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An Assessment of Illegal Solid Minerals Prospecting and Extraction and the Destruction of Archaeological Materials and sites in Nok Village and its Environs

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Abstract
This paper examines the devastating impact of illegal solid minerals prospecting and exploitation on archaeological materials in Nok village and its surroundings, Northwestern Nigeria. Through collection of oral traditions, review of several relevant literatures and a detailed case study, this paper investigates how this activity of man has affected the preservation of the invaluable archaeological materials and sites associated with the ancient Nok civilization which is known for its terracotta sculptures or figurines in the study areas. It also discusses the general implications of this destruction in terms of heritage preservation and offers recommendations for mitigating such damage.

Keywords: *Solid Minerals Prospecting and Extraction, Illegal Mining, Archaeological Materials and Sites,* ***Heritage Preservation****, Nok.*

Introduction
Illegal mining activities have become a major environmental and cultural threat in many parts of the world, particularly in Nigeria, a country that is rich in deposits of solid mineral resources including tin, columbite, gold, kaolin, tantalite, limestone, barytes, among others. The Nok Village and its environs which is situated at the Northwestern Nigeria is home to one of Africa's famous and most significant ancient cultures, and are facing increasing risks due to unregulated and illegal mining activities of solid minerals.

Nigeria's patrimony is both vast and diverse, including its tangible and intangible cultural resources, wildlife, and natural resources. As a nation, Nigeria is blessed with abundant solid mineral resources such as tin, gold, limestone, coal, and

gemstones which are widely distributed in all the states of the federation especially in the northern part of the country (Ajakaiye *et al.* 1992, Obaje 2009). Northern Nigeria is not only a resource hub for these minerals but also a region with immense archaeological value, particularly the Nok culture area. The Nok civilization which is well known for its intricate terracotta figurines of finely crafted people and animals, offers vital insights into early African civilization (Shinnie 1971, Tylecote 1975, Fagg 1977, Jemkur 1991, Grunberg 2014) and the age duration of this civilization is also said to have been recently "expanded from its initial estimate of 700 years (500 BC to AD 200) to 1500 years (1500 BC to the turn of the Common Era)" (Eggert and Rupp 2014, Franke and Breunig 2014:136). However, the increasing prevalence of illegal mining activities in this region has led to significant destruction of archaeological materials and sites, particularly in Nok Village and its surrounding areas.

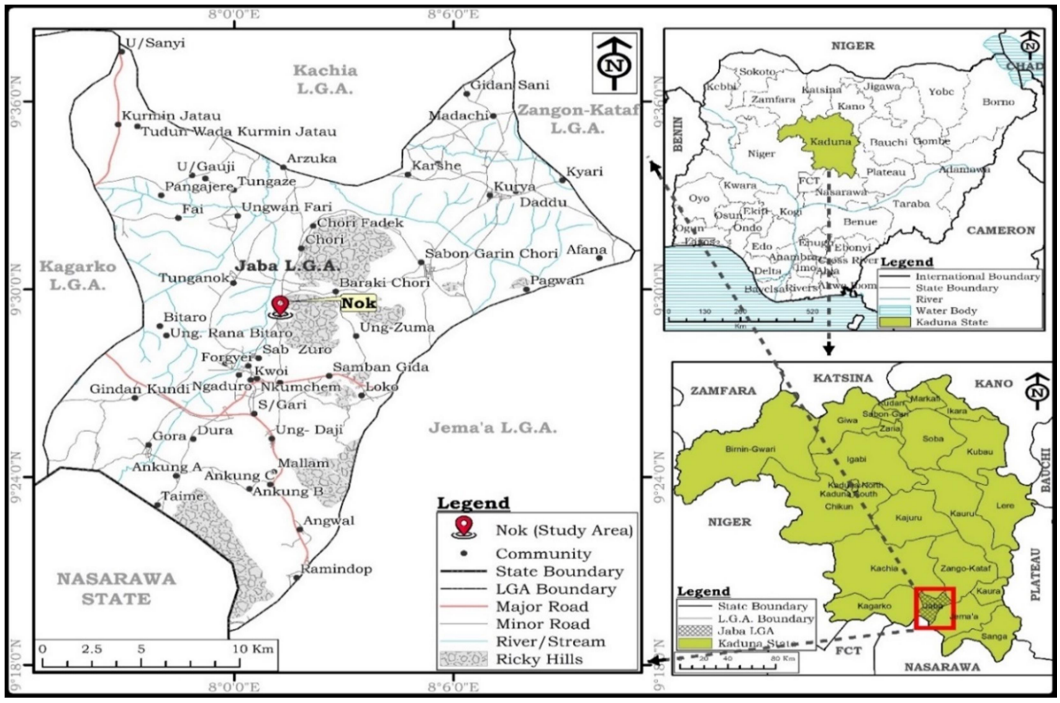
Illegal mining, characterized by unregulated and unauthorized extraction of solid minerals, is rampant in many rural areas of Northwestern Nigeria, particularly in Nok village and its surrounding areas. Although, studies have shown that, while legitimate mining can contribute to economic growth, illegal mining has become a serious threat to cultural heritage, as it often results in the destruction of archaeological materials, damage to ecosystems, and the alteration of the landscape (Ajakaiye *et al* 1992, Barwa 2018). This paper therefore, explores the nexus between illegal mineral prospecting and the destruction of archaeological materials, with a particular focus on Nok village and its environs. It argues that while the economic benefits of mining are significant, the loss of archaeological heritage poses long-term cultural and historical costs that cannot be measured in monetary terms.

