

# Exploitation and Excavation of Land for Clay as Raw Material for Potters in Vume in the Volta Region of Ghana

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## Abstract

Clay is a precious natural resource that is used in practically every aspect of life. It has a wide range of applications, including utilitarian and aesthetic items as well as electrical and electronic gadgets. Vume is rich in clay types, which may be found in vast concentrations. In Vume, the commonest way of clay winning is the open pit method. Most clay winners usually abandoned the sites after their clay winning activities without any effort to reclaim it. As a result, the study was designed to investigate the causes of such clay over exploitation and its consequences in Vume. The study employed qualitative research method with phenomenological approach to investigate the problem. The convenience sampling as non-probabilty sampling method was adopted to select six (6) clay winners from two (2) sampling sites of clay winning, making a total sampling size of twelve (12) for this research. The justification was that these clay winners were available at the clay sites and also engaging in unsystematic clay winning activities during the visits by the researchers. The main instruments used for data collection were interviews and direct observation of sites. The study showed that if this rapid clay depletion was not addressed, it would have a negative impact on the pottery and ceramic centers in Vume. The study recommended among others that, there could be proper mechanism to organize clay winners into Small Scale Enterprises and become official distributors of clay to potters in Vume and other industries as well as institutions within the catchment area so that government could get tax revenue from the clay winning activities to develop Vume and the country at large.

## Keywords

Clay, Clay Winning, Excavation, Potters and Pottery Making

## 1. Introduction

Clay is extremely vital and plays a significant role in practically every human endeavor (Khurana et al, 2015). Its applications range from kitchen utensils to interior and outdoor decorations as well as electrical and technological gadgets (Richerson, 2012). As a result, its application possibilities are virtually limitless.

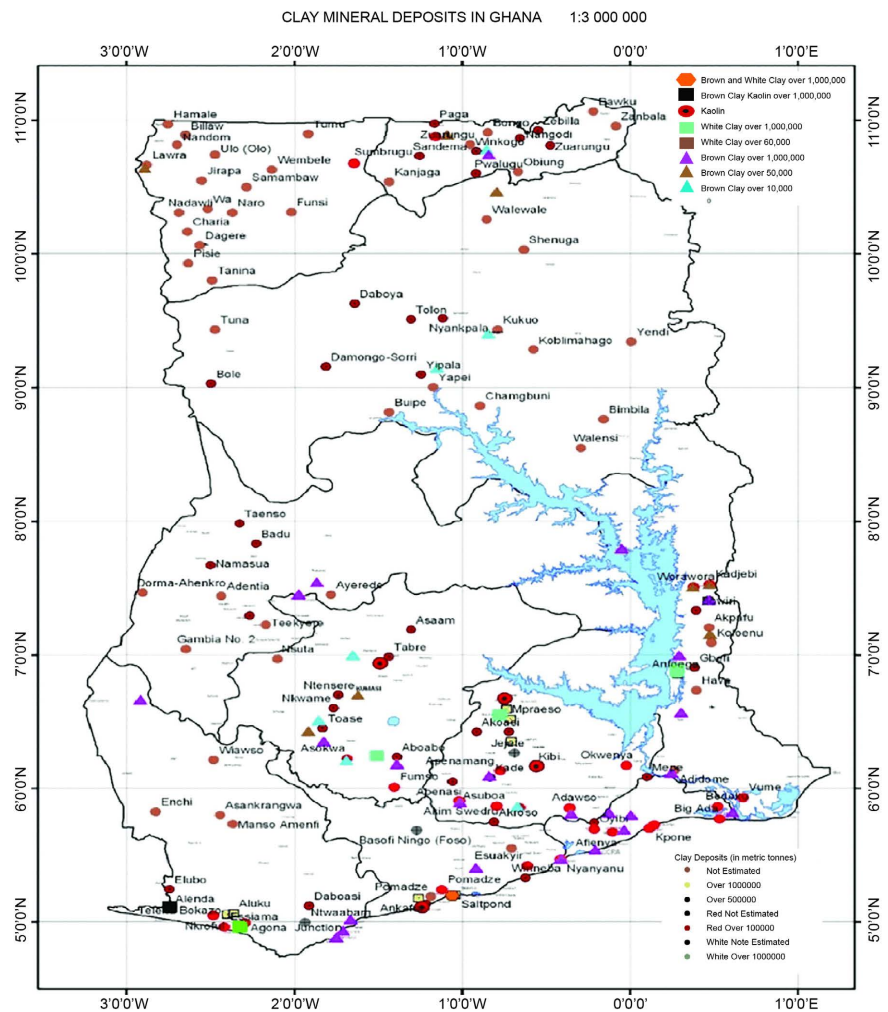
Worrall (2013) explained clay as an earthy material that is plastic when moist but hard when fired, that is composed mainly of fine particles of hydrous aluminum silicates and other minerals, and that is used for brick, tile, and pottery specifically.

