Gold Deposits

Exploration opportunities in Nigeria

INTRODUCTION TO NIGERIA

Nigeria lies approximately between latitudes 4°N and 14°N, and between longitudes 3°E and 15°E. Nigeria has an estimated current population of about 130 million, making it the most populous country in Africa and the tenth most populous in the world. The country's economy has witnessed increasing growth in recent years with the Gross Domestic Product increased by 6.1% from 2003 2004.

Nigeria has a long, but discontinuous history of mining and the country was a prominent exporter of tin, columbite and coal. Mining is administered through the Ministry of Solid Minerals Development, which is promoting private-sector led development and has initiated deep and wide ranging reforms of the mining sector.

These include:

1. A new mineral policy which emphasises greater private sector participation in an environment of orderly and sustainable development in the exploitation of solid minerals is already in the pipeline.

The key elements are:

- Security of tenure
- Clearly defined tax regime
- Realistic environmental protection regulation
- Guaranteed concession such as tax holidays (3years) deferred royalty payments, capitalization of exploration and property cost expenditure
- 100% foreign ownership of mining and exploration concerns.

2. Review of the current, 1999 Minerals and Mining Act, to ensure greater transparency in licensing procedures.

3. Establishment of the Mining Cadastre Office (MCO) as an autonomous body to administer mining titles "with integrity and in a transparent manner on a 'first-come first-served' basis".

CONDUCIVE ENVIRONMENT

Certain basic facilities favourable for conducting business exist in the country.

These include

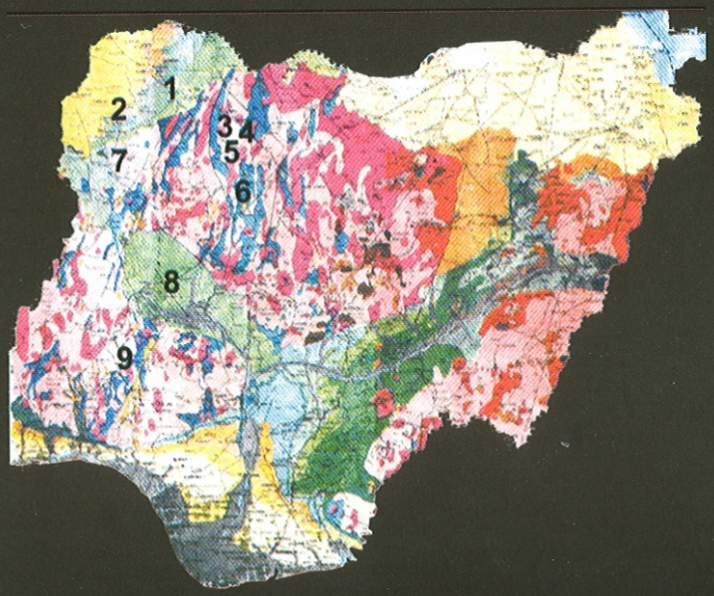
- A fairly developed infrastructure such as road network, deep ocean ports and jetties.
- Improved communication system
- Supportive banking institutions
- Relaxed foreign exchange for capital raising
- Existing joint venture opportunities
- A large community of skilled geoscientists and engineers
- A commitment to privatization

EXPLORATION OPPORTUNITIES IN THE NIGERIAN GOLD DEPOSITS

HISTORY OF GOLD PRODUCTION IN NIGERIA

In the absence of any systematic exploration and development, the Nigerian goldfields have experienced intense

GEOLOGICAL MAP OF NIGERIA SHOWING THE MAJOR AREAS OF GOLD MINERALIZATION



EXPLANATIONS

- Meta-Sediments
- Granitoids
- Sandstones
- Clays and Grits
- Sands and Clay
- Gneiss Migmatite complex

