

# THE MINERAL INDUSTRY OF SIERRA LEONE

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Sierra Leone's mineral resources are diverse, however, current output is limited to the production and export of rutile and its coproducts, bauxite, and the artisanal mining of diamonds and gold, listed by order of value.

The mineral industry generated from 15% to 18% of the gross domestic product, 90% of export earnings, and employed about 250,000 people before the forces of the Revolutionary United Front (RUF) disrupted diamond mining operations beginning in 1992 and the bauxite and rutile operations in late 1994 and early 1995.

The Government honored its commitment to the economic recovery program suggested by the International Monetary Fund (IMF). The rate of inflation decelerated from 115% in 1991 to 15% in 1994. Of particular concern has been the adoption of more stringent laws relating to the mining and marketing of precious minerals. In recent years, heavy revenue losses attributed to illegal trading in diamonds and gold contributed to the country's significant trade deficits. A new mining policy, in effect as of January 1994, offered more rigid requirements for licensing miners and exporters. Under the new law, higher minimum performance standards were set and failure to achieve these targets for 3 consecutive months could result in license revocation and loss of fees. Incentives were to be provided to dealers whose performance exceeds the minimum target.

Environment and resource management were seriously hampered by weak regulatory and enforcement capacity. Significant environmental problems were evident throughout the various sectors of the economy. Land degradation from large-scale and artisanal mining was pronounced throughout the interior of the country. Coastal mining sites have fared more favorably where Sierra Rutile, Ltd. has historically practiced mine site rehabilitation programs, including fish farms, infrastructure development, and village relocation activities. The village relocation programs have resulted in the development of planned villages containing improved housing, sanitation, water supply, and communal facilities.

Smuggling activities continued to deny the government full revenues from artisanal diamond and gold mining operations and official production data for these commodities remained little changed. Peak diamond production recorded in 1992 was achieved by the National Diamond Mining Co., which has since ceased operations partly because of rebel activities in the Yengema diamond mining district. Reduced bauxite output was the result of a diminished market, which forced a

temporary shutdown of mining activities in Spring 1994. (See table 1.)

The value of Sierra Leone's mineral exports was reported at \$108 million<sup>2</sup> in 1993, equal to approximately 90% of total exports for the year. Titanium minerals (rutile, ilmenite, and possibly zircon) continued to be the Nation's principal export, valued at \$62 million, with shipments destined for Western Europe and the United States. Bauxite exports earned approximately \$28 million. While illicit trading of diamonds and gold continued, official diamond exports were valued at approximately \$18 million.

Petroleum imports were valued at \$26.6 million. Nonfuel imports were reported at \$151 million.

The mining of bauxite, rutile, and ilmenite remained open to foreign investment. In 1993, a 50% interest in Sierra Rutile Ltd, a subsidiary of Nord Resources Corp. of the United States, was purchased by Consolidated Rutile Ltd. of Australia. The new company is known as Sierra Rutile Holdings Ltd.

The Sierra Leone Ore and Metal Co. (SIERMCO), the Nation's sole bauxite producer, operated in the southern Mokanji area mining deposits within 4 kilometers (km) of the Gondama washing plant. Plans for mining the Gbonge deposits, 16 km from the washing plant, have been reinforced by site preparation undertaken in 1993. SIERMCO estimated that the Gbonge deposit will sustain mining for 10 to 15 years. Soft bauxite sales in 1994, had prompted the company to temporarily cease mining for 3 months while reducing its 300,000 metric ton stockpile. In the first quarter of 1995, RUF forces' incursion into the mine area forced operations to close once again.

Sierra Rutile Holdings Ltd., the former Sierra Rutile, Ltd., launched an expansion and land rehabilitation program which would raise production to 190,000 metric tons per year (mt/a) by 1996. A 40,000 mt/a increase was to be achieved by the construction and commissioning of a second dredge and wet concentrator in the Gangama deposit. The \$72-million expansion was also to include construction of an oil-fired 20-megawatt powerplant.

In early 1995, RUF forces overtook the Gangama mine site. While control has changed hands at least twice between the Government forces and the RUF at the time of this report, security remained questionable. The company has chosen to abandon its assets, which are estimated by the company to be worth \$200 million. In spite of this instability, rutile prices

did not reflect much change as the bulk of Sierra Leone's output was committed to long-term contracts and not a spot market.

The source of diamond production in 1994 was mainly from small-scale artisanal mining. While production was almost entirely from alluvial deposits, recent interest had focused on high-grade Kimberlite pipes in the Yengeme and Tongo regions. Diamond Fields Resources obtained an exclusive option to develop the Koidu Kimberlite project. The company acquired an option to all outstanding shares of the Sunshine's Mining Co.'s Sierra Leone subsidiary, including technical data and Sunshine's past and future rights to the Koidu Kimberlite project. Company engineering evaluations placed reserves between 2.5 million to 3.5 million carats, about one-half of which are estimated to be of gem quality. However, their location in the center of RUF activity could delay any development.

The Diamond Corporation of Sierra Leone, a wholly owned affiliate of De Beers, announced in August 1994 that it had secured a permit for diamond mining in a 15,800-square-kilometer off-shore tract for \$500,000.

