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The Mineral Industry of Sudan

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In Sudan, the mineral sector's influence on the national economy was significant because of crude petroleum production. Sudan was not a globally significant producer or consumer of mineral commodities in 2010. 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 one of the reasons for the Executive Order (Bush, 2006).

Minerals in the National Economy

In 2010, the manufacturing sector accounted for 11% of the gross domestic product; petroleum, 7.5%; and mining and quarrying, 0.2%. The value of output in the mining and quarrying sector increased by 9.3% compared with that of 2009, and petroleum decreased by 5.1%. In 2010, crude petroleum exports were valued at $9.41 billion, or 82% of total exports; gold, 9%; and petroleum products, 3% (Bank of Sudan, 2011, p. 126–127, 176).

Production

In 2010, chromite production increased by 303%; salt, by 296%; cement, by 240%; gold, by 76%; and silver, by 53%. Manganese production also increased sharply. Marble production restarted in 2010. Mica production decreased by 90% in 2010, and kaolin, by 11% (table 1; Geological Research Authority of the Sudan, written commun., July 26, 2011).

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; the Khartoum Oil Refinery was a joint venture between state-owned China National Petroleum Corp. (CNPC) and Sudan Petroleum Corp. The Government held a 56% share in the Hassai gold mine; gold was also produced by artisanal miners. The cement plants were privately owned.

Commodity Review

Metals

Copper, Gold, Lead, Silver, and Zinc.—Artisanal miners accounted for most of Sudan's gold production. In the first 6 months of 2010, artisanal miners produced about 10,000 kilograms (kg) of gold. National gold production for all of 2009 was 14,914 kg (Miningreview.com, 2010; Bank of Sudan, 2011, p. 176).

In 2010, La Mancha Resources Inc. of Canada produced 2,129 kg of gold at the Hassai Mine in northeastern Sudan compared with 1,922 kg in 2009. La Mancha planned to mine between 1,900 and 2,200 kg of gold in 2011. By early 2011, the company planned to complete a feasibility study on a project to increase production at Hassai. Depending on the results of the study, production at Hassai could increase to more than 4,800 kilograms per year starting in 2013. The life of the project was expected to be 6 years (La Mancha Resources Inc., 2011).

La Mancha was considering the possibility of mining copper and gold from a polymetallic deposit under the Hassai open pit discovered in 2009. Resources in the polymetallic deposit were estimated to be about 50 million metric tons (Mt) of ore; the company hoped to increase resources to more than 100 Mt. Copper and gold production from the recently discovered deposit could start in 2015. La Mancha also explored for copper, gold, lead, silver, and zinc at its polymetallic Nuba Mountains concession in central Sudan in 2010 (La Mancha Resources Inc., 2010, 2011).

Industrial Minerals

Cement.—Production at Al-Rahji Group's Atbara cement plant increased to 799,100 metric tons (t) in 2010 from 200,900 t in 2009, and at Nile Cement Company Ltd.'s Rabak plant, to 175,000 t from 8,600 t because of capacity expansions. Al-Salam Cement Production Co. Ltd. produced 412,500 t in 2010 at its plant in Atbara, which was nearly unchanged from 2009 (Bank of Sudan, 2011, p. 150).

In July 2010, ASEC Cement Co. of Egypt (a subsidiary of Citadel Capital S.A.E. of Egypt) started production at its new plant at Takamol with a capacity of 1.6 million metric tons per year (Mt/yr). Berber Cement Co.'s new cement plant in the River Nile State, which had a production capacity of 1.6 Mt/yr, was completed in June. Mass Global Investment Co. of Jordan completed the new Al-Shamal plant in Atbara with a capacity of 1.5 Mt/yr in October. Berber produced 385,000 t of cement in 2010; Al-Shamal, 214,000 t; and ASEC, 127,000 t. Al-Qala'a Group of Egypt and the Sudanese National Pensions Fund were building the new Akham Cement Factory, which had a planned capacity of 1.5 Mt/yr (Bank of Sudan, 2011, p. 150; International Cement Review, 2010, 2011a, b).

