

# Geotourism and Mining Heritage: a Potential Gold Mine for Central Nigeria

NATHANIEL G. GOKI\*, SHEKWONYADU IYAKWARI AND ALLU A. UMBUGADI  
*Department of Geology and Mining, Nasarawa State University, Nigeria*  
(\*corresponding author e-mail: nathgoki@yahoo.com)

## ABSTRACT

The potential for geotourism and mining heritage of some landscapes in parts of Kaduna, Plateau, Nasarawa and Kwara states in central Nigeria were studied and compiled. The result show that geological endowments range from insalbergs, flood basalts and dome structures, which presents natural landscape for tourism. The quartzite ridges of the Oreke area in Ilorin host the Owu Falls of 120m cascading waters, the Kafanchan flood basalts that flowed extensively from the Kagoro hills with extensive columnar jointing creating the prestigious water falls of over 30m all present versed potential for geotourism. Mining activity around the Jos Plateau (Bassa, Jos, Bukuru, Barakin Ladi and Bokkos areas), southern Kaduna (Godogodo and Jagindi) create landscapes that if properly beautified can become tourist landmarks. Adopting and harnessing these landscapes can boost and provide alternative revenue for the affected central.

**Keywords:** geotourism, mining heritage, potential, development, central Nigeria.

## INTRODUCTION

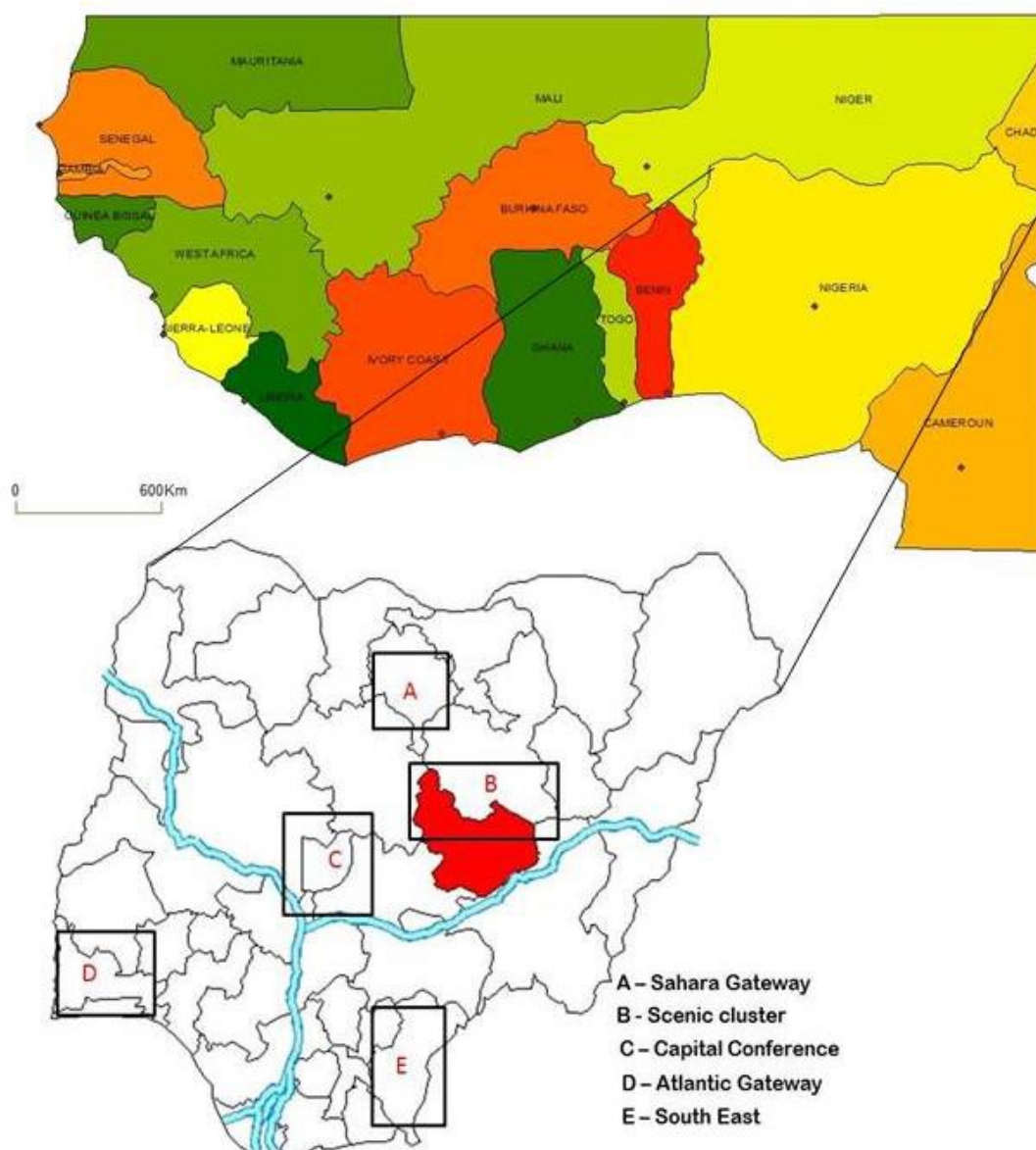
Geotourism, with proper management has been fingered as a powerful tool for sustainable development (Newsome et al., 2012). Traditionally it has been seen as a form of tourism which is principally exploiting geological attributes. Increasingly, wider definitions has been included to cover archeological, educational and more recently for economic purposes. The interest in this now established field has increased around the world (see e.g. Dowling, 2011; Hose, 2012; Newsome & Dowling, 2010). Ngwira, (2015) identified Geotourism and Geoparks in Africa as having Prospects for Sustainable Rural Development and Poverty Alleviation.

