysis of 7 factors that contribute to the high rise in cost of residential buildings in the Sekondi-Takoradi Metropolis were revealed. The two major factors identified are, the discovery of crude oil in the Western Region of Ghana as was shown by a mean score of 4.02. The second one is, high cost of building materials accounting for increased cost of building residential houses. This is indicated by the mean score of 3.71. Out of 9 effects identified, there were two major ones. The 1st one was, a majority view (96.8%) showing that the effects of high rise in cost of residential buildings is the increase in rent. It was also found that whenever there is an increase in the prices of building materials, it indirectly affects contractual charges and the cost of seeking for accommodation. This was shown by 92.4% respondents who were in agreement. The first suggestion agreed on by the total respondents as a strategy to lower the cost of residential buildings, (87%) of the respondents were of the view that efficient utilization of logistics plays a fundamental role in reducing building cost. The second suggestion agreed on by (80.5%) of the total respondents as a strategy was good management by contractors. Also, the factors of large scale land acquisition and utilization of local building materials emerged strongly to the two phenomena. In general, the respondents alluded to the fact that the discovery of crude oil in the Western region of Ghana, increase in population, cost of lands, the rate of inflation, cost of building materials, availability of infrastructure among other factors have over the last 3-5 years contributed to the high rise in the cost of residential buildings in the Sekondi-Takoradi Metropolis.

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CHAPTER ONE

INTRODUTION

1.1 Background of the Study

The definition for residential building cost differs by different personnel who are involved in the building industry such as developer, builder/contractor, supplier/ dealer, and client/buyer (Lee, 2009). Michele (2012), defines the cost of a house as the value for a residential property which gets a very good offer and ultimately receives a high monetary value. Another definition provided by Lee (2009) for the cost of a house is the value one pays in a transaction for the purchase of a residential facility from the perspective of the purchaser.

A shelter that is used to support a household living can be referred to as a residential building and it is one of the basic needs for all humanity. Everybody wants to own a house and that is a goal everyone is pursuing. The cost of a house is one major consideration one considers before deciding to own a housing facility. Apart from the cost being a huge consideration, the purchaser also look out for a good location, how accessible the facility is and the facilities that are available, Ameera et al., 2012). An improved infrastructure like urban roads, highways, public transport system, electricity and water will always guarantee a rise in the value of a housing facility.

According to (Muellbauer and Murphy, 1997), the biggest part of the wealth of most households is represented by the value of their house. This normally absorbs roughly one quarter of their disposable income. Hence, the propensity to consume among households is largely influenced by the value of their house (Case et al., 2004), therefore a rise in the cost of a house can change the economic activity and impact negatively on

the patterns of household. For the provision of residential houses, the construction industry plays a major role in that regard.

In Murie, 2007, the construction industry accounts for almost 10% of the world's Gross Domestic Product and it also provides about 7% of employment in the world. The Gross Domestic Product (GDP) of Ghana is accounted for around 6-9% by the construction industry, Chitkara 2010. According to Metri (2001), the industry contributes up to 10% of many countries GDP.

It is therefore certain that the activities of the construction industry impact hugely on the high rise in cost of residential buildings. In general, every client's objective is basically to implement a project within a reasonable time, budget and meet required quality. The global construction industry is plagued with cost overruns in project delivery. Mbachu and Nkado 2004, have it that globally the construction industry is plagued with cost overruns in project delivery. As a result, clients have lost confidence in consultants because of the added investment risk and inability to deliver value to clients.

Notwithstanding the challenges mentioned, the industry has greater prospect. The Government of Ghana still enjoys donor support from donor agencies and some developed nations. The discovery of oil in commercial quantities in the Western Region is widely expected to improve the economy and thereby boost the construction activities in the area. This means that new houses will be constructed and old ones rehabilitated. It has therefore become imperative that Project Managers and all stakeholders act efficiently and very effectively in order to minimize and or avoid the high rise in cost of houses in the Metropolis. This study has therefore being conducted to identify the

factors that influence high rise in cost of residential buildings in the Sekondi-Takoradi Metropolis, Western Region, in order to make such recommendations that will help avoid them or minimize their occurrence.

Serious efforts have been made by the Government of Ghana and other clients, Consultants and Contractors towards addressing the problem of high cost of building projects over the years. The passage of the procurement Act into law on 31st December, 2003 (Procurement Act 2003, 663), provides a good framework for developing and strengthening procurement institutions and their operational processes so as to reduce poverty, develop the private sector and ensure good governance as well as anti-corruption (Adjei, 2006). The law on Public Procurement is to ensure a fair, transparent and non-discriminatory processes in all procurement activities. It is the responsibility of the Procurement entities in respect of the 'Act' to ensure compliance with procurement requirement and processes, like procurement of goods, works and services. It is expected that variation on Government contracts does not exceed 15% of the Original Contract Sum. And this must be ensured by Tender Committees at the Regional, Metropolitan, Municipal and District levels thereby getting value for money.

Despite the serious efforts made by the Government of Ghana and other bodies to minimize high cost of residential buildings, it still remains endemic. It is therefore imperative that an investigation is carried out into the high cost of residential buildings, to eliminate or reduce it and mitigate its effects on the economy as a whole.

1.2 Problem Statement

Providing decent and affordable residential housing facility for the people of Ghana remains a very big challenge. The inability of both the government and the private

sector to meet the housing demand of the Ghanaian population should be of great concern to all.

However, the rate at which the cost of residential buildings are rising in the Metropolis is alarming. According to (GREDA)'s report on the prices of residential houses, the average price increase between 2007 and 2009 was 15% in Kumasi, 11% in Takoradi and 9% in Cape Coast.

However, the concern now is that between the year 2010 and 2015 the dynamics of the price increases have changed drastically. Statistics presented by the Bank of Ghana Research Department puts the average price increase at 31.5% in Kumasi, 43% in Takoradi and 27% in Cape Coast.

In the same regard, The Ghanaian Business Finder reported the increase in prices of residential buildings in some of the major cities in the country. According to this report which was published in September 2015 and was confirmed by the Director of GREDA Mr. Samuel Amegayibor stated that within 20 months that is from January 2014 to August 2015 Sekondi-Takoradi saw a very high rise in the price of residential buildings. In January 2014, a 3-bedroom house cost about GHC 180,000.00 on the average but as at August 2015 the same house type was costing GHC 250,000.00. Almost 40% increase.

A 3-bedroom house cost on the average was GHC 200,000.00 in January 2014 in Kumasi but as at August 2015 is was costing GHC 260,000.00, representing about 30% in price increase. Cape coast on the other hand had a very moderate increase with in the same time period. The percentage increase was almost 22%. GHC 140,000.00 in January 2014 and increased to GHC 170,000.00 in August 2015.

Therefore the case of Sekondi-Takoradi in terms of the prices increase is of a worrying nature and hence requires some investigation.

Providing decent and affordable residential housing facility for the people of Ghana remains a very big challenge. It is apparently clear that the private sector and government are not able to meet the housing demand of the Nation. Out of the 170 thousand housing units required annually to bridge the housing gap, both sectors are only providing a maximum of 450 thousand units per year. The Ghanaian population should be greatly concerned of this trend.

Land acquisition remains a huge problem in this country. President John Mahama stated on Cityfmonline.com, Tuesday 1st July 2013 edition that statistics available to him, indicates that the growth rate of Ghana's population could lead to sixty-three percent (63%) of the population moving into the urban areas by 2050. This statistics poses a huge and serious challenge to the availability and acquisition of land in the building industry for which reason; cogent steps should be taken to address this huge problem as early as practicable.

Another serious problem that is worth mentioning is that the cost of building materials and labour is very high. The increases in the prices of goods and services are ballooning on a monthly basis in this country and it should be of great concern to all and sundries.

This phenomenon no doubt throws all well intended planning off- gear completely, thereby leaving the Ghanaian worker in the state of near despair.

The low remuneration of the average worker in our country also remains a huge problem. One will naturally expect that as a worker, it should be presumed that ordinarily one will be able to afford a decent housing unit. But because of the low

monthly salary of workers; this expectation remains a mirage for more Ghanaian average worker.

For the lack of decent residential housing facilities, the level of productivity on the part of the worker is mostly affected. Some workers have to borrow huge sums of money in order to pay their two to three years rent advance. This kind of undertaking affects their psychological make-up even at the work place since they will be thinking intermittently about how these debts can be settled.