Alluvial gold has been mined mainly in the streams draining the northern Sula Mountains. Official gold production figures remained low due to illicit trading. In an attempt to reduce smuggling, the government has offered 40% of the sales proceeds from impounded gold and diamonds to those offering information leading to successful arrests.

Sierra Leone's sole petroleum refinery was operated at one-third capacity in recent years and was closed in 1992 due to the Nation's inability to raise capital for crude oil imports. This Freetown facility, owned by the Sierra Leone Petroleum Refining Co. Ltd, was placed in liquidation in early 1994. By yearend, the 10,000-barrel-per-day capacity refinery was sold to Unipetrol Nigeria PLC for a reported sum of \$1.2 million. Unipetrol estimated a further investment of \$1.5 million to \$2.0 million was necessary to rehabilitate the refinery.

Proven rutile ore reserves totaled 370 million metric tons (Mmt) containing 5.7 Mmt of recoverable rutile in 1993. Nearly 1 Mmt of recoverable rutile was added to proven reserves during that year as a result of exploration and ore definition work in the southern Gbangbama area and in the northern area near Sembehun.

Before the closure of the Marampa Mine, the 1.067 meter (m) narrow-gauge railroad delivered iron ore to the port at Pepel, 84 kilometers away. The line remained operable, but was in limited use.

The port at Freetown permitted a draft of almost 10 m and serviced most of the country's general cargo and all of its petroleum import traffic. The Ports of Niti and Pepel were operated by private mining firms and handle bulk exports of

bauxite, rutile, and, when in production, iron ore.

Sierra Leone was endowed with significant mineral potential. Chromite occurred in the Gori Hills near Hangha in the Eastern Province. Graphite, iron ore, kaolin, lignite, and platinum also offered some potential. However, inadequate development and poor resource management has earned the country the world's least developed status, according to the United Nations.

In an effort to improve the situation, the IMF structural adjustment program was adopted. This has led to exchange and trade systems being liberalized, price controls being lifted, and revenue collection and expenditure control systems being strengthened. Border security problems continued to drain resources from the economy. The Government estimated that perhaps as much as two-thirds of the diamond and gold mining and trading activity continued to bypass Government revenue collection channels, costing the Government an estimated \$220 million per year.

In 1994, nearly one-half of all foreign revenues were spent on servicing the foreign debt of \$1.2 billion. This includes \$450 million owed to institutions such as the IMF and the African Development Bank, \$350 million in Government debt, and \$400 million owed to trade creditors.

The mining of titanium-bearing sands has been the most successful mineral project in the country. Sierra Leone's rutile is of high grade, with notably low radioactivity. Sierra Rutile Holdings, Ltd. has been protected to some extent by its long-term sales contracts and high-quality ore during recent low world market prices. The RUF siege on the rutile and bauxite mines and the consequent abduction of the expatriot employees in 1994 and early 1995 has seriously endangered future investment in the country. With a large part of the surface alluvials exploited, increasingly deeper strata will have to be mined for diamonds, necessitating capital expenditures beyond the reach of artisanal miners. To keep the economic program on course and to attract foreign investment, the Government would have to remedy the deteriorating security situation in the country.

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<sup>1</sup>Text prepared Apr. 1995.

<sup>2</sup>Where appropriate, values have been converted from Sierra Leone leones to U.S. dollars at the rate of LEs567.46=US\$1.00 in 1993 and LEs578.17=US\$1.00 in 1994.

## Major Sources of Information

Ministry of Mines  
Freetown, Sierra Leone  
Bank of Sierra Leone  
Freetown, Sierra Leone

TABLE 1  
SIERRA LEONE: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

Commodity		1990	1991	1992	1993	1994 e/
Aluminum: Bauxite, gross weight	thousand tons	1,430	1,290	1,250	1,170	735 3/
Diamond:						
Gem e/	thousand carats	66	160	180	90	155
Industrial e/	do.	12	83	116	68	100
Total 4/	do.	78	243	296	158	255
Gold 4/	kilograms	32	26	92	157	123
Gypsum e/		4,000	4,000	4,000	4,000	4,000
Petroleum refinery products:						
Liquefied petroleum gas	thousand 42-gallon barrels	6	4	6	--	--
Gasoline	do.	180	125	200	--	--
Jetfuel	do.	100	100	125	--	--
Kerosene	do.	30	25	30	--	--
Distillate fuel	do.	375	300	350	--	--
Residual fuel	do.	300	250	300	--	--
Other	do.	1	1	1	--	--
Total	do.	992	805	1,010	--	--
Salt e/	thousand tons	200	200	200	200	200
Titanium:						
Rutile ore and concentrate 96% TiO <sub>2</sub> , gross weight	do.	144	155	149	152	137 3/
Ilmenite ore and concentrate 60% TiO <sub>2</sub> , gross weight	do.	55	60	60	63	47 3/
Zircon		--	1,100	1,330	--	1,300 3/

e/ Estimated.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Table includes data available through Mar. 15, 1995

3/ Reported figure.

4/ Data includes only officially reported production.