

The Brick Industry in Ghana: Historical Contexts, Advocacy and Way Forward

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The paper looked at historical antecedents of bricks industry in Ghana, its challenges and how governments and individuals have supported bricks advocacy in Ghana. The properties of clay minerals for structural products are tolerable among Ghanaian clays and though composite formulations have improve the suitability of the clay material for bricks production, its advocacy for construction in Ghana has not been fully pushed for. Through historical and descriptive methods, the study revealed that the brick industry in Ghana have suffered challenges such as poor management, limited technical-know-how, weak infrastructure, quality control and socio-cultural issues. Governments over the years have tabled good policies but implementation have been poor. The paper recommended among others that cottages and other projects such as public buildings, government affordable housing projects be built with bricks to encourage individuals to patronize bricks.

Keywords: brick industry; ghana, clay history, advocacy, infrastructure

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INTRODUCTION

The brick industry has been one of the earliest industries that has contributed immensely to development of every nation. When we put the industry into global setting, we begin to surmise the greater contributions nations have derived from and the profound reality of how Ghana is not making use of this industry. It has been a natural practice that many use materials that are abundantly available in their immediate environment as the basis for setting up industries. For example, in Atlanta Georgia located in the southeastern part of the United States, bricks building is very common simply because there are large tons of clay available. In other states, it is wood especially Pacific Northwest regions in the United States. Ghana as a country has lived on aid for as long as our minds can go far. We have always looked elsewhere for support and have struggled to live with our abundant available materials and resources. A country that has cocoa, minerals such as gold and in 2010 started drilling oil in commercial quantities yet have not done enough in that industry. Despite these resources and many others, we have always run to others for end products of our own resources that were exploited from our rich land.

The Ghana Geological Survey (1999) reported tons of deposits of clay in almost every region in the country. The importance of clay is demonstrated mainly in various applications that are documented as well as those classified as traditional uses without prior scientific knowledge. In Ghana, the use of clay extends from traditional uses such as geophagy to contemporary use in pottery, construction and water purification. Clay is overly distributed and each deposit has unique properties that can be tailored towards a particular application. This clay material is a chief component to the production of pottery, bricks and tiles (Kesse, 1985). The pottery industry just as the brick industry in Ghana have faced challenges militating against its development. Empirical findings reveal that apart from the socio-economic benefits it provided, it made us self-reliant on our available resources (Nortey et al, 2017a).

Konadu et al (2013) revealed that low plasticity found in kaolin clay minerals are suitable for the production of structural products such as bricks and tiles. These deposits are available and accessible in almost every region in Ghana. Structural products are mainly popular with non-plastic clays which is commonly kaolin based.

However, plastic clays in the right proportions with non-clay materials have been successful for the production of bricks. Bauxite, red mud and plastic clay from Ghanaian communities of Awaso and Tetegbu respectfully formed a composite to produce bricks of optimal mechanical strength (Konadu, et al, 2013). The properties of clay minerals for structural products are tolerable among Ghanaian clays. Composite formulations may also improve clay suitability for structural products. Despite the availability of the clay material and suitability for bricks production, its advocacy has not been fully pushed for.

Bricks have thrived over thousands of years because of their durability and longevity and have comparatively the least maintenance cost over time. The ceramic industry in Ghana has been one of the industries struggling to attain viability although there are pockets of the pottery activities that have continued to be in production despite numerous challenges. Carlton (2006) recorded modern pottery-making traditions of the western Balkans are amongst the most diverse in Europe, having developed by a process of invention, invasion and local adaptation and change into a proliferation of forms fully reflective of the long and complex history, not to mention present ethnic diversity of the region. This suggests that that the art of producing pottery and ceramics have gone through some developments and indeed these developments are championed by the practicing artist and government.

Several visits to bricks production sites in Ghana clearly revealed that the bricks industry is dipping down gradually. The demand for bricks is very low as compared to sandcrete blocks. This according to sources are attributed to the inability of stakeholders to include the use of burnt clay bricks in their building projects. In many state funded projects, sandcrete blocks are used and burnt bricks are largely excluded from all the projects right from the bidding stage. According to Adogbo and Kolo (2009), studies have shown that despite the modern and innovative materials in the market, there is still the need to go back to traditional material products. It is interesting to note that buildings such as The Ramseyer Memorial Presbyterian Church, Wesley Cathedral and Military Museum all in Adum Kumasi and several brick buildings in Accra built are still very attractive and in habitable conditions. Despite these evidential proofs, Ghanaians seem to prefer sandcrete blocks to burnt bricks even though burnt bricks exhibit numerous qualities. One significant importance of bricks is that it exhibits better thermal insulation property than other building materials such as concrete. Perforation can