The need arose therefore to investigate the possible Determinants of the High Rise in Cost of Residential Buildings in the Sekondi-Takoradi Metropolis and further examine their effects on the Ghanaian population. Having being able to establish these, I have made some recommendations to address the difficulties that were identified.

1.3 The Research Aim

The aim of this research is to investigate the factors that influence the high rise in cost of residential buildings in the Sekondi-Takoradi area.

1.4 Objectives:

In achieving the aim of this study, the following objectives are set:

1. to identify the factors that influence to the high rise in the residential building cost in the Metropolis;
2. to determine the effects of the factors that influence the high rise in cost of residential buildings in the Metropolis
3. to identify strategies to mitigate the impact of those factors that influence the high rise in cost of residential buildings in the metropolis.

1.5 Research Question

1. What are the factors that influence to high rise in cost of residential buildings in the Sekondi-Tarkoradi metropolis?
2 What effects do factors of high rise in cost factors of residential buildings have in the Sekondi-Tarkoradi metropolis?
3 What are the strategies that will lessen the impact of rising cost factors of putting up residential buildings?

1.6 Relevance of the Study

The High rise in cost of residential buildings be it rental or ownership, is affecting living conditions in the Sekondi Takoradi Metropolis. Tenants are complaining of increase in rent, while investors are taking advantage of the economic opportunity. This Study aimed at identifying the factors that influence to the high rise in cost of residential houses in the Sekondi Takoradi Metropolis. The study also determined the effects of the high rise in cost of residential buildings in the Metropolis. The Study will also help stakeholders, especially Consultants, Clients, Contractors, tenants and all others who are involved in providing and using residential facilities to put in measures that will mitigate the high rise in cost of residential buildings. The Study will serve as reliable information to Government and the Academia. It will help Government in shaping policies regarding the provision of low- cost housing facilities. This study will also serve as an academic material to students, institutions and construction managers. Finally, the study will serve as a source of relevant information for further studies on related topics.

1.7 Scope of the Study

This research focused on the Western Region of Ghana specifically the Sekondi Takoradi Metropolitan Area. This I believe gave me a true reflection of the selected

topic for the purpose of this research. The study covered a period of five (5) months, April 2016 to August, 2016.

CHAPTER TWO LITERATURE REVIEW

2.1 Introduction

This literature explores literature of various scholars both locally and internationally in the area of the determinants of high cost of residential buildings and their effect on the citizens in Sekondi-Takoradi as a case sturdy. In this section researchers review articles and books on determinants of high cost of residential buildings, their effects and to provide an alternative in dealing with the effects.

2.2 The Relationship between Variables

The researcher represents the relationship between variables in a study to show the conceptual framework and relationship between those variables graphically and diagrammatically, The factors that influence the high rise in cost of residential buildings in Ghana is the basis of the conceptual framework in this study. According to Ghana Statistical Service (GSS), land, labour, material, infrastructure, professional fees, financial charges and other contingencies are the main factors that influence the cost of buildings.

The inadequate housing stock in Ghana, the effects have been, overcrowding, slum and informal settlement especially in urban areas. The rising cost of residential houses in the metropolis is precipitated by the huge shortage in housing units. The demand for houses in Sekondi Takoradi has risen to 8,000 unit annually by (GSS) survey (housing and population census 2010 census. On the other hand Branz 2008, states that the high cost of houses can be attributed to population growth, difficulty is accessing land, increase in regulations and taxes.

2.3 Factors that influence the High Rise in Cost of Residential Buildings

The current housing deficit in the country stands out 1.7 million units and is expected to rise to 2 million in 2018 (GSS 2010 census). Some potential factors that influence the rise in cost of residential houses are reviewed in this literature.

2.3.1 Land

According to the Ministry of Lands and Natural Resources (2011), in Ghana especially in the Western Region land belongs to stools even though government can acquire it for national development. Serviced land is more expensive than raw land.

his research, the following factors were the underlining cause; the restriction of land use, the building codes, direct cost increases and delay in statutory authorities approving documents.

2.3.2 Building Materials

The cost of building materials have been rising astronomically. As a result, this cost can no longer be borne by central government directly or indirectly. These costs are therefore passed on to the developer who then pass them on by increasing the price of the houses, (GREDA) often unsuccessful.

Moreover, it has resulted in the current state of the sector, where there is a disjuncture between producers and consumers or end-users, and where a majority of establishments in the sector face unstable futures given the seasonal variability in the demand for building materials in the domestic economy. Most establishments attempt to buffer themselves from this effect by making inroads into several regional economies within the U.S. There is, however, a limit to the degree to which materials producer can hedge on uncertainty in the domestic economy by targeting regional or sub-national economies.

2.3.3 High Cost of Labour

The Marginal Revenue Product of Labour (MRPL) which is based on the Marginal Productivity of Labour (MPL), can be calculated,). They posit that the MPL is the increase in output from adding one additional unit of labour. According to Hall and Hitch (2007), the more the labour one adds to the output, the lesser result one gets. This reflected a downward slopping MPL curve.

2.3.4 Cost of Capital

The available sources of credit facility are largely from informal sources because the formal sector is very expensive to access. Institutional investors will usually require certain information about the performance of firms in order to advance financial assistance to them. The investors look out for the commercial viability of the project before they make decisions whether or not to grant finance assistance. Because periodically-disclosed financial statements do not provide warnings of problems, information asymmetry prevents investors from being fully informed and protected ((GREDA),).

2.4. The Effects of High Cost of Residential Buildings

Andrew Carter (Thursday 20 June 2013) notes that "the urgency of dealing with the UK's economic struggles is one of the biggest headaches for policy makers, as so many of the enablers of economic growth – improved skills levels, investment in infrastructure, stronger innovation networks – will take time to affect the economy.

Yet there is one policy area where consensus is growing that effective intervention has the potential to generate jobs and growth in both the short and longer term. In addition, this will address the unemployment issue in the country. It is believed that

Housing currently employs around a quarter of a million people in Britain and contributed almost £18bn to the economy in 2010. Government research conducted has these suggestions, every 100,000 new houses built could boost the nation's GDP by 1%. The number of jobs to be created are 1.5 jobs for every home built, while £1 spent on housing creates £2.09 in direct value for the economy (Andrew Carter (Thursday 20 June 2013)

From Cities Outlook 2013), when the residential houses are very expensive, many people are not able to stay in such areas and therefore slows down the economy activities in that area

2.4.1. High rent payment

Because of the high prices of residential buildings, people cannot afford to buy their own houses and therefore result to rental units. Due to the forces of supply and demand, landlords and landladies increase their rent.

2.4.2. Unavailability of Mortgage facility

In the boom years of 1996-2006, many banks were very keen to lend mortgages. They allowed people to borrow large income multiples (e.g. five times income). Also banks required very low deposits (e.g. 100% mortgages). This ease of getting a mortgage meant that demand for housing increased as more people were now able to buy. However, since the credit crunch of 2007, banks and building societies struggled to raise funds for lending on the money markets. Therefore, they have tightened their lending criteria requiring a bigger deposit to buy a house.

2.4.3. Unavailability of enough housing units

As a result of the high cost of residential buildings in the Metropolis, many people are not able to purchase houses. And because of the low demand due to the high rise in cost, investors are unable to invest more into constructing new housing units, (GREDA).

2.4.4. Creation of Urban/City slums

Since many people who are migrating from the rural areas to the urban areas cannot afford to purchase a house, they result to settling in unauthorized areas. Thereby creating slums in the cities or urban centers.

2.5 Strategies in Mitigating the Impeding Factors

Proactively using some integrating mitigation measures into new construction is typically more economically and feasible than retrofitting existing structures. Only after the overall risk is fully understood should mitigation measures be identified, prioritized, and implemented. Basic principles underlying this process include: Risk reduction techniques must address as many applicable hazards as possible. The allhazard mitigation, is a very Cost-Effective approach, it maximizes the protective effect of complementary mitigation measures and it optimizes all-hazard design techniques with other building technologies.

High-performance buildings should be designed to be part of the solution rather than part of the problem, wherever possible, by leveraging traditional hazard mitigation strategies (e.g., elevating structures in increasingly flood-prone areas, creating clear zones around buildings in areas with increasing wild land fire risk, etc.), and incorporating strategies to mitigate climate change (e.g., greenhouse gas emission reduction), and to adopt to changing environmental conditions.

