Prefabricated Housing, a Solution for Ghana's Housing Shortage

by

Evans K. Essienyi

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Kwame Nkrumah University of Science and Technology

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Signature of Author_____

Center for Real Estate
July 29, 2011

Certified by_____

John F. Kennedy
Lecturer, Center for Real Estate
Thesis Supervisor

Accepted by_____

David Geltner
Chair, Interdepartmental Degree Program in Real Estate Development

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ABSTRACT PAGE

Sub-Saharan Africa has been experiencing phenomenal population growth since the beginning of the 20th Century, following several centuries of population stagnation attributable to the slave trade and colonization. The region's population in fact increased from 100 million in 1900 to 770 million in 2005. The latest United Nations projections, published in March 2007, envisaged a figure of 1.5 to 2 billion inhabitants being reached between the present and 2050 (CEPED, 2008).

The growth in population poses a lot of challenges for Governments of these countries, not the least is housing the masses. Some governments have explored industrialized building systems (IBS) – PREFAB HOUSES to address the housing shortage. The social and economic factors in these countries have impeded the success of these housing initiatives.

In 1952 the then Gold Coast government explored the possibility of employing industrialized Building Systems (IBS) – PREFAB HOUSES to relieve the housing shortage in the country, then a British colony. The government engaged Messrs. N. V. Schokbeton of Kampen, Holland as consultant of the project and producers of the Prefab houses. The program was abandoned on the recommendation of the United Nations Technical Assistance Mission on Housing to Ghana.

This essence of this paper is to reviews the UN report to the government of Gold Coast to learn why the project failed and what might be done to make such a project successful in the 21st century . This paper uses case studies to show countries that have successfully and unsuccessfully employed Industrialized Building Systems (IBS) – PREFAB HOUSES to address housing shortage.

Finally, this paper employs a survey to gauge the interest - the willingness of the middle income Ghanaian to adopt prefab houses as dwelling units.

Thesis Supervisor: John F. Kennedy
Title: Lecturer, Center for Real Estate

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INTRODUCTION

Housing is meant to address basic human needs for shelter and security by providing protection against climatic (excessive heat and cold) and unwanted intrusions from insects, rodents and environmental nuances that may be harmful for health and wellbeing. (Norma L. Newmark & Patricia J. Thompson 1977) This makes the provision of houses a major concern for governments and individuals.

With a population of more than 840 million and growing at the rate of 2.4 percent per year, sub-Saharan Africa is the fastest-growing region in the world (Karin Ringheim and Jane Gribble 2010). "Increasing urban growth in Sub-Saharan Africa means that providing housing and other services for urban residents will be a major issue for urban managers and governments. A large proportion of the population in the metropolitan areas of developing countries is poorly housed and in some areas such as in the rural areas lacks housing altogether. The existing stock of housing cannot cope with the rapid population growth resulting from natural increase and tides of industrialization and immigration. The idea of increasing that stock may be hindered by other difficulties and damping factors, such as lack of skilled labor, lack of resources, shortage of building materials, ways of advanced construction methods, specialized technicians, and finally proper and flexible management" (Amid Massoudi & Wahak Simonian 1978).

Ghana is located in West Africa, it comprises 10 administrative regions. As of March 2011, the population of Ghana is over 24 million, up from 18.9 million in 2000, a 28% increase. Nationwide, 45 per cent of the population live in urban areas, although this percentage is higher in regions such as Greater Accra 16.1% and Ashanti 19.5% - (Ghana statistical services, Provisional results of 2010 Population and Housing Census)

> "The 2000 Population and Housing Census reported the existence of about 3.88 million dwelling units in Ghana, less than half of which are classified as houses. As much as fifty per cent of all dwelling units were constructed with poor quality mud bricks and earth, mostly with thatched roof and poor floor construction materials. ***In addition, 74,000 kiosks and containers housed several hundred thousand people and a large number of people in urban areas sleep on pavements, walkways and on streets.*** The report added that Ghana has 3.7 million households, and growing at 2 per cent, is expected to reach 6 million by 2025. That is 2.3 million new households will be generated, each expected to be sheltered in a housing unit. ***Half of all households in Ghana sleep in one room, 21 per cent in two rooms, 11 per cent in three rooms and only 18 per cent sleep in four or more rooms. The average household size was 5.1 people.*** Further analysis from the report indicates that Ghana had a housing deficit of one million units as of 2009 that will double in the next decade if the status quo is maintained."(Boakye, Charles Kwame, March 2010).

As in many developing countries, the government of Ghana has historically been directly involved in the housing sector. During the colonial period (i.e., before 1957), the British-led administration was involved in housing schemes financed by the central government. The Department of Social Welfare and Housing (DSWH) created in 1945 was given the responsibility of setting policies and implementing housing schemes. Between 1946 and 1948, the DSWH supervised the completion of seven subsidized housing estates (Planned Communities) which were located in Accra, Kumasi and Takoradi—the three major urban centers.

In the past the Government of Ghana tried a number of housing initiatives to address the housing shortage in Ghana. In 1952 the government of Ghana signed separate agreements with Messrs N. V. Schockbeton and the USSR respectively to set up prefabrication factories in Ghana to supply Prefabricated houses – (Prefabricated building is a type of building that consists of several factory-built components or units that are assembled on-site to complete the unit – Wikipedia http://en.wikipedia.org/wiki/Prefabricated_building) to address the country's housing shortage. The available evidence shows that both initiatives were ineffective (George Ofori, 1989). The purpose of this study is 1) to revisit the 1952 initiative and exam the economic or social factors that rendered the initiative ineffective 2) to gauge the interest of the middle class Ghanaian in prefab houses.

THE 1952 INITIATIVE (THE SCHOKBETON BUILDING METHOD)

Messrs. N.V Schokbeton is a company based in Holland with a factory in Kampen for manufacturing a special type of precast concrete building components. "The government of Gold Coast on the 18th of April 1952 reached an agreement with Messrs N.V Schokbeton to carry out a survey for the purposes of determining whether it is technically and economically practicable to produce in the Gold Coast concrete building components of the type produced at their factory in Kampen". (UN report on housing in the Gold Coast p 134)

The Schokbeton prefabrication method used a special type of precast concrete wall slabs. Slabs were joined together by posts of a special section and bolted together to form partition and external walls. The slabs were reinforced with steel. The width between the axis's of the posts were three feet. This was the module, which formed the basis for the design of all ground-floor or multi-storied houses.

In the agreement with the Gold Coast government, the schokbeton concern suggested creating three factories at Accra, Kumasi, and Takoradi, each supplying a region within a radius of 40miles. The capital investment for each factory was to be from $ 400,000 to $ 420,000 US dollars. (UN report on housing in Gold Coast 1954 p 139) the estimated capital requirement for the factories did not include the value of land (given as 20 acres on which the plants and staff quarters are to be built)

The minimum number of units to justify the establishment of the 3 factories was 9,000 room units per annum. The price of the Schokbeton house was based on the assumption of continuous full production, the government as owner of the factories would have been forced to see to it that the 9,000 units were produced and used every year. However as the price of the schokbeton houses were higher than those produced by the traditional method - (in-situ construction of Sandcrete block and mortar with all the concrete building elements cast and allowed to harden in place), direct sales of Schokbeton houses

would have been unlikely. The government would have had to take over the whole output for a program of subsidized housing.(UN report on housing in the Gold Coast p. 140)

Cost

The Schokbeton prefabricated houses were designed as one and two rooms family units they were also either one storey or two storey structures. The price points for the concrete component of the Schokbeton houses were as follows: for a two-roomed house type III the cost of the concrete component was estimated as £ 105 in honey comb slab, or £142 in F-slabs. The prices include £20 per room unit for transport and erection costs. The cost of a one room unit with the F-slab cost £51 at the factory

A sandcrete block wall (traditional method) for the same type of house would cost about £56 per room unit. The sandcrete wall for £56 at site is cheaper than the Schokbeton wall for £51 at the factory since transport and erection costs of £20 and substantial breakage allowance have to be added to the factory cost – (UN report on Housing in the Gold Coast p 138). The rest of the house is constructed traditionally in both cases and therefore does not affect any comparison that would be made.

Handling

The weight of a schokbeton element was 275 Ibs, the schokbeton slabs was both heavy and brittle and therefore required the use of suitable lifting devices for erection on-site. The transportation and erection of the prefabricated houses was to be outsourced to independent contractors. For every room unit at a cost of £51 the handling cost is £20 bringing the on-site cost per room unit to £71.

The selling points of the Schokbeton products:

Speed – the speed of erecting the precast concrete slab as walls. Because the precast concrete slabs wall are anchored by bolts to concrete posts and done in the dry state it is usually faster than the traditional brick and mortar in- situ construction.

Quality - The quality of finish of the walls. The factory made precast reinforced concrete slabs presents a better quality of surface finish than the traditional in-situ constructed wall owing to the controlled factory conditions under which they are manufactured.

What Happened

The government of Gold Coast agreed to pay £ 75,000 to Messrs. Schokbeton for a report on the possibility of relieving the housing shortage in the country and speeding up the development of the building industry with prefabrication.

While the survey was ongoing the government of the Gold Coast signed two agreements with Messrs. Schokbeton on the 8th of February 1952 and 30th July 1953 under which Messrs. Schokbeton undertook to build 168 Prototype houses in Accra, Kumasi and Takoradi at a total cost of £336,000 to the government. Eventually 64 of the houses were built at a total cost of more than £160,000.(UN report p. 136)

The government of the Gold Coast in a letter dated 5th November 1954 asked the United Nations Technical Assistance Mission on Housing to examine the Messrs. Schokbeton survey report and the houses and recommend a reasonable course of action.

The UN Technical Assistance Mission on weighing the advantages and disadvantages of the Schokbeton method and comparing with other methods in use elsewhere and in the Gold Coast advised the government to abandon the project recommended in the Schokbeton survey report for the following reasons:

1. The cost per unit of the Schokbeton house was higher than that of the traditional method. In addition it did not offer any measurable benefits. The final costs of the project were 80% higher than estimated (W.P Strassman 1977).

The current price as at 2011 of an all inclusive precast concrete floor slab produced in Ghana is **GHC 35.00** per m^2 and the traditional in-situ concrete suspended floor slab is **GHC 30.00** per m^2. This price difference of **GHC 5.00** on a large project assumes a lot of significance.

2. The success of the project hinged on extensive government intervention – it required the Government to purchase all the 9,000 units to be produced per annum and resell at a subsidized rate, putting additional burden on the government's budget.
3. The UN felt that there were other superior alternatives to achieving the same housing objective that the Schokbeton model was attempting to achieve. E.g. Partial prefabrication of parts of a house such as: solid or hollow concrete blocks for walls, prefabricated purlins for roofs, windows and door frames, lintels, stairs etc. They argued that since partial prefabrication needs only small plants, it could be carried out by small contractors or even by artisans and that would help to popularize the process.