1. Maru
2. Anka
3. Malele
4. Tsohon Birnin Gwari
5. Kwaga
6. Gurmana
7. Bin Yauri
8. Okolom-Dogungaji
9. Iperindo

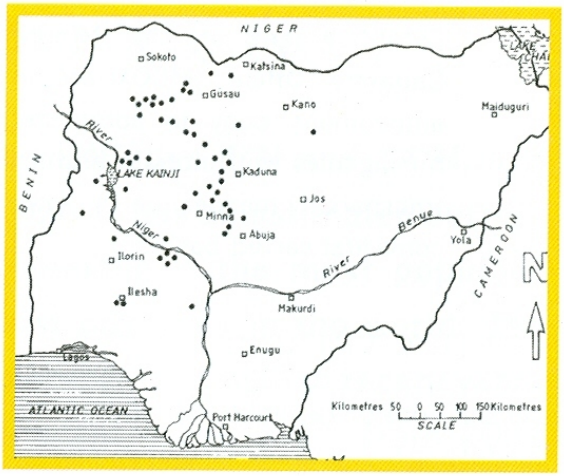
artisanal workings which target both the primary gold-quartz reefs and their associated alluvial occurrences.

Officially recorded gold production in Nigeria started by 1913 and peaked in the period 1933-1943 when about 1.4t of gold were produced. The gold production declined during the Second World War period and never recovered as mines were abandoned by mostly colonial companies.

The Nigerian Mining Corporation started exploration for gold in Nigeria in the early 1980s but failed to be sustained due to lack of funds. The discovery of petroleum and its subsequent domination of the Nigerian economy also contributed to the lack of attention to gold exploration despite the widespread potentials.

OCCURRENCE

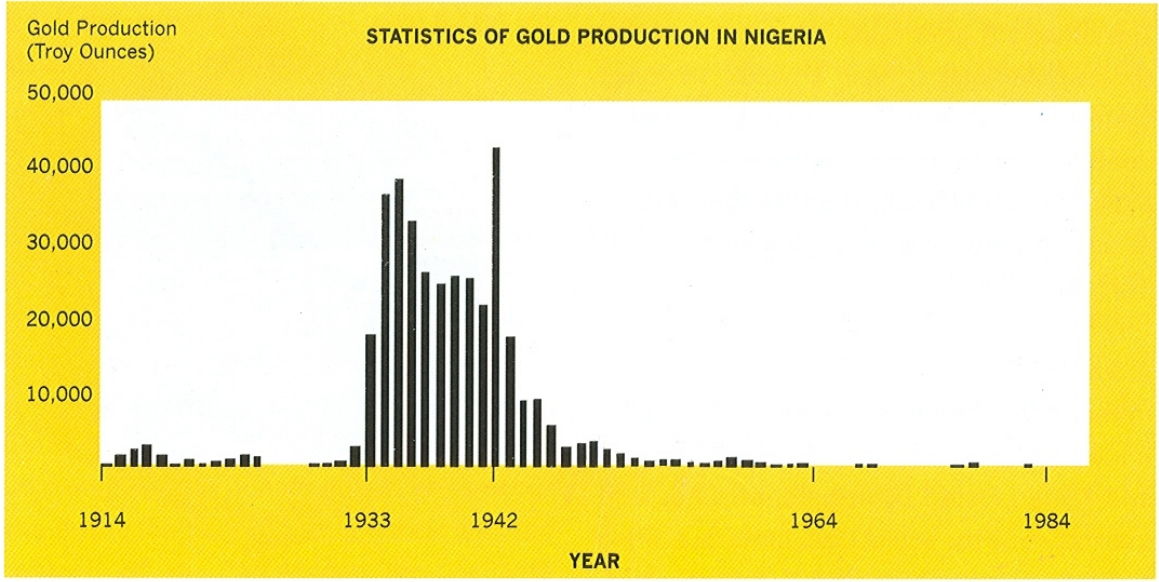
Gold in Nigeria is found in alluvial and eluvial placers and primary veins from several parts of supracrustal (schist) belts in the northwest and southwest of Nigeria. The most important occurrences are found in the Maru, Anka, Malele, Tsohon Birnin Gwari-Kwaga, Gurmana, Bin Yauri, Okolom-Dogondaji and Iperindo areas, all associated with the schist belts of northwest and southwest Nigeria. There are also a number of smaller occurrences beyond these major areas.