Mineral Fuels and Related Materials

Natural Gas and Petroleum.—In 2010, Sudan's crude petroleum output decreased by about 3%. Historically, production was limited by low recovery rates; the average recovery rate of oil in place was 23% compared to the worldwide average of 30%. From 2007 to 2009, domestic consumption of petroleum was less than 100,000 barrels per day (bbl/d) compared with average production of about 470,000 bbl/d (European Coalition on Oil in Sudan, 2010, p. 18–19).

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. In 2010, production in Blocks 1, 2, and 4 declined to 151,000 bbl/d from 176,000 bbl/d in 2009. Production in Blocks 1, 2, and 4 was expected to decrease to 100,000 bbl/d by 2014 (European Coalition on Oil in Sudan, 2010, p. 17; Sudan Petroleum Corp. Ltd., 2011).

Depending on the outcome of a referendum on the independence of the autonomous region of Southern Sudan in January 2011, Blocks 1, 2, and 4 could be divided between Sudan and the newly independent country of South Sudan. The Bamboo, the Bamboo West, the Garaad, the Heglig, the Taiyib, and the Toma oilfields are located north of the proposed national boundary and would remain in Sudan regardless of the outcome of the referendum. In December 2010, production from the oilfields north of the proposed national boundary was estimated to be about 50,000 bbl/d. The El-Haar, the El-Nar, the El-Toor, the Khairat, the Khairat Northeast, the Toma South, and the Unity oilfields are located south of the proposed national boundary and could be affected by the outcome of the referendum (European Coalition on Oil in Sudan, 2010, p. 10, 11, 25).

CNPC held Block 6, which is located to the northwest of Muglad in northern Sudan. In 2010, production in Block 6 increased to 41,000 bbl/d from 38,000 bbl/d in 2009. In late November 2010, the Government announced the commencement of production from a new oilfield that would increase production to about 70,000 bbl/d. The Government planned to increase production at Block 6 to 100,000 bbl/d within a few years (McDoom, 2010; Sudan Petroleum Corp. Ltd., 2011).

Blocks 3 and 7 in eastern Sudan were held by the Petrodar Consortium [CNPC (41%), Petronas (40%), Sudapet (8%), China Petroleum and Chemical Corp. (6%), and the Al-Thani Group of Sudan (5%)]. In 2010, production in Blocks 3 and 7 increased to 254,000 bbl/d from 242,000 bbl/d in 2009. Production in Blocks 3 and 7 is likely to be about 280,000 bbl/d in 2011 and 2012 and then to decrease to 250,000 bbl/d in 2013 and 100,000 bbl/d in 2018. Depending on the outcome of the referendum on Southern Sudan's independence, Blocks 3 and 7 could be divided between Sudan and the new country of South Sudan. All the currently operating oilfields in Blocks 3 and 7 are located south of the proposed national boundary (European Coalition on Oil in Sudan, 2010, p. 10–11, 17, 25; Sudan Petroleum Corp. Ltd., 2011).

Block 5A is located in the Muglad Basin in Southern Sudan. Block 5A was held by White Nile Petroleum Operating Co. [Petronas (68.9%), ONGC Videsh (24.1%), and Sudapet (7%)]. Output was about 17,000 bbl/d in 2010 compared with 20,000 bbl/d in 2009. The low quality of petroleum from Block 5A limited its production; it was necessary to blend Block 5A's output with higher quality petroleum from other blocks to avoid a price discount. Oil production in Block 5A reportedly led to contamination of local drinking water with arsenic, cadmium, cyanides, lead, and nickel (Sign of Hope, 2009; European Coalition on Oil in Sudan, 2010, p. 11, 16, 25; Sudan Petroleum Corp. Ltd., 2011).

