



# 2005 Minerals Yearbook

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ETHIOPIA

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# THE MINERAL INDUSTRY OF ETHIOPIA

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Ethiopia has been a producer of gold, silver, and tantalite, and such industrial minerals as brick clay, diatomite, feldspar, gemstones, granite, gypsum and anhydrite, kaolin, limestone, marble, pumice, quartz, salt, sand, scoria, soda ash, and talc. The country has also produced cement, lignite, lime, and steel (table 1). In 2005, Ethiopia's main mineral export was gold. Other metal deposits include iron ore, manganese, nickel, and platinum. Other industrial mineral deposits include apatite, bentonite, potash, and sulfur.

In 2005, Ethiopia's nominal gross domestic product (GDP) based on purchasing power parity amounted to about \$60.1 billion. The real GDP grew by 8.7% in 2005 compared with 12.3% in 2004. The mining industry was not a significant factor in the economy (International Monetary Fund, 2006, p. 184; 2006<sup>§1</sup>).

## Government Policies and Programs

The illegal mining of dimension stone, gemstones, gold, and salt reportedly contributed to widespread environmental damage in Ethiopia that included deforestation, soil erosion, and water pollution. The Government planned to organize artisanal miners into about 200 cooperatives to reduce illegal mining activities (Gebre-Selassie, 2005).

Most of the gold produced by artisanal and small-scale miners was smuggled out of the country. To alleviate this problem, the Government enacted regulations in 2005 that allowed gold traders to buy gold from artisanal and small-scale miners and sell it to the National Bank of Ethiopia at market prices (Gebre-Selassie, 2005; Bekele, 2006).

## Commodity Review

### Metals

**Gold.**—Ethiopia produced an estimated 3,900 kilograms (kg) of gold in fiscal year 2004-05 compared with 3,443 kg in fiscal year 2003-04. National gold exports amounted to 4,200 kg at a value of \$90 million (Bekele, 2006).

Midroc Gold Mine plc (a subsidiary of Midroc Ethiopia Group) operated the Lega Dembi Mine in southern Ethiopia; other gold mines that operated in southern Ethiopia included the Adola and Sakaro. Midroc produced an average of 3,500 kilograms per year of gold at Lega Dembi; production amounted to 3,600 kg in 2005. The company planned to increase output by reprocessing tailings (Bekele, 2006).

Midroc also explored for gold at concessions near the Lega Dembi Mine. From November 2004 to June 2005, Sheba Exploration (UK) plc conducted a trenching program at the Amora Hill prospect on the Mereto concession (African Mining, 2005).

**Platinum-Group Metals.**—At the end of 2004, Golden Prospect plc of the United Kingdom held three platinum and gold exploration licenses in Oromia Regional State. In early 2005, the Government approved Golden Prospect's acquisition of a 51% interest in a small-scale platinum and gold mining operation and two exploration licenses in the same area. The company planned to expand the mining operation, upgrade the processing plant, and conduct a resource assessment (Golden Prospect plc, 2005, p. 7).

### Industrial Minerals

**Cement.**—Ethiopia had four cement plants that produced about 1.57 million metric tons (Mt) of cement in fiscal year 2004-05 compared with nearly 1.32 Mt in fiscal year 2003-04 and 1.13 Mt in fiscal year 2002-03. The value of cement production amounted to \$58.7 million in fiscal year 2003-04 (Gebre Egziabher Mekonen, Mineral Operations Department Head, Ethiopia Ministry of Mines and Energy, written commun., February 2, 2006).

Mugher Cement Enterprise operated cement plants at Addis Ababa, Dire Dawa, and Mugher. In fiscal year 2004-05, Mugher produced 856,000 metric tons (t) of cement; the company planned to increase production to 876,000 t in fiscal year 2005-06. Messebo Building Materials Production Share Company operated a cement plant at Mekele in Tigray Regional State. In fiscal year 2004-05, Messebo produced more than 712,000 t of cement; the company planned to produce 800,000 t in fiscal year 2005-06 (Walta Information Center, 2005; Alemayehu, 2006).