Consequently prefabrication in Ghana was abandoned. It would help to know how prefabrication has been carried out in other parts of the world.

PREFABRICATION IN OTHER PARTS OF THE WORLD

Most of the developing countries in Asia, Africa and Latin America share the problems of poverty, large population growth and acute housing shortage. Providing affordable houses to the larger population is a demanding task which most governments in these countries are ill equipped to overcome. These factors call for appropriate building technology that has the dual benefits of economy as well as speed in construction. Prefabrication is the obvious choice to meet the ever-increasing demand for housing in these countries. However, because of the prohibitive initial set-up costs, total pre-fabrication does not appear to be a pragmatic offering in majority of the developing countries. For ensuring speed and economy in construction, the only practical solution to the problem of meeting the housing requirements of the masses is adopting appropriate low-cost construction techniques that involve partial prefabrication, i.e. employing prefabricated building components of such size and weight that they could be fabricated at construction sites or in industrial production units, e.g. economical walking systems and single stack system of plumbing, precast RC roofing/flooring elements, precast thin RC lintels, beams etc.

During the last five decades developing countries have made their first experiences with ***prefabricated, industrial*** building systems which they mostly imported (by transfer of respective production units) or systems which they developed on their own (sometimes copied from existing similar technical systems in the 'developed' world). In the majority of these countries, as experience shows, 'prefab' systems, usually heavy and large-scale, have been generally unable to cater for low-income housing, even in the cases where they were explicitly aiming at this target group. The most prominent aspects of their failure are:

1. high costs due to high fixed investments; high transport and assembly costs as the factory production is very centralized, heavy cranes are needed on site; the use of advanced technology

and of imported inputs, especially expensive building equipment and high-energy-content building materials such as cement and iron rods are responsible for the production of prefabricated components resulting in high-cost housing far beyond the limits of affordability

2. Assembly problems which result in severe inaccuracies and even leakages of the assembled components
3. The physical unsuitability of buildings to later changes of use, as the large-scale, heavy components of certain prefab-systems are absolutely static and rigid against change; and lastly,
4. Cultural unsuitability *as* most building systems are only geared to produce some kind of international building type but never take reference to the local or indigenous building culture.

These factors have not made Prefabrication popular with the masses in developing countries and also undermined the success of prefabrication housing programs.

Presently some countries continue to use prefabrication and in particular large components and systems on a relatively large scale, as they are in the possession of well-equipped factories or as they still possess the economic resources to pursue such programs. Nevertheless, in the majority of the developing countries the use of large-scale prefab-systems has slowed down considerably and there exist many doubts whether any continuation is feasible. Generally, with regard to fabrication there exists a 'stalemate' and there rarely exist considerations for a redevelopment or revision of state policy and approach towards prefabrication which could lead to modified utilization of existing productive resources. Particularly there is little connection seen between the popular housing sector, which produces the majority of today's housing stock through self-help/mutual aid and/or the work of small-scale contractors and the need to readjust and adapt the technological policy of the construction sector

towards the specific needs of the low-income population, their technical skills and economic capabi1ities.

THE MASS PREFAB HOUSING DILEMMA

One of the challenges of establishing and running economically profitably factories to mass produce prefab building components is the dilemma of whether the chicken first or the egg first. Whether the mass production of prefab components in factories first or the market first. We cannot have a satisfactorily run mass production factories unless there is a guaranteed and assured market for their products over the number of amortized years of heavy capital invested. There cannot be a guaranteed and assured market for such highly innovative new product unless structures built by their use are found economical and satisfactory. Economy cannot be achieved unless the factories are operated to their full rated capacity. The factories cannot be run to the full rated capacity without continued adequate captive demand. Such demands cannot be there unless there is an assurance of continued major mass housing and time bound finance, backed by housing programs; therefore, this becomes a complete vicious and evil cycle. This is the root cause of housing shortage problem remaining unsolved.

THE PUERTO RICAN CASE STUDY

Even if things go well technically, lack of volume can defeat Industrialized Systems Building (ISB) more easily in poor countries than in rich countries. This happens because of low wages, high capital costs, lack of developed financial markets and the existence of alternative forms of house construction. In a comparatively modest system for making 1,500 units in five years, the Puerto Rican ARUV-Estiot system, $488,000 were needed for fixed capital in 1970. About $185,000 would have been spent for cranes and rails at the plant and on site. Tractors and trailers would cost $78,000. The remaining $225,000 would go to the prefabrication plant - sheds, warehouses, metal forms, concrete spreaders, vibrators, compactors, screeders , and finishers. The annual cost of all this equipment at reasonable rates of amortization would be $210,000 with the cost of finance or $70,000 at 10 to 13 percent interest rates. About $148,000 for studies, plans and fees should be added as another fixed cost.

If 1,500 units can be built in five years as planned, the fixed cost per unit would be $1400. If only 240 units are built the fixed cost rises to $8,900 per units, a prohibitive amount. At Puerto Rican wage rates and other 1970 prices, the capital cost would have risen from 17% to 57% because of insufficient volume. After years of study that were heavily subsidized by the federal grant under "operation Breakthrough," the Puerto Rican government decided not to proceed with the ARUV-Estiot for the following reasons:

1. Demand would not be sufficient in coming years within a reasonable distance of any proposed plant
2. Labor-displacing did not seem to be desirable while unemployment was above 10% and rising
3. Finally costs remained too high for reaching those segments of the population that were ill-housed because of poverty

RELBEC CASE STUDY (PUERTO RICO)

RELBEC was a consortium that was formed in the 1970s by International Basic Economy Corporation (IBEC), Rexach Construction Company and the Danish Larsen and Nielson Consultor.

It was formed to produce prefabricated houses in Puerto Rico. Their method involved on-site prefabrication of heavy tilt-up panels for one and two storey single-family housing.

An amount of $6.4 million was invested in a prefab plant that was opened in May 1972 after 2 years of study and construction.

In the RELBEC plant, highly finished 10 ton panels were made in Danish horizontal automatic panel casting machines with cement poured from a buggy on a monorail. Post-tensioned floor slabs were made with the American spandec approach. A British vertical battery casting machine with rapid steam curing was also used. Windows, plumbing and electrical systems were fully integrated into the 10-ton panels.

Only 125 mostly unskilled workers operated all these equipment at a ratio of $51,200 of capital per worker. The labor content of the final structures was said to be only 3.3% cost. For an eight-hour shift, the volume was 1,500 dwelling units annually. The transportation costs limited the system to a 50km radius around the plant. A few elegant apartment blocks were built, but by December 1975 RELBEC was ready to sell to the government. The government refused to neither buy nor guarantee purchase of an annual 1,000 dwelling units. RELBEC declared bankruptcy and closed the plant.

PREFABRICATION IN AUSTRIA (THE CAMUS SYSTEM)

In Austria, prefabrication has been followed on a larger scale since 1960. Near Vienna, in the regions of the increased domestic architecture, the first factory for prefabrication panels was built by a company in collaboration with the municipality of Vienna. It produces according to the Camus system. The factory exists since 1961, it has a daily production of 4-5 flats with usable area of 70-80m^2 each; for each flat about 20 wall and floor panels are needed. In the beginning only heavy-weight concrete panels were made, now where possible light-weight elements are used. The statical system consists of rectangular cells that are closed on every side. The buildings are calculated as panel works of rectangular discs with immovable edges. All the loads are taken up by the panels – the Camus system.

The construction of the panels corresponds to their functions: the outward panels have several layers, they consist of an outer skin of a load bearing core of concrete, an insulation layer of polystyrene and of an inward skin. The floor panels are made of solid concrete or of hollow elements. The panels have a dimensional accuracy to the millimeter. There is a high grade of prefabrication: all the immobile parts of windows and doors, the heating and water installation, the outlets and the electrical installation are built –in in the factory. The fitting on the site takes about 8hrs of wok per a flat.

The following works are performed subsequently: fixing of the joints of wooden parts and of the installation, joining, passing through of the electric wires. The panels are transported by hydraulic machines and floats. Cranes haul the panels directly from the trailer to the building. The walls and panels are assembled for each floor and temporarily braced until the elements receive the connections by the welding of the reinforcement. The panels are connected at the edges of each room, so that no joints occur in the wall and floor areas.

Camus produces such prefabrication buildings to a height of 13 stories. For the operations for one medium-sized flat built according to this system, 615 working hours in the factory and on site are necessary, with additional working hours of the suppliers of 125 hours.

CASE STUDY IN FRANCE (The Camus System, Le Havre, 1949-1951)

After the Second World War, the need for new housing was the impetus for important research in prefabricated construction systems. In France, the engineer and builder Raymond Camus created a process of industrialization which he patented in June of 1948. Camus applied this system for the first time in Le Havre, a city whose center had been entirely destroyed during the wartime bombardments. Charged with the reconstruction of the city center, Le Havre architects Henri Loisel, Rene Vallin and Raymond Audigier chose prefabrication for all the buildings (to be located on the three city blocks of N17, N21 and V7)—from the structural level to the interior specifications—and worked in association with Raymond Camus. Each building was designed with a basement, a commercial ground floor, and 12 apartments distributed throughout three floors. The weight of the entire construction was supported by 700 assembled elements that followed the principle of load bearing walls. The partition walls (2.6m/8.5ft) and floor plates (almost 6m/20ft) were plain slabs of reinforced concrete. The façade panels were composed of a framework of reinforced concrete that included an exterior coating, a layer of minimally reinforced concrete gravel, a layer of thermally insulated polystyrene, a layer of reinforced vibrated concrete gravel, and an interior facing. The window and door framing was of reinforced cast concrete coated in a layer of cement. The balconies were constructed with a reinforced concrete slab integrated into the exterior façade walls. The stair enclosure was composed of an assembly of precast reinforced concrete. The body of the secondary floors was incorporated into the prefabrication: each panel incorporated its own distinctive assembly, including windows, doors, frames, rolling shutters,

decorative articulation, plaster castings, coatings, tiles, floors, plumbing and door hardware, water, gas, electricity, and septic lines. The in-floor and in-ceiling radiant heating tubes were installed during construction and connected by welding. At the time of Le Havre's reconstruction, prefabrication as a building system represented no more than 20 to 25 percent of all new construction, and consisted of manufacturing prefabricated parts to be assembled in strict successive order: walls, doors, windows, and piping. The novelty of the Camus system is founded on the integrated prefabrication of virtually all elements within one panel that could weigh up to four tons and was large enough that six assembled panels would form the six sides of a whole volume.