Geographical Background and Physical Setting

Geographically, Nok Village is located in Jaba Local Government Area of Kaduna State in the Northwestern region of Nigeria. It is situated at approximately Latitude 9.4800N to 9.5300N and Longitude 7.9800E to 8.0300E. The distances between these coordinates covers a radius encapsulating its surrounding villages. Nok village is adjoined by settlements including Unguwar Galadima situated approximately 4.5 km East, Kurmin-Jibrin which lies approximately 9 km Southwest, Samban situated approximately 10 to 15 kilometers Northeast, Chori located approximately 8 to 12 kilometers due South, Daddu situated approximately 12 to 18 kilometers West, as well as Bitaro situated approximately 5 to 10 kilometers Northeast. All these constitute parts of the

interconnected network or the general spread of the nearby settlements surrounding the Nok village.

The Nok village is situated in an area that is characterized by the northern climatic and cultural influences and its surrounding environs which is primarily rural, is also part of the Jos Plateau, characterized by rolling hills, savannah grasslands, and some forested areas (Adejuwon 1972, Jemkur 1991). The terrain in and around Nok village is generally hilly, with many parts of the region having high altitudes, making it slightly cooler compared to other parts of northern Nigeria (Odofin 1995).



Map of Nigeria Showing Nok Village and Its Adjoining Settlements
Source: Modified from https://www.openstreetmap.org/#map=6/9.117/8.674

Archaeological Materials Prevalent in Nok Village and Its Surrounding Areas

The Nok region, particularly around Nok Village and its environs, is home to a wealth of archaeological resources that are prevalent in the area. Many writers have reported that these resources have helped shape our understanding of the

culture, technology, and daily life of its past and present people (Fagg 1946, 1977, Jemkur 1991, Odofin 1995, Aliyu 2014, Breunig 2014). The sites also contain invaluable archaeological materials that are crucial not only to the study of African cultures but also to the broader field of world archaeology and history (Fajana and Biggs 1977). In addition, these materials together also reveal that the societies are complex and sophisticated. These key archaeological materials commonly found in these areas, as well as their significance however, include, but not limited to the following:

i. Terracotta Sculptures or Figurines: These are perhaps the most famous and distinctive materials associated with the Nok culture in general which are prevalent in these areas–as they often depict human figures, animals, and symbolic representations. The craftsmanship of these sculptures shows a high level of artistry and suggests that the Nok people had advanced artistic and social practices (Grunberg 2014).
ii. Stone Tools: Stone tools such as grinding stones, hand axes, and other implements, also constitute the materials that are often seen scattered on the ground surface and even beneath in Nok village and its surrounding areas. The prevalence of these tools in these areas suggest that they were likely used for agricultural, domestic, and hunting purposes, indicating societies that were engaged in subsistence farming and possibly trade.
iii. Iron Tools: People in the Nok area and its environs are believed to have had early knowledge of ironworking using iron tools such as knives, spears, and other materials are found in the areas. These tools demonstrate the advancement of the people's metallurgy and their contribution to the history of ironworking particularly in the region and in sub-Saharan Africa (Klyn 2018).
iv. Pottery: Potsherds in large quantities scattered on the ground surface and beneath are also seen in the Nok area. This fragmented pottery often exhibits a variety of shapes and designs, including bowls, pots, and storage vessels (Rice 2015). These items reflect the daily activities and practical needs of the present and past people.
v. Burnt Earth, Ashes and Charcoal: Evidence of fires, hearths and charcoal are also prevalent in these areas and have been found. This suggests that the people in these areas engaged in domestic activities like cooking, heating and possibly other ritual purposes.
vi. Animal Bones: Remains of domestic and wild animals such as cattle, goats, and antelopes, are also found in these areas, providing insight into the diet

and hunting practices of the people. These remains also suggest that the people engaged in pastoralism and hunting.