improve the thermal insulation property of bricks to some extent. The mass and moisture of bricks help to keep the temperature inside a brick house relatively constant. [Cultrone et al. \(2004\)](#) examined the thermal conductivity of bricks and revealed that the thermal conductivity of bricks measured at various water content and densities have shown that the thermal conductivity of denser bricks is higher

than less dense bricks. The increase in thermal conductivity due to wetting varies from brick to brick and may be as low as five percent (5%) or as high as thirteen percent (13%) for one percent (1%) increase in moisture content. Generally, the thermal conductivity is doubled when it is saturated with water ([Elert, et al., 2003](#)).

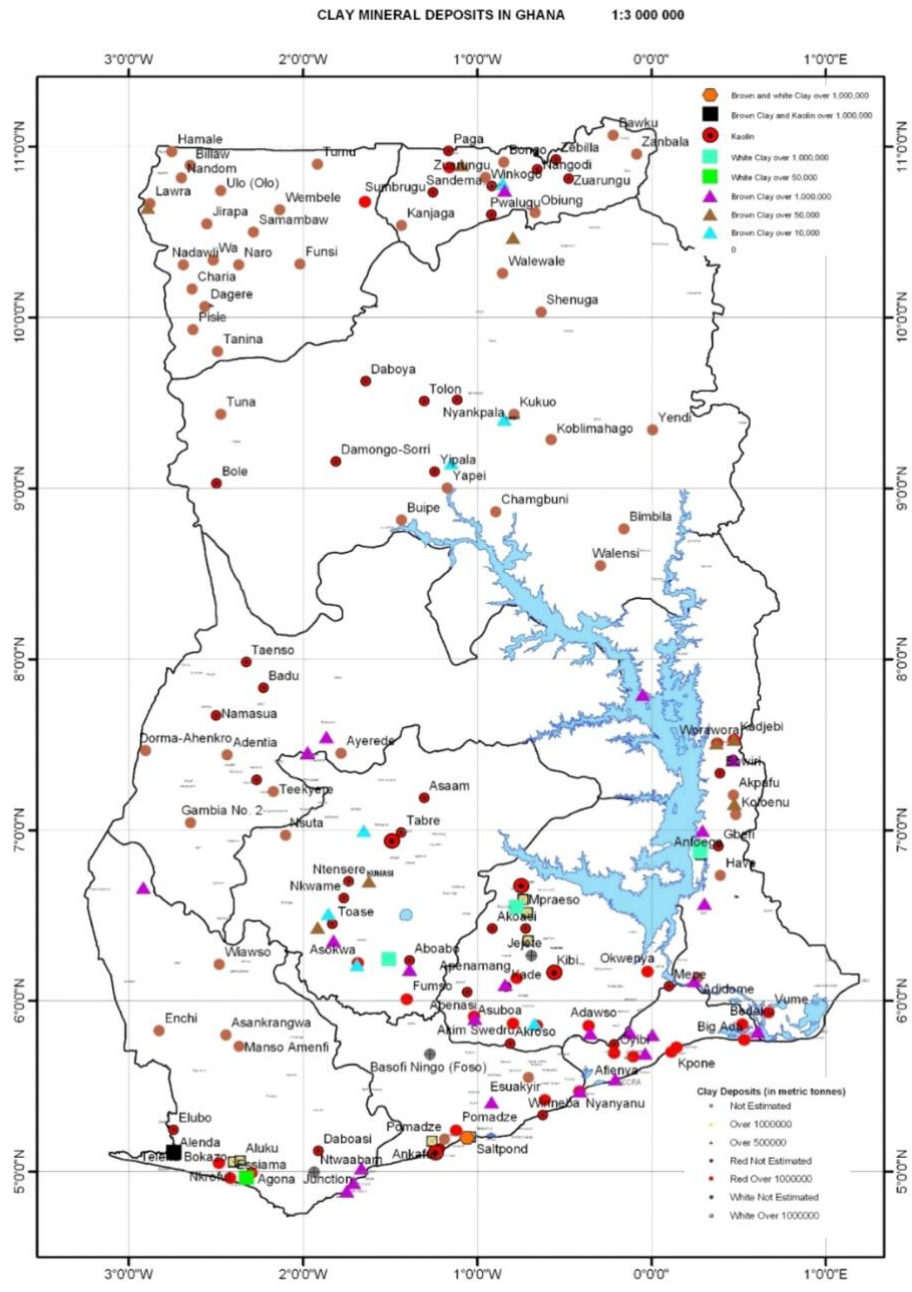


Fig. 1. Map of the Clay mineral deposits in Ghana showing the clay deposits spread across the entire land area. The country has 238,535km² land size with significant amount of clay reserves in commercial quantities. Source: Ghana Geological Service