The areas of gold occurrences in Nigeria.

GEOLOGICAL SETTING AND MINERALIZATION

Nigeria Archean to Lower Paleozoic basement rocks consist of a migmatite-gneiss-quartzite complex. They bear imprints of Liberian, Eburnean and Pan-African tectonic events. The enclosed schist belts lithologies, consist of upper Proterozoic fine grained clastics, pelitic schists, phyllites, banded iron formations, marble and amphibolites with imprints of the Kibaran and Pan-African tectonic events.



Metamorphism within the belt is that of green schist facies grading into amphibolites, especially in the older gneiss-migmatite-quartzite complex, with lesser volumes of volcanic rocks.

Primary gold mineralization in the schist belt commonly occurs in quartz veins within several lithologies. Morphologic types include bedding concordant veins or discordant vein system. Mineralized wall rocks are common adjacent to known veins and may be impregnated with fine grained sulphide minerals.

Maru

Two old gold mines are most important, and are within the Maru schist belt. Duki Mine is hosted by a shear zone traversing a quartzite-schist series, often exploiting the S_1 schistosity planes. The mineralization apparently made up of gold-quartz veins, was exploited by past miners for over 1 km of strike length, leaving behind series of collapsed N-S trending workings without any surface exposures of the mineralization. Recent explorations drilling by the Nigerian Mining Corporation have shown the continuity of the gold-quartz-sulphide veins below the old workings.

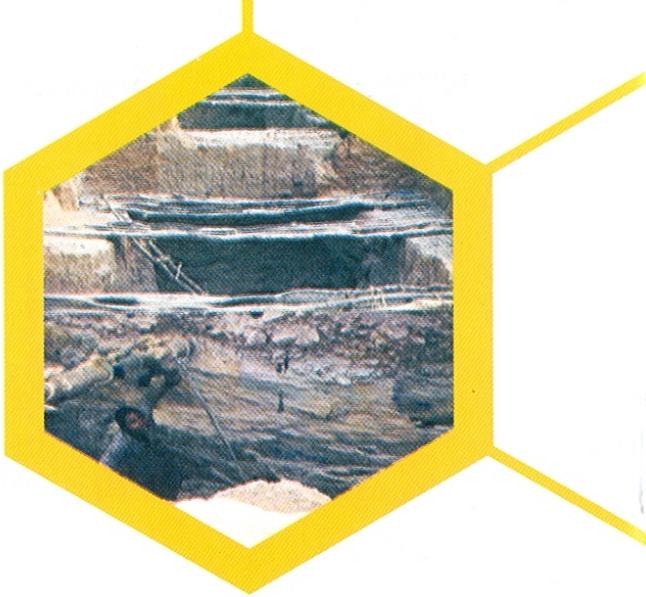
The other old gold mine (Maraba) is a two sub-parallel quartz vein (~ 300 m long) system. Tourmaline and chlorite in quartz floats and altered wall rocks are the only indicators of mineralization, as there are no in situ exposures due to intensity of past mining.

Anka

In this area, there are a number of old gold mines, such as Kwali, Jameson, Zuzzurfa and Kuba, hosted by schists, phyllites and quartzites of the schist belt. Individual veins or reefs seldom exceed 0.5 km of strike length as indicated by the extent of past workings, and are concordant with the host rock foliation. These mineralized wallrocks show metal values in the following range: Cu = 647-5410 ppm, Pb = 7550-22600 ppm, Ag = 1.5-8.6 ppm, and Au = 123-6320 ppb.

