

The Vernacular of African Social Cultural Disciplines and Its Influence on Modern Building Fabrics: A Case Study in Accra, Ghana

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To cite this article:

Kennedy Newton Nutassey, Sonia Elizabeth Tetteh, Gifty Ahwireng. The Vernacular of African Social Cultural Disciplines and Its Influence on Modern Building Fabrics: A Case Study in Accra, Ghana. *Journal of Civil, Construction and Environmental Engineering*.

Vol. 8, No. 2, 2023, pp. 38-41. doi: 10.11648/j.jccee.20230802.12

Received: July 27, 2022; **Accepted:** December 13, 2022; **Published:** March 31, 2023

Abstract: Designing of a building is always for intended purposes, the housing of human beings should be specific to its task and should be enjoyed and provides needed comfort for the end user regardless of the surrounding circumstance. However, environmental noise pollution is a problem affecting home users especially in developing countries like Ghana. Ghanaian building industry is now in a transition from foreign building design and its materials application without considering the socio-cultural implications. The traditional buildings in Ghana are basically one-storey single-family houses built with available local materials that are suitable for the climate and vernacular social-cultural disciplines. Ghanaians generally, built-up noise as a tool to exhibit powers unknown to them, these are observed on their daily social-cultural disciplines in worshipping, cooking, dancing, walking, talking and making fun. The new designs eventually put a toll on the home users especially how to prepare fufu with traditional methods: wooden mortar, wooden pestle that lead to contamination of fufu by mechanized methods. The paper seeks to concentrate on the processes of pounding fufu and its affiliation to activities in current modern buildings in Ghana. Special attention is paid on how traditional methods could be used to prepare fufu in new buildings and its consequences to food contamination and the noise in the building.

Keywords: Traditional Method Fufu, Noise in Modern Building, Contamination Food, Fufu Pounding Machine

1. Introduction

The globalization, civilization and land value have empowered the developing country in Africa to appreciate modern designs and multi-storey buildings [1]. The designers in most cases overlook the prevailing situation that occurs in a specific room, building. The purpose of a building is to house the end users to perform its function, as expected in avoidance of any socio-cultural differences or implications. Africans are active in their endeavours that increase noise level and have an impact on building fabrics and the environment. The noise created is based on cooking, dancing, walking, talking, worshipping, and

teaching, and making fun. The noise is above acceptable decibel ISO standards when measured. The constructional detail drawings and structural details were gathered, observed and analysed critically, the details do not address or control that effect. The normal structural works that prevails in other countries were used without considering the activities that each room is intended for referencing the earthly culture differences; cooking, worshipping and any other social activities. [2]. The study is to analyse the situation, measure the sound and the noise level, design, develop and test structural details that can withstand the pounding and reduce effects, absorb structure-borne sound created and prevent structural sound in the building and that affects

neighbourhood.

The focus of the study would be based on the structural design for Built-Environment that needs careful control measures and also the method of pounding fufu and its side effects noise creating on the building structures [1]. The craftsmen in Ghana are not well trained or educated to understand the importance of working drawing, even how to interpret building drawing and follow quality control plans. Construction cost of building would increase. The architect do not have time or incapable of designing building structures the engineers are not ready to calculate the transmission sound through the room and floors that could accommodate the sound transmission in the building structures. Without doubt, the generation of noise keep on increasing, due to modern designs, new building systems, choice of building materials, technology advancement in the building industry and foreign influence.

The occupants of apartment buildings in West Africa especially in Ghana find it difficult to enjoy the full vigour of their kitchen when preparing fufu with the traditional method. The traditional method to prepare fufu is by pounding in a giant wooden mortar and wooden pestle, in between the "blows" from the pestle, a mixture is turned by hand and water gradually added till it becomes slurry and sticky [3]. This process creates lot of noise, vibrate building structures, create fear and panic with a mind-set that it might collapse the building structures. As a result, the occupants opt to vacate their kitchen floors to a specific sport outside flat, to prepare the fufu. Structures and details of construction in Ghana, design building structures for commercial & apartment building and develop constructional details that could withstand shocks and absorb the noise and prevent sound transmission into the parts of the building.