Ghana is rich in natural resources and minerals, which account for a significant portion of a country's wealth (Standing, 2014). Exploiting clay has been shown to have a significant impact on the global economy, and for certain nations, clay products play a significant role in the development of paper industries, construction industry, paints industries, and pharmaceutical industry (Scott, 2010). The production of clay which is a chief raw material in ceramics has gained economic significance in the global economy, and this makes the material valuable and in certain jurisdictions, added to other minerals to serve as key raw materials in the manufacturing sector of the global economy. The importance attached to the material clay or the availability of ceramic materials in the country was what necessitated the establishment of the various ceramic industries such as Twyford ceramics, Sentou ceramics, and Wangkan ceramics in Ghana.

### 1.1. Background to the Study

Efavi et al. (2012) explain that all the regions of Ghana are endowed with clay deposits. Again, according to Kesse (1985), work has been done on the occurrence of clay deposits in Ghana, including the location, reserves in metric tonnes, approximate expected life span of the clay deposits in years and the possible usage of the deposits and Vume is no exception. Asamoah et al. (2018) went further to provide the map of Ghana indicating the location of clay mineral deposits as seen in **Figure 1**.

Vume is situated in the south Tongu District of the Volta Region and it is endowed with some of the best clay resources in Ghana. This rich natural resource has long been used as raw materials by local potters and traditional artisans. Vume clay resources are divided into number of categories based on its colour such as red, dark, grey and white thereby making it unique. Another characteristic of clay deposit in Vume is that it contains finer particle sizes and as such potters normally use the clay right after winning to make wares without wedging and ageing processes. However, The disorganized winning of clay and destruction of the land has resulted in destroying the vegetation of the environment, and causing confusion among the people of Vume and the local pottery and ceramic industry since there are no rules and regulations so far as clay winning is concerned.



**Figure 1.** Map of Ghana showing location of clay deposit. Source: Asamoah, R. et al. (2018).

## 1.2. Statement of the Problem

Vume is hub of pottery and ceramic production with a lot of sub pottery centers and individual pottery sheds. Each of these centers has separate site for prospecting clay as raw material for producing pottery wares. A trip to Vume and its environs revealed that sixty pottery centers operate separately with each center excavating raw materials from different clay pit. Unfortunately, human activities of clay winning have put these clay deposits under severe stress, and as a result, they are rapidly depleting. It is even more disturbing to note that, despite the rapid depletion, no proper measures have been outlined to ensure the conservation of clay resources in Vume. It is against this backdrop that this study seeks to determine the ways through which this canker can either be minimized or curtailed.

## 1.3. Objective of the Study

This research is aimed at determining the extent to which unsystematic winning

of clay takes place in Vume and its effect on pottery making and ceramic centers within the environs as well as the many reasons that have contributed to the bad practices of clay winning.

#### **1.4. Importance of the Study**

The study would be useful to potters in Vume and its surroundings in ensuring proper processes of wining clay for production.

#### **1.5. Scope of the Study**

The study would be conducted only to clay wining in Vume and its environs.

#### **1.6. Limitation of the Study**

The study was limited to taking of photographs (pictures) to recognize faces of clay winners during the clay winning period apart from the children. They were nervous the photographs could be used for possible arrest and prosecution by the Environmental Protection Agency (EPA) and security agencies. However, that did not affect responses to interviews to gather information for the study.