Malele

The Malele area is in the extreme southern part of the Maru schist belt. Gold Mineralization occur in a NNE trending gold-quartz vein series cutting both biotite-gneiss and chlorite schist, now represented by a series of sub-parallel surface workings (pits, trenches and water ponds) with the vein exposures seldom observed. The mineralization was discovered in 1934 with the most prominent of the veins being 1.5 m thick, 370 m long and a grade of about 30 ppm Au.



Tsohon Birnin Gwari and Kwaga

The Tsohon Birnin Gwari and Kwaga gold sites are within the Kushaka schist belt of northwestern Nigeria. While the Tsohon Birnin Gwari was an active gold mine in the 1930s where over 600 ounces of gold were produced, the Kwaga site is a recent discovery by artisanal miners following the extensions of the Tsohon Birnin Gwari mine.

The Tsohon Birnin Gwari gold reef system is about 7 km long, while the Kwaga reef system extends for about 3 km. Gold is mainly associated with pyrite and minor sphalerite, chalcopyrite, pyrrhotite, galena and magnetite. The gangue is predominantly quartz, but K-feldspar and graphitic matter (from wall rocks) are also constituents. Grades are very variable within the reef system and between oxide and

sulphide ore zones, but generally 5-100 g/t Au are found.

Recent core drilling and near-surface mine exposures have provided relatively fresh samples of the gold-quartz reefs and their altered wall rocks from which the geochemical characteristics of the Tsohon Birnin Gwari mineralization were studied.

Bin Yauri

Gold-sulphide-carbonate quartz veins occur in a brittle fault zone cutting hornfels of the contact of a Pan-African granodiorite batholith intruding phyllites and tourmalinites of Zuru schist belt in northwestern Nigeria. Mineralization has been uncovered over a strike length of 1.5 km by past miners (1920s-1940s).

Gold occurs associated with pyrite, chalcopyrite, galena, and minor sphalerite, magnetite and bismuth telluride in a gangue of mainly quartz with some carbonates, sericite, chlorite and tourmaline. The gold veins are surrounded by a narrow zone of hydrothermal alteration in which a chlorite-tourmaline-pyrite-carbonates association overprints a dominantly sericitic fabric of the hornfels wall rocks. Past mine records, reconnaissance exploration and studies have shown gold grades in the range 5-15 ppm.

Gurmana

The Gurmana area of gold mineralization is situated in the extreme southern part of the Kushaka schist belt. Gold mineralization is in the form of quartz-sulphide veins and stockworks hosted by amphibolites and gneisses. The gold-quartz-sulphide veins seldom extend more than a few tens of meters. Gold occurs with pyrite, chalcopyrite, galena, covelite and chalcosite.

Okolom-Dogondaji

The Okolom-Dogondaji area of gold mineralization is in the Egbe-Isanlu schist belt of southwestern Nigeria, and the primary gold-quartz veins and eluvial/alluvial placers have been mined extensively in the period 1930s-1950s. A

series of gold-quartz veins is hosted by N-S and NNE-trending shear zones, which cut gneisses, schists and amphibolites.

The most prominent site is the Okolom old mine, which a gold-sulphide-quartz reef system with a total strike length of about 3 km hosted by gneiss, amphibolite and talc schist. Other sites in the (Dogondaji) area have relatively smaller veins hosted by amphibolites, gneisses, mica schists and phyllites. Gold is associated with pyrite, marcasite, pyrrhotite, chalcopyrite, argentite and galena, with a gangue of quartz, tourmaline, sericite and chlorite.

Iperindo

The Iperindo old gold mine is in the Ilesha schist belt of southwestern Nigeria. The Iperindo mineralization comprises a series of auriferous quartz-carbonate veins localized by a subsidiary fault within biotite gneiss and mica schist, presently defined by sub-parallel old working extending overall for about 900m in a NNE direction. Gold occurs with pyrite, pyrrhotite and minor chalcopyrite, galena, sphalerite, magnetite and ilmenite. Adjacent to the gold-bearing veins the host granite-gneiss has been hydrothermally altered to a sericite-chlorite-epidote assemblage (also with hematite and pyrite).