By the end of 2005, Messebo and Mugher were reportedly producing at their full capacity of 1.7 million metric tons per year (Mt/yr). In spite of the recent increases in production, Ethiopia experienced shortages of cement in 2005; the cement industry was producing at full capacity and demand was estimated to be 2.4 Mt/yr. The Gilgel Gibe hydroelectric project and new residential construction each consumed between 10% and 11% of national cement production (Kiros, 2005).

Mugher planned to build a new cement plant with a capacity of between 1.46 and 1.64 Mt/yr to alleviate domestic cement shortages; Messebo also planned to expand its capacity. Fulaz Petroleum planned to build a new cement plant at Dire Dawa with a capacity of 440,000 metric tons per year (t/yr). The plant was expected to be completed by 2008 at a cost of \$107 million (Ethiopian Reporter, 2005; Kiros, 2005).

**Gemstones.**—Artisanal and small-scale miners produced a variety of gemstones. Opal was found at Mezezo in Amhara Regional State; garnet, at Harshitmi; sapphire, at Bonga; aquamarine, at Chembi, Kenticha, and Kilkile; emerald, at Chembi; and peridot, at Chewbet, Gofa Gedo, Mega, Megado, and Tassy. Other gemstones produced included amazonite, amethyst, quartz, and tourmaline. In fiscal year 2003-04, the production of opal increased to 370 kg from 187 kg in fiscal year 2002-03; and garnet, to 11 kg from 6 kg (Gebre

<sup>1</sup>A reference that includes a section mark (§) is found in the Internet Reference Cited section.

Egziabher Mekonen, Mineral Operations Department Head, Ethiopia Ministry of Mines and Energy, written commun., February 2, 2006).

**Salt.**—Afar Salt plc, Bashenfer Salt plc, and Geo Action plc mined salt at Afdera Lake in northeastern Ethiopia; artisanal miners also produced salt. In fiscal year 2003-04, national salt production increased to 200,000 t from about 145,000 t in fiscal year 2002-03 in spite of the poor condition of the Sodome Meda-Afdera gravel road. Since 2000, Ethiopia's salt production has nearly quadrupled.

**Stone, Crushed and Dimension.**—Ashraf Regional Group of Sudan planned to produce basalt, granite, limestone, marble, and sandstone in Amhara and Oromia Regional States. In Amhara Regional State, the company expected to produce 65,700 t/yr of sandstone, 59,100 t/yr of granite, 591,820 square meters per year (m<sup>2</sup>/yr) of sandstone slabs and tiles, and 394,180 m<sup>2</sup>/yr of granite slabs and tiles at Beko Abo. At Avola, production was expected to be 800,000 t/yr of basalt, and at Menta Woha, 54,000 t/yr of marble. In Oromia Regional State, Ashraf planned to produce more than 1.45 million square meters per year of sandstone slabs and tiles at Keteba and 54,000 t/yr of limestone at Tiffi. The Government awarded a mining license to Ashraf in September 2005 (Ethiopian Ministry of Mines and Energy, 2005a).

Fanous Construction plc planned to produce about 2.2 Mt/yr of basalt aggregate at Arbessa in Addis Ababa Regional State. In December 2005, the Government awarded a 10-year mining license to Fanous (Ethiopian Ministry of Mines and Energy, 2005b).

### **Mineral Fuels**

At the end of 2005, Ethiopia was totally dependent upon imports to meet its demand for petroleum. Natural gas resources in the Calub Field in the Ogaden Basin remained undeveloped. Small amounts of lignite were reportedly produced.

Petronas Carigali Overseas Shd. Bhd. of Malaysia explored for crude petroleum at Block G in the Gambella Basin. In August 2005, the company was awarded three concessions in the Ogaden Basin. Wal-Wal and Warder covered 36,796 square kilometers (km<sup>2</sup>); Kelafo, 30,611 km<sup>2</sup>; and Genale, 25,571 km<sup>2</sup>. Petronas planned to spend \$15 million on exploration in the Ogaden Basin starting in 2006 (Bekele, 2005b).

