



2013 Minerals Yearbook

SUDAN

THE MINERAL INDUSTRY OF SUDAN

By Thomas R. Yager

The mineral sector's influence on Sudan's economy was important because of petroleum production and refining. Between 2009 and 2012, cement and gold production became more important in the Sudanese economy. In recent years, the country also produced chromite, feldspar, fluorite, gypsum, kaolin, laterite, manganese ore, marble, mica, quartz, salt, silver, steel, and talc. Sudan was not a globally significant producer or consumer of mineral commodities in 2013.

Investment in Sudan's petroleum and petrochemical industries by U.S. individuals and organizations was banned by Executive Order 13412, which was issued by the President of the United States on October 13, 2006. The alleged use of revenues from petroleum sales to finance military operations in the Darfur conflict constituted the primary reason for the executive Order. U.S. individuals and organizations were banned from participating in the refining of South Sudanese crude petroleum in refineries located in Sudan (Bush, 2006; U.S. Department of the Treasury, Office of Foreign Assets Control, 2011, 2013).

Minerals in the National Economy

In 2013, the manufacturing sector accounted for 9% of Sudan's gross domestic product (GDP), and the mining and quarrying sector, 5.1%. Crude petroleum exports were valued at \$3.91 billion, or 55% of total exports in 2013; gold exports were valued at \$1.05 billion, or 15% of total exports; and petroleum product exports were valued at \$101 million, or about 1% of total exports. The United Arab Emirates received 88% of Sudan's gold exports. In 2012, gold exports were valued at \$2.16 billion, or 53% of total exports; crude petroleum exports, at \$699 million or 17%; and petroleum product exports, at \$256 million, or 6%. Refined petroleum imports were valued at \$1.46 billion, or 15% of total imports in 2013, and iron and steel imports were valued at \$711 million, or 7% of total imports (Bank of Sudan, 2014a, p. 118; 2014b, p. 12, 18, 29–30).

Production

In 2013, marble production increased by 770%; laterite, by 252%; refined gold, by an estimated 167%; kaolin, by 125%; chromite, by 69%; mica, by 54%; feldspar, by 21%; crude petroleum, by 20%; and gypsum, by 13%. Mined gold production decreased by 46%; mined silver, by an estimated 45%; and salt, by 21% (table 1; Bank of Sudan, 2014a, p. 141).

Structure of the Mineral Industry

Sudan's crude petroleum was produced by joint ventures of state-owned companies from China, India, Malaysia, and Sudan. The petroleum refineries were also state owned; Khartoum Oil Refinery Co. Ltd. was a joint venture between state-owned China National Petroleum Corp. (CNPC) and

Sudan Petroleum Company Ltd. (Sudapet). The Government owned Sudanese Mining Co., which produced gypsum and mica, and Ingessana Hills Mining Corp., which produced chromite. The Government also owned Sudan Gold Refinery Co. Ltd. at Khartoum and a 56% share in the Hassai gold mine in northern Sudan; gold was also produced by about 500,000 artisanal miners. The cement plants were privately owned (Addis Fortune, 2013).

Commodity Review

Metals

Chromium.—Ingessana Hills Mines Corp. produced chromite from the Ingessana Hills ophiolite in southeastern Sudan. The company was expected to produce about 40,000 metric tons (t) in 2013 compared with 18,300 t in 2012; actual production was 30,870 t (Addis Fortune, 2013; Bank of Sudan, 2014a, p. 141).

Gold and Silver.—Artisanal miners accounted for most of Sudan's gold production. In 2013, reported gold exports decreased to 24,813 kilograms (kg) from 46,133 kg in 2012. The reduction in exports could be attributable to the depletion of near-surface deposits, decreased gold prices, civil unrest, and pit collapses (Laessing, 2012; Bank of Sudan, 2014b, p. 12).

In 2012, artisanal miners in the Jebel Amir District in North Darfur State produced about 14,000 kg of gold. In January and February 2013, hostilities between tribal warlords over control of the mines resulted in more than 400 deaths. Mining operations were partially suspended in early May by a pit collapse resulting from heavy rains that killed at least 60 miners (Bariyo, 2013, Ismail and Kumar, 2013, p. 3).

Ariab Mining Co. Ltd. (Government, 56%, and Weather Investments II SARL, 44%) operated the Hassai Mine in northeastern Sudan, which was the leading large-scale gold mine in the country. Since 1992, total production at the Hassai Mine was about 72,000 kg of gold. Exploration was planned at depth at Hassai because of the impending depletion of near-surface deposits (Addis Fortune, 2013; Ismail and Kumar, 2013, p. 4).

