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The Mineral Industries of Bhutan and Nepal

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BHUTAN

Bhutan, which is a landlocked country located in Southeast Asia between China and India, produced coal, ferrosilicon, iron ore, and a variety of industrial minerals used locally for construction and exports (table 1). In 2014, Bhutan's economy continued to grow steadily. According to the National Statistics Bureau of Bhutan, the gross domestic product (GDP) increased by 5.17% compared with an increase of 2.06% (revised) in 2013. The mining and quarrying sector contributed 2.8% to the country's GDP. The mineral industry of Bhutan was small in scale relative to its major industries, which included the construction sector and the hydroelectric power generation sector. The Government had been actively developing both sectors (construction and power generation) in recent years and had also stimulated the mineral industry by sourcing the construction materials needed for the country's infrastructure projects. In 2014, only 0.9% of the total number of people employed in the country worked in the mining and quarrying industry (National Statistics Bureau of the Royal Government of Bhutan, 2015, p. 69, 123, 234–235).

Bhutan's exports made up 30.6% of the country's total trade, and imports made up 69.4%. Hydropower was the country's leading exported commodity and constituted about 20% of the GDP. Bhutan's leading trading partners were Bangladesh and India for exports, and India and Japan for imports. In 2014, Bhutan exported ferrosilicon (reported as exports in table 1), dolomite (98% of production was exported), gypsum (89%), marble (64%), and coal (22%) (table 1; Department of Revenue and Customs, 2014, p. iv, vi–vii; Mallet, 2014; National Statistics Bureau of the Royal Government of Bhutan, 2015, p. 144).

Production

In 2014, Bhutan's primary mineral commodity output was industrial mineral products; these included cement, clay, dolomite, granite, gypsum, limestone, marble, quartzite, stone, and talc. Additionally, coal, ferrosilicon, and iron ore were produced. Increases in production were reported for coal (56.8%), talc (31.5%), gypsum (17.8%), dolomite (17.3%), and limestone (11.6%). Stone production was 1.47 million metric tons (Mt), almost equaling the 2012 level of 1.49 Mt after falling to 38,542 metric tons (t) in 2013. Production decreases were reported for granite (32.5%) and clay (32.7%). Data on mineral production are in table 1.

Structure of the Mineral Industry

The mineral industry of Bhutan was relatively undeveloped, and only 33% of the country had been geologically mapped in 2014. Mineral resources, such as coal, dolomite, gypsum, limestone, and slate were known to exist in Bhutan. In addition, the country had small deposits of granite, iron ore, marble, quartzite, pink shale, and talc. Most mining facilities consisted of small operations owned and (or) operated by private companies, and others were owned and (or) operated by Government enterprises, such as the Dungsam Cement Corp. Ltd., the Natural Resources Development Corp. Ltd., and the Penden Cement Authority Ltd. In 2014, the total number of industrial license holders was 2,823, of which only 3.2%, or 92 licenses, were related to the mineral industry. There were 33 mines and 48 quarries operating in the country. Table 2 is a list of major mineral industry facilities in Bhutan (Royal Audit Authority, 2014, p. 3; National Statistics Bureau of the Royal Government of Bhutan, 2015, p. 123, 125).

Commodity Review

Industrial Minerals

Cement.—In 2014, Dungsam Cement Corp. Ltd., which was wholly owned by Druk Holding and Investments Ltd. (DHI), produced 200,181 t of cement; of this amount, 41% was sold and used for the construction of hydropower projects and other infrastructure construction projects in the country, 38% was exported, and 21% was sold locally to other buyers. The company also produced 396,657 t of clinker, of which about 98% was sold to India and the remaining 2% was consumed domestically (Druk Holding and Investments Ltd., 2014, p. 34).

In January, Dungsam Cement obtained a license to sell cement to India and planned to increase its cement exports by up to 80% of the company's production owing mainly to the relatively small market in Bhutan. The company reportedly planned to operate the plant at close to its capacity of 4,130 metric tons per day (t/d) (Global Cement, 2014).

Dolomite.—In 2014, DHI started investing in a dolomite manufacturing project, which would produce dolomite refractory bricks and high-alumina-content refractory products in bricks to be used by the ferrous and industrial manufacturing sectors. The company also completed a feasibility study for the plant, which would be located in Gomtu and managed by OCL India Pvt. Ltd. of India. DHI also acquired environmental clearance from the Government to develop a dolomite mine in Samtse District. The project would be managed by OCL Bhutan Ltd., which was a joint venture between DHI and OCL India Pvt. Ltd. (Druk Holding and Investments Ltd., 2014, p. 19).