Furthermore, the Nok region is equally rich in solid mineral resources, which has led to a growing conflict between the need to protect these ancient sites and the pressure to exploit the area's mineral wealth. The area's mineral wealth is more centered around industrial minerals and precious metals. Although, Obaje (2009), argued that precious metals are not essential for industrialization, it is important to note that they are a valuable source of foreign exchange especially because, their exploitation, to a large scale, promotes the establishment of ancillary industries. In addition, tin, columbite, and gold are noted as the most commonly mined minerals in Nok Village and its environs with kaolin, tantalite, limestone and barytes also being mined but to a lesser extent.

Major Types of Solid Minerals Occurrence in Nok Village and its Environs

Nok Village is noted to be rich in solid mineral resources. These minerals are primarily the target of illegal miners thereby leading to a growing conflict between the need to protect these ancient sites and the pressure to exploit the area's mineral wealth which is more centered around industrial minerals and precious metals. These solid minerals are said to be sought after mainly due to their commercial value both locally and internationally. According to Ajakaiye *et al.* (1992) and Obaje (2009), the following are the major solid minerals found in the Nok region owing to the fact that, geologically, the area falls within the Basement Complex including the Younger Granites of Nigeria:

i. **Tin**

Tin has been historically significant in the Nok region especially around the Jos Plateau and neighbouring areas. It is often found in alluvial deposits in riverbeds and hillsides and it is mainly used in the production of alloys, electronics, and soldering materials. The illegal miners, using rudimentary tools, often mine for this tin around the rivers and streams of Nok Village.

ii. **Columbite**

Columbite is often found in deep alluvial deposits alongside tin in these areas. It is a solid mineral that contains niobium, which is highly valuable in the manufacturing of electronics, steel, and aerospace components. The solid mineral is mainly used in the production of high-tech devices, such as mobile phones and computers, due to its superconducting properties.

iii. **Gold**

Gold deposits have also been found in and around Nok Village. these minerals found in both riverbed alluvium and hard rock formation are widely used in the jewelry industry as well as in electronics and financial reserves. This has increasingly attracted illegal miners who are focused on gold prospecting in the area.

iv. **Kaolin**

Kaolin is a fine, white clay solid mineral that is equally abundant in some parts of the Nok region. It is highly sought after for its use in ceramics, cosmetics, paper manufacturing, and as a filler in various industrial applications. It is for these obvious reasons therefore, that some areas around Nok see illegal miners more often extracting kaolin though it is less commonly mined compared to tin and gold.

v. **Tantalite**

Another type of solid mineral is tantalite which is a mineral ore of tantalum. This solid mineral is important for the electronics industry due to its ability to withstand high temperatures. For example, tantalite is used in the production of capacitors for electronic devices and aerospace components. While less prevalent than gold or tin, illegal mining of tantalite is still seen in the Nok region especially in particular areas known for mineral deposits.

vi. **Limestone**

Limestone is one solid mineral that is primarily used in the cement industry and as a building material. Although, it is not as commonly associated with Nok Village itself, it is found in other surrounding regions like Saminaka and Kachia also see limestone extraction where its extraction is prevalent by illegal miners.

vii. **Barytes**

This solid mineral is said to be sometimes mined in areas surrounding Nok. This is perhaps because of its use in oil drilling and in the paint and rubber industries.

An Overview of Illegal Mining in Northern Nigeria

Solid mineral prospecting in Nigeria dates back to colonial times when solid minerals such as tin and columbite were extensively mined (Ajakaiye *et al.* 1992). The exploitation of these resources has been particularly concentrated in the

northern regions with areas like Plateau, Kaduna, and Niger States being important centers for the mining activities. However, the focus on mineral extraction has often overshadowed concerns about the protection and preservation of archaeological materials which are located in the same regions. These developments perhaps skyrocketed the activities of illegal miners of solid minerals in Northern Nigeria which have escalated in recent decades, driven by both local and international demand as reported by the Geological Survey of Nigeria Agency (Obaje 2009). The 1999 Mining Act of Nigeria which established the legal framework for mining activities was intended to regulate the industry and promote responsible extraction practices as against illegal activities in the sector (Omofonmwan and Osa-Edoh 2008). However, enforcement of the law remains weak and seems ineffective, because illegal mining continues to thrive in most of the rural areas.