In February 2013, Managem Group of Morocco announced plans to start construction of a new gold mine at Mining Block 15 in northeastern Sudan after completing a feasibility study. Managem planned to produce to about 10,000 kilograms per year (kg/yr) of gold by early 2017. Resources at Wadi Gadgaba in Mining Block 15 were estimated to be more than 120,000 kg of contained gold (Otmene, 2013).

In September, Orca Gold Inc. of Canada completed its second drilling program at the Galat Sufar South (GSS) prospect in Mining Block 14 in northeastern Sudan. The company planned to engage in further drilling and to complete an initial resource estimate for GSS by the end of the first quarter of 2014. Orca Gold also relinquished Mining Blocks 19 and 77 in southeastern Sudan and Block 67 in northern Sudan. Toro Gold Ltd. of the

United Kingdom explored at Mining Block 12 near Port Sudan in early 2013 (Orca Gold Inc., 2013).

The Government completed a new refinery in Khartoum with capacities of 328,000 kg/yr of gold and 73,000 kg/yr of silver in September 2012. In December 2012, the Central Bank banned the export of unrefined gold to increase foreign exchange. Refined gold production increased to about 24,000 kg in 2013 from 9,000 kg in 2012 as the refinery had its first full year of production in 2013 (Gold Mining Journal, 2012; Ismail and Kumar, 2013, p. 3–4).

Industrial Minerals

Cement.—Sudan had eight cement plants with a combined capacity of 10.3 million metric tons per year. From 2009 to 2013, national cement production increased to an estimated 3.5 million metric tons (Mt) from 621,700 t. Output increased because of the expansion of Al-Rajhi Group's Atbara plant and the opening of six new plants from 2009 to 2011. The domestic cement industry had considerable excess capacity; the Government planned to export cement to Chad, Eritrea, Ethiopia, South Sudan, and North African and Gulf Cooperation Council countries (Bank of Sudan, 2013, p. 142; 2014a, p. 143; International Cement Review, 2013).

In 2013, Al-Rajhi Group produced 1.11 Mt of cement; Al-Shamal Cement Factory, 657,000 t; ASEC Cement Co. of Egypt (a subsidiary of Citadel Capital S.A.E. of Egypt), 644,000 t; Al-Salam Cement Production Company Ltd., 327,500 t; Nile Cement Company Ltd., 93,900 t; and Aslan Cement Co., 89,400 t. Increased production at Al-Salam Cement, Al-Shamal Cement, and Aslan Cement was offset by decreased production at Al-Rajhi, ASEC Cement, and Nile Cement in 2013. In 2012 (the latest year for which data were available), Berber Cement Company Ltd. produced 605,700 t (Bank of Sudan, 2013, p. 142; 2014a, p. 143).

Laterite.—Bricks were produced from lateritic soils, which have a high clay content. Many brick plants were located near Khartoum. In 2013, reported laterite production increased to 339,390 t from 96,400 t in 2012 and 24,500 t in 2011. The increase in reported output could be attributable to improved data collection (Bank of Sudan, 2014a, p. 141).

Stone, Dimension.—Sudanese marble production increased to 1,000 t in 2013 from 115 t in 2012. The increase could be a recovery from unusually low levels of output in 2012 (table 1).

Mineral Fuels

Petroleum.—In 2013, Sudan's production of crude petroleum increased to 45.2 million barrels (Mbbbl) from 37.7 Mbbbl in 2012. In 2012, the Governments of Norway and Sudan signed an agreement to increase the recovery rates of its currently producing wells to 47% from 23% (Arab Times, 2013; Bank of Sudan, 2014a, p. 139).

In 2013, the Greater Nile Petroleum Operating Co. [CNPC (40%), Petronas Carigali Overseas Shd. Bhd. of Malaysia (30%), ONGC Videsh Ltd. of India (25%), and Sudan Petroleum Company Ltd. (Sudapet) (5%)] produced crude petroleum in Blocks 1, 2, and 4 in south-central Sudan. After the referendum on

South Sudan's independence from Sudan, Blocks 1, 2, and 4 were divided between Sudan and South Sudan. The Bamboo, Bamboo West, Garaad, Heglig, Taiyib, and Toma oilfields are located in Sudan (European Coalition on Oil in Sudan, 2010, p. 25).

In 2012, production from the oilfields north of the national boundary in Blocks 1, 2, and 4 was reported to be about 48,400 barrels per day (bbl/d). By May 2013, output increased to between 50,000 and 60,000 bbl/d (Economic Times, The, 2013; Sudan Petroleum Corp., 2013).