Nigeria is the populous nation in Africa with a human population of at least 160 million. It is located in equatorial west Africa with versed arable land which prior to the discovery of oil in the 1940s was largely dependent on Agriculture and solid mineral resources both for local and export

earnings. Nigeria over decades has been driving her tourism potentials as an alternative revenue earner. This has made the Tourism Board to identify five major gateways in order to drive this all important sector (Fig. 1). These gateways were identified based on factors like existing airports and sea ports to serve as transport routes as well as population.

The Sahara gateway is exploiting the Kano airport as well as the proximity to land boarder cultural prospects from Niger and other Sahara trade routes. The Atlantic and Southeast gateways are to depend on the availability of seaports as major promoting determinants. The Abuja gateway is the capital city stimulant because of the traffic into the fast developing Federal Capital, while the Scenic Cluster depends heavily on the natural scenic endowments of the belt such as the highest spot heights in the country, tin mining and the cold climatic conditions.

The scenic cluster therefore strictly speaking is the geotourism niche of the country because of its geological



**Fig. 1** Map of Nigeria showing the tourism clusters, location of Plateau state an in set West Africa (Goki at al., 2016)

endowments. The Central Nigerian Belt (Fig. 2) coincides with the Rivers Benue and Niger with a scenic confluence in Lokoja, the very first capital of Nigeria, itself another geotourist landmark feature.