Mineral Fuels and Other Sources of Energy

Hydropower.—According to the National Statistics Bureau of Bhutan, the total installed electricity generation capacity of the country was nearly 1,500 megawatts (MW) in 2014. Most of the electricity were generated at the following hydropower facilities—Basochu I, Basochu II, Chhukha, Kurichu, and the Tala Hydropower Project Authority (National Statistics Bureau of the Royal Government of Bhutan, 2015, p. 120).

Bhutan's feasible hydropower potential was assessed to be about 24,000 MW, of which only 6% had been installed. In recent years, neighboring India had been involved in Bhutan's development of its hydropower industry by providing technical knowledge and funding for the construction of hydropower plants. India also would import most of the electricity produced, which in turn would generate export revenues and promote the economic growth of Bhutan. An agreement between the countries was formally established in 2009, and India committed to supporting Bhutan in the installation of 10,000 MW of hydropower capacity by 2020. India also agreed to import all of Bhutan's electricity surpluses. The plan to reach the capacity goal of 10,000 MW included the construction of 10 hydropower projects, of which 3—Punatsangchu I (1,200 MW), Punatsangchu II (1,020 MW), and Mangdechhu (720 MW)—were under construction in 2014 and were expected to be commissioned between 2017 and 2018. In April, Bhutan and India signed an inter-Governmental agreement for the joint development of four additional hydropower projects (Economic Times, 2014; Harris, 2014; Dharmadhikary, 2015).

In 2014, the Asian Development Bank (ADB) continued its commitment to improve Bhutan's energy sector by investing in the development of its hydropower industry. As of December, the ADB was providing assistance for the construction of the Dagachhu hydropower plant, which was expected to be commissioned in 2015, and the Nikacchu hydropower plant, which was expected to be commissioned in 2019 (Asian Development Bank, 2014a; 2014b, p. 1; Druk Holding and Investments Ltd., 2014, p. 18; Mallet, 2014).

References Cited

Asian Development Bank, 2014a, ADB to finance second hydropower plant PPP in Bhutan: Manila, Philippines, Asian Development Bank, December 15, 2 p. (Accessed August 6, 2015, at http://www.adb.org/print/node/150793.)

Asian Development Bank, 2014b, Bhutan fact sheet: Manila, Philippines, Asian Development Bank, December 31, 4 p. (Accessed August 6, 2015, at http://www.adb.org/sites/default/files/publication/27755/bhu.pdf.)

Department of Revenue and Customs [Bhutan], 2014, Bhutan trade statistics 2014: Ministry of Finance, Department of Revenue and Customs, August, 484 p. (Accessed September 24, 2015, at http://www.mof.gov.bt/wp-content/uploads/2014/08/BTS_2014.pdf.)

Dharmadhikary, Shripad, 2015, Hydropower in Bhutan—Time for a rethink?: International Rivers, January 8. (Accessed December 21, 2015, at http://www.internationalrivers.org/blogs/328-5.)

Druk Holding & Investments Ltd., 2014, DHI annual report 2014: Thimphu, Bhutan, Druk Holding & Investments Ltd., 90 p. (Accessed September 29, 2015, at http://www.dhi.bt/documents/10180/17712/annual+report+2014.pdf/b176131f-1e10-4ee3-8f30-1c8a278ce025.)

Economic Times, The, 2014, Power—Nerendra Modi lays foundation stone of Kholongchu hydro-power project The Economic: Times [Mumbai, India], June 16. (Accessed December 21, 2015, at http://articles.economictimes.indiatimes.com/2014-06-16/news/50624112_1_druk-green-power-corporation-hydropower-projects-bhutan.)

Global Cement, 2014, Dungsam Cement targets north-east India: Global Cement, February 12. (Accessed December 23, 2015, at http://reviewne.com/dungsam-cement-targets-north-east-india-global-cement.)

Harris, Michael, 2014, Bhutan, India sign hydroelectric power development agreement: HydroWorld.com, April 22. (Accessed December 21, 2015, at http://www.hydroworld.com/articles/2014/04/bhutan-india-sign-hydroelectric-power-development-agreement.html.)

Mallet, Victor, 2014, Bhutan hoping for happiness with hydropower: Financial Times [London, United Kingdom], January 2. (Accessed December 21, 2015, at http://www.ft.com/intl/cms/s/0/471f0d80-66d9-11e3-8d3e-00144feabdc0.html#axzz3v0Q7p2WL.)