Prefabrication following this method was conducted in a factory on a flat surface. Steel molds were heated by accélérer la prise. The assembly of panels was then erected on site using cranes and fork-lifts. There was no scaffolding involved and formwork was reduced to corners at the juncture of panels. To ensure the correct order of installation, each prefabricated section carried a number corresponding to a number on the plans. The advantages in cost and time efficiency of the Camus system were significant, as the coordination of the different building trades happened off-site in the controlled environment of the factory, and all that was needed for actual construction was a small and relatively unskilled labor force. Assembly of all the prefabricated elements represented approximately 12 percent of the total project time. Once the foundations were poured, the rebar was positioned and the concrete poured into the groove between the wall and the floor. The need for large storage spaces made transportation of the prefabricated elements difficult due to their weight and size. From the pouring of foundations to the delivery of furnishings, the process took one to two months for an individual home, four to six months for a building of 12 apartments, and eight to ten months for a building of 100 apartments. Begun May 3, 1950, the rebuilding of sector 17 was fully realized by January of 1951, reflecting the urgent need for housing in the postwar period, a result of wartime destruction, the "baby boom," and urban migration. To prefabricate is to standardize and hence to simplify. The risk of relegating aesthetic

considerations is understandable, given that the goal was to build as fast as possible with limited resources. The Camus system found widespread application both nationally and internationally, particularly in the former USSR. Russian engineers adopted the system very early on, but their zeal in applying prefabrication and standardization on such a massive scale meant that the quality of detailing suffered. During the 1960s, Camus factories produced approximately 20,000 housing units each year for the global market. The buildings constructed by Raymond Camus in Le Havre embody a pioneering vision for prefabrication, and were protected when the rebuilt city center of Le Havre was inscribed on the World Heritage list in 2005.

The case studies real some success and some failure. The successful cases are in the developed countries and the less successful cases happen to be in the developing countries. The common features of the developed countries are existing social infrastructure and an industrialized economy that lends itself to the setup of the prefabrication system. The developing countries seem to lack the social infrastructure and the industrial setup that would readily support the prefabrication system.

THE HOUSING SECTOR IN GHANA

"Ghana would need 5.7 million rooms by 2020 to meet her housing needs in the urban centers" (Dr. Graham Tipple 2011). This indicates that new rooms must be completed in every minute daily for 10 years.

http://www.ghanabusinessnews.com/2011/05/12/ghana%E2%80%99s-housing-needs-to-hit-5-7-million-by-2020/

Since Ghana gained independence 50 years ago, housing issues have been dominated by the government sector - housing Consultant Ohene Sarfoh .The Nkrumah administration, as part of its 1960-65 National Development Plan, first sought to provide housing for Ghanaians by parodying the mass construction of post-WWII European governments that were recovering from the destruction of the war. It was Dr. Kwame Nkrumah who formed the state bodies to address housing issues: the State Housing Corporation (SHC) and the Tema Development Corporation (TDC). The TDC was created with the special purpose of creating residential units in the rapidly growing Tema area as part of a major industrialization drive while the SHC worked in the regions across Ghana. The State Housing Corporation (SHC) constructed about 24,000 single household dwellings between 1957 and 1990 (Tipple and Korboe 1998)

> "Like so many of Nkrumah's industrialization drive, and like those of the Soviets and Communist China, the resources allocated to such ambitions ran dry. Funding for these bodies was progressively reduced over the years. The intentions stated in those days were never realized" - Mr. Sarfoh

The governments housing policy directions have been in the direct supply of a small numbers of dwellings and a number of measures to induce demand. The measures have included subsidies for the renting and subsequent purchase of government-built dwellings; subsidized interest rates for borrowers from the few institutions concerned with housing finance, and a rent control regime. At the same time, state financial agencies have been encouraged to invest in low-cost housing. Loans have been available to some fortunate few from the State Insurance Corporation (SIC), the Social Security and National Insurance Trust (SSNIT), and the First Ghana Building Society (FGBS) but recipients have inevitably been relatively well of and in formal employment. SSNIT and SIC have also constructed Planned Development Units (PDU) of housing for rental purposes as a form of capital investments, 1985 to 1990 (Ghana, 1993)], but they were unsuited for their purposes of securing long-term financial yields while providing housing for low income households. They have been let at rents which are too high for low-income people but are too low to allow a return on the investment sufficient to maintain the capital base, as a result, the housing agencies have been selling them to tenants since 1993.

Private Citizens are making some attempts at addressing their housing predicaments by putting money by and accumulating sums and constructing their own dwelling units. This process usually takes a long time to complete. Some people are able to complete their developments over as long a period as twenty years. Some fortunate ones are able to move into their houses after five years.

Apart from the challenge of financing, most people face the challenges of security of land tenure. Land tenure is a major problem in Ghana due to the lack of proper land title system.

THE LAND TENURE SYSTEM IN GHANA

Land tenure denotes the system of landholding, which has evolved from the peculiar political and economic circumstances, cultural norms and religious practices of a people regarding land as a natural resource, its use and development. Implicit in this definition are the rules, regulations and institutional structures both customary and enacted legislations, which influence the holding and appropriation of land and its resources for socioeconomic development (Ghana, Ministry of Lands and Forestry, 2003).

Land tenure in Ghana is generally communal in nature and this has determined the nature of land administration over the years. To the Northern tribes, land is generally believed to be owned by the "Tendaneena" who are fetish priests. In the Akan states, land is regarded as a feminine spirit, "Asaase Yaa", which in the words of Asiamah (1983) is "helpful when appropriated and harmful when neglected". Again, in the Akan states, land is seen as an ancestral trust which must be passed on to succeeding generations, with the chief, being the link between the living and the departed, he is the administrator of this heritage. To the Ga states, land is said to be owned by the lagoon gods and its administration is in the hands of the "Wulomei", who are the fetish priests of the lagoon gods. These religious notions of land ownership have doubtlessly determined the administration and manner of usage of land. Thus outright ownership of land is still a rare form of land tenure in Ghana. Leases and rentals over a satisfactory period of time for economic or commercial activities are possible and involve permission by the allodial titleholders to use the land. However, the land must revert to the community or the allodial titleholder at the end of the lease or cessation of the activity for which the lease was granted in the first place. Nevertheless, the tenure system of land in Ghana is defined by the 1992 Constitution of the Republic of Ghana. The Constitution recognizes two (2) tenure systems namely: public and customary.

Public lands are vested in the President, on behalf of, and in trust for the people of Ghana based on the relevant provisions of the Administration of Lands Act, 1962, (Act 123). Public lands also include any other land acquired through the State Lands Act, 1962, (Act 125) or through any other statutes, in the public interest. Public lands are administered by the Lands Commission and its secretariats, as provided in the Lands Commission Act, 1994, (Act 483). Public lands can be grouped into two categories –state lands and vested lands.

State Land - refers to land that the Government has compulsorily acquired for a specified public purpose or in the general public interest by the lawful exercise of its constitutional or statutory power of eminent domain. All previous interests are extinguished and persons who previously held recognizable interests in such lands are entitled by law to compensation either monetary or replacement with land of equivalent value. Laws governing the compulsory acquisition of land by the government include Article 20 of the 1992 Constitution, Administration of Lands Act 1962, (Act 123,) the State Lands Act 1962, (Act 125) the Land Statutory Act 1963, (Act 186) and regulations made under these statutes.

Vested Lands - is a unique situation brought about by statutory intervention where the landowner retains the customary land ownership but the management of the land is taken over by the state in trust for the owners. The management responsibilities cover legal (e.g. prosecution), financial (e.g. rent assessment, collection, disbursement) and estate management (e.g. physical planning and its enforcement and administration of the property). Vested lands are administered under the Administration of Stool Lands Act, 1962 (Act 123) and the Lands Commission Act, 2008 (Act 767).

Customary Lands

Customary lands are lands owned by stools, skins, families and clans usually held in trust by the chief, head of family and clan or fetish priests for the benefit of members of that group. Section 36 (8) of the

1992 Republican Constitution of Ghana recognizes customary ownership of land. Private ownership of customary land can be acquired by way of a grant, sale, lease, gift or marriage. Ownership is by way of outright purchase from customary land owners or private individuals. Customary lands support the livelihoods of the majority of the population in the country and therefore sustainable management of such lands is critical to the overall socio-economic development of the country.

PROBLEMS ASSOCIATED WITH THE EXISTING SYSTEM

The variety of customary arrangements, combined with some inconsistencies in the procedures for deed and title registration, make it difficult, though not impossible, for potential investors to acquire large parcels of land for large-scale economic activities. This is particularly the case where the activity has a long economic gestation period. In addition, the different traditional ownership structure, in some cases, requires negotiations with a large number of allodial titleholders. Such negotiations can often be protracted, cumbersome, frustrating and expensive.

THE ECONOMIC IMPACTS OF THE CURRENT SYSTEM

The current land tenure system constitutes a serious disincentive to investment in Ghana's economy. The lack of several large-scale commercial agricultural projects in Ghana, similar to those existing in some francophone West African countries such as the Ivory Coast, can be partly attributed to the problems associated with acquiring land for economic activities.

It is unlikely that serious large overseas investors would be prepared to undertake protracted negotiations, on a one-to-one basis, with several allodial title holders in order to put together suitable large parcels of land for large-scale commercial real estate projects. Even where this is possible,

investors potentially face the problem of on-going litigation over the legal right of the land they have acquired or leased. There are over 60,000 land cases currently clogging the court system in Ghana (Tsikata, P. Y 2005). It is not uncommon for the rights to land, which has already been leased or rented and compensation duly paid by an investor to one allodial titleholder, to be challenged or disputed by another allodial titleholder. One commonly hears of stories from friends where disputes have arisen when individuals had successfully negotiated parcels of land for residential/commercial construction only to be challenged by other parties, who also claim ownership of, or interest in, the same parcel of land. (Feature Article of Sunday, 11 May 2003 **Columnist:** Asumadu, Kwame Dr. Reform of Ghana's Land Tenure System)

Land is a basic and necessary component of housing. Any unresolved problems with land are a stumbling block to efficient housing delivery. If the Government is serious about addressing the shortage in housing, then some bold measures must be adopted to settle land issues. This will give people the confidence and security to buy and own land and to develop houses for themselves and houses for sale and for rent.

Apart from financing and land, building materials is also an issue. The most important building materials – reinforcement bars and cement are imported from outside the country with foreign currency making their prices less affordable to most people. The available local building materials like clay, lime and bamboo have not been explored to the benefit of the local building industry.