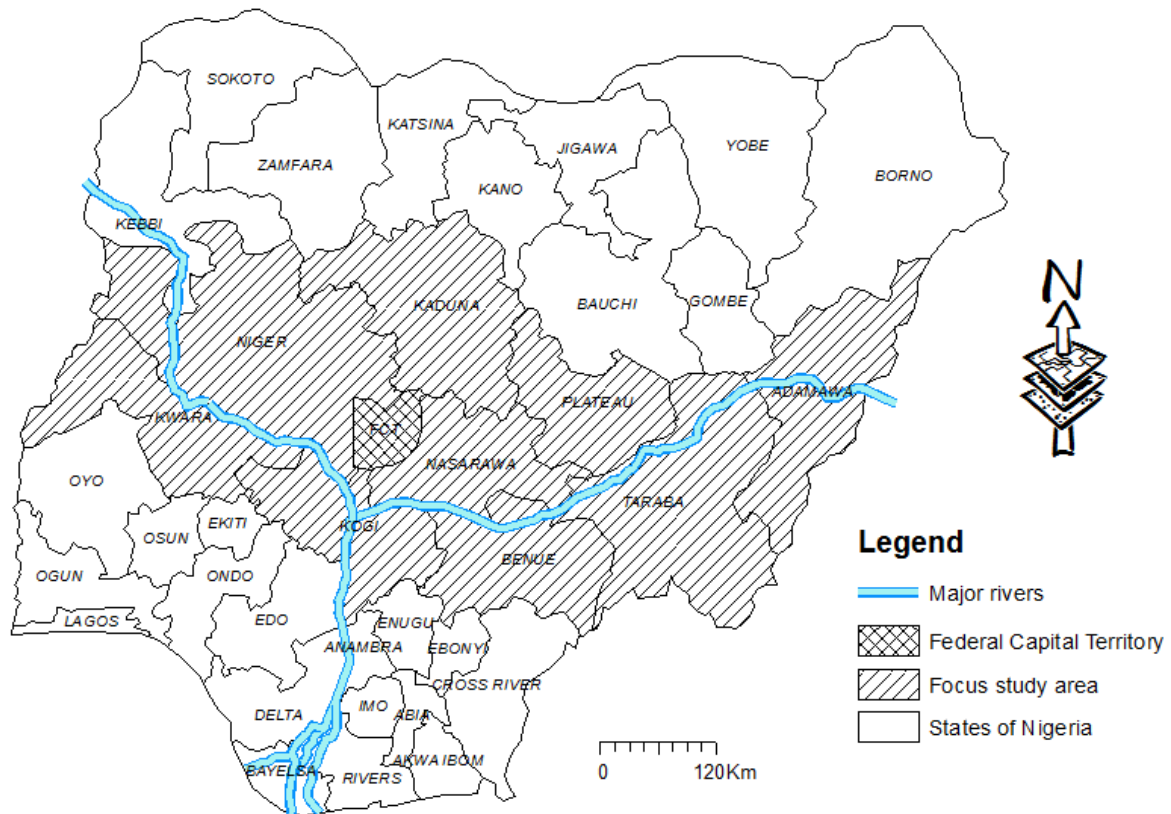
These river basins therefore provided the requisite depressions into which most of the upland areas that transcends the valleys flow into justifying the location of waterfalls stretching from Farin Ruwa Falls (Wamba), arguably the highest in west Africa; the Kurra and Assop falls all of which are falling from the Upland rocks of the Jos Plateau. Other examples on the Plateau have been reported by Ogezi et al.

(2010) and Iyakwari and Lar (2012). Then to the Owu Falls in Kwara State.

Central Nigeria is therefore a stretch endowed with extensive geosites.

## MATERIALS AND METHODS

This work is a preliminary compilation of all the geosites and mining heritage sites in central Nigeria. The work involves visiting and snapping the sites, assessing the accessibility to such sites and subsequently compiling the investment potentials in those areas as well as watching the possibility of



**Fig. 2** Map of Nigeria showing the central Nigerian area – the study focus

revenue generation for the local as well as national economies as an alternative for revenue generation in a challenged economy like Nigeria. Some of these geosites have been reported by other others (Ogezi et al., 2010), but this paper attempts to expand their coverage over a wider belt of central Nigeria.

## RESULTS

Figure 3 gives a generalized map which at the present scale cannot capture all, but some of the major geosites and mining heritage sites. They range from falls in Kwara, Kaduna, Plateau and Nasarawa states as the first categories. It will suffice to say that depending on accessibility and size, some are more developed than the others. However, such descriptions are relative because generally, those geosites have the capacity to attract other facilities like camps, resorts and hotels. The geosite size in itself may not be the determinant but

a stimulator.