In October 2005, Pexco Exploration of Malaysia was awarded a concession that covered 29,865 km<sup>2</sup> at Abred and Ferfer in the Ogaden Basin. Pexco planned to spend \$5 million on exploration over 4 years beginning in 2006. In October, Afar Exploration Company of the United States was negotiating with the Government over a concession and production-sharing agreement that covered 18,000 km<sup>2</sup> in northern Afar Regional State (Bekele, 2005a, b).

### **Infrastructure**

The state-owned Ethiopian Electric Power Corp. (EEPCO) generated most of the country's electricity from hydroelectric plants. EEPCO's plants had a capacity of 750 megawatts (MW) in 2005; the company planned to increase capacity to 2,900 MW by 2010. In July 2005, Salini Construttori S.P.A. signed an agreement with EEPCO to build the 460-MW Beles hydropower

project. Beles was expected to be completed in 2008 at a cost of \$619 million. Other hydropower projects under development included Gilgel Gibe II and Tekeze with capacities of 425 MW and 300 MW, respectively (Mekuria, 2005).

In 2004, Ethiopia's transportation network comprised nearly 36,500 km of roads; the Ethiopian segment of the Addis Ababa-Djibouti railroad was 781 km. The road network was expected to increase to about 104,200 km in 2015.

### **Outlook**

The low level of mineral exploration in Ethiopia was likely to constrain production increases for columbium (niobium) and tantalum, gold, and silver and the development of such other metals as iron ore, manganese, and nickel. Production of industrial minerals faces a variety of constraints. In recent years, domestic output of kaolin and sulfuric acid has been inhibited by limited domestic demand; caustic soda, by import competition and shortages of lime needed as raw material; and silica sand, by the capacity of the country's only glass and bottle factory (Ethiopia Ministry of Mines and Energy, 2002, p. 6, 10, 14, 15). The production of cement and other building materials was likely to increase because of rapid growth in the construction sector and planned capacity-expansion programs.

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TABLE 1  
ETHIOPIA: PRODUCTION OF MINERAL COMMODITIES<sup>1,2</sup>

(Metric tons unless otherwise specified)