In February 2010, Red Sea Petroleum Operating Co. (CNPC, 35%; Petronas, 35%; Sudapet, 15%; Express Petroleum of Nigeria, 10%; Hi-Tech Petroleum Group, 5%) started drilling the Tokar-1 exploration well at Block 15 on the Red Sea. The Government announced favorable results from the drilling in August. Nile Valley Petroleum Ltd. (a subsidiary of Citadel Capital) explored at Block A, which is located southwest of Blocks 3 and 7, and Blocks 9 and 11, which are located in the Khartoum Basin. The company planned to drill a well at Block 9 in 2010. Blocks 9, 11, and 15 are located north of the proposed national boundary between Sudan and Southern Sudan. Depending on the outcome of the referendum on Southern Sudan's independence, Block A could be divided between Sudan and the newly independent country of South Sudan (Badr and Resillot, 2010, p. 30; European Coalition on Oil in Sudan, 2010, p. 11, 24–25; Watkins, 2010).

The Government awarded Block 10 in northwestern Sudan and Block 14 in eastern Sudan to Fenno Caledonian Ltd. of the United Kingdom in June 2010 and August 2010, respectively. In August, the Government also awarded Block E in the Muglad Basin to Star Petroleum of Luxembourg. Blocks 10 and 14 are located north of the proposed national boundary between Sudan and South Sudan. Depending on the outcome of the referendum on Southern Sudan's independence, Block E could be divided between Sudan and the newly independent country of South Sudan (European Coalition on Oil in Sudan, 2010, p. 11, 24–25; Watkins, 2010).

In late 2010, Total S.A. of France and its joint-venture partners had not started exploration on Block B in Southern Sudan because of security concerns and the lack of an investor to replace Marathon Oil Corp. of the United States. Marathon withdrew from the project in 2008. Total's plans were on hold pending the outcome of the referendum on Southern Sudan's independence (Africa Energy Intelligence, 2010; European Coalition on Oil in Sudan, 2010, p. 16–17).

CNPC operated a petroleum 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. In 2010, CNPC signed an agreement with the Government to increase capacity to 150,000 bbl/d (European Coalition on Oil in Sudan, 2010, p. 13).

In October 2009, the governing authorities of Southern Sudan announced plans to open to tender a new petroleum refinery in Akon with a capacity of 50,000 bbl/d. Construction was expected to take 36 months; the capital costs were estimated to be $2 billion. The refinery's production was likely to be consumed domestically. Financing for the refinery had not yet been secured in December 2010 (Watkins, 2009; European Coalition on Oil in Sudan, 2010, p. 13).

Outlook

Sudan's crude petroleum production could increase in 2011 and 2012 because of expansions in Blocks 3, 6, and 7; the increases are likely to be at least partially offset by decreasing production in Blocks 1, 2, and 4. By 2014, production is expected to decline substantially in Blocks 3 and 7; national production is likely to be below the levels reached in 2010 in spite of increased output from Block 6. Higher levels of production may be sustained with new discoveries or increased recovery rates. Depending on the outcome of the referendum on Southern Sudan's independence, most of Sudan's currently producing oilfields could be located south of the proposed national boundary (European Coalition on Oil in Sudan, 2010, p. 11, 13, 24–25).

Cement and limestone production is likely to increase sharply in 2011 and 2012 as the new plants completed in 2010 reach full capacity and the new Al-Shamal plant is completed in 2011. Gold production is likely to increase to more than 40,000 kg by 2012. Copper production could start in 2015. The outlook for chromite production depends heavily upon world stainless steel markets (Miningreview.com, 2010).