National Statistics Bureau of the Royal Government of Bhutan, 2015, Statistical yearbook 2015: Thimphu, Bhutan, National Statistics Bureau of the Royal Government of Bhutan, October, 292 p. (Accessed June 1, 2017, at http://www.nsb.gov.bt/publication/files/pub3cb4010sp.pdf.)

Royal Audit Authority [Bhutan], 2014, Performance audit report on tax on mining and quarrying sector: Royal Audit Authority, October, 233 p. (Accessed September 23, 2015, at http://www.bhutanaudit.gov.bt/publication/Performance Audit Report on Mining and Quarry 2014.pdf.)

NEPAL

Nepal, which is a landlocked country located in Southeast Asia between China and India, produced coal, gemstones, steel, and a variety of industrial minerals, such as cement, clay, quartzite, stone, and talc. In 2014, Nepal's economy continued to grow steadily; according to the Central Bureau of Statistics of Nepal, the GDP rate of growth was 5.15% compared with 3.46% (revised) in 2013. The mining and quarrying sector contributed less than 1% to the country's GDP in 2014. The mineral industry of Nepal was small in scale relative to other major industries, such as the construction sector, which contributed 6.3% to the country's GDP in 2014. The country's steep topography has proven to be a challenge for the mining industry; therefore, mineral resources were mostly unexploited. Nepal was thought to have small deposits of metallic and nonmetallic mineral resources, such as cobalt, copper, iron ore, lead, magnesite, and zinc. In 2014, exports made up 12.7% of total trade, and imports made up 87.3%. The leading trading partners were India (60%) and the United States (9%) for exports, and India (57%) and China (30%) for imports (table 1; Central Bureau of Statistics, 2014; Asian Development Bank, 2014b, p. 5–6).

In 2014, the Asian Development Bank (ADB) continued its commitment to improve Nepal's infrastructure through the ADB country partnership strategy that prioritized the development of energy, transportation, water, and urban infrastructure projects. The ADB sought to improve the generation, transmission, and distribution of energy and to reduce power shortages, and to continue its support of the construction of a road network to connect the country to other regional markets (Asian Development Bank, 2014a).

Production

Nepal's mineral industry was dominated by the production of industrial minerals, which were used mainly for domestic construction. Cement and brick production were Nepal's main mineral-related industries. Preliminary production data from the Department of Mines and Geology of Nepal reported significant decreases in the production of coal (85.2%), clay (73.8%), talc (61.2%), limestone (49.2%), and marble chips (15.7%) (table 1).

Structure of the Mineral Industry

The production of cement and the generation of hydropower were the two main industries in Nepal. The country had become almost self-reliant in cement production, and as cement manufacturers started production in recent years, the demand for electricity increased. The country's cement operations were mostly privately owned. In 2014, according to the Nepal Cement Manufacturers Association, 44 cement plants were operating in

the country, of which 12 had their own clinker production units. Table 2 is a list of major mineral industry facilities in Nepal (Kathmandu Post, The, 2014).

Commodity Review

Industrial Minerals

Cement.—In recent years, the demand for cement had increased significantly owing to the Government's infrastructure improvement plans, which included the construction of bridges, dams, and housing. In 2014, Chaudhary Group commissioned a cement factory with the capacity to produce 1,200 t/d. The plant was located in Palpa in western Nepal. In January, Dangote Group of Nigeria announced plans to invest $800 million to build a cement plant in Nepal and asked the Government to assist it in locating a site. The plant would include its own powerplant, which would have 30 MW of electricity-generating capacity, and the company asked the Government to provide an additional 30 MW of generating capacity to ensure proper operation of the plant (Global Cement, 2014b; Kathmandu Post, The, 2014).

In December, Arghakhanchi Cement, which is located in Bhairahawa, was set to start production at its 1,200-t/d-capacity plant. Kadiya Group, Murarka Group, and Siddhartha Group of Nepal each owned shares in the plant. Three mines, located in Narapani and Khanchikot in Arghakhanchi District and in Jonchha in Palpa District respectively, would provide limestone for the Arghakhanchi cement plant (Global Cement, 2014a).

In December, Sarbottam Cement Industries (SCI) started commercial operations at its 400,000-metric-ton-per-year cement plant. The plant, which cost $64 million to build, included a powerplant and a grinding unit (Global Cement, 2014c).