2. The Processes and Methods to Prepare Fufu

The processes of making of fufu involves series of steps which is time consumed time. The process stages in preparing fufu include; washing the ingredients cassava, yam, or cocoyam tubers, peeling, slicing, boiling and pounding [11]. Fufu is a staple and well patronized traditional African dish especially in Ghana. It is mostly made from cassava or yam, mostly with added unripe plantain or cocoyam [13]. In other parts of the world such as the Caribbean and many nations with population of West African origin, fufu, presented in different forms is normally eaten.

There are two main methods to prepare fufu;

2.1. Traditionally Method to Prepare Fufu

This method is by application of two apparatus; wooden mortar and wooden pestle. This method to preparing fufu is by constantly pounding continuously until correct result is obtain. The traditional method needs little human energy in the activities which create noise in its environment when

preparing the food. [4, 8]

Traditionally fufu is prepared by pounding boiled chopped, peeled plantain, cassava, yam, or cocoyam tubers through pounding process takes some time until a fine texture is attained for consumption [2]. All apparatus used to prepare the fufu are carved out wood. The mortar is of hard wooden hollow bowl like structure where the already cooked yam is placed and subsequently, manually pounded continuously with a pestle. The pestle is also a hard thick log of wood measuring on the average 100 cm in length, 4cm in diameter at the upper action and about 8 to 10cm diameter at its hammer head. [11].

It is mainly prepared by pounding boiled cassava or yam, most often with boiled plantain or cocoyam, in a wooden mortar using wooden pestle until the required texture is obtained. The pounding requires a lot of energy thereby making preparation of the food a laborious task, especially if it is to be prepared for many people as in restaurants. [7] Crude way of preparing fufu make noise and vibrate building structure [1].

2.2. Mechanical Method to Process Fufu

The mechanized way to prepare fufu; boiled ingredient tubers are poured into a hopper which passes through the throat into the auger through the inlet gate of the pounding chamber. The auger breaks the boil lumps into mash and conveys it to the die and builds up pressure for extrusion. Pressure resulting from rotating auger forces the mash through the perforations in the die, compressing and forming it into pellets. The pellets were allowed to break off by force of gravity. A more modern way of fufu preparation which does not use the mechanised mean, is the usage of the well-advertised dried fufu product popularly called "neat" fufu in Ghana. This method, even though, gained much popularity, it is retrogressing, when not fresh, and when prepared, it becomes brownish in colour [2]. This does not only reduce the labour involved in pounding, but also reduces the time of pounding and ensures cleanliness, efficiency and safety [4]. The concentration of fufu is phenomenon attributed to possible leaching of metals from the locally manufactured cooking resulted to ware of mechanized fufu pounding machine. And also, some vendors milled the fufu using an aluminum milling machine before using the traditional method in pounding fufu to obtain the right consistency. In addition, the use of metal scouring sponge in cleaning the pots could enhance the leaching of the metals into the food during pounding. [8]

2.3. Determine the Traditional Methods of Processing Fufu

The traditional method of preparation of fufu involves constant pounding the ingredients in a mortar with a pestle for some hours. This is considered structurally unsafe and acoustically inconvenient [5]. The pounding with mortar and pestle is laborious process and pounding generate a lot of sweat and noise and not all the sweat might escape into the food, and therefore making it unhygienic [3]. The noise and

vibration also create unrest in residence, and as a result, dwellers find it inconveniencing to pound fufu in their residence because of the noise pollution it causes in the neighbourhood. The process of making the food is very cumbersome. It requires physical pounding by one or more people, depending on the quantity, in mortars and pestles traditional method. The starchy nature of fufu allows it to form a bond when it is beaten in a mortar [4]. This level of contamination is due to the mode of preparing the fufu. The preparation of fufu involved pounding cassava and plantain in a mortar using a pestle while turning the resulting paste with the bare hands, which were occasionally washed in a container of water. This process promote microorganism, and the organisms would multiply when the fufu is not eaten immediately. [12]

The mechanized method consist of pounding pot is made of steel that may contaminate the food (food poisoning). These may occur due to rusting. In addition, the pounding blade is made of coated corrosion resistant mild steel that is likely to fail after long period of use and may contaminate the food through chemical reaction.

This mechanized means of pounding fufu, have higher rate of contamination, it can easily lead to serious food poisoning [2] and [4]. The difficulty in materials is as a result of these varieties of materials in the engineering field coupled with the complex relationships between the selection parameter such as its functionality. If the selection process is done haphazardly, the risk of overlooking a possible attractive alternate material may occur. To avoid this there is the need for the analysis of the material performance requirement [4]. In most fufu processing market, the fufu is consumed immediately it is processed, wet paste and ready-to-eat fufu have short life span and would not pass through any secondary process before being supplied to traders with pre-order [6].