Regulations, codes, standards, and best practices will guide the design of buildings to resist natural hazards. For new buildings, code requirements serve to define the minimum mitigation requirements, but compliance with regulations in building design is not always sufficient to guarantee that a facility will perform adequately when impacted by the forces for which it was designed. Indeed, individual evaluation of the costs and benefits of specific hazard mitigation alternatives can lead to effective strategies that will exceed the minimum requirements. Additionally, special mitigation requirements may be imposed on projects in response to locale-specific hazards. When a change in use or occupancy occurs, the designer must determine whether this change triggers other mitigation requirements and must understand how to evaluate alternatives for meeting those requirements.

Finally, designers should augment the codes and standards to consider the importance of nonstructural elements, assets, and mission of the building. And avoid the use of some elements like, windows, hoods, parapets and balcony railings, and electrical and mechanical systems which may account for more than 70% of the value of a building.

CHAPTER THREE RESEARCH METHODOLOGY

3.1 Introduction

This section of the study embodies the methods employed in undertake this exercise. The methods comprising the study design, sampling procedure methods of data collection are detailed. Subsequently, data collection methods and instruments, sources of data, field problems encountered, the ethical consideration observed in the study, profile of the study area forms the conclusion part of this section

3.2 Study Design

Research design and methods are essential parts of research exercise because largely, the analysis as well as what to expect are premised on both conceptualizations. An ambiguous and vaguely defined research design could lead to error in the potential results generated (Levin, 200)). A cross-sectional study design has been adopted in this study to examine the factors that influence the high rise in the cost of residential buildings in the Sekondi-Takoradi metropolis. A cross sectional approach is a study design according to literature provides detailed information about a phenomenon within a short span of time. The choice of this design was thus informed by its ability as highlighted. This method has aided the researcher to study the characteristics of interest (Olsen and St George, 2004; Levin, 2006). Again, the study has employed quantitative approaches to efficiently and effectively carry out the data analysis and the discussion.

3.3 Sampling Procedure

Sampling procedure embodies the various processes and principles observed by the researcher to arrive at a definite sample through to data collection and analysis. The process of sampling starts with the definition of the study population (inclusion and exclusion criteria), this precedes the appropriate sampling technique that details the approach to select the sample for the study and lastly, the numeric sample size and the data collection methods and instruments form the conclusion part of this segment.

3.3.1 Study Population

Population of a study involves a group of individuals taken from the general population who share common characteristics. The target population for this exercise involves all the building contractors, traders in building materials and household heads within the western region. However, for lack of resources such as time, funds, personnel, and

logistics, the population of this study is limited to the subjects mentioned located in the Secondi-Takoradi Metropolis. To this end, the study population for this exercise includes the entire building contractors, household heads (clients), and dealers in building materials within the Metropolis.

3.3.2 Sampling Technique

In order to ensure that the sample fairly represent people who are germane to the issues relating to factors that influence the high rise in the cost of residential buildings in the Sekondi-Takoradi metropolis, various sampling techniques will be employed. The purposive sampling will be employed to select both building contractors and dealers in building materials. This is because the contractors as well as the dealers are sparsely located in the Metropolis. This therefore requires the investigator to select them based on the characteristics under study. Lastly, the snowball sampling was utilized to select the clients (house owners) in the study area that have the characteristics of interest under study. This method is applicable in an event where participants are given equal chance of being included or excluded. After the preliminary study, 12 active building sites were counted in the metropolis where construction work was actively on going. Averagely one could count as many as 15 uncompleted buildings being worked on. Armed with this information, the researcher purposively contacted the owners and administered questionnaires to elicit the relevant information from them. The anticipation was that at every site, 80% of the building owners were contacted making a total of 144 building owners.

3.3.3 Sample Size Estimation

The sample size for this study consists of 48 building contractors, 27 dealers in building materials, and (125) building owners (clients). This sample is justified by Bell (2002)

submission that sample size must include 50% of the population. The distribution of the sample size estimation is illustrated in the table.

Table 3.1 Sample Size Estimation

Categories	Traders in building material	Building contractors	Clients
Population	37	70	180
Sample	27	48	125
Total			**200**

Source: researchers' construct.

3.4 Source of Data

Both primary and secondary data was utilized for effective and efficient execution of this study. The primary data was sourced from the participants of the study. Precisely, the views and opinions of house owners (clients), dealers in building materials and contractors regarding the subject matter constitute the primary data for the study. The secondary source of data include published paper from renowned journals, newspaper articles germane to the construction sector, books and authoritative discourse from resource personalities.

3.4.1 Data Collection Methods and Instruments

Basically, structured questionnaires and interview guide constitute the main instruments for data collection for the study. Methodically, the researcher with the other research assistants interviewed the key informants (building contractors and dealers in building materials) face-to-face to elicit their views and experiences regarding the subject matter. With respect to the house owners (clients), owning to their number, questionnaires were administered to elicit information necessary to address the subject matter. Pretesting was conducted to test the efficiency of the instruments by utilizing a single community in the Metropolis proir to the main data collection period.

3.5 Data Management

Data management is very technical and a key components of the research process. The collected quantitative data was cleaned, edited and entered into a computer software, preferrably, the SPSS. To avoid double entry, the responses were first entered into microsoft excel and subsequently exported to the SPSS package to conduct the final analysis. Responses were generated into frequency tables and charts to help in the discusion of the objectives of the study regarding the interviewees' responses, the provided information was transcribed and utilized to augment the discusion of the study as necessary, the qualitative data supplemented the quantitative discusion in the analysis.

3.6 Validity and Reliability

Validity refers to the extent to which an instrument measures what it is designed to measure (GSS). The researcher will ensure that reliable procedures are followed in order to guard against fabricated and inessential data gathered for the study. With respect to reliability of the data gathered, the researcher will ensure that, there s a high degree of consistency and accuracy by making sure that each instrument measured variables that it is supposed to measure. Again, to ensure reliability and future replication of the study, all required logical stages of conducting research will be followed.

These will include identification of the problem, formulating of objectives, and research design of the study. The scope of the study was duly documented. Invariably, all sources relied on from which both the primary and secondary data were obtained were provided. Furthermore, the process of data collection were explained and the guidelines for administering the instrument of data collection (questionnaire) were duly and logically

provided in order to ensure that the outcome is logical and scientific as required of research

3.7 Ethical Considerations

A letter, introducing the study, was obtained from the Head of the Department of Building Technology at the Kwame Nkrumah University of Science and Technology. A duplicate copy of the introductory letter was sent to the metropolis for permission to conduct the study. The clients, dealers in building materials and contractors were adequately informed about the purpose of the study before the questionnaires and interviews were administered and conducted respectively to secure their consent.

However, participants who could neither read nor write were asked to give oral consents before the interviews could begin. By these arrangements, the right of the respondents were respected. The authors of scholarly works that were referred to in writing this thesis were duly acknowledged in both the running texts (i.e. the body) and the bibliography

3.8 Limitations of the Study

With recourse to the processes and principles enbedded in research studies, this study encountered several limitations. However, the scientific rigor employed in the study ensured great decline of such biases.

3.9 Profile of the Study Area

Sekondi-Takoradi metropolis is located at the southeastern part of the western region. The metropolis is bordered to the west by Ahanta west district and to the east by Shama district. At the south of the metropolis is the Atlantic Ocean and at the northern part is Wassa east district. The metropolis covers land size of 191.7km^2 and Sekondi-Takoradi

is regional administrative capital. Though the smallest district in terms of land size, the Sekondi-Takoradi metropolis is the most urbanized among the 22 districts in the region

Sekondi-Takoradi comprises twin cities of Sekondi and Takoradi. It is the capital of Sekondi-Takoradi metropolitan district and the western region of Ghana. It is the region's largest city and an industrial and commercial Centre, with a population of 44,205 according to the 2010 census report. The housing stock of the metropolis is 60,705, which account for 16% of the total number of houses in the western region. The average number of persons per house according to the Ghana statistical service national census report is 8.8. Apparently, over half (56.3%) of all dwelling units in the metropolis are compound houses; 15.8 percent are separate houses and 13.9 percent are flat/apartment. The census report indicates that, 42 percent of the dwelling units in the Metropolis are owned by private individuals while household members own 32.8%. It is on record that only 1.3% of dwelling units is owned through mortgage schemes. On construction, the primary material for construction of houses in the metropolis is cement block/concrete (84.1%). Cement and metal sheets are the main materials utilized for the construction of floors and as roofing materials for dwelling units in the metropolis respectively.