In Nok and its surrounding villages, for instance, the illegal mining activities are typically carried out by small-scale miners including local villagers who do not adhere to safety or environmental standards. These miners always converge on the sites where obvious evidence of the solid mineral are found and begin to dig often using numerous rudimentary tools such as picks and shovels or, in some cases, large-scale machinery, covering a wide area, which exacerbates the destruction of archaeological sites. The unregulated nature of the illegal mining operations means that these miners frequently disrupt the integrity of archaeological deposits, eroding the soil and disturbing or even destroying valuable cultural materials (Barwa 2018).

Worthy of note here is that the illegal miners are often unaware of or indifferent to the importance of the archaeological sites they are disrupting. While some sites are protected under national heritage laws, enforcement is limited, particularly in remote regions like Nok Village, where the miners operate with little oversight (Okpoko 2014). As a result, these miners often unearth and destroy archaeological materials such as terracotta sculptures, pottery, and iron tools, as well as the stratigraphy that preserves the archaeological contexts. Therefore, once disturbed, the historical information provided by these materials is lost forever.

Impact of Illegal Mining on Archaeological Materials and Sites in Nok and Environs

The impact of illegal mining activities on archaeological materials in the Nok area and its surrounding environs is profound and far-reaching. This is mainly because

archaeological sites in the area are often located in the same terrain as valuable solid mineral deposits, a development which leads to a direct conflict between the mining activities and heritage preservation (Grunberg 2014). Additionally, the physical impact of these illegal mining activities such as the use of rudimentary equipment and other heavy machinery for excavations is the primary means by which the archaeological sites are destroyed. Because these tools, when used, usually tear through the stratigraphic layers of the soil containing the archaeological deposits thereby causing irreparable damage to both surface and sub-surface materials. In particular, one of the most significant consequences of this destruction is the loss of archaeological materials in their original context and the negative change on the original nature of the landscape in form of undulating terrain and large gullies.

(a) **(b)**

Large gullies on the landscape created by erosion and the destruction of archaeological materials as a result of the aftermath of illegal prospecting and extraction of solid minerals at:
***(a)** Kurmin-Jibrin and **(b)** Daddu*

Archaeological materials are valuable not only for their artistic and historical significance but also for the information they provide about the past societies. As such, when these materials are destroyed without proper and systematic excavation or documentation, the potential for understanding the past lifeways, particularly of the Nok people and civilization, is also diminished (Barwa 2018). Furthermore, the impact of illegal mining activities in Nok Village and its environs is also severe and indeed has great environmental and social

consequences. This is because deforestation, habitat destruction, and water pollution caused by the illegal mining activities often lead to the degradation of the natural environment. This, in turn, affects the livelihoods of the local communities in the area who rely solely on natural resources for agriculture, fishing, and hunting. On the other hand, the illegal mining activities equally have social impact. This is usually felt in conflict-prone communities within Nok and environs where the illegal mining often leads to violent clashes between the miners, police forces, and the locals. This scenario acts as a catalyst to undermine the rule of law and contribute so much to a vicious cycle of corruption, poor governance, as well as weakening the capacity of the law enforcement institutions in Nigeria.

In addition, from a broader perspective, the use of chemicals such as mercury and cyanide in illegal gold mining has been reported in other parts of Nigeria, and although this is not widespread in the Nok region, the possibility of contamination however remains (Omofonmwan and Osa-Edoh 2008). This further complicates the preservation of both natural and cultural resources in the region.

