

THE MINERAL INDUSTRIES OF

DJIBOUTI, ERITREA, ETHIOPIA, AND

SOMALIA

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Djibouti

In recent years, Djibouti, which is a small East African country, has been known to produce occasionally small quantities of clays, granite, limestone, marble, salt, and sand and gravel. Other mineral occurrences of potential economic interest included diatomite, geothermal fluids and mineral salts, gold, gypsum, perlite, petroleum, and pumice.

In 2001, Djibouti's gross domestic product (GDP) amounted to about \$1.73 billion at purchasing power parity. The per capita GDP at purchasing power parity was about \$700 in 2000. Djibouti's GDP increased by 2% in 2001 after rising by 0.7% in 2000, 2.2% in 1999, and 0.1% in 1998. In 2000, manufacturing accounted for 7% of the GDP; construction, 8%; electricity, 5%; and mining and energy, about 1% (International Monetary Fund, 2002b, p. 164; 2002a§¹, b§).

By the end of 2002, the Government hoped to establish a fiscal, institutional, and legal framework to support the development of domestic natural resources. The Government also planned to promote the use of local materials in construction and public works (World Bank, 2001b, p. 30).

In 2000, Djibouti's production of salt increased to 135,933 metric tons (t) from 127,283 t in 1999 and 82,876 t in 1998 (British Geological Survey, 2002, p. 227). Salt was produced by artisanal miners and exported to Ethiopia.

The International Cement Review (2001a) estimated that Djibouti's cement consumption increased to 80,000 t in 2001 from 70,000 t in 2000 and 1999 and 60,000 t in 1998. The country had no domestic cement production; most imports came from countries in the Persian Gulf. Djibouti also served as a transshipment center for cement destined for Ethiopia.

Djibouti did not have production facilities for petroleum products; all petroleum demand was met through imports. In 2001, the Iranian Government signed agreements with Etablissement de Hydrocarbures and Electricité de Djibouti to build an oil refinery and a power station (Africa Energy Intelligence, 2001a). Djibouti also had resources of natural gas.

In 2000, Djibouti produced 223.3 gigawatthours (GWh) from four diesel-fired powerplants. This was an increase from 194.3 GWh in 1999 and a decrease from 225.6 GWh in 1995. In 2001, the Djiboutian Government began discussion of a joint venture between Geothermal Development Associates of Nevada and Electricité de Djibouti to create a 30-megawatt (MW) geothermal plant near Assal. The Government was

working on a long-term plan for development of the electrical sector that it hoped to complete by March 2002; power generation was to be deregulated (Africa Energy Intelligence, 2001b; World Bank, 2001b, p. 30; Ministère de l'Economie des Finances et de la Planification, chargé de la Privatisation, 2001§).

Djibouti's transportation network comprised about 2,900 kilometers (km) of roads, of which nearly 400 km was paved. The World Bank assisted the Government in developing a long-term program to develop the national road network. Initial investment would focus upon road links to Ethiopia to complement the planned increase in capacity at the Djibouti port (World Bank, 2001b, p. 30).

The outlook for Djibouti's mineral industry is for little growth in the short run; constraints include small domestic markets, minimal known natural resources, and slow GDP growth. The World Bank (2001b, p. 35) predicted that the GDP would increase in 2002 by 1.6%; in 2003, by 2.1%; and in 2004, by 3.1%.

Eritrea

In recent years, the East African country of Eritrea has produced a variety of minerals, rocks, and semimanufactured goods, which included basalt, cement, common clay, kaolin, coral, gold, granite, gravel, gypsum, lime, limestone, marble, pumice, quartz, salt, sand, and silica sand (table 1). The country also had known occurrences of such metals as chromium, copper, iron, lead, magnesium, nickel, silver, and zinc and such industrial minerals as barite, feldspar, and potash.

In 2001, Eritrea's GDP increased by 6.5% after falling by 8.6% in 2000 and rising by 1.2% in 1999 and 3.2% in 1998. In 1999, manufacturing accounted for 8% of the GDP; construction, 9%; and mining and quarrying, less than 1% (International Monetary Fund, 2000, p. 24; 2002b, p. 164).

Gold was produced in Eritrea by artisanal miners. From 1997 to 2000, the production of gold declined by nearly 57% (table 1); this decrease may be attributable to the fall in gold prices and the war with Ethiopia. In 2000, the value of gold produced in Eritrea amounted to \$1.7 million (Zerefe Awalom, Eritrea Ministry of Energy and Mines, written commun., 2001).

Sub-Sahara Resources NL, which was formed by the merger of Maiden Gold NL and Universal Gold NL, held the exploration licenses for the Debarwa copper deposit and the Emba Derho polymetallic deposit. In 2001, Sub-Sahara engaged in exploration at the abandoned gold mines at Medrizien and Woki Duba. The company also explored for

¹References that include a section twist (§) are found in the Internet References Cited section.

copper at Aggiar and Medrizien and for zinc near Adi Nefas; Sub-Sahara applied for a license that contains the Adi Nefas gold and zinc deposits. In 2002, the company planned to continue exploration activities (Sub-Sahara Resources NL, 2002, p. 11-12).