HISTORY OF LOCAL BUILDING METHODS

In the Southern area of Ghana the traditional timber framework can be found with wattle and daub construction, as well as houses built with the Atakpame method or walls of stones, sun-dried bricks from

laterite and burnt bricks from clay. Traditional roofing is thatch from different materials or in a few fishing villages, flat mud roofs or roofs from split bamboo. The house plan is rectangular, roofs are quite steeply pitched (except when flat mud roofs) and gable-ended. With increasing foreign influence which brought in imported materials and technologies, one can trace certain stages of development in the building methods. The wattle and daub construction, spread throughout the south, followed by the Atakpame building – from wet mud balls molded in layers. This method was chosen in many areas after it was found that the wattle and daub method was more tedious, required more skills and that termites were moreover attacking the timber framework and reinforcement of the wattle and daub wall, causing early deterioration and collapse. Whilst the house built from wattle and daub still has a thatch or shingle roof, the Atakpame house is covered with corrugated iron sheet. An improvement on this method is the construction with sun-dried mud bricks bonded with mud mortar or cement-sand mortar, and roofed with iron sheets. Stone wall construction is not common, but can be found in the Akwapim area, the Western Region, Accra and Cape Coast. The most advanced building method is the construction with blocks (from sand and cement). In the rural areas where the farmer or fisherman or craftsman is his own builder (with exception of some areas in the Ashanti and Brong-Ahafo regions) the traditional methods are still used, at the same time modern methods are becoming familiar. The house owner may have one next to the other type of building (wattle and daub, Atakpame and sun-dried mud bricks) in his compound.

WALLS

There are three typical types of wall construction, the wattle and daub wall, the Atakpame wall and the wall from sundried bricks.

WATTLE AND DAUB

Holes are dug into the ground at regular intervals after the desired shape of the building has been marked out with the help of pegs and strings. The vertical posts which are to carry the roof structure are inserted into the holes and stabilized with stones rammed around them at the base. This process goes on together with the laying of the floor (foundation) slab. For the timber framework, as well as for the main roof structure the wood of the Fan Palm is used. The Raphia Palm wood and the rachis petioles of the leaves are also used for posts and beams. Leaves of this palm tree are used for thatching as well. For the horizontal and vertical members of the framework, which are tied in before the mud is applied; split bamboo are used. When the framework has been completed, the roof is built. After this, wet molded mud balls are pressed and worked into the framework of the walls to a thickness of 150 to 200mm. Generally the walls are only smoothened but in some cases rendered with a soft mud and sand mixture. This method of construction allows the builder to complete the walls, when he has the necessary help, in a few days, since he need not wait for each course to set and dry before he lays the next one. The walls also require no cover during rain, as the roof is already completed.

Google images

ATAKPAME WALLS

The name of this wall building method is associated with the town Atakpame in Togo. Although the method of building with molded wet mud balls is common in the northern part of Ghana, the Atakpame" method refers to a rectangular wall which has been properly laid out by the builder with pegs and string. The preparation of the mud is similar to that by the northern people. A pit is dug near the building place, the excavated mud is mixed with water, kneaded with bare feet and molded into balls of about 200mm diameter. Courses of up to 600mm in height are laid, each course covered with palm leaves and allowed to set and dry out gradually before the next course is added. Wet mud cannot bear its own weight and would slump otherwise. Each course is properly leveled out on the top; the sides of the wall are scraped smooth with an old cutlass. Openings for windows and doors are noted and left during construction. The wall thickness is generally about 300mm. After five courses has been reached, or a wall height (excluding the foundation) of approximately 2.50m and when the last course is still wet, holes are made into it at 600mm centers at the top through which ropes are drawn for fixing the wall plate of the roof framework. Lintels over doors and window openings are pieces of the Fan Palm. The walls are generally not rendered and the pronounced horizontal lines of the courses are clearly visible.

SUN-DRIED BRICK WALLS

From a borrow-pit close to the building mud is dug up, mixed with water and kneaded. The mixture is then pressed into wooden casts. The size of a brick is approximately 200 x 90mm. A drying shed is erected with timber posts, beams and a thatched roof. Under this the bricks are left to dry slowly. This may last, depending on the weather, up to two weeks. The bricks are laid with mud-sand mortar or a weak cement-sand mortar, where cement is available.

C.S.I.R (Building and Road Research Institute), K.N.U.S.T., Kumasi, Ghana Optimum Shelter Group,

ROOFS

The traditional thatched roof is a coupled-roof over a rectangular building layout with gable ends. The hipped-end-roof was introduced later. The roof has a pitch of about 45^0. For its construction the following materials are used:

Fan Palm (locally called “Agobeam”), resistant to termites and fungi, used for ridge beams, eaves beams, centre posts and wall plates, fronds are used as purlins; Savannah Bamboo (locally called “Pamplo”) used for rafters; thatch (locally known as “Ebe”), a common grass throughout the savannah areas used for roof.

WINDOWS AND DOORS

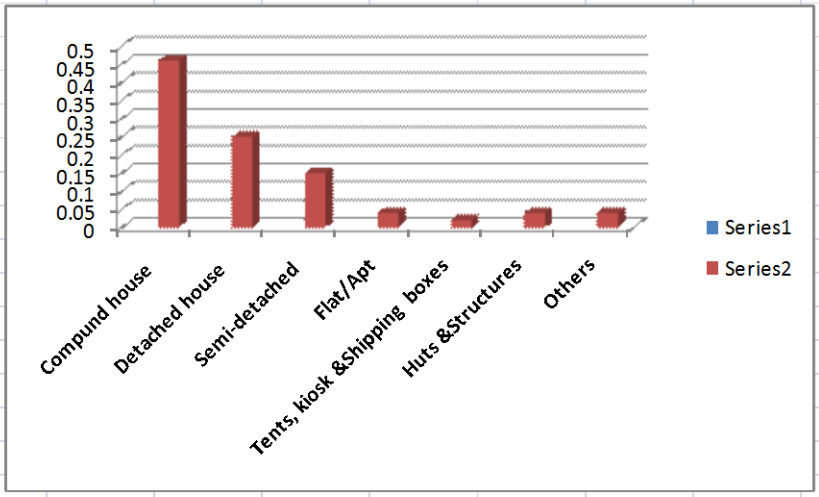
Window and door frames are fitted into the wall during construction, mainly in the Atakpame and sun-dried brick walls. Properly constructed arches from brick can also be found. The windows are wooden jalousie outward opening casement windows, or boarded and paneled window shutters, horizontally pivoted, with or without a fixed jalousie vent above. Doors are ledged, braced and boarded doors or

paneled doors. The ironmongery for windows and doors, e.g. hinges, bolts, hasps and latches is manufactured by the local blacksmith in the village. In the Akpafu area and Amedume Hills iron ore can be found.

The building types and methods found in the urban centers are different than those in the rural areas. Builders in the urban centers use imported materials as well as imported building techniques. In the rural areas, the methods employed in building houses are simple skills that have been passed down by generations. These methods produce houses that are of less durability than the building in the urban centers.

THE TYPE OF HOUSES BUILT IN GHANA.

DISTRIBUTION OF HOUSE TYPES IN GHANA	
Compund house	46%
Detached house	25%
Semi-detached	15%
Flat/Apt	4%
Tents, kiosk &Shipping boxes	2%
Huts &Structures	4%
Others	4%



Different styles of housing in different parts of the country. In the towns and cities most houses are built from concrete blocks with concrete floors. The better quality houses have tiled roofs; others have corrugated sheet metal roofs. The majority of houses are quite small and single storey. In rural areas, and especially in the north of the country, the prominent houses are made from concrete with a sheet metal roof but many are made from baked earth with a straw roof.

Concrete is extensively used because it's readily available, quick, cheap and easy. Timber is rarely used in houses except for doors, window and door frames and roof trusses.
In rural areas transporting concrete and concrete blocks is difficult and expensive. Materials that are immediately available like sandcrete blocks and rammed earth blocks tend to be favored.

In the recent Census, the Ghana Statistical Services (GSS) classified 'occupied dwellings' into 10 categories as follows: rooms in a compound, the separate house (detached house), semi-detached house, huts/buildings, improvised house (kiosk/container), living quarters attached to a shop, camps or tent, hotel or hostel, flat or apartment, and others.

Of these, compound houses – (in a compound house, several families occupy one room of a rectangular structure built around a central courtyard, with three or four rooms on each side of the rectangle. The families' share the building amenities like toilet facilities, standpipe, bathroom, electric meter and generally live in a communal form) accounted for 46% and emerged as the most common dwelling unit in both urban and rural areas. Separate or detached houses (25%) were found to be the second most common dwelling type in all regions (ranging from 15.9% - 27.2%) except the Volta Region (44.7%) where it is predominant. Semi-detached house (15%) is the third most common type in all regions and in rural (15.6%) and urban localities (14.8%). Flats or apartments ranked fourth in the country at (4%) and (7.2%) in urban localities. Improvised house (kiosk/Shipping boxes) and living quarters attached to a shop' (2%) were found mainly in urban localities of the Greater Accra and Ashanti Regions due to rural urban migration. In Greater Accra the nation's capital for example, these improvised houses (kiosks and containers) are used for both commercial and residential purposes. Huts and structures attached to compound houses constitute 4% and other houses such as guest houses, motels and hotels also make 4% - Bank of Ghana Report 2007.

HOUSING FINANCE IN GHANA

The development of housing finance is inextricably linked to a country's economic development, strengthening of financial institutions, reducing poverty, promoting social stability, and improving people's lives. The housing finance market is among the most important in any economy because it accounts for a sizeable portion of a country's productive activity through backward linkages to land and labor markets, and related industries. At the individual level, enabling access to homeownership will not only provide a most basic need, shelter, but will provide individuals with dignity and collateral – a means of economic empowerment.

Ghana's housing market was crippled by the unstable political climate of the early 1980s, people were afraid to own property because the rich and wealthy were being victimized. The years were also characterized by Government's lack of resources to provide appropriate housing. "Ownership of property, especially houses, is a very important aspect of the Ghanaian tradition. Houses do not only provide shelter, but also serve as a measure of social standing and prestige" (**Vuyisani Moss).** In spite of this premium placed on houses and property, the Ghana Real Estate Developers Association (GREDA) (1998) notes that only 5% of those who want to own a house can do so from their own resources. Others (60%) would need some form of financial assistance and the remaining 35% won't be capable of owning and building a house in a life time

Most households in Ghana use their own savings, sweat equity, barter arrangements and remittances to build their houses. The commercial financial institutions provide very little support to low and moderate-income households in the form of mortgages. Where it has done so, it has favored the owner occupied and new dwellings and offers very limited support to the rental and incremental housing

development. The traditional mortgage lender is limited in its ability to serve low and moderate-income households. The payment-income ratio is too high. Transaction costs in lending to this market are usually high and small loans are unprofitable and riskier for a commercial lender. Ferguson (1999) notes that incremental building process (building in phases) is the only building strategy that works for low and moderate-income households. In Ghana, people usually build in phases over a number of years.