Ghana has a housing deficit of approximately 1.7million units. Currently, the annual housing requirement in Ghana is about 50,000 units, while the annual housing supply stands at 25,000 units. Cement production in the country relies heavily on imported clinker and gypsum which cost the country

at least US\$300 million annually (Daily Graphic online, 2014). Despite this situation, there is very low official and private commitment to the use of local building materials such as burnt bricks, pozzolana cement and compressed earth blocks or bricks. This study provides historical background to

Ghana's bricks productions, examines challenges and the role of government advocacy to its usage and discusses alternatives to nipping these challenges in the bud.

METHODS

This study employed an argumentative research approach based on 23 years experience in the ceramic industry including the brick sector. It involved extensive travels to various bricks and tile companies that are functioning and those that have collapsed. These archival visits provided details to how these companies were managed and collapsed. Purposive and convenient sampling techniques were used to gather companies such as Saltpond Ceramics in the central region, Vicalex Bricks and Tile in the Ashanti region, Alajo Bricks and Tile in Accra, Adidome Bricks and Tiles in the Volta region and Prampam Brick and Tile.

RESULTS AND DISCUSSION

This section is devoted to rigorous discuss on Ghana's Brick Industry based on the following research gaps. 1. What are the historical perspectives on Ghana's Brick and Tile Industry 2. What are the challenges of Ghana's Brick and Tile Industry and how do we nip these challenges in the bud?.

Research Question One: Historical Perspectives on Ghana's Brick and Tile Industry

The relevance of the brick and tiles industry and clay products generally in our social and economic development goes beyond any imagination. The industry represents the core sector for industrialization in many countries over the years. The industry forms the base for ceramic production and when developed has the potential to create employment opportunities, cost savings, import substitution and foreign exchange savings as well as the growth in many others sectors of the economy, especially in the housing sector.

In the past, efforts were made to grow the industry with several government interventions as well as private initiatives. For some inexplicable reasons, the growth of the industry has remained stagnant over a long period. It is really important to note that if we want to cause a significant improvement in the housing delivery in this country, reduce our import bill and create meaningful employment sector for our youth then this is the time to actualize the necessary interventions to revamp the clay industry in the short, medium and long terms and advocate for its products.

The brick and tile industry was a formulated and extensive plan for a West African Institute of Arts, Industries and Social Sciences which included a huge pottery and bricks and tile factory at Alajo ([Woets, 2014, p.8](#)). This brick and tile factory started operating in 1943 when the British government in London released the necessary funds. Woets ([2014](#)) recorded that Michael Cardew worked and trained some Ghanaian artists in pottery, brick and tile production at Alajo clay works. Notable Ghanaian potters such as Zigga, Daniel Cobblah, Ashia-Lampety, Dankwa and R.R Amponsah were among the early trainees in pottery and brick and tile productions. According to G.A Stevens ([1930](#)), the ceramic factory formed part of the ambitious scheme that would supply the whole West Africa as well the occupying British Army with earthenware and bricks products. In 1954, the Gold Coast government started a major brick and the tile factory in Mallam-Accra. The factory happened to be one that grew out of the private enterprise of a Lebanese national with the help of technicians trained from Alajo clay works in the 1930s.

As at 1970, there were four major brick factories operating in the country namely GIHOC Brick and Tile at Mallam, Prampram Brick and Tile, Bank of Ghana Clay Products Limited and Agritree brick factory. Around 1975, about ten other factories partly sponsored by government and the then Bank for Housing and Construction (BHC) were added to the existing ones. It is significant to note that before the installation of the BHC factories, the C.P.P. Government had in the 1960s imported Ten Hungarian Brick machines for installation at district levels out of which only two were installed at Kibi and Tanoso near Sunyani.

The rest were left to rot at the GIHOC factory at Mallam in Accra. Between 1989 and 1992 all the state supported brick factories were either abandoned or divested. Most of the plants and machinery available were sold to scrap dealers to be vandalized and destroyed. One of the most painful destructions was what happened to ceramic-cordierro, a state of the arts tile factory built at Takoradi to produce porcelain glazed wall and floor tiles for the building industry. One can also consider the Saltpond ceramic factory which was built to produce first class sanitary wares for the building industry. There was mass importation of brickmaking machines from Brazil which led to setting up of more brickmaking factories, however, their products did not have the needed impact on the construction industry since many could not survive ([Acheampong, et al, 2014](#); [Hammond, 1997](#)).