The nuisance associated with noise for traditional method, even the traditional method is less expensive than mechanized once, people patronized more, and even doe they are expensive to operate and acquire and most of them are not hygienic develop a machine to enhance the hygienic processing of fufu for both domestic and commercial consumption. [4]

- 1) Develop a pounding machine that will be powered by electric current and convert this through the operation of an electric motor to the rotation of a shaft, that is connected directly to the motor, a pounding blade is attached to the shaft and the rotating effect of the shaft cause the pounding blade to pound.
- 2) Develop a pounding machine that will pound in few minutes.
- 3) Aid easy packaging of pounded yam.
- 4) To eliminate the tedious and laborious indigenous process of preparing pounded yam [9].

Heavy metal pollution is one of the major concerns for food safety and security due to its severe detrimental effects on human health and the environment.

Contamination of food by heavy metals is a concern as

consumption of contaminated food is one of the most likely human exposure routes to metals. Fufu is a delicacy in Ghana consumed mainly by African extradition where pounded yam meal is a staple food and preferred delicacy. However, care must be taking to ensure healthy and hygienic practice such that the food making process is free from contamination of any kind.

2.4. Determination of Mechanical Methods of Processing Fufu

Generally, the use of machines to do work makes the completion of the work faster, neater and more appreciable. Applying this idea to food making pounded fufu has become an increasing interest for most researchers especially those in the food industry, housing industry, and engineering industry [10].

Pounding has been an integral part of majority activities of people Africa particularly Ghana where virtually all the ethnic group have one or more item to pound before use. The ancient and traditional method of pounding is carried out with the use of the wooden mortar and pestle. The wooden mortar has a concave base with a cup-like hole in it, for housing the items to be [5].

Handling processes such as the use of stainless steel utensils will likely reduce the levels of the toxic metals to acceptable levels [8].

3. Effects of Pounding Fufu in Apartment Building or in Rooms

The method of preparation of fufu involves pounding of ingredients in a mortar with a pestle constantly or continuously until is save for eating. This process is considered unsafe in building structures [14]. The effects is not only acoustically inconveniencing tenants in their apartments. Presently the occupants in the multi-storey apartment buildings in Ghana are now nuisance to one another, despair persist warning not to in pound fufu on the upper floors. [15] The design of majority of high rise apartment buildings in Ghana inhibit the ability of residents to prepare their highly preferred food, fufu, which is of concern. The occupants persist to pound fufu on their kitchen floors, the noise and vibration, it creates in building. Most city dwellers find it inconveniencing to pound fufu in their residence because of the noise pollution it causes in the neighbourhood through the building structures.

4. Conclusion

Fufu processing are always done in buildings either at private or public places. In Ghana fufu are served cold and consumed cold. The wet fufu paste is ready-to-eat food; which does not pass through any secondary process before consumption. The intervention of modern mechanized fufu pounding machines, is suffering a lot of setbacks, because of the cultural significance attached to the traditional methods

and food hygiene. The mechanized fufu pounding machines some consist of stainless steel. The steel has the tendency to contaminate the food (food poisoning) that may occur due to rusting. In addition, the pounding blades are also made of coated corrosion resistant mild steel that have the possibility to fail within a given period. The cost element is even higher as compared to the traditional method apparatus on the hand create noise more than other electrical cooking gadgets in the kitchen or home which complement traditional method. The materials used to pound fufu are made out of wooden which medicinal, healthier and without present of metallic elements or components. The traditional method create noise, but Ghanaian's living in the flats or studio apartment, persist to pound fufu on their kitchens, which transmit noise through the building fabric. The modern building systems are in Ghana are not design to prevent such transmission of noise in the building. The noise and vibration in the buildings creates fear and panic for home users. Most city dwellers find it inconvenience to prepare fufu in their residence because of the noise pollution it causes in the neighbourhood through the building structures end up deploring the mechanized method that contaminate the food. A well-structured design system, with considerable building materials suitable for kitchen floor, that could withstand the pounding shock, reduces the sound effects and controls the vibration in the building system will be the solution.

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