MORTGAGE MARKET INITIATIVES

The banking system in Ghana did not escape the economic decline and political instability of the 1970s and 1980s. General lack of confidence in the banking system by the public, the banks' inability to engage in venture capital, high default rates, widespread fraudulent practices and lack of expertise to properly appraise projects were some of the problems facing the banking system (Hanson, 1999). A few banks in Ghana offer mortgages to High Net Worth customers. The First Ghana Building Society (FGBS) has so far been unable to provide mortgage financing on a sustained basis. Home Finance Company Limited (HFC) has turned out to be the dominant housing finance institution in Ghana, providing a wide range of mortgage financing on a sustained basis to a broad spectrum of customers.

The HFC was originally conceived to operate as a secondary mortgage institution providing sustained housing finance in a two-tier housing system. A two-tier mortgage financing system in Ghana was based on the following assumptions: that there would be strong Central Government support for HFC given the acute housing shortage; that the creation of HFC as a secondary mortgage institution would be the catalyst to jump start primary mortgage lending by banks after their restructuring.

The newly restructured banking system would be insulated from significant risk through an arrangement whereby the primary institutions would bear only 10% default risk, while the Government bore the

remaining 90%. HFC was thus to bear no default risk. The operation of the mortgage market has turned out differently as only one primary institution has been active in the market.

A loan of US$30 million was facilitated in 2006 by the Overseas Private Investment Corporation (OPIC) to support a solely private Ghanaian housing company, Ghana Home Loans. In August 2007, the International Finance Corporation (IFC) a member of the World Bank Group that provides investments and advisory services to build the private sectors in developing countries invested $25 million to support three financial institutions –Ecobank Ghana, Merchant Bank and Fidelity Bank, to boost their mortgage operations in Ghana. (Featured article 07/11/08 Daily Guide)

Both the government and the private sector recognize that financial support in the form of mortgage to qualified Ghanaians is one of the effective means of addressing the housing shortage. The above initiatives on the part of the Government in providing support for HFC and the loans by the IFC and OPIC to some banks in Ghana to originate mortgages are some of tangible efforts aimed at addressing the housing shortage.

SURVEY DATA RESULTS

A total of 12 middle class Ghanaians were surveyed to gauge their interest in prefab houses. The survey had 100% response rate. A total of 11 questions were administered to the renting respondents and 15 questions were administered to the owning respondents. It took about a week to receive all the responses.

The details of the responses are as follows:

50% of the respondents own houses or are in the process of owning a house, 41.66% of the respondents rent their living quarters presently and 8.33% were neither owning nor renting. This group of people would typically be living with their parents in a family house with a lot of spare bedrooms. There is also the possibility of such respondents living in the property of a relation who lives permanently abroad but visit Ghana occasionally during Christmas or other family ceremonies. It is typical for Ghanaians living abroad to build houses in Ghana as a second home. The houses serve as a measure of their success abroad and also provides a place for them to stay when they visit; it is cheaper than going to a hotel.

Results of the renting respondents

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
YES	83%	100%	33%	83%	83%	100%					
NO	17%	0	67%	17%	17%	0%					
2BRM							0%				
3+ BRM							100%				
20K-30K								33%			
30K-40K								17%			
40K+								50%			
MORTG									50%		
SAVN									50%		
PRECAST										17%	
TIMBER										0	
STEEL										0	
ALL MAT.										83%	
20K-30K											17%
30K-40K											83%

Q1 Do you rent a house presently

Q2 Do you have plans of owning a house

Q3 Would you consider a prefab house

Q4 Do you already own a piece of land

Q5 Do you have a preferred location in the city

Q6 Is it important that you have extra bedrooms and amenities

Q7 What size of house (in terms of bedrooms) would you like

Q8 What is your budget for a house

Q9 How do you hope to finance your house

Q10 what is your preferred material for a prefab house

Q11 How much would you be willing to pay for a prefab house

Results of owning respondents

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
YES	100%	83%	100%												
NO	0	17%	0												
MASONRY				100%											
AFFORDT.					17%										
SPEED					33%										
QUALITY					50%										
PURCHASE						17%									
BUILT						83%									
3BEDRM							33%								
4+BEDM							67%								
PROXIMITY								33%							
AVAILABILITY								67%							
MORTGAGE									67%	50%					
SAVINGS									33%	50%					
30K-40K											33%				
40K+											67%				
COST												67%			
DESIGN												33%			
CONTRACTOR													83%		
SELF SUPR.													17%		
1-2YRS														17%	
2-3YRS														33%	
3+YRS														50%	
PHASES															83%
CONTNUOUS															17%

Q1 Do you own a house presently

Q2 Is it a prefab house

Q3 Do you know someone who is also building his own house

Q4 what material is your house made of

Q5 if your house is not a prefab under what conditions would you consider a prefab house

Q6 Did you purchase or build your house

Q7 what size (in terms of bedrooms) is your house

Q8 how did you choose the location of your house

Q9 If you purchased your house how did you finance the purchases

Q10 if you built your house how did you finance the development

Q11 how much did you pay for the house

Q12 why did you choose to build instead of outright purchase

Q13 Did you engage a contractor or you supervised yourself

Q14 how long did it take or do you think it will take to complete the development process

Q15 Was the development process in phases or continuous

SURVEY DATA ANALYSIS

Analysis of the renting respondents

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
YES	83%	100%	33%	83%	83%	100%					
NO	17%	0	67%	17%	17%	0%					
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40K+								50%			
MORTG									50%		
SAVN									50%		
PRECAST										17%	
TIMBER										0	
STEEL										0	
ALL MAT.										83%	
20K-30K											17%
30K-40K											83%

Q1 Do you rent a house presently

Q2 Do you have plans of owning a house

Q3 Would you consider a prefab house

Q4 Do you already own a piece of land

Q5 Do you have a preferred location in the city

Q6 Is it important that you have extra bedrooms and amenities

Q7 What size of house (in terms of bedrooms) would you like

Q8 What is your budget for a house

Q9 How do you hope to finance your house

Q10 what is your preferred material for a prefab house

Q11 How much would you be willing to pay for a prefab house

Of the renting prospects, when asked if they had plans of owning houses, 100% of them said yes. This is not surprising. It is a confirmation of the observation made earlier by **Vuyisani Moss - "**Houses do not only provide shelter, but also serve as a measure of social standing and prestige"

When respondents were asked if they will consider prefab houses as part of their options when choosing a house, 33% said Yes and 67% said No. The 33% who said yes is an indication that there is some interest that can be explored. The 67% who stated no interest in prefab are the typical Ghanaians. A further inquiry revealed that, the 67% who said no, are concerned with society's perception of their house. Culturally in-situ construction is favored over prefab construction. Other also mentioned cost of the house implying that they perceive prefab houses as more expensive than in-situ houses.

When respondents were asked what size (in terms of bedrooms) of house they would like, 100% of them said three (3) or more bedrooms. This is also consistent with the Ghanaian culture that is still significantly extended. In Ghana when a young couple has a baby, it is typical for the wife's mother to come and stay with the young couple to help take care of the newborn and the mother. It is not uncommon to have the parents of both spouses to visit the new couple at the same time. it is also common to have relatives who visit the city for their own business to visit and stay with their kins in the city. The large houses are a measure of social standing and also a means to accommodate such cultural necessities.

When asked what their budget was, 33% of the respondents said (GHC 20,000 – 30,000), 17% said (GHC 30,000 -40,000) and 50% said GHC 40,000 or more. The exchange rate as at 07/12/11 is **GHC 1** is equivalent to **US$ 0.6589** http://www.xe.com/ucc/convert/?Amount=1&From=GHS&To=USD . The

middle class Ghanaian earns between $1 1,000 and $30,000 per annum. This response signifies a willingness to spend at the lower end of the range, three times the annual gross salary and for the upper end of the range the whole annual salary.

When respondents were asked how they hoped to finance their houses, 50% of the respondents said they will use mortgage and 50% said their own savings. I personally find this response very interesting, that 50% will consider mortgage. The typical Ghanaian has traditionally used his own savings to develop his house. The response is an indication that the banking sector is becoming vibrant and it is becoming easier to access mortgage if you have a regular source of income. This is healthy for the building industry. A financial services company in Ghana offers mortgage to qualified applicants for a term of up twenty (20) years at varying interest rates and it requires a 20% down payment. The monthly debt service is up to 40% of the Mortgagee's monthly income.

When respondents were asked if they already own a piece of land, 83% of the respondents said yes, they already owned a lot. 17% of them said No. However, most people have inherited the land from their parents as part of family land. This type land usually lacks title or deed and therefore will not be good as collateral for a mortgage. As a result of the severe housing shortage and the prestige place on houses, the average person from college who successfully lands a job is admonished by his parents to immediately put money aside to purchase some piece of land to start building his house gradually. Some well to do parents acquire lots on behalf of their children to increase their chances of owning their own houses. Renting a house in Ghana is an unpleasant experience.

When respondents were asked if they had a preference for a particular location in the city for the location of their property, 83% of the respondents said yes and 17% said no. The distribution of social services in Ghana is very uneven, apart from the central part of Accra and a few old planned

communities. The entire capital city lacks adequate distribution of power, portable water, and tarred roads. In some areas it is not uncommon to have lack of power or the flow of portable water for days. In Ghana these services are provided solely by the government so people do not have the option of switching to a different supplier. The government has not adequately covered the city with these services so everyone would like to live where there is access to these services. This might explain why most people have a preference for a particular location.

Respondents were asked if it was important for them to have the following amenities: kitchen, toilet facilities, backyard, extra bathroom and porch as part of their house, 100% of the respondents said yes.

When respondents were asked what material would they want their prefab houses to be made of, 17% of the respondents said they would prefer precast concrete, and 83% of the respondents said they would prefer a combination of building materials –timber, sheet metal, glass and precast concrete.

Respondents were also asked how much they would be willing to pay for a prefab house, 17% of the respondents said they would be willing to pay (GHC20,000 – 30,000) and 83% of the them said they would pay (GHC 30,000 – 40,000).

Analysis of owning respondents

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
YES	100%	83%	100%												
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COST												67%			
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1-2YRS														17%	
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Q11 how much did you pay for the house

Q12 why did you choose to build instead of outright purchase

Q13 Did you engage a contractor or you supervised yourself

Q14 how long did it take or do you think it will take to complete the development process

Q15 Was the development process in phases or continuous

A total of 6 respondents acknowledge either owning their houses or in the process of owning t a house.