Mineral Fuels and Other Sources of Energy

Hydropower.—Nepal had the potential to develop its hydropower industry, which had the potential of a commercially feasible capacity of 80,000 MW, although only 700 MW had been installed. In September, the Investment Board of Nepal signed a foreign investment agreement to build a 900-MW-capacity hydropower plant in the Karnali River at a cost of $1.4 billion. GMR (an infrastructure group in India that held a 73% share in the project), was contracted to build the plant. The Government of Nepal would hold a 27% share in the project and would receive 12% of the electricity; the remaining output was expected to be exported to India. The project was expected to be commissioned in 2021 (Mallet, 2014).

References Cited

Asian Development Bank, 2014a, Nepal fact sheet: Manila, Philippines, Asian Development Bank, December 31, 4 p. (Accessed August 6, 2015, at http://www.adb.org/sites/default/files/publication/27783/nep.pdf.)

Asian Development Bank, 2014b, Nepal—Key indicators for Asia and the Pacific 2015: Manila, Philippines, Asian Development Bank, 9 p. (Accessed November 5, 2015, at http://www.adb.org/sites/default/files/publication/175162/nep.pdf.)

Central Bureau of Statistics [Nepal], 2014, Nepal in figures 2014: Kathmandu, Nepal, Central Bureau of Statistics, 1 p. (Accessed October 13, 2015, at http://cbs.gov.np/image/data/Publication/Nepal in Figures English 2014.pdf.)

Global Cement, 2014a, Arghakhanchi Cement to launch in December 2014: Global Cement, December 9. (Accessed December 23, 2015, at http://www.globalcement.com/news/item/3133-arghakhanchi-cement-to-launch-in-december-2014.)

Global Cement, 2014b, Dangote hunts land for cement plant in Nepal: Global Cement, January 8. (Accessed December 23, 2015, at http://www.globalcement.com/news/item/2189-dangote-hunts-land-for-cement-plant-in-nepal.)

Global Cement, 2014c, Sarbottam Cement Industries starts commercial operation in Nepal: Global Cement, December 17. (Accessed December 23, 2015, at http://www.globalcement.com/news/item/3153-sarbottam-cement-industries-starts-commercial-operation-in-nepal.)

Kathmandu Post, The, 2014, Nepal's booming cement industry lures investors: Kathmandu [Nepal] Post, January 19. (Accessed June 30, 2014, at http://kathmandupost.ekantipur.com/news/2014-01-20/nepals-booming-cement-industry-lures-investors.html.)

Mallet, Victor, 2014, Nepal launches hydropower growth plan with $1.4bn deal: Financial Times [London, United Kingdom], September 22. (Accessed December 21, 2015, at http://www.ft.com/intl/cms/s/0/ff40a2d2-422c-11e4-a9f4-00144feabdc0.html#axzz3vheB9MI6.)

TABLE 1
BHUTAN AND NEPAL: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Country and commodity[2]		2010	2011	2012	2013	2014
BHUTAN						
Cement[e]	thousand metric tons	200	544	521	500	600
Clay		--	--	7,353	15,166	10,209
Coal, bituminous		87,815 [r]	108,904	98,731	77,744 [r]	121,891
Dolomite		1,214,620 [r]	1,082,301 [r]	1,499,535 [r]	1,740,016 [r]	2,040,691
Ferrosilicon[3]		97,528	96,711	107,819	110,000 [e]	110,000 [e]
Granite		9,396 [r]	463 [r]	1,807 [r]	6,464 [r]	4,362
Gypsum		344,034	352,234 [r]	313,173 [r]	351,421 [r]	414,148
Iron ore:						
Gross weight		--	--	3,742 [r]	20,506 [r]	18,997
Metal content		--	--	2,300	12,700	11,800
Limestone		704,912 [r]	649,291	677,129 [r]	1,006,235 [r]	1,122,825
Marble		71,278 [r]	71,582	59,542 [r]	60,708	61,921
Quartzite		111,371 [r]	95,016 [r]	88,631 [r]	90,909	83,907
Stone		6,649,978 [r]	1,842,679 [r]	1,494,467	38,542 [r]	1,474,395
Talc		40,204 [r]	8,562	16,063 [r]	9,584	12,601
NEPAL						
Cement[e]	thousand metric tons	1,360	2,200	2,700	3,000	3,000
Clay, red	cubic meters	6,705 [4]	9,066	13,400 [4]	18,070 [r, 4]	4,735 [p]
Coal, bituminous		3,391 [4]	10,904	14,084 [4]	8,051 [r, 4]	1,189
Gemstones:	kilograms					
Kyanite		NA	2,980	1,934 [4]	1,187 [r, 4]	1,200 [e]
Quartz		1,000	560	1,114 [4]	4,256 [r, 4]	4,000 [e]
Tourmaline		NA	--	--	696 [r, 4]	700 [e]
Quartzite, slab[e]	square meters	3,000	-- [r]	--	2,000	2,500
Steel, rolled[e]	thousand metric tons	85	80	80	80	80
Stone:						
Limestone		580,000	1,276,452	4,719,542 [5]	3,371,071 [r, 4]	1,713,372
Marble:						
Aggregate	cubic meters	NA	13,593	--	--	--
Chips	do.	1,330 [3]	1,969	2,995	2,436 [r, 4]	2,054
Slab, cut	do.	500	13,595	--	--	--
Talc		1,655 [3]	6,935	5,140	5,703 [r, 4]	2,211