CHAPTER FOUR

DATA PRESENTATION ANALYSIS AND DISCUSSION

4.1 Introduction

This aspect of the study highlights demographic information of the respondents, addresses the factors that contribute to the high rise in the cost of building residential houses and explores effects of factors that account for high rise in cost of building residential houses. The strategies to mitigate the impact of factors that result in the high cost of building residential houses form the concluding part of this chapter.

4.1 Analysis of the Background information of Respondents

This aspect of the study focused on identifying the features that characterize the people who responded to the research instruments developed for the purposes of this study.

4.1.1 Area of Expertise

The statistics shown in table 4.1: below indicates that 24% of the respondents are building contractors with 13.5% of them being dealers in building materials. However, most respondents (62.5%) were found to be building owners during the period of the study.

Table 4.1: Background information of Respondents

Statements	Frequency	Percentage
Area of Expertise		
Contractor	48	24
Client	125	62.5
Sale of building material	27	13.5

Source: Field Survey, 2016

4.1.2: Years of Practices

The table 4.2: below illustrates the data collected from the field on the number of years the respondents have been in practice of providing residential buildings in Sekondi –

Takoradi Metropolis. The study discovered that 21 (30.9%) of the respondents have been in the business of providing residential buildings over 6-10 years now. Those who have served the housing industry in the Metropolis up to five (5) years form 13 (19.1%). Also, 14 (20.6%) were respondents who had over 20 years' experience serving in housing industry, whereas respondents who served within the bracket of 16-20 years were 11 representing (16.2%). Again, it was found that 9 (13.2%) of them between 11-15 years have been working in the subsector for providing residential buildings. The years of practice of the respondents in the housing industry helped the researcher to differentiate between the different categories of respondents in the Metropolis.

Table 4.2: Background information of Respondents

Statements	Frequency	Percentage
Years of Practice		
Up to 5 years	13	19.1
6-10 years	21 9	30.9
11-15 years	11	13.2
16-20 years	14	16.2
Over 20 years		20.6

Source: Field Survey, 2016

4.1.3: Level of Education

The statistics below in table 4.2: shows the analysis of the levels of education of the respondents. It shows that 63 of the respondents constituting (31.5%) were senior high graduates, 31 of them constituting (15.5%) were holders of professional diploma, and 78 respondents representing (39%) were first degree graduates. However, 19 and 9 of the respondents as at the time of the study have acquired their master's and doctoral degrees respectively. The study discovered also that slightly more than half of the respondents were university graduates and had in-depth knowledge of the subject matter.

Table 4.3: Background information of Respondents

Statements	Frequency	Percentage
Level of Education		
Senior high school	63	31.5
Professional Diploma	31	15.5
Bachelor Degree	78	39
Master/PG Degree	19	9.5
Doctorate	9	4.5

Source: Field Survey, 2016

4.1.4: Years of Stay and Class of Residence in the Metropolis

The researcher wanted to know how long the respondents have stayed in the Metropolis and in which kind of communities they resided. The statistics in Table 4.4: shows that 66 (33.3%) of the respondents have stayed between 11-15 years in Sekondi-Takoradi Metropolis, 50 (25.3%) of the respondents stayed over 20 years, whilst 43 of the respondents have stayed between 6-10 years in the Metropolis representing (21.7%). Also, 28 and 11 of the respondents have been residing in the Metropolis up to 5 years indicating (14.1%) and (5.6%) respectively.

Table 4.4: Background information of Respondents

Statements	Frequency	Percentage
Years of stay in the Metropolis		
Up to 5 years	28	14.1
6-10 years	43	21.7
11-15 years	66	33.3
16-20 years	11	5.6
Over 20 years	50	25.3

Source: Field Survey, 2016

4.1.5: Type of House Ownership

The respondents were also asked to indicate the type of house ownership in which they resided. The study revealed that most of the respondents 134 (67.3%) were residing in rental apartments with (25.1%) of them occupying family houses in the Metropolis.

Aside these findings, it was found that 5% of the respondents personally owned their houses in which they are residing whereas (2.51%) of them were staying in staff residence during the period of the study.

Table 4.5: Background information of Respondents

Statements	Frequency	Percentage
Type of House Ownership		
▯ Rental	134	67.3
▯ Family House	50	25.1
▯ Staff Residence	10	5.0
▯ Family House	5	2.51

Source: Field Survey, 2016

4.2: Factors that Contribute to the High Rise in Cost of Residential Buildings

This section of the study tried to identify the factors that contribute to the high rise in the cost of building residential houses. The responses of the respondents were ranked on a likert scale, recorded in Table 4.6, and discussed into detail in the ensuing paragraphs.

Table 4.6: Factors contributing to high cost of residential buildings

Study responses	Mean	Std. Deviation	Rank
Discovery of crude Oil	4.02	1.224	1st
Increase in population	3.94	1.300	2nd
Cost of land	3.68	0.877	3rd
Inflation rate	3.63	1.108	5th
Cost of building materials	3.71	0.877	4th
Availability of infrastructure (road network, electricity, water, etc.)	3.59	1.095	6th
Difficulty in land acquisition	3.57	1.230	7th
Labour cost	3.57	1.332	7th
Capital cost (contractors)	3.52	1.264	8th
Cost overran in construction	3.48	1.051	9th

Class of residence	2.95	1.319	10th

Scale: Not Very Severe = 1, Not Severe = 2, Moderately = 3, Severe = 4, Very Severe = 5.
Mean of Means (MM) = 3.60545, Mean of Std. Deviation = 1.15245

Source: Field Survey, 2016

The Table 4.6 explains the factors that contribute to the high rise in the cost of residential buildings in the Sekondi-Takoradi Metropolis. In trying to establish the factors influencing the high rise in the cost of building residential houses, the study enquired from the respondents, the difficulty confronting them in acquiring lands for building houses, and the responses were given as the following; most respondents indicated that acquiring lands for construction of houses in the Metropolis has been severely difficult and it was evidenced by a mean of 3.57. This was closely followed by a small section of the respondents who expressed that they have been encountering no severe difficulty in acquiring lands for building houses (SD=1.230). Though there is a slight statistical dichotomy between the two submissions, the study can conclude that since majority of the respondents in the Metropolis indicated that they find acquiring lands for residential housing purposes severely difficulty in Sekondi-Takoradi and for that matter it has contributed severely to the high rise of cost of building residential houses in the Metropolis.

In responding to the statement that there is very severe cost of building materials in the Metropolis, most of the respondents expressed that the cost of building materials for housing projects appeared to be severe, though there was no unanimity in their agreement (M=3.71, SD= 0.877).

Responses as revealed by the study also have it that most of the respondents were in the known that the labour cost and capital cost (contractors) appeared to be severe

during the period of the study. This was clearly shown by the mean scores of 3.57 and 3.52 respectively. It can be inferred from the above that the cost of engaging the services of laborers and building contractors in putting up residential houses in Sekondi-Takoradi have contributed to the high rise in the cost of residential building.

With respect to the issue of whether the discovery of crude oil in the Western Region of Ghana has contributed to the high rise in the cost of residential buildings, analysis of the data shows that the respondents indicated that the discovery of crude oil has contributed severely to the high rise in the cost of residential buildings in the Sekondi-Takoradi Metropolis. This is evidenced by the mean score of (Mean = 4.02). However, a small section of the respondents did indicate that the discovery of crude oil in the region has not severely contributed to the high rise in the cost of residential buildings in the Metropolis (SD = 1.224).

On the issue of whether increase in population of the people in the Metropolis, and as to whether inflation rate of the economy and cost overran in construction of residential houses have severely contributed to the high rise of the cost of residential buildings, responses from the data revealed that majority of the respondents concurred with these statements. These assertions are clearly shown by the mean scores of 3.94, 3.63, and 3.48 respectively.