Commodity <sup>3</sup>		2001 <sup>c</sup>	2002 <sup>c</sup>	2003	2004	2005 <sup>c</sup>
Cement, hydraulic		900,000 <sup>4</sup>	900,000 <sup>4</sup>	1,130,066 <sup>r</sup>	1,315,934 <sup>r</sup>	1,568,000 <sup>4</sup>
Clays: <sup>5</sup>						
Brick		200,000	170,000	140,000	106,609 <sup>4</sup>	125,000
Kaolin, China clay		1,800	3,534 <sup>4</sup>	3,088	4,251 <sup>r</sup>	4,300
Other clay	cubic meters	25,000	27,000	28,000 <sup>c</sup>	28,000 <sup>c</sup>	28,000
Columbium (niobium) and tantalum:						
Columbite-tantalite, ore and concentrate:						
Gross weight	kilograms	46,900 <sup>4</sup>	55,000 <sup>4</sup>	58,350 <sup>r</sup>	70,730 <sup>r</sup>	71,000
Nb content	do.	4,700	5,500	5,800 <sup>c</sup>	7,100 <sup>c</sup>	7,100
Ta content	do.	28,000	33,000	35,000 <sup>c</sup>	45,000 <sup>r</sup>	45,000
Diatomite		300 <sup>r</sup>	500 <sup>r</sup>	700 <sup>r</sup>	2,000 <sup>r</sup>	2,000
Feldspar		250 <sup>r</sup>	230 <sup>r</sup>	208 <sup>r</sup>	361 <sup>r</sup>	370
Gemstones: <sup>6</sup>						
Amethyst	kilograms	NA	NA	NA	1	1
Aquamarine	do.	NA	NA	NA	2	2
Emerald	do.	NA	NA	--	1	1
Garnet	do.	NA	NA	6	11	11
Opal	do.	NA	NA	187	370	370
Peridot	do.	NA	NA	1	--	--
Quartz	do.	NA	NA	31	469	470
Sapphire	do.	NA	NA	8	1	1
Tourmaline	do.	NA	NA	5	5 <sup>c</sup>	5
Gold, mine output, Au content <sup>6</sup>	do.	3,862 <sup>4</sup>	3,670 <sup>4</sup>	3,875	3,443	3,900
Gypsum and anhydrite, crude		50,500 <sup>4</sup>	22,500 <sup>4</sup>	48,058 <sup>4</sup>	51,200	52,000
Lime		4,100	4,500	3,400 <sup>r</sup>	3,800 <sup>r</sup>	3,800
Quartz		NA	NA	115	170	170
Salt, rock		90,000	120,000	145,070 <sup>r</sup>	200,000 <sup>r</sup>	200,000
Silver, mine output, Au content	kilograms	3,545 <sup>4</sup>	900 <sup>4</sup>	999	1,133	1,200
Soda ash, natural		7,543 <sup>4</sup>	3,843 <sup>4</sup>	4,377	6,444	6,500
Stone, sand and gravel: <sup>5</sup>						
Basalt		NA	NA	592,000	17,800	21,000
Dolomite		NA	NA	1,600 <sup>r</sup>	2,250 <sup>r</sup>	2,300
Granite	square meters	17,000	10,000	4,087	19,499	23,000
Ignimbrite	cubic meters	NA	NA	229,013	229,277	270,000
Limestone:						
Slab/tiles	square meters	NA	NA	6,420	3,078	3,700
Other	thousand metric tons	1,600 <sup>r</sup>	2,000 <sup>r</sup>	2,290 <sup>r</sup>	2,380 <sup>r</sup>	2,800
Marble:						
Slab/tiles	square meters	110,000	110,000	106,241	122,008	145,000
Terrazzo	do.	NA	NA	144,045	114,446	140,000
Block and other		14,000	14,000	16,200	14,600	16,000
Pumice <sup>5</sup>		180,000	210,000	218,676 <sup>r</sup>	270,994	320,000
Rhyolite		NA	NA	34,000	20,900	25,000
Sand <sup>7</sup>	thousand metric tons	2,000	2,200	2,300	2,300	2,700
Sandstone	do.	NA	NA	318 <sup>r</sup>	1,221	1,500
Scoria <sup>c</sup>		310,000	340,000	350,000	350,000	420,000
Silica sand		6,000	6,000	5,400 <sup>r</sup>	4,550 <sup>r</sup>	4,600

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits. <sup>r</sup>Revised. NA Not available. -- Zero.

<sup>1</sup>Table includes data available through April 10, 2006.

<sup>2</sup>Data are for the Ethiopian calendar year ending July 7 of the year listed.

<sup>3</sup>In addition to the commodities listed, some lignite, crude and semimanufactured steel, sulfuric acid, and talc reportedly were produced, and platinum was reportedly contained in gold ingots from the Lega Dembi Mine, but information is inadequate to estimate output.

<sup>4</sup>Reported figure.

<sup>5</sup>When reported as volume or pieces, conversions to metric tons are estimated.

<sup>6</sup>Does not include smuggled artisanal production.

<sup>7</sup>May include gravel.