Challenges in Cultural or Heritage Management and Protection in Nigeria

Cultural and heritage management in Nigeria faces numerous challenges, particularly in regions rich in historical artifacts and natural resources. One such area is Nok village and its environs which for a long period, have been grappling with a growing problem of illegal mining activities. The illegal mining activities, driven by the search for solid minerals like tin, gold, and other precious materials, have become a significant threat to the protection and preservation of cultural heritage in these areas. The illegal miners who often dig indiscriminately and unregulated without regard for the environment or cultural significance end up destroying the archaeological materials which were once carefully buried in the earth (Barwa 2018). This has also highlighted significant challenges in the management and protection of cultural heritage particularly in Northern Nigeria in general. It is in the light of this that the Federal Government of Nigeria established regulatory frameworks and laws designed to protect cultural artifacts and control mining activities. These include the National Commission for Museums and Monuments (NCMM) serving as the principal statutory body responsible for the development, preservation, and management of museums and monuments in Nigeria, the Ministry of Mines and Steel Development (MMSD), the Nigerian Mining Cadastre Office (MCO) and the Nigerian Geological Survey Agency (NGSA). However, despite the presence of these frameworks and laws,

illegal mining activities in the country continue unabated due to the weak and ineffective enforcement mechanisms. This is particularly true especially in rural and remote areas like the Nok village and its environs, where government presence is limited, and the illegal miners operate with impunity (Okpoko, 2014). Additionally, the lack of proper coordination between these cultural heritage agencies and the mining authorities exacerbates the problem, leaving archaeological sites and materials vulnerable to destruction. Moreover, there is also a lack of public awareness about the importance or value of archaeological materials particularly in rural areas like the Nok village and its environs. For instance, many of the local communities in these areas view mining as a source of immediate economic gain and do not recognize the long-term value of preserving cultural or heritage sites or practices for future generations. Owing to these fundamental reasons, destruction or neglect of these heritage sites by the illegal miners always occur without much resistance (Adebayo 2015, Barwa 2018). In the same vein, the absence of education and outreach programs regarding the significance of the Nok culture and its archaeological resources further hinders efforts to protect these sites.

Recommendations for Mitigating the Destruction of Archaeological Materials and Sites

To address the destruction of archaeological materials in Nok village and its environs, a multi-faceted approach is needed. First, there must be greater enforcement of existing mining and heritage protection laws. This means that the Federal Government of Nigeria should strengthen the capacity of the NCMM and the other mining agencies like the MMSD, MCO and NGSA to efficiently monitor mining activities and protect cultural sites from destruction (Obaje 2009, Okpoko, 2014). These enforcement actions will underscore the government's determination to really regulate the mining sector and to ensure the government’s commitment to combating illegal mining activities, recognizing its detrimental impact on the country’s economy, cultural heritage as well as national security in general.

Secondly, public awareness campaigns should be launched and enhanced particularly in rural areas in order to educate the local communities who are potential illegal miners about the cultural and historical value of archaeological sites and materials. The local communities should also be engaged in the preservation process. This could be achieved through the provision of alternative

sources of livelihood by the government to reduce the dependence on the illegal mining (Ajakaiye *et al.* 1992).

Thirdly, partnerships between archaeologists, geologists and other environmentalists, as well as the mining sectors should be encouraged to ensure that authorized mining operations are carried out responsibly and in a manner that does not destroy archaeological materials. The establishment of buffer zones around archaeological sites within Nok and its surrounding villages as well as the use of sustainable mining practices could also be helpful in mitigating the environmental and cultural impacts of illegal mining activities (Grünberg 2014). Furthermore, the privatization, commercialization and general reform exercises currently being undertaken by the Federal Government of Nigeria should lead to an upsurge in fighting against the illegal mining of the solid mineral resources in the entire country particularly in the Nok area (Obaje 2009).

Finally, owing to the fact that illegal mining of solid minerals in Nigeria is a serious offense, perpetrators found guilty of such activities should, therefore, be made to face stringent penalties and sanctions under Nigerian law. These sanctions can be in form of: revocation of the mining licenses issued to individuals or entities that are also found to be engaged in illegal mining activities, substantial fines, and to a large extent, imprisonment of convicted individuals found guilty of these offenses. There should also be confiscation or seizure of the equipment used in the illegal mining operations.

Conclusion

The challenges facing cultural and heritage management particularly in northern Nigeria are indeed very complex. This is quite obvious from the fact that illegal solid minerals prospecting in Nok and its environs represents a serious threat to the preservation of archaeological sites and cultural heritage in these areas. Our study discovered that destruction of the valuable archaeological materials such as terracotta sculptures and pottery through unregulated mining activities is an irreversible loss that diminishes our understanding of Nigerian history in particular and African civilizations in general. Therefore, to safeguard Nok village, its environs as well as the archaeological resources inherent in these areas, a comprehensive approach that combines effective enforcement, community engagement, and sustainable mining practices is essential. The protection of these invaluable sites and materials is not only a national or government responsibility

but also an all-encompassing one involving individuals and all stakeholders as they contribute to our shared understanding of human history.

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