If we consider all these attempts to grow the brick and tile or ceramic industries through both direct public participation and private initiative without success, the question to ask ourselves is what are we doing wrong?

Research Question Two: The Bricks Industry: Nipping the Challenges in the bud

There are many challenges which have militated against the development, sustenance and growth of the clay or ceramic industry in the country. We wish to attempt a breakdown of some of these challenges at the end of which we will be able to gather the pieces together to form an opinion on the way forward.

Technical Know-How

One of the fundamental causes of difficulties in the operations of brick industries locally is the general lack of technical knowledge of the industry. From the feasibility stage up to the period of operations most of the factories built lacked effective technical direction and supervision. This factor has often caused a sharp disparity between machinery selection and raw materials suitability in the local industry.

There has been no interest from official sources to equip local personnel in the industry with adequate know-how through sponsorship and attachment to countries and foreign industries where brick making is of historical significance. What we as a nation need to be aware of is that one cannot import an industry effectively by assembling machinery without the know-how. The best way to import that know-how is to send local personnel to the source of the industry to gain firsthand knowledge on how things are done over there. That is the Asian way to gain knowledge for the industry. Instead of sending local experts abroad to select machinery and equipment, we rely on faxes, now E-mails and foreign agents and sometimes non-technical persons to select outmoded technologies for our new brick factories. Our society needs to develop confidence in our local people, train them and use them to do the work.

A corresponding factor to the problem of know-how as analyze above is the over reliance on foreign experts and currently politicians who mislead or misdirect our local entrepreneurs to set up factories in most cases with obsolete and second-hand equipment and technology which are dumped on us by these 'experts' which ends up as liabilities for the factories rather than assets. Some of these 'experts' also acted as agents of multinational companies whose interests were served to make us continuously

import alternate products such as cement and foreign building materials. The logic is that if our local brick factories succeeded then their principals abroad will lose their foreign trade in cement. So, we were misdirected and old technologies and machines whose parts are no more available were dumped on us resulting in our factories never seeing the lights of day. Local experts trained abroad could help select machinery that would suit our local environment like the Asians do.

Weak Infrastructure and Quality Control

The second factor which affected the industry negatively was the general lack of basic infrastructure for manufacturing in most parts of the country. This factor has caused delays and unnecessary challenges for procurement and control during the operation period. The inadequacies created by the lack of telecommunication, electricity, good roads, water and other infrastructural amenities in most parts of the country had resulted in the wrong siting of factories. Sometimes, operations of the factories become difficult because they are sited far away from the source of raw material or market centers. These factors continue to cause high expenditure on raw materials procurement as well as delivery of products to the consumer. At Mbroh Ceramics, there was a challenge of funds for step-down transformers to extend power to factory and rehabilitate existing machinery.

Linked to the problem of infrastructure has been the usual under-capitalization syndrome, which affects most industries in Ghana. Our local entrepreneurs faced challenges of inadequate technological know-how and lacked managerial competence at the decision making and project implementation which led to the collapse of many bricks factories. Most of the factories were built without adequate and appropriate digging and handling equipment, artificial dryers, clay storage sheds and pits, good kilns and delivery trucks. Technically, most factories could not maintain any meaningful equality control system. The factories, which operated without effective kilns, had problems of under firing and thus could not control quality. If a factory wastes working capital to produce about 1million bricks but could not sell even 50% of that quantity due to ineffective handling and under firing, then that factory will become financially broke in no time. It is also true to state that most local brick companies did not motivate their local staff adequately to encourage dedication and efficiency. In most cases machinery were purchased without any due regard to transport and communication facilities for the staff to the factory. Most brick companies in Ghana

spend millions on machinery procurement but neglect basic needs of the factory staff for effective operation. Money is spent on factory sheds, offices and grandiose promotional programmes without catering for kitchen and simple descent toilet and washroom facilities for staff.

Financial Agreement and Management

One of the major factors which affected the smooth operation of the brick factories in hazardous financial arrangement engaged in between entities and the financial institutions in the capitalization of companies. Most of these factories could barely run at breakeven point because they were funded on high debt to equity ratios. There were more debts involved in the capitalization of companies so much that high interest rates cause many to step on the stage of liquidation even before the first year of operation was over. All over the world, successful brick companies only emerge after long years of operation. Thus, if our brick industry will succeed then more favorable and long-term financial arrangements should be utilized to fund the factories. The capital expenditure must always be treated more as equity or grants than loans from our banks. No venture capital provision ever came the way of the local brick and tile industry.