Regarding the issue of whether the class of residence has contributed to the high rise in the cost of building residential houses, responses from the data showed that majority of the respondents indicated the class of residence has severely influenced the increasing cost of building residential houses in Sekondi-Takoradi Metropolis. This was clearly shown by the mean score 2.95. Yet, this was not unanimous as a significant number of

the respondents pointed out that the class of residence has not severely contributed to the high rise in the cost of building residential houses (SD=1.319).

The respondents (M=3.59) seemed to support the view that availability of infrastructure in terms of road network, electricity, water, etc has severely contributed to the high rise in the cost of building residential houses as clearly manifested in Table 4.6. However, there were still a significant proportion of the respondents (SD=1.095) who indicated that availability of infrastructure; for instance road network, electricity, water, etc. has not very severely contributed on the high rise in the cost of building residential houses in the Metropolis.

Moreover, the respondents seem to suggest that the cost of acquiring lands has impact severely on the high rising in the cost of building residential houses (M=3.68) as shown in Table 4.6 There were however, diverse responses with regards to the statement that the cost of lands acquisition has severely contributed to the increasing cost of building residential houses in the Metropolis (SD = 0.877).

In general, given the scale under Table 4.6 and a Mean of Means of 3.60545 indicates that the respondents alluded to the fact that the discovery of crude oil, increase in population, cost of lands, the rate of inflation, cost of building materials, availability of infrastructure among other factors have over the years contributed to the high rise in the cost of building residential houses in Sekondi-Takoradi Metropolis

4.4 Effects of High Rise in Cost of Residential Buildings on the socio-economic activities in STMA

This section of the study explores the effects of factors that contribute to the rising cost of building residential houses. The Table 4.7 details the statistical account of the participants' responses.

Table 4.7: Effects of Factors that Account for High rise in Cost of residential Building

	Factors	*Degree of Impact*				
		Disagree (%)	***Strongly Disagree (%)***	***Neutral (%)***	***Agree (%)***	***Strongly agree (%)***
1	Increase in rent	21 (10.5)	13 (6.5)	23 (11.5)	91 (45.5)	52 (26)
2	Overcrowding	11 (5.5)	20 (10)	3 (1.5)	89 (44.5)	77 (38.5)
3	Overpopulation at low class residential areas	12 (6)	19 (9.5)	16 (8)	119 (59.5)	33 (16.5)
4	Income increase for landlord	3 (1.5)	13 (6.5)	11 (5.5)	114 (57)	70 (35)
5	Establishment of estates	31 (15.5)	12 (6)	27 (13.5)	60 (30)	70 (35)
6	Development of residential facilities in high class residential areas	4 (2)	5 (2.5)	15 (7.5)	125 (62.5)	51 (25.5)
7	Conversion of residential buildings into commercial in the city center	11 (5.5)	9 (4.5)	6 (3)	140 (70)	34 (17)
8	Demolition and re-work	16 (8)	12 (6)	38 (19)	114 (57)	20 (10)
10	The approval of contractors for new project	19 (9.5)	21 (10.5)	25 (12.5)	69 (34.5)	66 (33)
11	Design complexity of project	36 (18)	15 (7.5)	16 (8)	121 (60.5)	12 (6)
12	Conflict on the project site	12 (6)	12 (6)	17 (8.5)	130 (65)	29 (14.5)
13	Changes in material specification	11 (5.5)	37 (18.5)	5 (2.5)	145 (72.5)	3 (1.5)
14	Change of design or scope	4 (2)	4 (2)	8 (4)	99 (49.5)	85 (42.5)

Source: Field Survey, 2016

4.4.1 High rise in Cost of Residential Buildings Influences Increase in Rent and Overcrowding

Increase in rent and other utilities has increased the standard of living in the urban areas of which Sekondi-Takoradi is no exception. The cause of this social problem has been

attributed to several factors including the cost of building in the Ghanaian setting. Participants of this study in view of the above were asked to assert their opinion about this phenomenon. Majority of 143 (71.5%) did indicate that one of the effects of high cost of residential buildings is the increase in rent. On the other hand, 34 (17%) and 23 (11.6%) opined their disagreement and remained neutral respectively. In another fashion, overcrowding which has burden the urban areas in Ghana was in the context of this study noted as one of the resultant effects of high cost of residential buildings. Participants were on this premise asked to express their opinion on this phenomenon. Majority of 166 (87.5%) affirmed their agreement to the assertion that indeed overcrowding results from high rise in cost of residential buildings. However, 31 (11.5%) and 3 (1.5%) were in disagreement and whiles a section remained neutral respectively. On this premise, it becomes evidential as per the findings of this study that both increase in rent and overcrowding in the SekondiTakoradi are considered as the effects of the high cost of building residential houses.

4.4.2 High Building Cost Creates Overpopulation and Increase Landlords' Income

The resultant effect of high building cost inducing overpopulation at low class residential areas as well as increasing the income of property owners has always been a perception. This study sought to identify the authenticity of this popular perception by inquiring from the study participants. Majority of 152 (76%) agreed to the assumption that indeed high cost of building has the tendency to overpopulate low class residential areas. However, 31 (15.5%) and 16 (8%) participants disagreed and remained neutral to this assertion respectively. With a majority of participants agreeing to the fact that high cost of building indeed overpopulates low residential area, this study can confirm that in the Sekondi-Takoradi metropolis, high cost of building has

overpopulating capacity. This finding is in accord with Mbachu, J. I. C., and Nkado, R. N. (2004that high cost of building in the United States has the capacity to create slums and overcrowding.

Rationally, when there is price increase in the production process, it directly affects the unit price of that product. Transferring this application to the construction industry, it is expected that, whenever there is an increase in the prices of building materials, it indirectly affect contractual charges and the cost of seeking accommodation. The finding in this study is not different as 184 (92%) agreed to the fact that high rise in cost of residential buildings increase the income of property owners. However, 15 (7.5%) and 11 (5.5%) disagreed and were neutral respectively. This wholly confirms the assumption that the high cost of building increase property owners' revenue.

4.4.3 Establishment of estates Development of residential facilities in high class residential areas

With the cost of building residential houses increasing for individuals, investors and government are expected to bring up such alternative policies such as building such facilities as estates and the development of high class residential facilities. The opinions of the respondents were sought by the study. While 9 (4.5%) disagreed that high cost of building residential homes results in government and other private real estate developers shifting attention to the establishment of estates to supplement the provision of housing. The factors accounting for high rise in cost of residential homes according to (88%) of the respondents (i.e. 176/200) would lead to the establishment of estates. There however were 15 (7.5%) of the respondents who were uncertain on whether high cost of building residential homes would trigger the building of estates. Other researchers were also of the opinion that factors that account for high cost of building

residential homes would likewise cause developers and government to turn attention to the development of residential facilities in high class residential areas.

When the case was studied in Sekondi-Takoradi, it was identified that majority 176 (88.4%) were of the view that factors that account for the high rise in cost of residential buildings in the Sekondi-Takoradi are likely to result in the development of residential facilities in high class settlement as a means of salvaging the situation among the affected elite in society. There were however 9(4.5%) minority who believed otherwise. In-between these opposing sets of views is the remaining 15 (7.5%) of the respondents of this study who could not exactly tell what direction of change the situation under discussion would yield. From the foregoing discussion of the data collected for this study, it can be seen that high cost of building are likely to bring about the establishment of estates and the development of residential facilities in high class settlement as a means of salvaging the situation.

4.4.4 High Building Costs Results in the Conversion of residential buildings into commercial in the city center and Demolition and Re-work

The growth of the Central Business District is bound to affect in diverse ways the housing patterns and arrangements within the urban milieu such as Sekondi-Takoradi. With growth, competition between residential and commercial use of land within the city coupled with the bottleneck of high cost of building residential homes can lead to the rooms being allowed for the use that offers the higher compensation to the owner for lease. When the respondents were required to respond in this respect, it was found that 20 (10%) of the respondents opined that high rise in cost of residential buildings would not lead to the conversion of the existing residential buildings into commercial ones in the city center, 28 (14%) of the people studied were also of the view that high rise in cost of residential buildings would not result in the demolition and rework of

existing structures. Contradicting the views of the few minority; 174 (87%) believed that high rise in cost of residential buildings would lead to the conversion of residential buildings in the center of Sekondi-Takoradi into commercial ones. The competition for space for both residential and commercial would be won by the party with the strongest financial muscles. Also, 134 (67%) of the respondents believed that high rise in cost of residential buildings would result in the decision to demolish and re-work existing structures at cheaper cost for continuous use. There were yet again some of the respondents who were indifferent as to what direction high rise in cost of residential buildings would affect the tendency to convert residential buildings within the central business district into commercial ones and how it may lead to the demolishing and re-work of existing structures. The idea that is generated here is that prolonged increase in the cost of building residential homes would lead to the conversion of residential homes near the central business area into commercial and also the demolishing and rework of existing structures.