When respondents were asked what material their houses were built of, 100% of the respondents said masonry – sandcrete blocks and in-situ concrete. This is very consistent with the building industry in Ghana. Masonry is the cheapest and most common building materials in Ghana. The construction labor force in Ghana is also most familiar working with masonry and new material will require some retraining of personnel to make them conversant with the skills required to work with.

When respondents were asked whether their houses were prefab or in-situ construction, 83% of the respondents said their houses were in-situ and 17% said their houses were prefab. I find it a little curious that some people already own prefab masonry houses in Ghana. These kinds might be from the colonial era. Some parts of the capital city that were inhabited by the European colonial masters in the late nineteenth and early twentieth century could have been prefab houses. Some of these houses are rented out to young people who get jobs in the city and have to relocate from some parts of the country to the capital to work.

Respondents were also asked under what condition they would be willing to consider prefab houses. 17% of the respondents said affordability – if the prefab houses were more affordable than the traditional houses they would go for prefab houses. 33% also mentioned speed of obtaining the house

as a factor that would make them consider a prefab house. 50% of the respondents said they would consider prefab houses for their quality of workmanship.

When respondents were asked whether they purchased or built their houses, 17% responded that they bought an already built house, 83% of the respondents said they built their houses themselves.

Respondents who had indicated they purchased their house, they were asked how they financed the purchase of their house, 67% of the respondents said they used mortgage and 33% said they used their own savings. This response confirms the earlier observation that the banking sector was becoming vibrant and the middle class Ghanaian was becoming more aware of the use of mortgage to finance development and even more importantly, it was becoming easier to obtain a mortgage if one had a regular source of income.

For those who indicated that they built their house, 50% said they used mortgage and the remaining 50% said they used their own savings. This is a good trend, that people are accessing mortgage to build their houses.

When respondents were asked why they chose to build themselves instead of an outright purchase, 67% of them said the cost of the house was a factor that influenced their decision to build instead of purchase an already built house. http://www.ghanaweb.com/GhanaHomePage/realestate/ prices for completed houses in Ghana range from $40,000 to $400,000. People choose to build themselves because they feel they would be able to derive more value per a dollar than they would get from an outright purchased. 33% responded that they wanted to have an input in the design of their house. From the notion that houses are life-long assets, people feel attached to their homes as a result, they would like to be involved in the decision to create the location and sizes of the spaces they will be occupying for the rest of their lives.

When respondents were asked how much they paid to purchase or develop their homes, 33% of the respondents said they paid GHC (30,000 – 40,000) and 67% said they paid GHC 40,000+ for their homes. What is not obvious from the response is whether these amounts were what the respondents were willing to pay for the houses or these sums were what they had saved or they could access from their banks.

When respondents were asked what the sizes (in terms of no. of bedrooms) of their houses were, 33% of them said their houses were 3 bedrooms and 67% said 4 or more bedrooms. The average Ghanaians desire for large houses even though they cost more is culturally influenced as has been discussed earlier. The extra bedrooms help to host other family members during festive occasions or during extended visits by relatives from other parts of the country or town.

When the respondents who built their houses were asked if they engaged a general contractor or self supervised their development, 83% said they engaged a general contractor and 17% said they self supervised. This trend is also an improvement on the prevailing tendencies. This is good for the building sector; it will create jobs for a lot of informal contracting enterprises. This trend is also an indication that the middle class are beginning to seek professional building services.

When respondents were asked whether their development was in phases or continuous, 83% of them said it was in phases – meaning the substructure is first completed and a fallow period elapses after which the superstructure block work up to the lintel and another fallow period is observed before the substructure gets completed and subsequently the finishes are undertake. The fallow periods afford the building owner sometime save or secure additional financing to continue the development process.

When respondents were asked how long on the average it took for them to complete their development, 50% of the respondents said it took 3 or more years to complete the development, 33% said the development took 2- 3 years and only 17% of the respondents said their development process

to 1- 2 years. This extended duration of development is as a result of developing in phases, and the development in phases is also because the funds for development are accumulated from savings over the course of the development. Even for those who use mortgage, the funds are provided by the banks in tranches. The typical project is broken down into phases by the credit department of the bank and the credit officer works with the mortgagee, when the first phase is completed, pictures of the ongoing project are taken and a report is written and placed on file before the second tranche is paid. This process repeats itself until the building is completed. It must be mentioned that this extended process usually comes at some cost because the cost of materials and labor goes up this inevitably overrun the cost of the project. Most people developing in Ghana usually overrun their development cost by at least

20%. However employs the protracted process to protect capital. Some people as the mortgage and apply the funds to other endeavors. Some people buy new cars and other also use their funds for elaborate marriage ceremonies or attend to family issues.

When respondents were asked how they chose the location for their houses, 33% of them said the choice was based on proximity to work and family and 67% of them said the choice was influenced by the availability of land for sale. As has been made clear earlier, in Ghana land is owned by tribes – "stools and skins ". The stools and skins are the symbols of authority of the chiefs. The chiefs of southern and middle Ghana sit on stools and those in the north sit on skins. Land transactions are usually fraught with a lot of litigations. Some land developers have paid huge sums of money to the tribal leaders to acquired large parcels of land; they have also dealt with a lot of the issues that are likely to result in litigations. The land developers have in turn sliced the large parcels into "plot" of sizes ranging from 70'x 100' to 100' x 100'. These "plots" are marketed and sold to people who prefer to deal with these land developers than the tribal leaders directly. These "plots" do not always have access to services like roads, water and power. The people who buy these "plots" are responsible for drawing these services to

the “plots”. There are some developed lands (serviced plots) that have these services connected to the “plots” but these are prohibitively expensive for the middle class Ghanaian. “Serviced plots” sold in Ghana cost from $6,500 - $20,000 depending on the location of the lot.

The respondents were finally asked if they knew someone who was also building his or her own house, 100% of the respondents said yes. This is clearly delineates the state of affairs in the country. It is everyone’s desire to own a house, it is a measure of social standing and security and in the short term, rents in Ghana are very high and one has to pay in advance two (2) years rent to landlords to lease a property, it is no different when the lease expires and it has to be renewed.

CONCLUSION

Government of Ghana Prefab Project in 1952

The failure of the prefab housing project in Ghana is not very different than what has happened in other low-income countries. The economic and social factors that make prefab housing successful in developed countries such as: well functioning market economy, heavy industrialization and a well developed housing sector devoid of informal or small scale contractors are absent in developing countries and the absence of these factors undermine all efforts to implement prefabrication programs.

Removal housing shortage is an economic issue not a physical issue – (W.P Strassman 1974). Implicit in Strassman's statement is the fact that, for prefabrication to be successful in any country, the country's economic variable must be very strong. This is consistent with the success of prefabrication programs in France and Austria, the case studies cited above.

In 1952, Ghana's economy was largely agrarian, Cocoa was it main export commodity. It had a budding industrial sector and non-existent financial and banking sector. Ghana's transportation infrastructure was also undeveloped. The Tema motorway and the Tema harbor were yet to be constructed and not many tarred roads existed.

In the light of the above, I can fairly conclude that the Government's prefab housing program failed because the economic and social structures required to support the program was lacking and the government had to provide those resources within a short time for the prefab program, and that meant a significant upfront investment which funds the government did not have or had not budgeted for. The investment was required for the setting up and operating of the three prefabrication factories in Accra, Tarkoradi and Kumasi. It was also required of the government to purchase or provide a purchase guarantee for the 9,000 units of houses that would be produced annually and subsequently sell it at a

subsidized rate to the targeted group. This would have involved a large amount of the government's budget more than the Government had allocated for housing for any given year.

Further, the price point per unit area of the prefab houses to be produced was higher than the houses produced by the traditional method, though the prefab houses required more man hours to construct and did not offer any measurable advantage over the traditional buildings.

Middle income Ghanaian's interest in Prefab houses

From the responses received in the survey, there exists some knowledge of prefab houses in Ghana among the middle class Ghanaians. There is also some interest and a willingness to adopt prefab houses as dwelling units among theses income group. However, the expressed interest is under some caveat. The prefab houses would be an alternative to the traditional in-situ houses if they are delivered within the following parameters:

1. That is relatively cheaper than the traditional in-situ houses on a per square foot basis

When the renting respondents were asked how much they are able and willing to pay for a house, 83% of them said they can afford between (GHC 30,000 and 40,000)

2. That it can be delivered within a relatively shorter period compared to the in-situ houses

When the owning respondents were asked what factors would make prefab houses more acceptable to them, 33% of them mentioned speed of delivery as a factor.

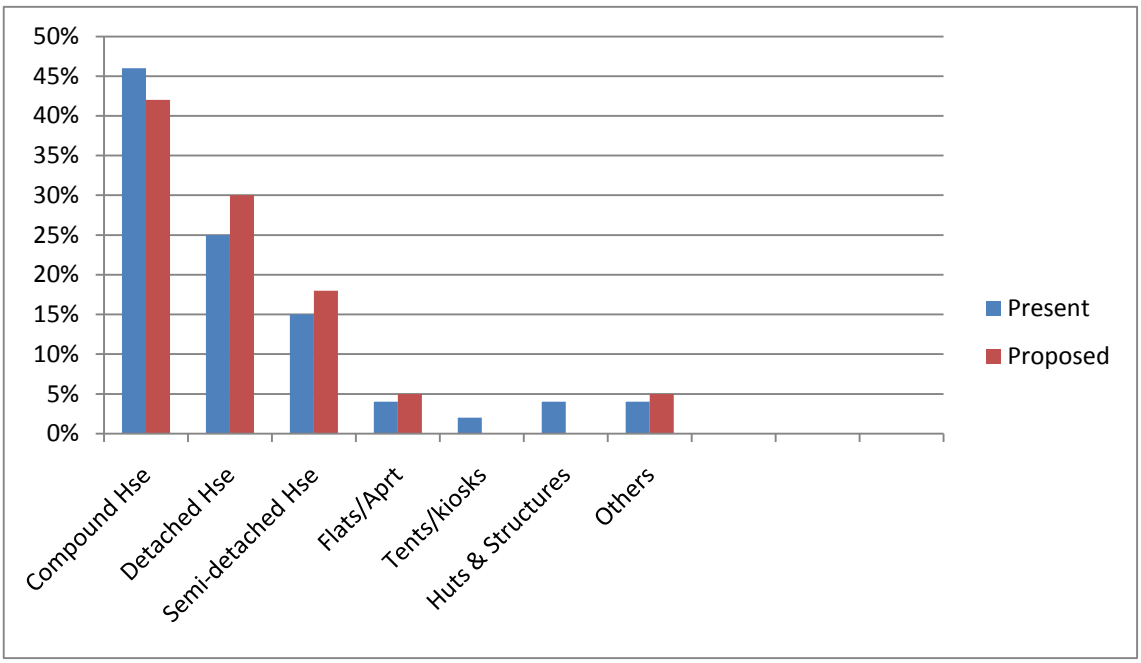
3. That the quality of the finished end product will be superior to the traditional in-situ houses

50% of the respondents who either own or a are in the process of owning a house mentioned quality of final product as a factor that would make prefab houses more acceptable them.