CNPC held Block 6, which is located to the northwest of Muglad in northern Sudan. In 2012, total production in Block 6 was reported to be about 59,100 bbl/d compared with 53,800 bbl/d in 2011. The new Hadida oilfield in Block 6 was producing at the rate of 10,000 bbl/d in January 2013; CNPC planned to increase output to 20,000 bbl/d by yearend (Arab Times, 2013; Sudan Petroleum Corp., 2013).

In late 2012, Star Oil Co. [Ansan Wikfs Investments Ltd. of Yemen (66%) and Sudapet, (34%)] started production at the South Annajma oilfield in Block 17 at the rate of 6,000 bbl/d. In 2013, Star Oil planned to increase production to between 10,000 bbl/d and 15,000 bbl/d at South Annajma, which is located north of Block 6. The company subsequently revised its production target to 11,000 bbl/d by 2014 (Africa Energy Intelligence, 2013; Arab Times, 2013; Sudan Petroleum Corp., 2013).

CNPC operated the Khartoum oil refinery at Jali in northern Sudan with a capacity of 100,000 bbl/d; the company accounted for most of Sudan's refined petroleum products output. The refineries in Port Sudan and El-Obeid had capacities of 25,000 bbl/d and 15,000 bbl/d, respectively. The Government was considering an expansion of the Khartoum oil refinery to 200,000 bbl/d, and Port Sudan and El-Obeid, to 50,000 bbl/d each. No further details as to when the expansion might take place were available (Arab Times, 2013).

Outlook

Sudan's crude petroleum production is likely to increase modestly in 2014 because of expansions in Blocks 6 and 17. Production levels are also expected to increase depending on results of efforts to increase recovery rates. Crude petroleum production, especially in Blocks 2 and 4, could be affected by disputes with South Sudan over the Abyei Area. The Government's plans to expand refinery capacity could increase output of refined petroleum products.

Gold production is likely to increase in the near future because of new production by Managem and other large-scale producers. Production at the mines in the Jebel Amir District is likely to depend on the country's political stability. The outlook for chromite production is expected to depend heavily upon world stainless steel markets.

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TABLE 1
SUDAN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	2009	2010	2011	2012	2013
Cement, hydraulic	621,700	1,929,700	3,002,300	3,511,000 ^r	3,500,000 ^e
Chromite, mine output, gross weight ³	14,087	56,823	64,128	18,300	30,870
Feldspar	--	923	9,519	26,283	31,700
Fluorite	NA	NA	NA	950	1,000 ^e
Gold:					
Mine output, Au content ⁴	14,914	26,317	23,739	46,133	24,813
Refined	do.	do.	do.	9,000 ^e	24,000 ^e
Gypsum	30,000	31,000	13,000	117,073	132,000
Kaolin	36,799	32,696	15,096	11,579	26,000
Laterite	NA	NA	24,500	96,400	339,390
Manganese ore	500	--	--	-- ^e	3,250
Marble	do.	1,625	1,214	115	1,000
Mica	100	10	378	324	500
Petroleum:					
Crude, including lease condensate ⁵	173,453	168,656	106,216	37,737	45,200
Refinery products:					
Liquefied petroleum gas	3,915	3,798	3,617	3,217 ^r	2,942
Gasoline	9,488	10,593	9,811	9,381	8,613
Naphtha	207	180	177	75 ^r	164
Jet fuel	981	1,059	1,062	935 ^r	630
Kerosene	240	196	186	62	150
Distillate fuel oil	19,115	17,489	15,460	12,600 ^r	11,894
Residual fuel oil	2,108	1,732	1,830	663	1,426
Petroleum coke	1,713	1,774	1,571	1,477	1,408
Total	37,767	36,821	33,714	28,410 ^r	27,227
Quartz	NA	NA	NA	5,292	5,300 ^e
Salt	35,793	141,840	10,791	26,315	20,800
Silver:					
Mine output, Ag content	413	631	570 ^{r,e}	1,100 ^{r,e}	600 ^e
Refined	do.	do.	do.	200 ^e	500 ^e
Steel, semimanufactured ^e	550,000 ^r	580,000 ^r	400,000	400,000	400,000
Talc	1,167	--	--	-- ^e	-- ^e

^eEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. do. Ditto. NA Not available. -- Zero.

¹Table includes data available through October 22, 2014.

²In addition to the commodities listed, the following are presumably produced, although available information is inadequate to estimate output: clay and (or) shale for cement manufacture [normally about 0.4 metric ton of clay and (or) shale per metric ton of finished cement]; limestone for agriculture, cement manufacture (normally 1.4 metric tons per metric ton of finished cement), construction aggregate and fill, and lime manufacture; and other construction materials (clays, sand and gravel, stone, and others for local use).