4.4.5 High rise in Cost of Buildings affects the approval of contractors for new project and Design complexity of project

The effects of high rise in cost of residential buildings was further studied in order to identify its impact on contract approval in the award of new contracts to contractors and the design complexity of projects. The views collated showed 40 (20%) people opposing the idea that high rise in cost of residential buildings has an effect on the approval for the award of contracts, with 25 (12.5%) being uncertain and majority 135 (67%) believing that indeed the increase in cost of building residential homes within Sekondi-Takoradi would definitely affect the approval for the award of contracts for new projects. Further, it was revealed that high rise in cost of residential buildings according to 51 (25.5%) of the respondents would not affect design complexity of

project, with 16 (8%) indifferent and majority 133 (66.5%) with the opinion that high rise in cost of residential buildings determines the nature of design complexity of projects. The foregoing discussions and analysis revealed that the nature of design complexity depends on the cost of building. Also, high rise in cost of residential buildings determines the time taken and general decision to approve for the award of contracts for new projects.

4.4.6 High rise in Cost of residential buildings Breeds Conflict on the project site

Contractors, labourers and project owners negotiate various terms with regards to money. It is rational to believe that when the financiers of projects perceive that certain factors would increase the cost of building, they do all that they can to minimize cost. The quest of owners to cut down cost and the desire of contractors to amass wealth enough and increase profitability most at times results in unhealthy conflicts. When the respondents were asked their opinion on the effects of high rise in cost of residential building's roles on conflict on the project site, 24 (12%) were of the view that high rise in cost of residential buildings does not breed conflict at project sites even though majority 159 (79%) of the respondents opposed the minority view by stating that high rise in cost of residential buildings can bring about conflict at project sites while 17 (8.5%) of the respondents said they could not tell whether there was any relationship between high cost of building residential houses and the prospect of conflict at project sites. The overriding idea here is that high rise in cost of residential buildings is a major contributor to project site conflict.

4.4.7 High rise in cost of Residential Buildings Leads to Changes in material specification and Design and Scope for Buildings

When cost places the individual customer at an unfavorable side of the budget line, he/she must sacrifice some level of consumption to remain in equilibrium, bringing this idea to the choice made in building when cost becomes higher, it is rationally expected that there would be amendments to initial plans. The respondents however had varied stance on this issue. With 48(24%) and majority 148 (74%) disagreeing and agreeing respectively to the idea that high cost of building causes changes in the material specification in building process. Only a small section of the respondents 5(2.5%) of the respondents could not take a definite stance on how they think high cost of building affects changes in material specification in building projects. Further again, as much as 184 (92%) of the respondents opined again that project owners are compelled to change the original design and scope of the houses they conceived earlier when there are existing factors that result in unreasonable increase in the cost of building residential homes. Only an insignificant 8 (4 rise in cost%) of the respondents opposed the idea that builders are compelled by high cost of building to change the design and scope of the building while 8 (4%) of the respondents were neutral on this issue. The inference that could logically be drawn here is that high cost of building residential houses distorts original material specification, scope and design

of residential houses

4.5 Strategies to Mitigate the Impact of Factors That Result in the High Cost of Residential Houses

This section of the study explores the potential measures when advanced would help reduce the rising cost of building residential houses if not terminate it entirely. Among the factors considered are:

4.5.1 Good Management and the Use of Efficient Logistics by contractors

As one of the pragmatic measures to reduce the rising cost of building residential houses, the study participants 24 (12%), disagree that good management of contractors help reduce the effect of high cost of building residential houses whiles 15 (7.5%) remained neutral to this assertion. However, majority 161 (80.5%) intimated that good management of contractors help reduce the effect of the rising cost of building residential houses. That said, the use of efficient equipment, tools and plants as a tool to reduce the effects of the rising cost of building was refuted by 15 (7.5%) study participants while 10 (5%). Notwithstanding, majority of 174 (87%) intimated that as a strong tool to reduce the effect of rising cost of building residential houses. This presupposes that in the entire metropolis of Sekondi-Takoradi good management of contractors and efficient utility of logistics are potential ways to reduce the cost of building residential houses. It therefore contentious to assert that good management of contractors and efficient utilization of logistics play a fundamental role in reducing the high rise in cost of residential buildings.

Table 4.8 Measures to Reduce the Rising Cost of Building Residential Houses

No	*Mitigating Factors*	*Degree of Impact*				
		Strongly disagree (%)	***Disagree (%)***	***Neutral (%)***	***Agree (%)***	***Strongly agree (%)***
1	Good management of contractor	11 (5.5)	13 (6.5)	15 (7.5)	92 (46)	70 (35)
2	Use of efficient equipment, tools and plants	7 (3.5)	8 (4)	10 (5)	56 (28)	118 (59)
3	Use of materials on the local market	18 (9)	16 (8)	30 (15)	69 (34.5)	67 (33.5)
4	Large scale land acquisition	19 (9.5)	21 (10.5)	25 (12.5)	69 (34.5)	66 (33)
5	Constructor's high financial state	20 (10)	21 (10.5)	54 (27)	67 (33.5)	38 (19)
6	Availability of required labour skills	3 (1.5)	36 (18)	42 (21)	95 (47.5)	24 (12)
7	Coordinating between consultants and contractors or subcontractors	96 (48)	65 (32.5)	16 (8)	18 (9)	6 (3)
8	Less load on contractor	59 (29.5)	32 (16)	38 (19)	54 (27)	17 (8.5)
9	Regular Payment of work done	12 (6)	69 (34.5)	39 (19.5)	65 (32.5)	15 (7.5)
10	Adequate control procedures	95 (47.5)	27 (13.5)	20 (10)	30 (15)	28 (14)
11	Prevention of demolition and re-work	69 (34.5)	39 (19.5)	59 (29.5)	25 (12.5)	8 (4)
12	Regular materials delivery on site	98 (49)	14 (7)	50 (25)	20 (10)	18 (9)

Source: Field Survey, 2016

4.5.2 Large Scale Land Acquisition and Utilization of Local Materials

In an attempt to explore the potential measures to deal with the effects of the rising cost of residential buildings in the Metropolis, the factor of large scale land acquisition and utilization of local building materials emerged strongly as 136 (68%) and 135 (67.5%) respectively agreed to the two phenomena. However, 34 (17%) and 40 (20%) respectively intimated that using local material as well as large scale acquisition of land

are not prudent measures to mitigate the effects of the rising cost of residential houses. Even though 55 (22.5%) remained unresponsive so long as this phenomena is concerned, the overwhelming majority indicating that the application of those measures would yield positive results simply consolidates the fact that they are prudent measures. One can therefore assert that the utilization of local building materials and the acquisition of large scale of land in the Sekondi-Takoradi Metropolis are part of the effective measures to reduce the impact of the high rise in cost of residential buildings.

4.5.3 Contractors' High Financial State and Availability of Required Labour Skills

Apparently, it is perceived that building contractors charge exorbitant prices in the Ghanaian context. In view of this, intended builders engage roadside masons and carpenters to build for them in most cases. As one of the approaches to subdue the rising cost of building residential houses, the study sought the responses of the study participants to unearth the right mechanism to reduce drastically if elimination is impossible. To this end, 41(20.5%) established that they disagree that contractors' high financial state when reduced would reduce the rising cost of building while 54 (27%) remained unconcerned with this assertion. However, 105 (52.5%) did indicate that indeed the high state of contractors when reduced would help minimize the effects of the rising cost of building residential houses. In addition, the availability of labour skills arguably is a fundamental element that ensures cost reduction in building. 39 (19.5%) did indicate that avalanche of specific skills regarding building construction does not reduce cost. Conversely, 119(59.5%) indicated that when skills abounds, the supply of skills supersedes demand hence prices will fall making construction work very affordable to clients. As per this finding, it must therefore be emphasized that availability of skills to a large extend ensures reduction in the cost of building.