Under the above conditions the prefab houses will gain acceptability among the middle income Ghanaians. The degree of the success will improve if these prefab houses are built on service plots that have access to power, portable water, streets and drains.

RECOMMENDATIONS

PROPOSED AND PRESENT TYPES OF HOUSES IN GHANA



The economic situation of Ghana has improved a bit since 1952 in terms of standard of living, DGP and economic activities. http://www.indexmundi.com/ghana/economy_profile.html

http://www.voanews.com/english/news/africa/decapua-poverty-trap-12jul11-125425588.html.

This means that the factors that undermined the success of the prefab housing program in 1952 are not completely present. However, a safer proposition from my point of view would be partial prefabrication where some prefabricated components are combined with the traditional method of constructing. This is already underway in Ghana by companies like Trassaco, ACP concrete products, CP, Osiadan, Phastor and other smaller manufacturing firms. This recommendation is consistent with the response by the 33% of respondents whom are willing to consider prefab houses. The degree of interest needs to be cultivated with partial prefabrication to grow to a point where prefab is acceptable by 60 or 80% of the population. My expectation is that, if these efforts are intensified and more building elements are

prefabricated, this would make them more accessible, and cheaper because of competition among the producers. As the general population becomes better acquainted with these products and confidence in their suitability grows, it will become very easy to produce and sell prefab houses in Ghana.

50% of the respondents who own houses mentioned that, it took 3 or more years to complete their house. The common thing is that while they are on the project, they may be renting an apartment and paying rent. The monthly rent paid by the middle class ranges from $200 -$300. Over a year, this comes up to $2,400 - $3,600 and over the period of 4 years before the house is occupied the amount spent on rent is in the ranges of $9,200 – $14,400. This is about a third of the amount the average person said s/he is willing to spend of a house. All things being equal, if this money can be saved, the time it takes to develop the house can be reduced by a third. The significant cash out lay in rents negatively affects the ability of the potential house owner to complete his/her project on time.

I recommend that the concept of expandable houses should be promoted. If houses can be designed with a core part that can be constructed first and can be occupied with minimal inconvenience during construction, this will save people a lot of money that would otherwise have gone into rents. This savings in rents will also ensure quicker completion of houses.

Finally, a combination of partial prefab and the concept of expandable house will provide potential home owners with the dual benefits of a good price point and the flexibility of construction because, the house would still be completed in phases so the investment is not upfront and some sweat equity may be involved and also the core of the house can be occupied while the other parts follow saving imputed rent that can be invested in the project to complete the house quicker. This gives the best of prefab – speed and quality and the best of the traditional method – flexibility of construction.

APPENDIX

Survey questions for owning respondents

Prefabricated houses are houses that have the components built in a factory and the complete house assembled on site

1 * Do you own a house

- ( ) Yes
- ( ) No

2 * What material is the house built of

- ( ) Timber
- ( ) Masonry (sandcret blocks, bricks and concrete)
- ( ) Steel
- ( ) Other

3 * Is it a prefabricated house

- ( ) Yes
- ( ) No

4 * If no, under what conditions would you consider a prefabricated house

- ( ) Affordability
- ( ) Speed of acquisition
- ( ) Quality of workmanship

5 * Did you purchase or build your house

- ( ) Purchase
- ( ) Built

6 * what is the size of your house

- ( ) 2-bedrooms

- ( ) 3-bedrooms
- ( ) 4 or more bedrooms

7 * How did you choose the siting of your house

- ( ) Proximity to family and work
- ( ) Availability of land for sale
- ( ) Family land
- ( ) Access to social services

8 * If you bought the house, how did you finance the purchase

- ( ) Mortgage
- ( ) Own savings

9 * How much did you pay for the house?

- ( ) GHC (20,000 - 30,000)
- ( ) GHC (30,000 - 40,000)
- ( ) GHC 40,000 +

10 * If you built your house, how did you finance the development

- ( ) Mortgage
- ( ) Own savings

11 * Why did you choose to build instead of outright purchase

- ( ) Location
- ( ) Cost
- ( ) Design considerations

12 * Did you engage a Contractor for the development process or you self-supervised

- ( ) Contractor
- ( ) Self-supervision

13 * How long did it take you or do you think it will take to complete the house

- ( ) 1-2 years
- ( ) 2-3 years
- ( ) 3 + years

14 * Was the development process if phases or continuous

- ( ) Phases
- ( ) Continuous

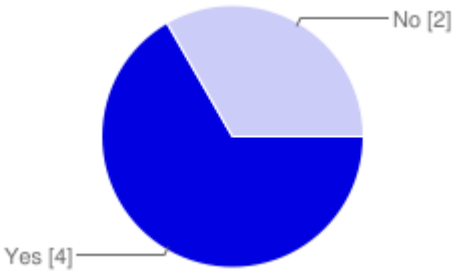
15 * Do you know someone who is also building his own house

- ( ) Yes
- ( ) No

6responses

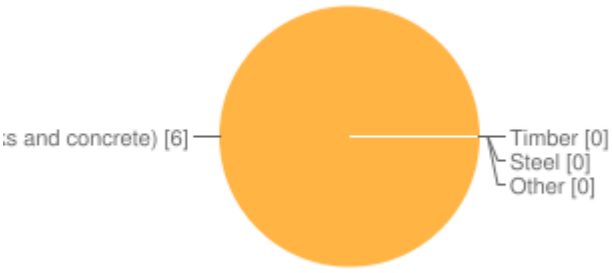
Summary See complete responses

1



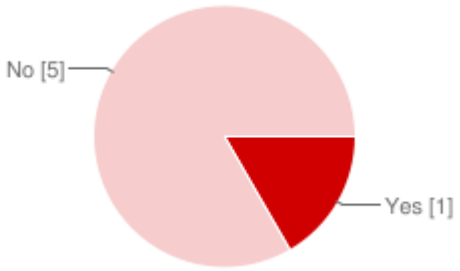
Yes	**4**	67%
No	**2**	33%

2



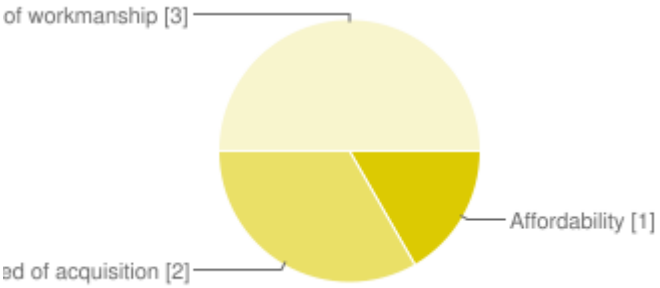
Timber	**0**	0%
Masonry (sandcret blocks, bricks and concrete)	**6**	100 %
Steel	**0**	0%
Other	**0**	0%

3



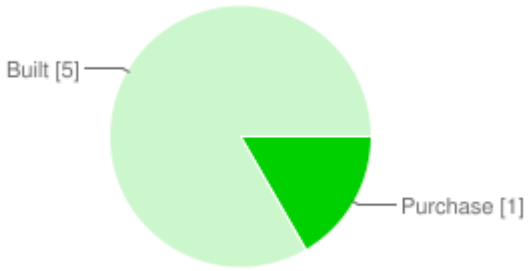
Yes	**1**	17%
No	**5**	83%

4



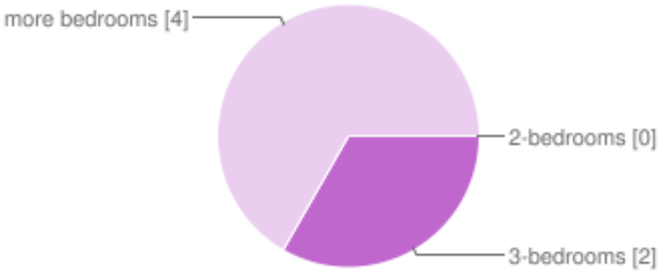
Affordability	**1**	17%
Speed of acquisition	**2**	33%
Quality of workmanship	**3**	50%

5



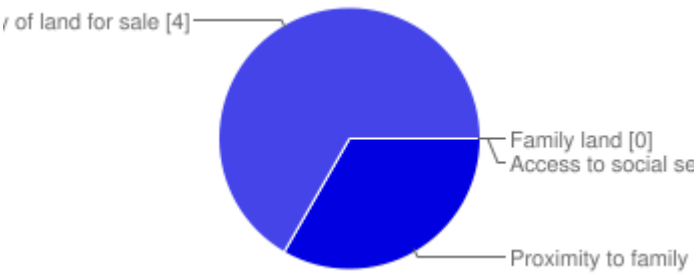
Purchase	**1**	17%
Built	**5**	83%

6



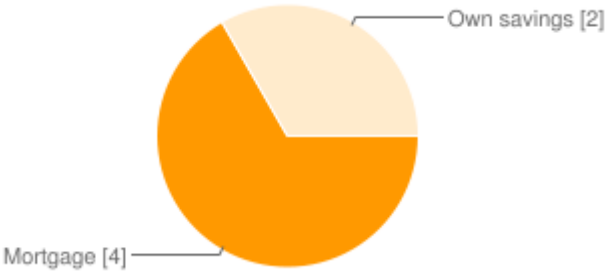
2-bedrooms	**0**	0%
3-bedrooms	**2**	33%
4 or more bedrooms	**4**	67%

7



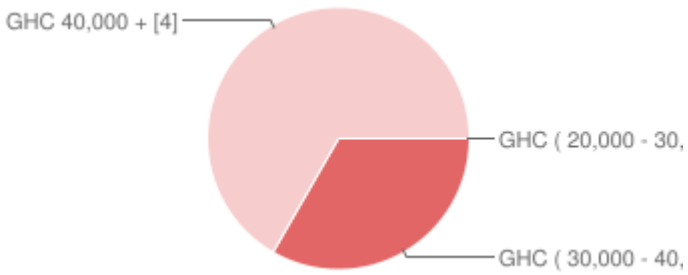
Proximity to family and work	**2**	33%
Aavilability of land for sale	**4**	67%
Family land	**0**	0%
Access to social services	**0**	0%

