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The Mineral Industry of Sudan

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The mineral sector's influence on Sudan's economy was significant mainly because of petroleum production and refining. In recent years, however, cement and gold production have also begun to be important to the Sudanese economy. Sudan was not a globally significant producer or consumer of mineral commodities in 2011.

In January 2011, the autonomous region of Sudan known as Southern Sudan, which was composed of the States of Central Equatoria, Eastern Equatoria, Jonglei, Lakes, Northern Bahr el Ghazal, Unity, Upper Nile, Warrap, Western Bahr el Ghazal, and Western Equatoria States, held a referendum on independence from Sudan. The people of Southern Sudan voted for secession, and the new country became independent with the name of the Republic of South Sudan on July 9, 2011 (Kron and Gettleman, 2011; Pitt, 2011).

As a result of the referendum, the oilfields were divided between South Sudan and Sudan, but disputes between the countries regarding petroleum remained unresolved at yearend. Control of the Abyei Area was disputed by the Governments of South Sudan and Sudan. In May 2011, Sudanese military forces moved into Abyei (Pitt, 2011).

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. Unless they received permission from the U.S. Office of Foreign Assets Control (OFAC), U.S. individuals and organizations were banned from providing services to the petroleum industry of South Sudan if the services benefited the Government of Sudan or were related to the production or transportation of petroleum or petrochemicals in Sudan. U.S. individuals and organizations were also banned from transactions involving the petroleum industry without the permission of the OFAC if the Government of South Sudan made payments to the Government of Sudan for selling South Sudanese petroleum (Bush, 2006; Pitt, 2011).

Minerals in the National Economy

In 2010 (the latest year for which data are available), 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 that of petroleum decreased by 5.1%. In 2011, crude petroleum exports were valued at $7 billion, or 72% of total exports; gold, 15%; and petroleum products, 3% (Bank of Sudan, 2011, p. 126–127, 176; 2012, p. 14).

Production

In 2011, cement production increased by an estimated 146%. From 2007 to 2010, the production of salt increased by 519%; gypsum, by 289%; and chromite, by 267%. Crude petroleum production decreased by an estimated 35% in 2011, and that of gold, by 10% (table 1).

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, which was the only large-scale gold mine in the country. Artisanal miners accounted for most of Sudan's gold production. The cement plants were privately owned (table 2).

Commodity Review

Metals

Copper, Gold, and Silver.—Artisanal miners accounted for most of Sudan's gold production. In 2011, national gold exports decreased to 23,739 kilograms (kg) from 26,317 kg in 2010. It is unclear whether the decrease in gold exports was attributable to the secession of South Sudan (Bank of Sudan, 2012, p. 14).

In 2011, La Mancha Resources Inc. of Canada produced 2,231 kg of gold at the Hassai Mine in northeastern Sudan compared with 2,129 kg in 2010. La Mancha planned to mine nearly 1,900 kg of gold in 2012. In 2011, the company also completed a feasibility study on the Hassai CIL project, which is expected to start production in 2013. The Hassai VMS copper-gold project is likely to start in 2015. The projects could extend the life of the Hassai Mine from 2014 to 2025. La Mancha planned to produce 5,800 kg of gold in 2013, 6,500 kg in 2015, 3,500 kg in 2017, and less than 750 kilograms per year (kg/yr) starting in 2019 (Plyley and others, 2010, p. 260, 263–268; Thompson, 2011; La Mancha Resources Inc., 2012).

From 2015 to 2019, copper production from the Hassai VMS project was likely to be nearly 52,000 metric tons per year (t/yr). Copper production was expected to decrease sharply in 2020, although operations would continue through 2025 (Plyley and others, 2010, p. 268).

The Government planned to increase gold production to offset the loss of crude petroleum production from secession. By the end of 2011, the Government had awarded 200 gold exploration licenses to 73 companies; Brinsley Enterprises Ltd. of Jordan and Toro Gold Ltd. of the United Kingdom explored for gold in northeastern Sudan. The Government also planned to complete a new refinery with a capacity of 150,000 kg/yr of gold and

30,000 kg/yr of silver in early 2012 (African Business, 2011; Thompson, 2011).

Industrial Minerals

Cement.—Sudan had seven cement plants with a combined capacity of 10.1 million metric tons per year (Mt/yr). 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 that 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; International Cement Review, 2011a, b).