There are many brick factories, which needed recapitalization after few years of operation to enable them service the initial debts incurred during the building stages of the factory. Typical examples were the B.H.C. sponsored factories in the 1980's. Others needed constant injection of working capital to cover operations. In all such cases the unfavorable atmosphere of banking policies in the country made it impossible for these factories to get help. At Ashanti brick & tile it was a technical management challenge coupled with working capital and kiln. This challenge was also associated with Vicalex bricks & tiles who needed funds to expand drying sheds, kiln and purchase handling equipment

The brick industry has been saddled with a lot of management problems simply because Ghanaians fail to recognize the industry as a basic ceramic enterprise. Most of the industries were traditionally handled from feasibility stage to operation stage mainly by civil engineers. The situation has always been like that of choosing a physician to perform the functions of a pharmacist. No matter how related the knowledge would be a physician cannot adequately perform the functions of a pharmacist. The physician is the end user of the work of the pharmacist. The same applies to brick making. The brick industry is basically a ceramic enterprise and this fact need to be recognized by all entrepreneurs. Nevertheless,

like all other manufacturing enterprise, other disciplines are needed to enable it function. For effective management of our brick industries, a multi-disciplinary approach needs to be arranged appropriately in every factory. All the disciplines must play complimentary roles. It follows then that every brick factory must be technically run with the presence of a ceramist. This discipline must prevail in every brick factory alongside other complimentary personnel to enhance efficiency.

Another managerial problem identified with some of the brick factories in Ghana relates to the employment of large managerial staff. Unlike most industries, the brick industry thrives better on a small and well –motivated managerial staff. The bulk of the operations require minute to minute on the spot decision making. Delays could hamper the efficiency of operations and large managerial staff would create bureaucracy on urgent issues. Some of the capital-intensive factories created high operational over heads without any corresponding efficiency in productivity because the large managerial staff gave room for redundancy, conflict of interest and irresponsibility. Linked to the negative impact of the managerial staff in the brick industry is under-employment in some of the factories.

While the lack of technical know-how has contributed to the breakdown of most of the brick factories, it is also true that some factories collapsed because their operation cost went too high due to over-staffing with a consequent under-employment at high managerial levels. If a factory with a production capacity of about ten to twelve million bricks a year operates with managing director, general manager, factory manager, production manager, commercial manager, accountant, administrative manager with a host of assistants and foremen then that factory's overheads will never allow the price of bricks to be affordable. Such a factory will face marketing problems which in the end will not be viable. Ideally, every brick factory can be managed by about three top managers and their supervisors or foremen. These are managing director or general manager who should combine the jobs of director and factory management; a production manager in charge of all technical management and an accountant to supervise all administration and commercial activities. They can be assisted by middle level management staff in the form of foremen and supervisors. These can be adequately motivated to deliver and innovate to operate profitably.

Socio-Cultural Challenges

Apart from all the afore mentioned factors, the brick industry in Ghana is saddled with a socio-cultural naivete which causes contemporary preference in cement-based buildings to rate higher than brick ones. Most people are not educated and convinced about durability of bricks. The lack of adequate brick layers in the system also gives credence to the low preference in using bricks for building in Ghana. Cement block masons are often employed to do the work of brick layers and they end up making brick houses look unattractive. It is also a fact that many local architects and builders, also shy away from projects involving bricks because of lack of adequate knowledge on brick works. Our interactions with the public revealed that the demand for bricks was greatly affected when the Awudome Cemetery in Accra was fenced using bricks. The use of bricks as wall for one of the biggest cemeteries in Ghana affected the demand for bricks simply because the public did not want to build with a material that has been used for cemetery. One of the socio-cultural constraints of the industry has been the abuse of minds and the need for attitudinal change. It is strange that the public did not or are unaware that in several developed countries bricks have been used for residential and other public projects. There is the need for behavioural and attitudinal change.

The Role of the Industrial Artist

To the industrial artist, it is also fundamental to note that the development of the industry is first and formally hinged on the adequate training and assertiveness of the industrial artist. So far, the brick industry has become one of the main available sources of employment for many (Nortey et al., 2018). However, over the years a general lack of initiative of most trained industrialists have contributed to the drought in employment avenues. Among notable areas where ceramists can assert themselves and open the way for others behind to enter are, the steel industry, paper industry, cement industry, the housing industry, glass industry, the pharmaceutical and soap industry just to mention a few. Any industry that depends on heat treatment by any form needs ceramic product to perform.

