Ministry of
Mines and Steel
Development

TIN IN NIGERIA

Exploration and Investment Opportunities in Nigeria

Introduction

Nigeria has recently emerged as a rapidly growing source of tin-in-concentrate, with tin ore exports in the first four months of this year, as totals of importing country data, at 2,967 tonnes (gross weight) or an estimated 2,000 t of tin contained based on a 67% average tin content. This figure is almost three times the amount of metal than the equivalent period of 2016 (ITRI). It is envisaged that if shipments continue at this rate for the remainder of 2017, the country will have exported 6,000t of tin, double the estimated output in 2016. This could potentially see Nigeria become the largest tin producing country in Africa. The potential for expansion in the Nigerian Tin Field remains significant with considerable opportunities for job creation. The tin reserves in Nigeria have been conservatively estimated to be in excess of 31,000t (52,000t ITRI), with most of it concentrated in the central Jos Plateau.

2014 Top Producing Countries (ITRI)

	Country	Tin Metal	
		Tonnes	%
1	China	103,400	33.8
2	Indonesia	88,300	28.9
3	Myanmar	30,000	9.8
4	Peru	23,100*	7.5
5	Bolivia	19,800	6.5
6	Brazil	12,100	4.0
7	Australia	6,900	2.3
8	Vietnam	5,400	1.8
9	DRC	5,100	1.7
10	Rwanda	4,000	1.3
11	Malaysia	3,800	1.2
12	Nigeria	900**	0.3
	World Total	306,000	

*from San Rafael Mine (7.5% of the world production)
**MID suggests production at around 380 t and 900 t for 2014 and 2015 respectively (USGS 2,500 tpa)
Note that the top 3 producing countries represent 72.5% of world production

Top Tin producing Countries 2014

Historically, tin has been used as an alloy with copper to produce bronze. More recently it found use in the automobile industry and in the manufacture of tin cans. Today, tin is used mostly in lead-free soldering and electronic gadgets.

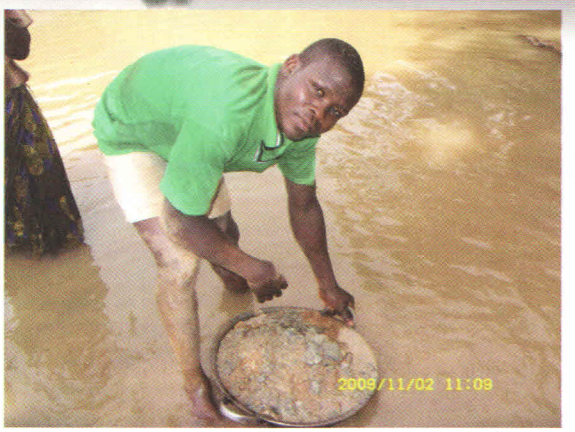
In recent years tin production has relatively been stable, with refined tin production totaling about 300,000 tpa. However, consumption has steadily increased and there is believed to be a supply gap looming. It is generally considered that artisanal and small-scale mining constitutes almost half of all global tin mine production annually. As a result the estimates of mineral production, resources and reserves in these areas are not typically known and are rarely reported. This situation is applicable to Nigeria where tin production has been estimated and was listed as the 12th world producer in 2014.

Background

Nigeria has a long, but discontinuous history of mining but the country was a prominent exporter of varied mineral commodities including tin. Tin mining in Nigeria has been traced back to the exploration and discovery tin produced by the natives in the river beds north of Keffi. This and the Bauchi & Plateau areas, contained rich deposits of tin concentrates, were worked in 1884 & 1886 by the National African Company and Niger Company respectively. In 1902-1903 a survey party, under the direction of colonial Laws of the Niger Company, surveyed the country to the east of the Niger and found more tin in the Bauchi Province. It was also discovered that native smelting had also been going on for a long time previously in the area. In 1909 a company, called the Tin Fields of Northern Nigeria, Ltd., was formed for the purpose of acquiring and dealing with tin mining properties in Nigeria. In the succeeding years, several more companies were formed to exploit the tin fields. Systematic exploitation of the alluvial deposits in Northern Nigeria followed the discovery of mineral resources by the Colonial Mineral Surveys, now the NGSA. Annual production of tin peaked at 11,000t in 1975. This output subsequently fell to between 500tpa (USGS) and 2,500tpa (ITRI). The Nigerian Mines Inspectorate report a figure of 900t (2015).