In 2010, ASEC Cement Co. of Egypt (a subsidiary of Citadel Capital S.A.E. of Egypt), Berber Cement Company Ltd., and Mass Global Investment Co. of Jordan opened new cement plants in Takamol, Berber City, and Atbarta, respectively. Berber produced 385,000 t of cement in 2010; Al-Shamal, 214,000 t; and ASEC, 127,000 t. In early 2011, Al-Qala'a Group of Egypt and the Sudanese National Pensions Fund started production at the new Akham Cement Factory, which had a capacity of 1.5 Mt/yr (Bank of Sudan, 2011, p. 150; International Cement Review, 2011b).

Mineral Fuels

Petroleum.—In 2011, Sudan's production of crude petroleum decreased to about 110 million barrels (Mbbl) from 168.7 Mbbl in 2010. The decrease in output was attributable to the secession of South Sudan. 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% (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 2011, production in Blocks 1, 2, and 4 declined to an estimated 130,000 barrels per day (bbl/d) from 151,000 bbl/d in 2010. After the referendum on South Sudan's independence, Blocks 1, 2, and 4 were divided between Sudan and 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 remained in Sudan. The El-Haar, the El-Nar, the El-Toor, the Khairat, the Khairat Northeast, the Toma South, and the Unity oilfields are located in South Sudan (European Coalition on Oil in Sudan, 2010, p. 25; 2011, p. 8, 10; Sudan Petroleum Corp. Ltd., 2011).

In the first half of 2011, production from the oilfields north of the national boundary in Blocks 1, 2, and 4 was estimated to be about 50,000 bbl/d, and in the disputed Abyei Area, about 5,000 bbl/d. The Government planned to increase production to 70,000 bbl/d from 50,000 bbl/d by mid-2012 with the discovery of new oilfields in Block 2 (European Coalition on Oil in Sudan, 2011, p. 8, 10; Mazen, 2011).

CNPC held Block 6, which is located to the northwest of Muglad in northern Sudan. In early 2011, production in Block 6 was estimated to be about 60,000 bbl/d compared with 41,000 bbl/d in 2010. Output increased because of a new oilfield that opened in November 2010. The Government planned to increase production in Block 6 to 100,000 bbl/d by mid-2014 (European Coalition on Oil in Sudan, 2010, p. 11, 25; Mazen, 2011; 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 2011, production in Blocks 3 and 7 increased to an estimated 280,000 bbl/d from 254,000 bbl/d in 2010. Block 3 is located in South Sudan and Block 7 was divided between Sudan and South Sudan. All the currently operating oilfields in Blocks 3 and 7 are located south of the national boundary (European Coalition on Oil in Sudan, 2010, p. 11, 17, 25; 2011, p. 8, 10; Sudan Petroleum Corp. Ltd., 2011).

Block 5A, which is located in the Muglad Basin, is held by White Nile Petroleum Operating Co. [Petronas (68.9%), ONGC Videsh (24.1%), and Sudapet (7%)]. Block 5A is south of the national boundary with South Sudan. Output was about 17,000 bbl/d in 2010 (European Coalition on Oil in Sudan, 2010, p. 11, 16, 25; Sudan Petroleum Corp. Ltd., 2011).

In September 2011, Star Oil Co. (Ansan Wikfs Investments Ltd. of Yemen, 66%, and Sudapet, 34%) was drilling a third well on Block 17 in Abyei. Star Oil could start production at the rate of 15,000 bbl/d in Block 17 by mid-2012 (Africa Energy Intelligence, 2011).

CNPC and its joint-venture partners held Blocks 13 and 15 on the Red Sea. In 2010, CNPC drilled an exploration well at Block 15. 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. Petronas and its joint-venture partners held Block 8. Fenno Caledonian Ltd. of the United Kingdom held Blocks 10 and 14. Total S.A. of France and its joint-venture partners held Block B, which was in South Sudan. Blocks 8, 9, 10, 11, 12A, 12B, 13, 14, and 15 remained in Sudan after the referendum on South Sudan's independence. The national boundary ran through Blocks A, C, and E (European Coalition on Oil in Sudan, 2010, p. 11, 24–25; Watkins, 2010; Citadel Capital S.A.E., 2011).