To impact positively on all these industries mentioned, there is the need to work on the orientation of the ceramic students to technologically driven ones. Ceramics is basically the utilization of inorganic chemistry or earthly materials to produce heat resistance products. To equip our players in the industry with the relevant skills, their study of both the physical and chemical characteristics of the earthy materials employed in

production such as, clays, feldspar, silica and the numerous oxides that help to give character, from texture and colour to the burnt stuff need to be mastered.

The time has arrived for all players in the ceramic industry, whether in academic, industry or public practice to assert themselves professionally and impact our society on the roof tops for all to see. With the boom in the mining industry now in Ghana, the production of crucibles for the mines as well as metal casting industry is long overdue. Every year an amazing tonnage of ceramic tiles imported into this country should be a challenge to the local players in the brick and tile industry. Even if we pick the housing sector alone, the brick and tile industry hold a key to the mitigation of the housing challenges facing this country. Materials from foundation to the roof can all be provided by the brick and tile industry together with other locally produced products in wood, metal, and stone.

If locally produced materials are encouraged, the ceramist can provide not less than 60% of the inputs for the housing delivery. And many of the developed world like Holland and Japan, the ceramic industry particularly the brick and tile factories provide engineering materials. Among the concerns associated with the housing delivery in this country, the challenge of building material supply runs the most critical. Societies which have managed to provide adequate housing for their people had relied mostly on locally produced material source. Ghana therefore has to make a concerted effort to develop its local building materials industry, in order to impact positively on our housing delivery.

The most basic building materials which will impact positively on the housing industry is the Brick and Tile or clay-based material. The clay industry can provide materials for buildings from the foundation level through to the roof. The durability of these materials as well as their environmentally friendly characteristics could help restructure our housing policy to take adequate care of our hopeless maintenance culture.

Another significant advantage of the clay industry is the usefulness of burnt clay products in waste management and irrigation development. Burnt bricks, clay pipes and assorted tiles could be employed in the efficient construction of incinerators, sewerage diction, water filtration and biogas plant construction respectively. Industrial kilns, heaters and boilers for producing sanitary wares, textiles, paper and other wood products as

well as pharmaceuticals are all part of the benefits that the industry can provide.

Research Questions 3: Government Advocacy and Interventions

Several governments have made attempts of strengthening the brick industry. In 1976, the Ministry of Works and Housing constituted a committee to address the Country's Housing challenges through the use of locally produced products such as bricks. This led to a policy for the development and use of Local Building Materials in August 1978. The committee's terms of reference were: To examine critically and submit realistic and practical recommendations on how best and how effectively, local building materials could be developed and used extensively in national building programmes. To ensure that the result of the recommendations could be used in the then financial year. Among the recommendations were; as a short-term measure, the improvement of the existing building materials industries especially brick and tile factories, such that they could increase their production capacities. For the medium term, the development and use of some essential building materials was also most critical. These were burnt clay bricks, lime, pozzolana, natural stones stabilized earth blocks and wood products. Training of personnel both in the manufacture and their methods of use was also an essential prerequisite to the local building materials revolution. The long-term phase was the general use of capital-intensive methods of production. In the view of the committee these three factors were critical: reducing the cost of building materials. Ensuring a success in the national programme for development and use of local building materials thus making national building and construction industry self-reliant. However, it is disheartening to note that these recommendations have not been worked on to efficiently yield results.

In 2010, Cabinet approved a policy on the use of locally developed building materials for the construction of 60 per cent of public buildings in the country by the year 2015, following the submission of a strategic plan to the Ministry of Environment, Science, Technology and Innovations by the Building Road and Research Institute (BBRI) of the Council for Scientific and Industrial Research. As a result, the Ministry assisted the BBRI to set up a National Artisan Training Centre to train the youth on the use of local materials for housing construction in the country. This has been a brilliant policy but again the implementation has been very poor. As of now, there has been the construction of many public buildings in the country with other building

materials and not the bricks as suggested. A classic example is Affordable Housing Project in Asokore Mampong in Kumasi. The BBRI recommended that at least one brick and tile factory should be set up in every district in all the regions where clay has been identified and that local brick manufacturers should be supported in terms of inputs, structures and markets for their products. Despite these recommendations, sandcrete blocks are still being used by both private and public institutions. However, reports at BBRI show that currently the demand for bricks is increasing and this is a positive sign for the industry to thrive if the right steps are taken and enforced.