8



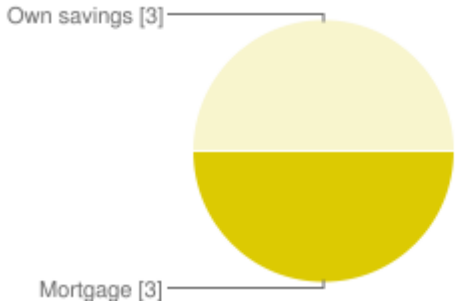
Mortgage	**4**	67%
Own savings	**2**	33%

9



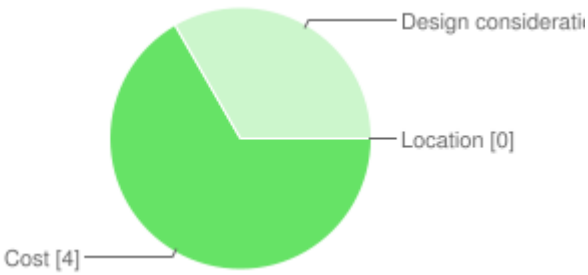
GHC (20,000 - 30,000)	**0**	0%
GHC (30,000 - 40,000)	**2**	33%
GHC 40,000 +	**4**	67%

10



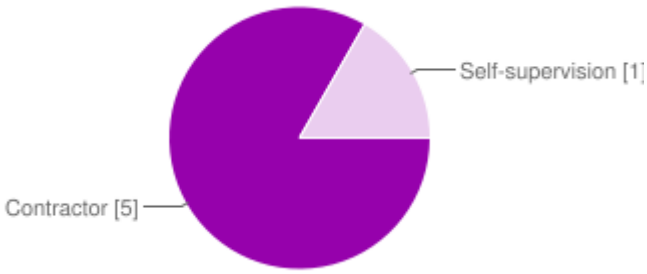
Mortgage	**3**	50%
Own savings	**3**	50%

11



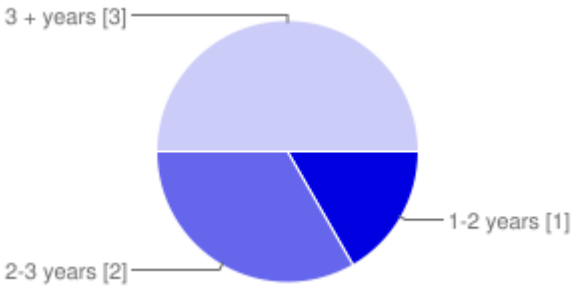
Location	**0**	0%
Cost	**4**	67%
Design considerations	**2**	33%

12



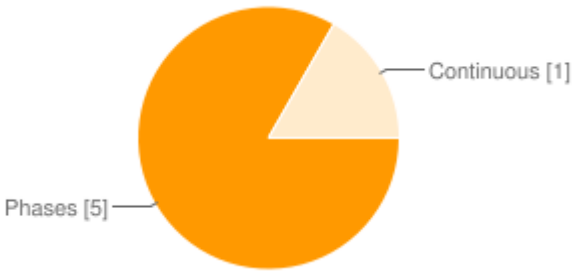
Contractor	**5**	83%
Self-supervision	**1**	17%

13



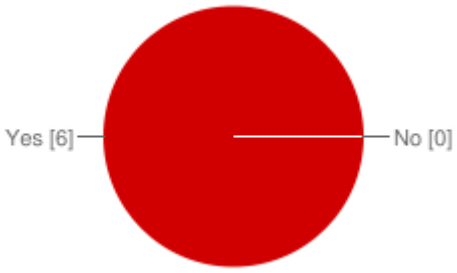
1-2 years	**1**	17%
2-3 years	**2**	33%
3 + years	**3**	50%

14



Phases	**5**	83%
Continuous	**1**	17%

15



Yes	**6**	100%
No	**0**	0%

Survey to investigate the interest of the Middle class Ghanaian in Prefabricated Houses MIT THESIS (respond only if you are renting a house)

Prefabricated Houses are houses which have the components made in the factory and assembled on site

1 * Do you own or rent a house presently

- ( ) Rent
- ( ) Own
- ( ) None of the above

2 * Do you have plans of owing a house?

- ( ) Yes
- ( ) No

3 * If yes what kind of house are you considering, would you consider buying a prefabricated house?

- ( ) Yes
- ( ) No

4 * What size of house would you like

- ( ) 1 Bedroom
- ( ) 2 Bedroom
- ( ) 3 or more Bedrooms

5 * What is your budget?

- ( ) GHC (20,000 - 30,000)
- ( ) GHC (30,000 - 40,000)
- ( ) GHC 40,000+

6 * How do you hope to finance the house?

- ( ) Own Savings
- ( ) Mortgage

7 * Do you already have a piece land?

- ( ) Yes
- ( ) No

8 * Do you have a preference for any particular location in the city?

- ( ) Yes
- ( ) No

9 * Is it important to you that your house has the following features eg. Porch, store, backyard, living room, Kitchen and an extra bathroom

- ( ) Yes
- ( ) No

10 * If you would consider a prefabricated house which Building Material would you prefer the house made of

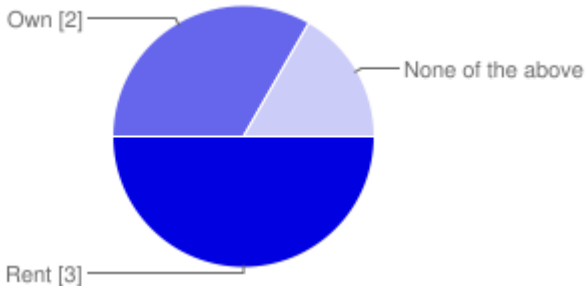
- ( ) Timber
- ( ) Precast Concrete
- ( ) Metal Sheeting
- ( ) A combination of all the Above

11 * If you would consider a prefabricated house how much would pay for it

- ( ) GHC (20,000 - 30,000)
- ( ) GHC (30,000 - 40,000)
- ( ) GHC 40,000+

Summary responses

1

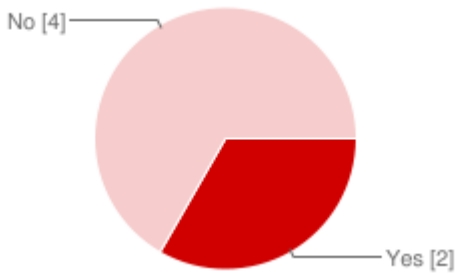


Rent	**3**	50%
Own	**2**	33%
None of the above	**1**	17%

2

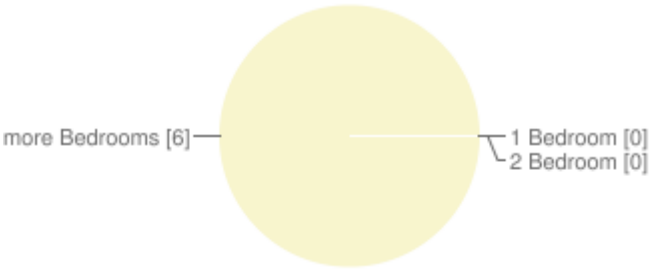
Yes	**6**	100%
No	**0**	0%

3



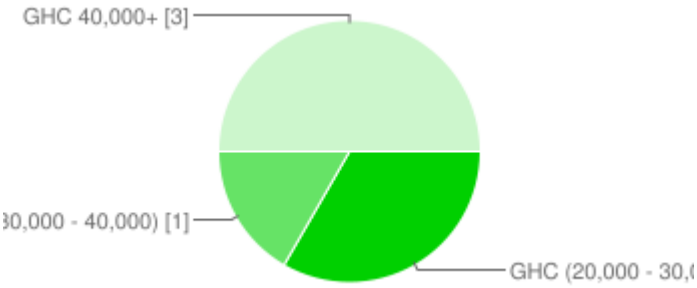
Yes	**2**	33%
No	**4**	67%

4



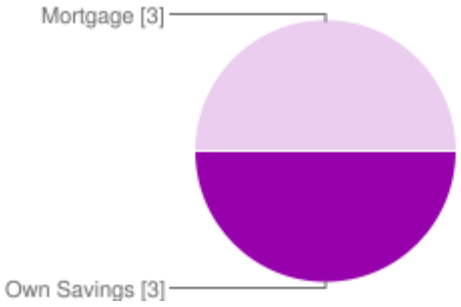
1 Bedroom	**0**	0%
2 Bedroom	**0**	0%
3 or more Bedrooms	**6**	100%

5



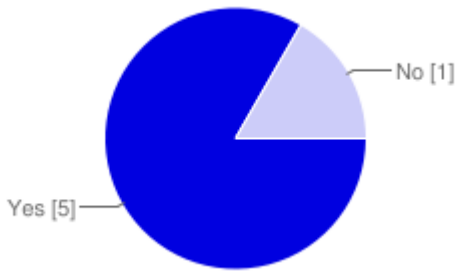
GHC (20,000 - 30,000)	**2**	33%
GHC (30,000 - 40,000)	**1**	17%
GHC 40,000+	**3**	50%

6



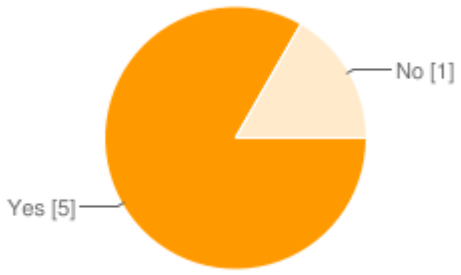
Own Savings	**3**	50%
Mortgage	**3**	50%

7



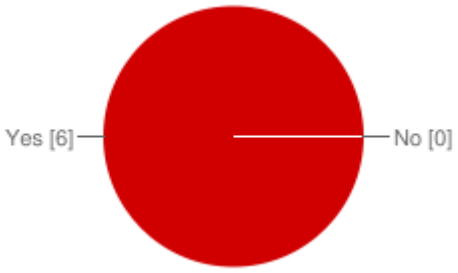
Yes	**5**	83%
No	**1**	17%

8



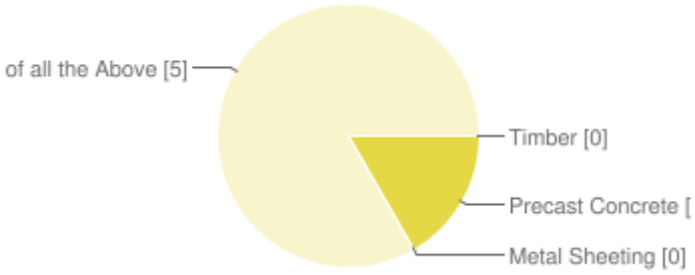
Yes	**5**	83%
No	**1**	17%

9



Yes	**6**	100%
No	**0**	0%

10



Timber	**0**	0%
Precast Concrete	**1**	17%
Metal Sheeting	**0**	0%
A combination of all the Above	**5**	83%

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