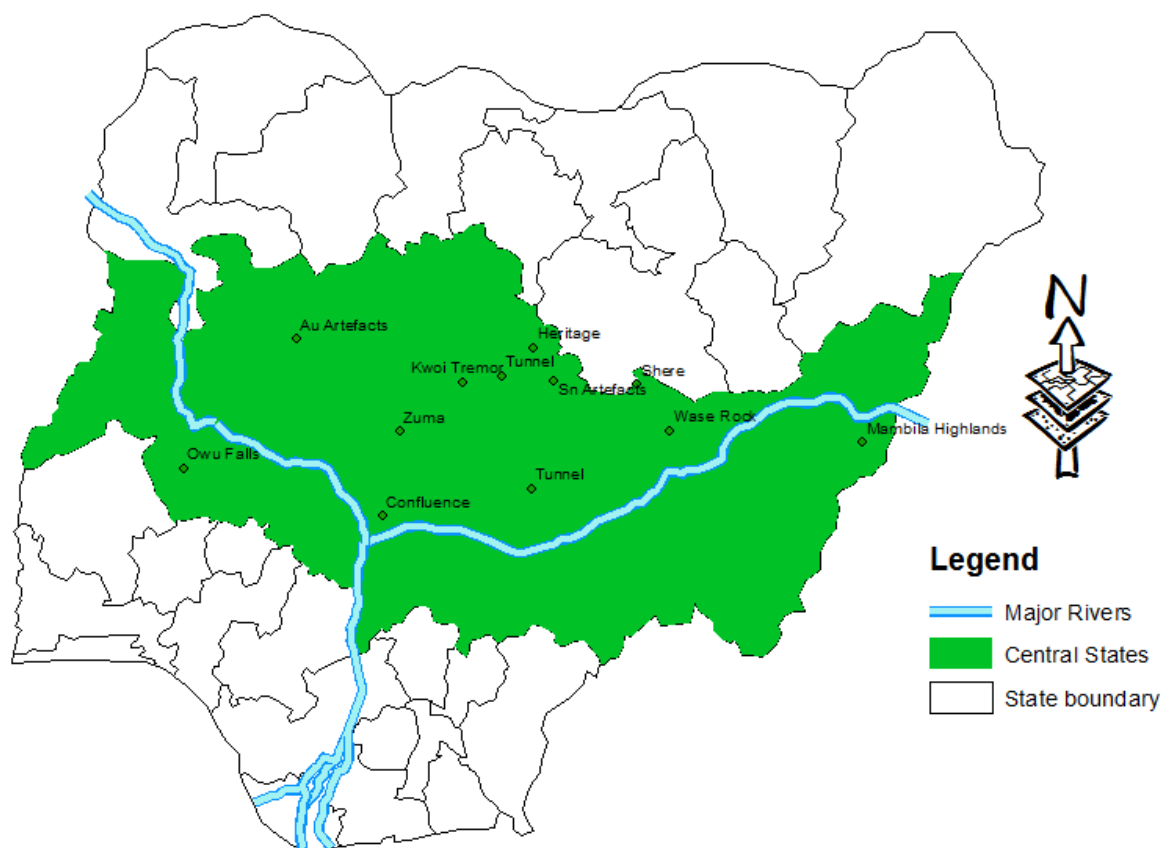
### Water Falls

Beautiful water Falls are also abundant and a few have been presented (Figure 4, 5, 6) including those that have not been presented such the Farin Ruwa Falls Wamba (Fig. 2).

The Kafanchan falls (Fig. 4) represents a water fall plunging some twenty meters over extensive basalt flows stretching for some tens of kilometres through the sleepy central Nigerian town that boarder the south-western Plateau Younger Granites hosted historical tin fields. The flood basalts themselves display columnar jointing which provides geological attraction for holiday makers.

The recreational ecstasy provided by the dissected quartzite ridge which forms part of an extensive Okegbala – Oreke quartzite ridge exposed at different road cuts at both the Lokoja north-eastern exit and the south-eastern exit respectively, exposing its anticlinoral axial planes. This regional





**Fig. 3** Map of Nigeria showing some major landscape geosites in central Nigeria



**Fig. 4** Falls over the basalt flows of Kafanchan

structure created the over 120m high Owu Falls (Fig. 5). The three-step cascading waters has been a major attraction with attempts made by the Kwara State Tourism Board to make it a tourism landmark.



**Fig. 5** Owu Falls Kwara State, a 120 m cascading water fall over the Oreke quartzite ridge.

The Kurra falls (Fig. 6) with elevation of about 1150 m above sea level located some 77 km southeast of Jos is ideal for recreational activities such as boating, rock climbing and picnics.

### Rock and Hill Attraction

The next category is geological in nature. Here, the main attraction stem from high landscape that are mainly used for mountain climbing, geological fieldwork and the scenic ecstasy that they give tourists.

The Wase hill (Fig. 7) rises for nearly

150 m above its base with a monolithic structure and can be sighted 40km away. Continuous weathering led to a pile of rubble at its base. Caves within the plug which historically served as hiding place during war, now houses wild animals.

The beautifully arranged Riyom rock formation (Fig. 8) situated along the Jos Abuja road and which was historically used as a hiding place in ancient times is a beautiful landmark feature that is often celebrated among the Berom cultural group on the Plateau. The rocks, just like the Shere Hills (Fig. 9) forms part of the Nigerian tin-rich Younger Granite Complexes. The Shere Hills has been used for decades as a leadership training centre because of its height of 1 829 m, presumed to be the highest in the country.