The interventions and government advocacy have not yielded much results as patronage of the building material are still minimal. The sure way to go now is practical demonstration of using bricks to build both residential and commercial facilities by the government or institutions. Little can be done about individual preferences on what to use in building their structures. The following recommendations are made based on the findings:

1. Government should prioritize and consider adequate funding and public resources to bricks and other building materials such as timber. These supports must go with brick construction of public residential buildings are constructed using bricks for the public to appreciate, it will obviously whip up interest in our local materials and products.
2. The training and research institutions such as BBRI, the Technical Universities should strengthen and expand their artisanal training to bricks layers. Most construction artisans are only specialized in sandcrete blocks construction and just a few who can expectedly construct with bricks. There is the need to open training schools for our masonry artisans to master the skills of bricks laying. This is very fundamental to increasing the demand for the products.
3. In addition, Consultants and designers should incorporate the local materials in the design, specification and structural strength design of government projects and that the government should take steps to instruct Metropolitan, Municipal and District Assemblies (MMDAs) to use local building materials for public buildings and other structures. Definitely, when this is done, it will call for demand of the product and lead to the development of the brick industry.

4. Energy conservation measures should be looked at by both academia and the government. One of the challenges of the brick industry has been the cost of firing. The Agricultural sector especially the forestry department should liaise with the industry in designing non-polluting energy sources. Technological transfer is also recommended such as the vertical shaft kiln developed by the Chinese. This kiln was tested in Nepal and has assisted in developing their brick industry. These trainings must not only be for the owners and supervisors but must trickle down to the workers in the production studio such as the kiln and machinery operators. This would ensure gradual building of knowledge and confidence to produce more quality bricks for the industry.
5. The study also recommends the integration of women into the industry. Most of these industries discriminate in employing the services of women in the production processes. They do have a say in which materials are to be used and when they are involved in the production, it is more likely they will encourage their families to patronize bricks in their construction. Currently, Vicalex has a female as the production manager and the company is doing very well in meeting the demands of customers.