TABLE 2  
ETHIOPIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity
Caustic soda		Abiyata Soda Ash Enterprise (Government-owned)	Plant at Ziway	10,000.
Cement		Messebo Building Materials Production Share Company (Government-owned)	Plant at Mekele	800,000 cement.
Do.		Mugher Cement Enterprise (Government-owned)	Plant at Mugher	720,000 cement; 620,000 clinker.
Do.		do.	Plant at Addis Ababa	125,000 cement; 112,000 clinker.
Do.		do.	Plant at Dire Dawa	32,000 cement; 24,000 clinker.
Columbium (niobium) and tantalum	kilograms	Ethiopian Mineral Resources Development Enterprise (EMRDE) [Government-owned]	Kenticha Mine near Borena	112,000 tantalum. <sup>c</sup>
Glass		Addis Ababa Bottle and Glass Share Company	Plant at Addis Ababa	8,000.
Gold		Midroc Gold Mine plc (subsidiary of Midroc Ethiopia Group)	Mine at Lega Dembi	1,500,000 ore processing.
Do.	kilograms	do.	do.	4,000 gold.
Kaolin		Ethiopian Mineral Resources Development Enterprise	Mine at Bamba Wuha	15,000.
Marble		Ethiopian Marble Industries	Mines at Harar and various sites in western Ethiopia	NA.
Do.		National Mining Corp. (subsidiary of Midroc Ethiopia Ltd.)	Mine at Mugher	NA.
Do.		Saba Stones	Mine in Tigre Province	NA.
Salt		Afar Salt plc, Bashenfer Salt plc, and Geo Action plc	Mines at Afdera Lake	NA.
Soda ash		Abiyata Soda Ash Enterprise	Mine at Lake Abiyata	20,000. <sup>c</sup>
Steel:				
Crude		Ethiopia Iron and Steel Factory	Plant at Akaki	NA.
Semimanufactured		do.	do.	12,000.
Do.		Zuqala Steel Rolling Mill Enterprise (Government-owned)	Plant at Debre Zeit	100,000.
Galvanized		Akaki Metal Products Factory	Plant at Akaki	NA.
Sulfuric acid		Melkasa Aluminum Sulfate and Sulfuric Acid Factory	Plant at Melkasa	NA.

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits. NA Not available.

TABLE 3  
ETHIOPIA: MINERAL RESOURCES IN 2005<sup>1</sup>

Commodity	Deposit	Tonnage	Grade	Mineral content
Diatomite	Lakes Region, Shewa and Arsi Provinces	NA	NA	85 Mt.
Dolomite	Galleti	NA	NA	1.4 Mt.
Do.	Hula-Kuni	NA	NA	250,000 t.
Feldspar	Kenticha	1.14 Mt	40% feldspar	500,000 t.
Do.	Babile-Bombas	0.3 Mt	50% feldspar	150,000 t.
Gold	Lega Dembi	NA	NA	83,000 kg.
Do.	Adola	NA	NA	4,500 kg.
Gypsum	Sodoble	NA	NA	56 Mt.
Do.	Adigudom	NA	NA	400,000 t.
Kaolin	Bombowha	1 Mt	30% kaolin	300,000 t.
Do.	Kombelcha	0.96 Mt	31% kaolin	300,000 t.
Limestone	Mossobo	NA	NA	69.5 Mt.
Do.	Mugher	NA	NA	50 Mt.
Do.	Dire Dawa	NA	NA	46 Mt.
Marble	Mora	NA	NA	46.5 Mt.
Do.	Baruda	NA	NA	13.6 Mt.
Natural gas	Calub	25 billion cubic meters	NA	NA.
Peridot	Bulgendo	NA	NA	2,457 kg.
Salt	Denkali depression	NA	NA	3,000 Mt.
Do.	Lake Afdera	NA	NA	290 Mt.
Silica sand	Mugher	NA	NA	3.4 Mt.
Soda ash	Lakes Abiyata, Chiltu, and Shala	NA	1.1% to 1.9% Na <sub>2</sub> CO <sub>3</sub>	460 Mt.
Talc	Anno	NA	NA	120,000 t.

NA Not available.

<sup>1</sup>Abbreviations used in this table for commodities include the following: Na<sub>2</sub>CO<sub>3</sub>--sodium carbonate (soda ash). Abbreviations used in this table for units of measurement include the following: kg--kilograms; Mt--million metric tons; t--metric tons.

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