4.5.4 Consultants' and Contractors' coordination and Less Load on Contractors

Good coordination between consultants and contractors has been espoused as an underlying factor advancing the forward match of the construction sector without any dispute. The study participants 161 (80.5%) astonishingly did indicate that coordination between consultants and contractors is not what propels the progress of the construction sector. Notwithstanding, 24 (12%) disclosed their disagreement with the assertion that coordination between the two entities (consultants and contractors) does not auger well for the reduction of the rising cost of building. It is therefore evidential given the statistic of respondents who disclosed their support for this assertion to argue that certainly coordination between the two entities (consultants and contractors) pay off. Less load on contractors as indicated in the questionnaire was statistically endorsed by 16 (8%), implying that study participants disagreed to the assertion that less load on contractors help minimize the rising cost of building houses. On the contrary, 71 (35.5%) agreed that less load on building contractors indeed help minimize the rising cost of building. Weighing the two categories of responses, it is quite obvious that majority of the participants are apparently not in support of the fact that less load on contractors help reduce the rising cost of building residential houses. On this premise, this study can remark that loads on contractors succinctly do not affect the cost of building.

4.5.5 Regular Payment of work done and Adequate Control Procedures

In the Ghanaian setting, regular payment of work done is a sin qua non for equipping the contractor and further increase the expertise and experience of the contractor.

Additionally, adequate control procedure ensures efficiency and accuracy in output.
Sampled participants 122 (70%) opine that the principle of regular payment of work done is not productive in respect of reducing the cost of building. Conversely, majority 58 (29%) supports the fact that the regular payment of work done progressively

enhances the tendency to minimize the increasing cost of residential buildings. a considerable participants 20 (10%) were uncertain as they declared their neutrality to that assertion. In a similar development, participants were required to indicate whether they agree or disagree to the principle that adequate control procedures help reduce the cost of building residential houses. Impressively, 122 (61%) of the study participants disagreed to the notion that, adequate control procedures help reduce the impact of rising cost of building. On the contrary, 59 a minimum of (29.5%) agreed to the notion that adequate control procedures ameliorate the effects of rising cost of building residential houses. As per the finding of the study, the argument now holds that control procedures are not enough principle to deal with the impact of rising cost of building. However, regular payment of work done according to the participants help reduce the effect of rising cost of building.

4.5.6 Prevention of Demolition and re-work and Regular Materials Delivery on site

As popularly known, prevention of demolition and rework saves cost in the interim. However, in the long term, when the building collapses, the cost that is incurred to restore the building to its proper standing comes with a huge cost. To this end, participants were inquired whether they agree to the fact that prevention of demolition and re-work is the way to go in an attempt to reduce the effects of the cost of building residential houses. Majority of 108 (54%) agreed that this idea is the path to thread. However, a section of the participants constituting the minority disagreed to that approach.

Again, delivering materials regularly on site is noted as an approach to fast track the building process and therefore reduces cost. In view of this, the study explored the participants' opinion on this phenomenon. Statistically, 112 (56%) of the total

participants disagreed to this notion. Conversely, minority participants of 38 (19%) agreed to this practice as the way forward to reduce the effect of the rising cost of building. Conclusively, as per the finding of this study, it is novel to assert that, prevention of demolition and re-work is helps to reduce the cost of building houses. Again, regular materials delivery on site has no influence in the quest to reduce the effect of the cost of building houses.

CHAPTER FIVE SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter of the research summarised the findings in response to the stated research questions and objectives.

5.2 Summary of Major Findings

The findings of this study based on the various objectives and research questions are summarised below under the following headings. The study was conducted on 24% people being contractors, 13.5% dealers in building materials and 62.5% owners of building.

5.2.1 Factors that Contribute to the High Rise in the Cost of Building Residential Houses

1. The study revealed that majority of the population in Sekondi-Takoradi Metropolis face a lot of challenges in accessing land acquisition and it was evidenced by a mean of 3.57 resulting in the increase in the cost of land and causing an increase in the cost building residential homes. Only a small section of the population as shown by 1.230 standard deviation was encountering no severe difficulty in acquiring lands for building houses.
2. Majority of the contractors and building owners within the metropolis cited high cost of building materials as one of the major reasons accounting for increased cost of building residential homes. This is indicated by the mean score of 3.71, even though there were some insignificant opposing views to this respect as was shown by a standard deviation of 0.877.

3. Labour cost and capital cost are among the highest contributors to the increase in cost of building residential homes as was shown by mean scores of 3.57 and 3.52 respectively for how severely they increase building cost.
4. Another very significant factor identified to be a key contributor to the increased rise in the cost of building residential homes according to the study is oil find in the Western region of Ghana as was shown by a mean score of 4.02 with only a small section of the respondents indicating otherwise as is shown by a standard deviation of 1.224.
5. Population growth or increase, inflation rate and cost overran have also been identified to be among the factors that bring about rise in the cost of building residential homes. These assertions are clearly shown by the mean scores of 3.94, 3.63, and 3.48 respectively in the responses of the respondents of the study.
6. In addition to the above factors, class of residence has also been identified to have severely influenced the increasing cost of building residential houses in Sekondi-Takoradi Metropolis. This was clearly shown by the mean score 2.95. With only a minority of the population unaffected by class of residence ((SD=1.319).
7. Again, the respondents (M=3.59) support the view that availability of infrastructure in terms of road network, electricity, water, etc. has severely contributed to the high rise in the cost of building residential houses. Reference was also made to the cost of acquiring lands as having severe impact on the high rising in the cost of building residential houses (M=3.68).

5.2.2 The Effects of Factors That Contribute to the High Cost of Building Residential Houses

The effects of the high cost of building yields certain consequences as summarised below.

1. There was a majority view (96.8%) showing that one of the effects of high cost of building is the increase in rent. Only 17% and 11.6% opined their disagreement and remained neutral respectively.
2. In another fashion, a resounding 83.2% of the study population affirmed that overcrowding which has bedeviled the urban areas in Ghana as one of the resultant effects of high cost of building with only 17% and 16% were in disagreement and whiles a section remained neutral respectively.
3. Further, there was 76.4% agreement to the assumption that indeed high cost of building has the tendency to overpopulate low class residential areas with only 15.5% and 8% participants disagreed and remained neutral to this assertion respectively. High cost of building was thus identified to be a leading cause of overcrowding and slum emergence.
4. It was also found that whenever there is an increase in the prices of building materials, it indirectly affect contractual charges and the cost of seeking accommodation. This was shown by 92.4% respondents who were in agreement to the fact that high cost of building increase the income of property owners.
5. The factors accounting for high cost of building residential homes according to 60% of the respondents (i.e. 130/199) would lead to the establishment of estates by investors and government to lessen the housing deficit.
6. There is a majority (88.4%) view that factors that account for the high cost of building residential houses in Sekondi-Takoradi are likely to result in the development of residential facilities in high class settlement as a means of salvaging the situation among the affected elite in society.
7. It was found that; majority, (89%) believed that high building costs for residential homes would lead to the conversion of residential buildings in the

center of Sekondi-Takoradi into commercial ones. This they said would happen since land and proper owners would lease property to the bidders with the strongest financial muscles

8. The study further revealed that with 6.5% and majority 88.5% disagreeing and agreeing respectively to the idea that high cost of building causes changes in the material specification in building process, high building cost would lower material and quality specifications based on the majority view.
9. Lastly, there was 92.4% support for the idea that project owners are compelled to change the original design and scope of the houses they conceived earlier when there are existing factors that result in unreasonable increase in the cost of building residential homes.

5.2.3 The Strategies to Mitigate the Impact of Factors That Result in the High Cost of Building Residential Houses

1. The first, 87% people were of the view that efficient utilization of logistics play a fundamental role in reducing building cost.
2. The second suggestion agreed on by 80.5% of the total respondents as a strategy to lower building costs is good management by contractors.
3. The majority (80.5%) of study participants astonishingly did indicate that coordination between consultants and contractors is not what would help lower building costs, with only 12% of them believing otherwise and the rest quite uncertain about the issue.
4. Also, the factors of large scale land acquisition and utilization of local building material emerged strongly as 136 (68%) and 135 (67.5%) respectively agreed to the two phenomena.