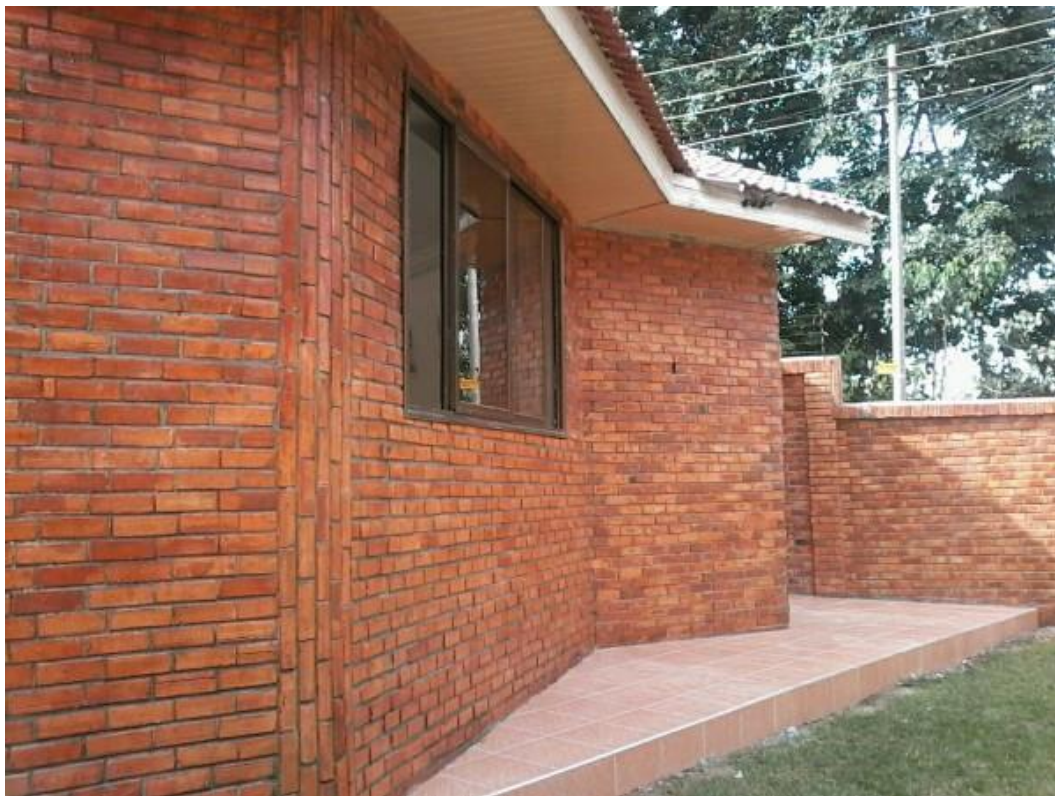


Fig. 2: A well-constructed brick building and wall

Source: Field study, 2018

CONCLUSION

Although Ghana is endowed with several resource including naturally occurring materials in our environment, we have not done much in the areas of producing high technological products such as automobiles, high standard computers etc. However, at least in the areas of construction, we have battled with the challenges of setting up and patronizing clay products such as bricks. The main raw material

for bricks production is clay which is readily accessible in almost every region of the country. The discussions so far call for the government to enforce the use of locally produced Ghanaian clay bricks in the construction of schools, universities, clinics and police stations if Ghana really want to achieve the mission of Ghana going beyond aid. Little has been done with regards to advocating for the use of bricks. The use of bricks can only be on the rise if the product is practically demonstrated by building

structures with it. With such physical brick structures within our environment, it will certainly lead to changing minds and preferences to higher demand for bricks construction projects.

REFERENCES

- Acheampong, A., Hackman, J.K., Ayarkwa, J. & Agyekum, K. (2014). Factors inhibiting the use of indigenous building materials in the construction industry, *African Development and Resources Research Institute*, 8:2, 1-15
- Adogbo, K.J & Kolo, B. A. (2009). The perceptions on the use of indigenous building materials by professionals in the Nigerian Building Industry, Ahmadu Bello University
- Bediako, M.; Gawu, S.K.; Adjaottor, A.A. (2012). The Construction Industry of Ghana, *Construction and Building Materials*, 3 (29), 667-71.
- Bediako, M. & Atiemo E. (2014) Building Materials in Ghana, *Journal of scientific research & reports.*, 3(23), 3018–3030.
- Carlton, R. (2006). The role and status of women in the pottery traditions in the Western Balkans,
- Cultrone, G., Sebastián, E., Elert, K., de la Torre, M.J., Cazalla, O., and Rodriguez-Navarro, C. (2004). Influence of mineralogy and firing temperature on the porosity of bricks, *Journal of the European Ceramic Society*, 24:3, 547–564.
- Danquah, J. A., Abrokwah, P.O., Ampofo, T. & Ankeah, J.S (2015). Appraisal of burnt bricks as building material in Ghana, *International Journal of Scientific Research and Education*, 3(1), 2814-2826
- Elert, K., Cultrone, G., Rodriguez Navarro, C., and Sebastián Pardo, E. (2003). Durability of bricks used in the conservation of historic buildings—influence of composition and microstructure, *Journal of Cultural Heritage*, 4: 2, 91–99.
- Ghana Geological Survey Dept. (1999). Ghana *Geological Survey.*, 1, 11-15.
- Hammond, A.A. (1997). Small and Medium Scale Brick and Tile Production in Ghana: An Overview, Wall Building Case Study, Gate Publishing.
- Kesse, G. O.; Balkema, A. A. (1985). Clay deposits in Ghana, *Journal of Water Resource and Protection*, 1(3), 522-530.
- Konadu, D. S.; Annan, E.; Buabeng, F. P.; Yaya, A. (2013) Fabrication and Characterization of Ghanaian bauxite red-mud clay bricks for construction applications, *American Journal of Materials Science*. 3(5), 110-119.
- Nortey, S., Amoanyi, R. & Okai, F.E. (2018). Towards a sustainable ceramic industry in Ghana: An Assessment off the working environment using five forces industrial model, *Journal of Sunyani Technical University*, 2:1, 56-78.
- Nortey, S., Amoanyi, R. & Essuman, A. B (2017a). The Determinants of Pottery Demand in Ghana, *Journal of University of Science and Technology*, 37:1, 75-84
- Nortey, S. & Asiamoaso, E. (2017b). The Socio-Economic Effect of the Decline of Pottery on Four Centres in Ghana. *Journal of Sunyani Technical University*, 1:3, 15-29
- Stevens, GA (1930, April). The Future of African Art. With Special Reference to Problems Arising in Gold Coast Colony. *Africa. J. the Int. Afr. Instit.*, 3 (2): pp. 150-160.
- Woets, R. (2014). The recreation of Modern and African Art at Achimota School in the Gold Coast (1927-52), *The Journal of African History*, 55(3), 445-465