Another major region with geotourist potential is the Pankshin Wulmi Hills (Fig. 10) which forms part of the Sara-Fier Younger Granite Complex. The area around these hills prides itself as the coolest region in Nigeria with historical records of mild snow falls in the past. Extensive hill chains with cable line rides abound in such scenic geomorphological terrain.

The Gahweng columnar Tertiary basalts (Fig. 11) which extends for several kilometres along the Bachit River in Riyom area with its distinctive and impressive straight sides and edges is another major geosite in central Nigeria. This can attract tourists in large numbers if properly developed.

The Jibang bridge (Fig. 12) abuts another extensive basalt flow sourced probably from the volcanic flows associated with the uplands of the Pankshin Hills. The bridge itself is one of the tallest in height and has attracted a lot of tourist attraction with a possibility of complimenting such a potential with the underlying basaltic base.

### Mining Heritage sites

Extensive tin mining activity and other minerals have occurred over the century in this belt. Artefacts dot the landscape



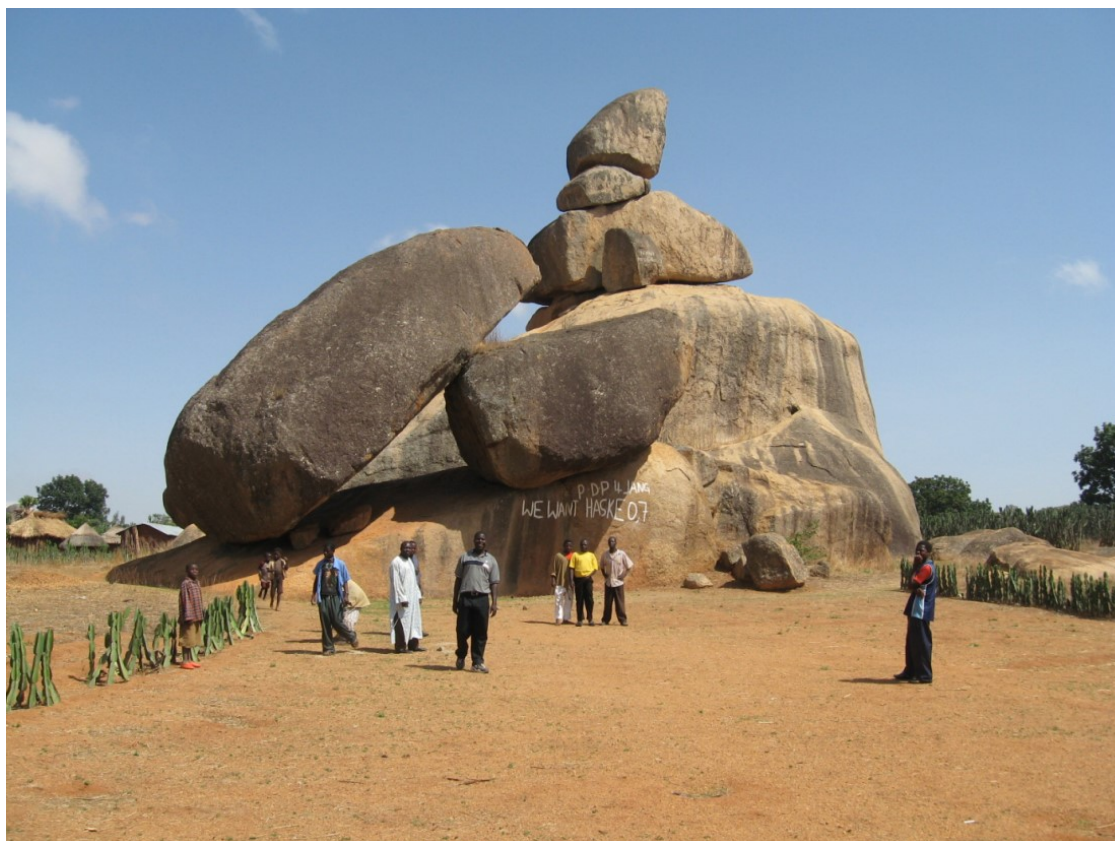


**Fig. 6** Kurra Falls in Riyom, south east of Jos, central Nigeria



**Fig. 7** Wase rock (trachytic plug) with a dry season background with no beautification and landscaping





**Fig. 8** Riyom rocks along the Abuja – Jos highway with a natural arrangement



**Fig. 9** Shere hill used as leadership training facility since the 1960s located east of Jos, central Nigeria





**Fig. 10** Hilltop scenery of the Pankshin uplands designed for mountain climber's lovers (indicated by arrows)



**Fig. 11** Gahweng Columnar basalts, central Nigeria





**Fig. 12** Jibang Bridge, Quan Pan abutting basalt flows from the Pankshin Hills Central Nigeria

ranging from equipment and other landmarks that present extensive history and which can be harnessed for tourism. Draglines in and around Jos mining town (Fig. 13), tunnels used by ancient miners (Figs. 14 - 17) whose history are gradually wearing out are abundant. It is difficult to completely isolate and develop such sites as observed by Conesa (2010), partly because urban development has caught up with mining areas, and partly because of the apathy created by the exploitative mining companies of the past thereby creating stiff opposition from present attempts to gain confidence of the indigenous local inhabitants.

### **Mining Ponds**

The most visible evidence of mining in this region is the ponds (Figs. 18 and 19) now filled with water. So many are used for agricultural purposes while some are used for recreational purposes. So many of the ponds can be utilized for recreation without much hazards (Goki et al., 2016).

### **DISSCUSSION AND CONCLUSION**

The geology of Nigeria trisects the country into three stable platforms with the largest in the north while the two other major upland areas form the cores of western and eastern Nigeria. Sandwiched between these platforms are the major drainage systems, River Niger to the west and Benue valley to the east. The connection in Lokoja of these river systems coincides with the E-W central region which geologically also stretches from the upper Benue, Middle Benue and the Nupe/Bida intracratonic troughs. These region has also been geopolitically coined North Central Nigeria, also referred to as middle belt by a group of people who have been geographically, ethno-politically and socio-economically yearning for identity.