### **2. Clay Wining and Prospecting Methods in Vume**

Vume is noted for a fine grain clay with high plasticity and water holding capacity. Almost the entire territory of Vume land is rich in clay for pottery and ceramics and this accounts for the unsystematic exploitation of the clay mineral. According to *Okafor (2006)*, clay winning activities even though economical can cause major impact on the environment. Again, *Fedra et al (2005)* also mention that extraction of raw material like clay from their natural habitats has a significant effect on the natural environment. In Ghana, the most common way of digging clay is the open pit method. It is usually done by using various types of tools. As a result, Vume's pottery artists employ this traditional (open pit) method of clay wining to create pottery and ceramics wares. The hand digging method, also known as the manual method, has been used by local pottery makers for a long time. Pickaxes, shovels, hoes spades, wheelbarrows, head pans, and mattocks are used in manual mining activities. Hand-digging may be the sole way to get clay in some circumstances as far as the traditional pottery production remains the economic activity of the people of Vume.

Notwithstanding all the benefits and advantages of manual or hand clay wining, the method has its adverse effect on pottery and ceramic production (*Mandal & Sarkar, 2019*).

#### **2.1. Brief Overview of Pottery Making in Vume**

According to history, the people of Vume migrated from Denkyira in the Central Region of Ghana and they brought with them pottery making skills which they practiced till now (*Asihene, 1978*). In Vume, pottery making is regarded as 'mamanu' meaning grandmothers' legacy. The potters use the clay that is won by

the unsystematic clay winning activities as their main raw material. The potters normally produce pots for cooking, drinking and bathing. Pottery making is mostly done by women. Various names are assigned to pots to identify them and their uses, for instance, *'tomedeze'* is named so because it is used for fetching water from the river. A pot used drinking water or just like a cooler is called *'xomeze'*. A pot meant for preparing corn flour meal is referred to as *'akpledaze'*. A pot used for preparing soup is called *'kutu'*. Bigger pots meant for storing palm oil are known as *'avavitorgu'*. A pot used for medicinal purposes is called *'anyigabator'* and a pot used for spiritual protection is called *'tormekasu'*. These pots have cultural, aesthetic and economic values to the people of Vume.

### 3. Materials and Methods

The study employed qualitative research method with the phenomenological approach as research design to investigate the problem. The phenomenology focuses on the commonality of a lived experience within a particular group. The fundamental goal of the approach is to arrive at a description of the nature of the particular phenomenon (Creswell, 2013). It investigates the everyday experiences of human beings while suspending the researchers' preconceived assumptions about the phenomenon (Van Manen, 2014). Typically, interviews are conducted with a group of individuals who have first-hand knowledge of an event, situation or experience (Moustakas, 1994). Therefore, this research was designed to investigate the causes of such clay over exploitation and its consequences by clay winners and for that matter potters in Vume.

The target population was the residents of Vume who engaged in clay winning for sale to the traditional potters. For the purpose of the study, convenience sampling as non-probability sampling method was adopted to select six (6) clay winners from two (2) sampling sites of clay winning, making a total sampling size of twelve (12) for this research. The justification was that these participants were the people available at the clay sites and also willing to be interviewed and observed engaging in unsystematic clay winning activities during the visits by the researchers. The main instruments used for data collection were interviews and direct observation of sites. In addition to observing the sites, the researchers took notes and photographs of the clay winning sites. The data was read and reread and then culled for liked phrases and themes that were then grouped to form clusters of meaning (Creswell, 2013).

### 4. Results and Discussions

A visit by the researchers to selected clay winning pits at Vume revealed the involvement of child labour as a means of winning clay. Srivastava (2011) explains child labour as work that deprives children of their childhood, their potential, and their dignity, and that is harmful to physical-mental development. Children of school age have been witnessed risking their lives in perilous clay pits in pursuit of clay for a few cedis as shown in **Figure 2** on the next page. It could be



**Figure 2.** Children in one of the mining pits at Vume.  
Source: (Field work, 2022).

deduced that such children could become school drop outs as a result of clay winning activities if the desire to make money outweighs that of schooling at these tender ages.