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

[1]Table includes data available through December 23, 2015.

[2]In addition to the commodities listed, metallic commodities, such as copper wire, lead, manganese, and zinc, and crude construction materials, such as sand and gravel, presumably were produced in Bhutan and Nepal, but information was inadequate to make reliable estimates of output.

[3]Data compiled from the United Nations Comtrade database for all ferrosilicon exported from Bhutan.

[4]Data are for the fiscal year ending July 15 of the following year.

TABLE 2
BHUTAN AND NEPAL: STRUCTURE OF THE MINERAL INDUSTRIES IN 2014

(Thousand metric tons unless otherwise specified)

Country and commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity[e]
BHUTAN				
Cement		Dungsam Cement Corp. Ltd. (Druk Holding and Investments Ltd., 100%)	Nganglam, Pemagatshel District	1,500
Do.		Penden Cement Authority Ltd. (Druk Holding and Investments Ltd., 40.3%)	Gomtu, Samtse District	375
Coal		Goop Sonam Drukpa	Eastern Bhutan coalfields	NA
Dolomite		Jigme Mining Corp. Ltd.	Chunaikhola Mine, Samtse District	2,000
Ferrosilicon		Bhutan Ferro Alloys Ltd. (Druk Holding and Investments Ltd., 25.7%) (Government of Bhutan, Marubeni Co., and Tashi Commercial Co.)	Phuentsholing, Lhukha District	110
Gypsum		Druk Satair Corp. Ltd.	Khothakpa Mine, Pemagatshel District	NA
Limestone		Bhutan Coal Co. Ltd.	Haurikhola Mine, Samtse District	NA
Do.		Dungsam Cement Corp. Ltd. (Druk Holding and Investments Ltd., 100%)	Kangrezi Mine, Pemagatshel District	NA
Do.		do.	Marung Ri Mine, Pemagatshel District	NA
Do.		Penden Cement Authority Ltd.	Penden Mine, Samtse District	NA
Do.		do.	Uttare Mine, Samtse District	NA
Quartzite		Bhutan Ferro Alloys Ltd.	Pakchina Mine, Chukha District	NA
Do.		do.	Tintale Mine, Samtse District	NA
Stone		Natural Resources Development Corp. Ltd.	Homdhar quarry, Zhemgang District	NA
Do.		do	Ngangsing quarry, Pemagatshel District	NA
Do.		do.	Tsangkhar quarry, Monggar District	NA
NEPAL				
Cement		Araniko Cement Industries	Jitpur factory	NA
Do.	metric tons per day	Arghakhanchi Cement	Bhairahawa	1,200
Do.	do.	Dang Cement Industries Pvt. Ltd. (Ambuja Cement Ltd., 85%)	NA	1,200
Do.	do.	Chaudhary Group	Palpa, western Nepal	1,200
Do.	do.	Jagdamba Cement	Bhairahawa	1,200
Do.	do.	do.	Birgunj	1,000
Do.		Lhaki Cement Pvt. Ltd.	Bhawani Khola	660
Do.		Hetauda Cement Industries Ltd.	Hetauda, Makwanpur District	260
Do.		Manasa Cement Industry	Chandragadhi, Jhapa District	37
Do.		Maruti Cement	NA	NA
Do.		Saurabh Group	Sarbottam Cement Industries	400
Lead and zinc		Nepal Metal Co. Ltd. [Government (71%), and Khetan Group (13%)]	Lari	NA
Magnesite	metric tons	Nepal Orind Magnesite Ltd. [Government (75%); Khetan Group (12.5%); Orissa Industries Ltd. (12.5%)]	Dolkha District	50
Marble		Godavari Marble Industries Ltd.	Godawari, Latitpur District	1

[e]Estimated. Do., do. Ditto. NA Not available.