³Presumed to be ores and concentrates with an estimated average grade of about 54% chromic oxide.

⁴Reported exports.

⁵For 2011, South Sudanese production is included only for the period before independence on July 9. South Sudanese production is not included in 2012 or 2013.

TABLE 2
SUDAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2013¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners		Location of main facilities	Annual capacity
Cement	Atbara Cement Company Ltd. (subsidiary of Al-Rajhi Group)		Plant at Atbara	1,850,000
Do.	ASEC Cement Co. (subsidiary of Citadel Capital S.A.E.)		Plant at Takamol	1,600,000
Do.	Berber Cement Company Ltd.		Plant at Berber	1,580,000
Do.	Aslan Cement Co.		NA	1,500,000
Do.	Nile Cement Company Ltd.		Plant at Rabak	1,500,000
Do.	Al-Shamal Cement Factory (Mass Global Investment Co.)		Plant at Atbara	1,480,000
Do.	Al-Salam Cement Production Company Ltd.		do.	660,000
Do.	Sudanese Cement Factory		Plant in Nile State	100,000
Chromite	Ingessana Hills Mines Corp.		Mine at Ingessana Hills	48,000
Gold:				
Mine	kilograms	Artisanal miners	Jebel Amir Mines in North Darfur State	15,000 ^c
Do.	do.	do.	Various locations	30,000 ^c
Do.	do.	Ariab Mining Co. Ltd. (Government of Sudan, 56%, and Weather Investments II SARL, 40%)	Mine at Hassai	2,000
Refined	do.	Sudan Gold Refinery Co. (Government, 100%)	Refinery at Khartoum	328,000
Gypsum	Sudanese Mining Corp. (Government of Sudan, 100%)		Bir Eit Mine in Red Sea State	15,000
Limestone	Al-Salam Cement Production Co. Ltd.		Mine in River Nile State	730,000 ^c
Do.	Al-Rajhi Group		Mine at Atbara	500,000
Do.	Nile Cement Company Ltd.		Mine at Rabak	200,000
Mica	Sudanese Mining Corp. (Government of Sudan, 100%)		Mines at Sheriek	1,800
Petroleum:				
Crude	thousand 42-gallon barrels	China National Petroleum Corp., 95%	Block 6 near Muglad	26,000 ^c
Do.	do.	Greater Nile Petroleum Operating Co. [China National Petroleum Corp. (CNPC), 40%; Petronas Carigali Overseas Shd. Bhd., 30%; ONGC Videsh Ltd., 25%; Sudan Petroleum Company Ltd. (Sudapet), 5%]	Blocks 1, 2, and 4 in Unity State ²	22,000
Do.	do.	Star Oil Co. [Ansan Wikfs Investments Ltd., 66%, and Sudan Petroleum Company Ltd. (Sudapet), 34%]	Block 17 in South Kordofan State	2,200
Refined	do.	Khartoum Oil Refinery [China National Petroleum Corp. (CNPC), 50%, and Sudan Petroleum Company Ltd. (Sudapet), 50%]	Refinery at Jali	36,500
Do.	do.	Port Sudan Refining Ltd. (Government of Sudan, 100%)	Refinery at Port Sudan	9,100
Do.	do.	El-Obeid Refinery Co. (Government of Sudan, 100%)	Refinery at El-Obeid	5,500
Salt	Bittar Salt Company Ltd. (subsidiary of El-Nilein Holding Co.)		Mine at Port Sudan	100,000
Silver, refined	kilograms	Government of Sudan	Refinery at Khartoum	73,000
Steel:				
Crude	Sudan Master Technology		Plant at Giad Industrial City	60,000
Rebar	Al-Assad Steel Bar Factory		Plant at Khartoum	394,000
Do.	Sudan Master Technology		Plant at Giad Industrial City	150,000
Do.	Sudanese Steel Products Ltd. (subsidiary of Hafez Elsayad Barbary Ltd.)		Plant at Khartoum	150,000
Do.	Sudanese Malaysian Factory		do.	100,000
Galvanized	Sudanese Steel Products Ltd.		do.	20,000

^cEstimated. Do., do. Ditto. NA Not available.

¹In addition to the facilities listed, about 1.8 million barrels per year of crude petroleum were produced in the Abyei Area, which was claimed by both South Sudan and Sudan.

²Bamboo, Bamboo West, Garaad, Heglig, Taiyib, and Toma oilfields only. Before July 9, 2011, capacity was 47 million barrels per year and included the El-Haar, El-Nar, El-Toor, Khairat, Khairat Northeast, Toma South, and Unity oilfields, which became part of South Sudan after independence on July 9, 2011.