In Nigeria, the sharing of resources is based on such parameters in addition to what that region brings to the national purse. Lately, there is even increasing call for true federalism where each region





**Fig. 13** Dragline used dated near a century used by the early tin miners on the Plateau



**Fig. 14** Tin mining Tunnel site in Godogodo, southern Kaduna





**Fig. 15** Naturally stabilized abandoned molybdenite mined out shaft in Kigom Younger Granite Complex, Jos



**Fig. 16** Step bench work for Tin mining since the early 19th century being destroyed by artisanal activity (Goki et al., 2016)





**Fig. 17** Gold mining artefact from Niger central Nigeria



**Fig. 18** Google image showing an example of mining ponds in one of the mining towns around the Jos Plateau





**Fig. 19** A beautifully landscape pond by mining along Barkin Ladi – Bokkos road

controls its resources and only contributes a little percentage to the central government. These geotourist endowments are therefore a strong option in the present modern Nigerian context.

The trisect architecture of Nigeria is not only a stratigraphic classification but geomorphological strato-step down for most of the Falls in the country. The steep gradients provided by the anorogenic uplift that form the Jos Plateau and the domal uplifts of the Pan-African intrusions in the north, east and west of the country which also remotely influenced deformation of the sediments within these basins are also significant. This geological observation makes the middle belt to be very rich in terms of geosites. Even the mining activities in the states named are also direct consequences of alluvial mining activity that accumulates in the valleys adjoining the hills that boarder the escarpments. Southern Kaduna and Nasarawa mining and heritage sites are as a result of mining of

alluvial tin sourced from the Plateau area.

The authors believe that central Nigeria, if well explored for geosites as alternative sustainable development venture is a potential gold mine.

Additionally, this cosmopolitan belt has been populated by immigrants from other regions of Nigeria, western Africa and Europe because of the mining history at the turn of the century, including early colonial explorers and missionaries both from the West and the Arabs through the trans-Saharan trade routes. Hospitality therefore is not a major challenge. In fact, until recently, Jos Plateau State was the tourist Headquarters of Nigeria coupled with its cold climate prompting the now botched Super Eagles training camp in Kuru, a nearby suburban centre in Jos.

Even in religious history, this central region either houses the headquarters or was a founding centre for about ten well spread churches in Nigeria (ECWA, COCIN, ERCC, Winners Chapel to

mention a few). The headquarters of the Nigerian Mining and Geosciences Society is in the same central Nigerian city of Jos (now gradually relocating to the central city of Abuja). The implications for this are that tourism which is usually an essential part of most conventions around this area will always not lack geotouristic patronage.

It is the opinion of the authors that central Nigeria holds great potential for geotourism and some form of mining heritage.

Geotourism for sustainable development of this region is achievable and can therefore be pursued.

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