Nigerian Tin exports 2014-2017

Geology of Tin Mineralization in Nigeria



An Artisanal miner panning alluvial material for tin

The Younger Granites of Nigeria have been recognized as the source of rich alluvial cassiterite deposits that had long been known to exist on and around the Jos Plateau ring complexes. These result from a succession of magmatic activity, from volcanism to plutonism, associated with ring faulting and subsequent emplacement of granite melts at high crustal levels in the crust in the Jurassic. These granitoids are mainly rhyolites, quartz-syenites or granites, which have alkaline to peralkaline compositions, with some being aluminous to peraluminous, The ring complexes are associated with considerable cassiterite, wolframite, scheelite and zinc mineralization, which have sustained the tin mining industry. A suite of older granitoids which intruded the Precambrian rocks and which are older than the younger granites are pegmatites. These host tin lodes containing cassiterite, wolframite, sphalerite etc.

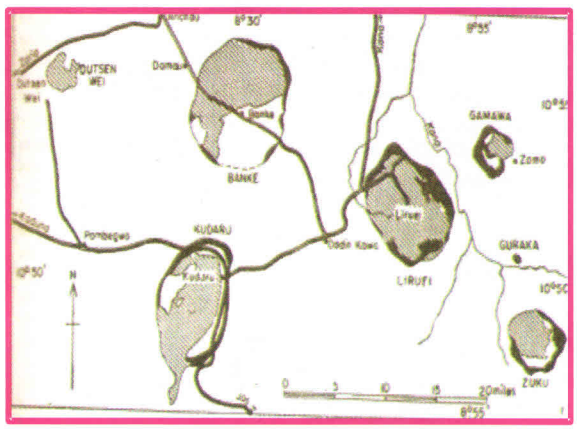
Mineralization Types

Two types of tin mineralization has been identified in Nigeria

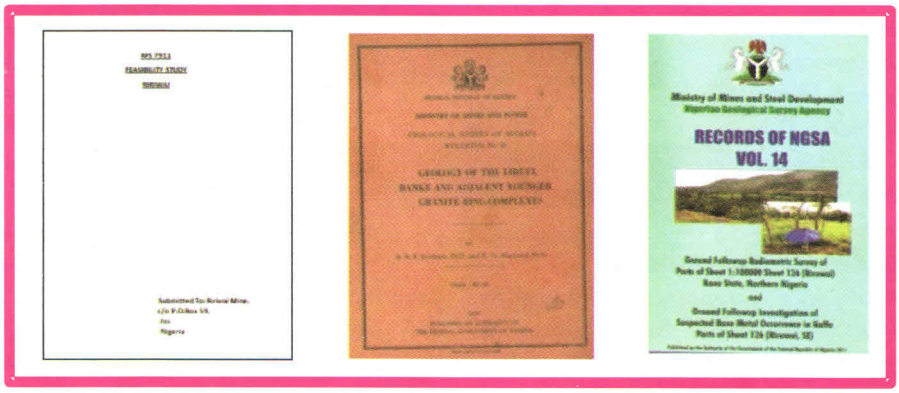
- Alluvial and eluvial placers largely derived from erosion of ring dykes, bosses, large stocks and batholiths of biotite granites which are rich in cassiterite.
- Pegmatites containing cassiterite and coltan introduced during late stage albitization. These are occassionally associated with beryl tapiolite and minor sulphides.

Investment Opportunities

1. Applying for mineral titles with a view of wholly owning the mining rights for tin deposit.
2. Partnering with existing title holders for detailed exploration development and mining as consultants and specialists.
3. Partnering with existing title holders in joint venture agreement to explore, mine and market the tin resources of areas of interest.
4. Legal transaction in tin won in mining operations for export.



Ring complexes in NW Nigeria



Available reports: Feasibility, Bulletin and Records