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).

Outlook

Sudan's crude petroleum production could increase from 2012 through 2015 because of expansions in Blocks 2 and 6 and the startup of production in Block 17; the increases are likely to be at least partially offset by decreasing production from existing wells in Blocks 1 and 4. Without new investment, Sudanese production could decline to about 50,000 bbl/d by 2018. Higher levels of production may be sustained with new discoveries or increased recovery rates. Increases in crude petroleum production, especially in Block 17, are likely to depend on the resolution of disputes with respect to Abyei, pipeline transit fees, and other issues (European Coalition on Oil in Sudan, 2011, p. 10).

Cement and limestone production is likely to increase in 2012 and 2013 as the new plants completed in 2010 and 2011 reach full capacity. Cement demand is expected to increase to about 5.8 Mt in 2015 from 4 Mt in 2010. Gold production is likely to increase by at least 3,600 kg by 2013. Copper production could start in 2015. The outlook for chromite production depends heavily upon world stainless steel markets (Renaissance Capital LLC, 2011, p. 35).

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TABLE 1
SUDAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2007	2008	2009	2010	2011[e]
Cement, hydraulic		326,200	246,500	621,700	2,112,600	5,200,000
Chromite, mine output, gross weight[3]		15,476	27,094	14,087	56,823	57,000
Gold, mine output, Au content[4]	kilograms	6,049	7,508	14,914	26,317	23,739
Gypsum		7,974	12,705	30,000	31,000	32,000
Kaolin		27,846	87,151	36,799	32,696	33,000
Manganese ore		400	--	500	378,990	380,000
Marble	cubic meters	6,000 [e]	1,600	--	16	16
Mica		NA	66	100	10	10
Petroleum:						
Crude, including lease condensate[5]	thousand 42-gallon barrels	176,574	168,898	173,453	168,656	110,000
Refinery products:						
Liquefied petroleum gas	do.	3,587	3,332	3,915	3,798	3,800
Gasoline	do.	10,279	9,244	9,488	10,593	10,600
Naphtha	do.	170	219	207	180	200
Jet fuel	do.	929	836	981	1,059	1,100
Kerosene	do.	239	251	240	196	200
Distillate fuel oil	do.	15,410	13,903	19,115	17,489	17,500
Residual fuel oil	do.	4,175	4,534	2,108	1,732	1,800
Petroleum coke	do.	--	1,632	1,713	1,774	1,800
Total	do.	34,789	33,951	37,767	36,821	37,000
Salt		22,922	10,581	35,793	141,840	150,000
Silver	kilograms	2,405	--	413	631	640
Steel, semimanufactured[e]		67,000	67,000	67,000	67,000	67,000
Talc		2,620	4,667	1,167	--	--

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. do. Ditto. NA Not available. -- Zero.
[1]Table includes data available through January 10, 2013.
[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.
[5]For 2011, South Sudanese production is included only for the period before independence on July 9.

TABLE 2

SUDAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2011[1]

(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	1,800,000
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	1,600,000
Do.		Al-Qala'a Group and Sudanese National Pensions Fund	Plant in Nahral-Neil State	1,500,000
Do.		Al-Shamal Cement Factory (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	Artisanal miners	Various sites	25,000 e
Do.	do.	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.	Mine in River Nile State	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[2]	110,000
Do.	do.	China National Petroleum Corp. (CNPC)	Block 6 near Muglad	22,000
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[3]	20,000
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[2]	7,300
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		Bittar Salt Company Ltd. (subsidiary of El-Nilein Holding Co.)	Mine at Port Sudan	100,000
Do.		Sudan Salt Co.	do.	45,000 e
Do.		Ba'boud Salt Co.	do.	30,000 e
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. Do., do. Ditto.

[1]In 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.

[2]Through July 8, 2011, only. Blocks 3, 5A, and 7 became part of South Sudan on July 9, 2011.

[3]Bamboo, Bamboo West, Garaad, Heglig, Taiyib, and Toma oilfields only. Prior to July 9, 2011, capacity was 47 million barrels per year and included the El-Haar, the El-Nar, the El-Toor, the Khairat, the Khairat Northeast, the Toma South, and the Unity oilfields, which became part of South Sudan.