5. To minimize building cost, 52.5% respondents did indicate that the high state of contractors' charges for work is reduced; the cost of building residential houses would be lowered. There were however a section of the respondents who doubted how feasible this idea would eventually tend out to be.
6. Regular payment for work done and control procedures were not identified to have a definite impact in reducing cost of building residential homes since there was no clear difference between the influences of it on cost according to the respondents.
7. Demolition and re-work, according to 54% of respondents is not the way to go in an attempt to reduce the effects of the cost of building residential houses. Conclusively, as per the findings of this study, it is novel to assert that, prevention of demolition and re-work helps to reduce the cost of building houses.
8. Again, delivering materials regularly on site is noted as an approach to fast-track the building process and therefore reduces cost according to the agreement of 19% participants of the study while 56% were in total disagreement of this notion.

5.3 Conclusion

In general, given the scale under Table 4.2 of the previous chapter, and a Mean of Means of 3.60545 indicates that the respondents alluded to the fact that oil find in the Western region of Ghana, increase in population, cost of lands, the rate of inflation, cost of building materials, availability of infrastructure among other factors have over the years contributed to the high rise in the cost of building residential houses in Sekondi-Takoradi Metropolis.

Also, the general effects of high cost of building residential homes, were identified among other things to include high rents, overcrowding and slum creation, development of residential facilities in high class settlement as a means of salvaging the situation among the affected elite in society, focus on estate buildings and the eventual conversion of residential buildings in the center of Sekondi-Takoradi into commercial ones.

Good management by contractors, efficient utilization of logistics, large scale land acquisition and utilization of local building materials, non demolition and re-work were the strategies identified to be means if employed would help mitigate the rising cost of building residential houses within the Sekondi-Takoradi metropolis.

5.4 Recommendations

Based on the findings of this study and lessons from the best practice elsewhere revealed by the review of literature, the following recommendations are put forward for consideration.

5.4.1 Recommendation to Institutions

- Contractors must use the all-hazard mitigation approach which is the most Cost-Effective approach that maximizes the protective effect of complementary mitigation measures and optimizes all design techniques with other building technologies.
- Local government authorities and government at large must institute regulated framework that would minimise the cost charged by contractors for their services so as to lower building costs.

- The national economic management policies must be reviewed and wellstructured so as to lower inflation and consequently stabilise prices of building materials as a way of minimising cost.
- Educational institutions must focus attention on intensive research to unravel local building materials and best ways of employing best technologies in local building projects in order to reduce cost.

5.4.2 Recommendations to Individuals

- Individuals should come together to form groups that would mobilise capital for large scale acquisition of land and other building materials since purchasing in bulk has the likelihood of lowering cost of materials and thus the building cost.
- Also, contracts should be awarded to contractors who have the needed expertise to apply technology, finish projects on time so as to prevent delays that eventually meet up with high inflation and increase in cost of building materials.

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APPENDIX

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

COLLEGE OF ARCHITECTURE AND BUILT ENVIRONMENT

DEPARTMENT OF BUILDING TECHNOLOGY

This questionnaire is part of a research work being undertaking by MSc. Construction Management student of the Department of Building Technology, KNUST, researching on the topic: '**The Factors that Influence High Rise in Cost of Residential Buildings in the Sekondi Takoradi Metropolis' .**This questionnaire is designed to solicit your views on the study based on your experience in working within the Ghanaian Construction Estate Industry. The study is aimed at:

1. Identifying the factors that contribute to the high rise in cost of residential buildings in the Sekondi Takoradi Metropolis.

2. Determining the effects of high rise in cost of residential buildings in the Sekondi Takoradi Metropolis.

3. Identifying the strategies in mitigating those effects.

The information obtained from this survey shall be kept anonymous and completely confidential. Only findings in aggregate from it will be submitted to the relevant authorities.

Your participation in this survey is much needed and we will be grateful if you could answer these few questions.

If you have any questions and contributions about this research, please email me at dbbloe2013@gmail.com or call me on 0200847748.

I would like to thank you for your cooperation in completing these questions.

Questionnaires

SECTION A: BACKGROUND OF RESPONDENTS

1. Please indicate which of the following that best describes your area of expertise.

A. Consultant [ ]
B. Client [ ]
C. Contractor [ ]
D. Tenant [ ]
E. Procurement Officer [ ]
Other (s), please specify
……

2. For how long have you been in professional practice?

A. Up to 5years [ ]
B. 6-10 years [ ]
C. 11-15years [ ]
D. 16-20 years [ ]
E. Over 20 years [ ]

3. Please indicate your level of education.

A. Professional Diploma [ ]

B. Bachelor Degree [ ]

C. Master/PG Degree [ ]

D. Doctorate [ ]

E. Other (s) please specify [ ]

4. How long have you lived in the Sekondi Takoradi Metropolis?

A. Up to 5years [ ]

B. 6-10 years [ ]

C. 11-15years [ ]

D. 16-20 years [ ]

E. Over 20 years [ ]

5. What class of residence do you live in?

A. 1st Class [ ]

B. 2nd Class [ ]

C. 3rd Class [ ]

D. 4th Class [ ]

6. What is the state of ownership of your residence?

A. Personal [ ]

B. Rental [ ]

C. Staff residence [ ]

D. Family House [ ]

E. Others …….. [ ] **SECTION B: CONTRIBUTING FACTORS**

In your experience, which of the following factors contribute to the high rise in cost of residential buildings in the Sekondi Takoradi Metropolis? Please indicate the level of influences of each factor by ticking the appropriate boxes.

1-Not Very Severe, 2-Not Severe, 3-Moderately Severe, 4-Severe, 5-Very Severe

No	*Factors contributing to high cost of residential buildings*	*Levels of Severity*				
		1	*2*	*3*	*4*	*5*
1	Difficulty in land acquisition					
2	Cost of building materials					
3	Labour cost					
4	Capital cost					
5	Oil find					
6	Increase in population					
7	Inflation rate					
8	Cost overran in construction					
9	Class of the residence					
10	Availability of infrastructure (road network, electricity, water, etc.)					
11	Cost of land					
	Other factors					
12						
13						
14						
15						
16						

SECTION C: EFFECTS OF THE FACTORS

In your experience which of the following effects of high rise in cost of residential buildings are prevailing in the Sekondi Takoradi Metropolis.

Please tick [√] where appropriate by indicating the level of impact of each effect.

1= Lower, 2= Low, 3= High, 4= Higher, 5=Highest

No	*Factors*	*Degree of Impact*				
		1	*2*	*3*	*4*	*5*

1	Increase in rent					
2	Overcrowding					
3	Overpopulation at low class residential areas					
4	Income increase for landlord					
5	Establishment of estates					
6	Development of residential facilities in high class residential areas					
7	Conversion of residential buildings into commercial in the city center					
8	Demolition and re-work					
9	Delays in payment of work done					
10	Inadequate control procedures					
11						
12	Safety consideration/ emergency field condition					
13	Change orders					
14	Lack of coordinating between consultants and contractors or sub-contractors					
15	Delay of materials delivery on site					
16	Lack of communications					
17	The approval for the award of contractors for new project					
18	Design complexity of project					
19	Conflict on the project site					
20	Changes in material specification					
21	Change of design or scope					
22	Poor management of contractor					
23	Inefficient equipment, tools and plants					
24	Unreliable sources of materials on the local market					
	If Others Please Specify					

SECTION D: OVERCOMING THE EFFECTS

In your experience which of the following can mitigate the effects of high rise in cost of residential buildings in the Sekondi Takoradi Metropolis?

Please tick [√] where appropriate by indicating the level of impact of each mitigation factor.

1= Lower, 2= Low, 3= High, 4= Higher, 5=Highest

		Degree of Impact

No	*Mitigating Factors*	*1*	*2*	*3*	*4*	*5*
1	Good management of contractor					
2	Use of efficient equipment, tools and plants					
3	Use of materials on the local market					
4	Large scale land acquisition					
5	Constructor's high financial state					
6	Availability of required labour skills					
7	Coordinating between consultants and contractors or sub-contractors					
8	Less load on contractor					
9	Regular payment of work done					
10	Adequate control procedures					
11	Prevention of demolition and re-work					
12	Regular materials delivery on site					
	If others please specify					
13						
14						

Thank You