During the study, it was revealed that these children had no knowledge about the consequences that unsystematic digging of clay could cause as one of them said ‘we dig clay for sale so we could get money for school’. Therefore, it was evident that the children were winning clay without knowing its effect on the environment.

When the clay winners were asked why they engaged in unsystematic clay winning. It came to light that most of them engaged in clay winning because they had no formal jobs and as such that had been their main source of income for survival. Only few of the clay winners said ‘this is serving as extra income to support our livelihood’. It was also observed that no proper measures had been put in place to regulate clay winning activities to enable the community to benefit from it. The clay deposit environment has been left in the hands of these clay winners at the detriment of the Vume community as seen in **Figure 3**. They paid no tax to the community and as such the community could be losing revenue for developmental projects in Vume.

It was manifested during the study that the clay mined lands have not been reclaimed. When it was enquired why the clay mined lands have not been reclaimed, the respondents clarified that there was no need for any reclamation because such lands could not be used for agricultural purposes and that the time for reclamation should be used for winning a lot of clay. The clay winners’ understanding of land reclamation contradict the report made by **Alfred & Tuley (1974)** that environmental problems caused by mining activities can be minimized by adopting best mining practices like land reclamation after the clay winning.

It was observed that most of the clay pits had been filled with stagnant water



**Figure 3.** Clay prospecting in a pit at Vume. *Source:* (Field work, 2022).

and could serve as breeding grounds for mosquitoes and other dangerous aquatic species. This confirms [Aigbedion & Iyayi \(2007\)](#) talk about the effect of minerals exploitation and the level of damage each mineral exploitation and for that matter clay being one of the minerals exploited has a high level of damage recorded as shown in [Figure 4](#).

Again, [Sarkodie et al. \(2014\)](#) cited McMahon and Renny (2001) that unprotected pits, during rainy seasons, form breeding grounds for disease vectors such as mosquitoes and housefly which are the main agents that spread malaria and water borne disease. Therefore, there could be high malaria infections rate within Vume and its environs if these pits are left unattended to or reclaimed.

The attempt to mine clay ultimately led to the excavation of the entire area, which had a significant damaging effect on the inhabitants of Vume's agricultural operations since, in addition to pottery and ceramics, farming is one of their main sources of income.

## 5. Conclusion and Recommendations

Upon the findings gathered from the study, it can be concluded that clay winners in Vume had little or no knowledge about the effects. These unstructured activities could escalate health problems and that they engaged in this activity mainly for livelihood without paying attention to the environmental degradations, and the increasing depletion and waste of clay resources in Vume must consequently be addressed urgently. If clay is mined in a certain order, it would ensure long-term viability of ceramic raw materials. If land waste is reduced, it would create the opportunity for a generation to continue running the local pottery and ceramic industry in future and subsequently increase productivity and profit margins at various pottery centers in Vume.



**Figure 4.** Abandoned clay pits with stagnant water and deformed land in Vume. *Source:* (Field work, 2022).

Therefore the following are recommended:

1) Community bye-laws to ban children from clay winning activities: There should be community bye-laws to ban children of school going age from embarking on any clay winning activities for financial gains in Vume. Local potters in Vume could also make it a policy not to purchase raw material (clay) from children. This would go a long way to deter children from engaging in unsystematic clay winning in Vume.

2) Ensuring availability of raw material all year round: To ensure all year round supply of clay, it should be mined in cyclical form so that the first mined area could be refilled naturally while clay miners move to different areas in serpentine direction. At the moment, the surface of the land is being destroyed because of the unrestrained ongoing extraction of clay and the subsequent formation of many clay pits. Despite being a renewable natural resource, it takes time for land to prepare for the re-exploitation of whatever minerals it may contain.

3) Creation of employment opportunities: In order to maintain clay resources in Vume and its surroundings, there could be proper mechanism to organize clay winners into Small Scale Enterprises and become official distributors of clay to potters in Vume and other industries as well as institutions within the catchment area so that government can get tax revenue from the clay winning activities to develop Vume and the country at large.

4) Further research: It is also recommended that further research could be conducted to find out the environmental effects on the possible future naturally refilled clay to authenticate its properties such as porosity and shrinkage of the clay.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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