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TABLE 1

SUDAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
Cement, hydraulic		202,200	326,200	246,500 r	621,700 r	2,112,600
Chromite, mine output, gross weight[3]		28,772	15,476	27,094	14,087	56,823
Gold, mine output, Au content[4]	kilograms	6,219 r	6,049 r	7,508 r	14,914 r	26,317
Gypsum		7,000	7,974	12,705	30,000	31,000
Kaolin		11,641	27,846	87,151	36,799 r	32,696
Manganese ore		--	400	--	500	378,990
Marble	cubic meters	12,000 e	6,000 e	1,600	--	16
Mica		NA	NA	66	100	10
Petroleum:						
Crude, including lease condensate	thousand 42-gallon barrels	132,738	176,574	168,898	173,453	168,656
Refinery products:						
Liquefied petroleum gas	do.	3,742	3,587	3,332	3,915 r	3,798
Gasoline	do.	9,717	10,279	9,244	9,488 r	10,593
Naphtha	do.	216	170	219	207 r	180
Jet fuel	do.	1,445	929	836	981 r	1,059
Kerosene	do.	320	239	251	240 r	196
Distillate fuel oil	do.	13,554	15,410	13,903	19,115 r	17,489
Residual fuel oil	do.	2,566	4,175	4,534	2,108 r	1,732
Petroleum coke	do.	--	--	1,632	1,713	1,774
Total	do.	31,560	34,789	33,951 r	37,767 r	36,821
Salt		11,638	22,922	10,581	35,793	141,840
Silver	kilograms	2,437	2,405	--	413	631
Steel, semimanufactured[e]		67,000	67,000	67,000	67,000	67,000
Talc		216 r	2,620 r	4,667	1,167	--

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. NA Not available. -- Zero.

[1]Table includes data available through January 12, 2012.

[2]In 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).

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

[4]Reported exports.

TABLE 2
SUDAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement		Atbara Cement Company Ltd. (subsidary of Al-Rajhi Group)	Plant at Atbara	1,900,000
Do.		ASEC Cement Company (subsidiary of Citadel Capital S.A.E.)	Plant at Takamol	1,600,000
Do.		Berber Cement Company Ltd.	Plant at Berber	1,600,000
Do.		Mass Global Investment Co.	Plant at Atbara	1,500,000
Do.		Nile Cement Company Ltd.	Plant at Rabak	1,500,000
Do.		Al-Salam Cement Production Co. Ltd.	Plant at Atbara	600,000
Chromite		Ingessana Hills Mines Corp.	Mine at Ingessana Hills	48,000
Gold	kilograms	Compagnie Miniere Or (Government of Sudan, 56%, and La Mancha Resources Inc., 40%)	Mine at Hassai	5,000
Gypsum		Sudanese Mining Corp. (Government, 100%)	Bir Eit Mine in Red Sea State	15,000
Limestone		Al-Salam Cement Production Co. Ltd.	NA	730,000 [e]
Do.		Al-Rahji Group	Mine at Atbara	500,000
Do.		Nile Cement Company Ltd.	Mine at Rabak	200,000
Mica		Sudanese Mining Corp. (Government, 100%)	Mines at Sheriek	1,800
Petroleum:				
Crude	thousand 42-gallon barrels	Petrodar Consortium [China National Petroleum Corp. (CNPC), 41%; Petronas Carigali Overseas Shd. Bhd., 40%; Sudan Petroleum Company Ltd. (Sudapet), 8%; China Petroleum and Chemical Corp., 6%; Al-Thani Group, 5%]	Blocks 3 and 7 in Upper Nile State	110,000
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	55,000
Do.	do.	China National Petroleum Corp. (CNPC)	Block 6 near Muglad	26,000
Do.	do.	White Nile Petroleum Operating Co. [Petronas Carigali Overseas Shd. Bhd., 68.9%; ONGC Videsh Ltd., 24.1%; Sudan Petroleum Company Ltd. (Sudapet), 7%]	Block 5A in Unity State	22,000
Refined	do.	Khartoum Oil Refinery [China National Petroleum Corp. (CNPC), 50%, and Sudan Petroleum Corp., 50%]	Refinery at Jali	36,500
Do.	do.	Port Sudan Refining Ltd. (Government, 100%)	Refinery at Port Sudan	7,900
Salt		Sudan Salt Co.	Mine at Port Sudan	45,000 [e]
Do.		Ba'boud Salt Co.	do.	30,000 [e]
Do.		Prison Salt Works (Government, 100%)	Mines at Port Sudan and Sawakin	NA
Steel:				
Crude		Sudan Master Technology	Plant at Giad Industrial City	60,000
Rebar		do.	do.	150,000
Do.		Sudanese Steel Products Ltd. (subsidiary of Hafez Elsayad Barbary Ltd.)	Plant at Khartoum	150,000
Galvanized		do.	do.	20,000

[e]Estimated. NA Not available.