In early 2001, Nevsun Resources Ltd. completed geologic mapping and rock sampling on the Enjahai, the Seroa Mine, and the Tofalebu gold occurrences. Nevsun planned to engage in diamond drilling at Enjahai. Other gold occurrences that have been explored in recent years include Ak, Bisha, Harab Suit, Ketina, Matite, Nefasit, Okreb, Tekeze, and Zara (Resource Information Unit, 2001a, p. 91-94).

The Eritrea Cement Factory, which was the country's only cement producer, was able to increase output in 1999 owing to upgrades of equipment and employee skills. The war with Ethiopia caused the production of many construction materials to decline in 1999 and 2000 (table 1). In 2000, the value of gravel and crushed rock amounted to \$418,000; sand, \$367,000; and limestone, granite, marble, basalt, and silica sand, \$399,000 (Zerefe Awalom, Eritrea Ministry of Energy and Mines, written commun., 2001).

In 2001, postwar rebuilding efforts spurred a recovery in Eritrea's construction sector. Numerous projects, which included repairs to the country's airports, bridges, dams, railways, and roads; expansion and improvements to ports and water and sewage networks; and the construction of housing units and commercial and industrial buildings, were underway or under active consideration. The World Bank and the Eritrean Government developed a \$280 million plan to rebuild Eritrea's economy.

Salt producers in Eritrea included Alkelder Salt & Affiliates, Assab Salt Works, and Massawa Salt Works. The country's salt production declined sharply in 1998 and 1999 (table 1). The Government planned to privatize Assab Salt Works and Massawa Salt Works. In 2000, the value of salt produced in Eritrea amounted to \$909,000 (Zerefe Awalom, Eritrea Ministry of Energy and Mines, written commun., 2001).

In 2000, Eritrea's consumption of petroleum products was estimated to be about 2.9 million barrels (Mbbbl), all of which has been imported since the closure of the Assab Refinery in 1997. In May 2001, CMS Oil and Gas (a subsidiary of CMS Energy Corporation) signed an agreement with the Government to explore for natural gas and petroleum in the Dismin Block in northeastern Eritrea. The Government was also interested in developing geothermal, solar, and wind energy; geothermal areas occur in the Danakil region (U.S. Commercial Service, 2001§; U.S. Energy Information Administration, 2002§).

The Eritrean Electricity Authority, which was responsible for the generation, transmission, and distribution of electricity, had about 60 MW of diesel-fired capacity. In 1999, Eritrea produced an estimated 206.8 GWh of electricity, which was an increase from 185.8 GWh in 1998 and 154.8 GWh in 1996. Sales of electricity increased to 155.9 GWh in 1999 from 145.6 GWh in 1998 and 127.5 GWh in 1996. Many rural health clinics, schools, and villages used solar photovoltaic power systems (International Monetary Fund, 2000, p. 34; U.S. Energy Information Administration, 2002§).

Eritrea's transportation network comprised about 4,000 km of roads, of which nearly 900 km was paved. The railway linking

Ak'ordat and Asmara with the port of Massawa was 317 km; only a 5-km stretch in Massawa was operational. Rehabilitation of the remainder was under way. Ports and harbors were Assab and Massawa.

The outlook for Eritrea's mineral industry is for gradual recovery from the war. Demand for such construction materials as basalt, granite, gravel, limestone, marble, and sand is likely to increase. Further development depends upon favorable global market conditions, the continuation of peace with Ethiopia, and landmine clearing.

Ethiopia

Ethiopia has been a producer of minerals, rocks, and semimanufactured goods, such as brick clay, cement, columbium (niobium), diatomite, feldspar, gold, gypsum and anhydrite, kaolin, lime, pumice, salt, scoria, soda ash, sand, stone, and tantalum (table 1). Ethiopia's main mineral export was gold. Other metal deposits included copper, iron ore, manganese, molybdenum, nickel, platinum, and zinc. Other industrial mineral occurrences included apatite, bentonite, dolomite, gemstones, granite, potash, quartz, and talc.

In 2001, Ethiopia's GDP amounted to about \$39 billion at purchasing power parity. Per capita GDP at purchasing power parity was \$590 in 2000. The GDP grew by 7.9% in 2001 after increasing by 5.4% in 2000 and 6.3% in 1999. Mining and quarrying accounted for less than 1% of the GDP (International Monetary Fund, 2002b, p. 164; 2002a§, b§).

The Ethiopian Mineral Resources Development Enterprise (EMRDE) operated the Kenticha columbium and tantalum mine near Borena. In fiscal year 2000-01, EMRDE produced 47 t of tantalum (table 1) and earned export revenues of \$5.6 million. For fiscal year 2001-02, the company planned to increase tantalum production to 60 t.

Midroc Gold (a subsidiary of Midroc Ethiopia Ltd.) operated the Lega Dembi gold mine. The company planned to start underground operations and to make upgrades to its processing plant in 2001 that would increase gold production capacity to nearly 4,700 kilograms per year (kg/yr) of gold from about 2,800 kg/yr. Other gold mines that were operating in Ethiopia included the Adola and the Sakaro. Sheba Exploration Ltd. of the United Kingdom was prospecting for gold in the northern province of Tigray. In 2000, gold was the mineral commodity that made the largest contribution to the Ethiopian economy; the value of gold produced exceeded \$33.18 million (Gebre-Selassie, 2001; Resource Information Unit, 2001b; Getachew Tesfaye, Ethiopia Ministry of Mines and Energy, written commun., 2001).

In 2001, Golden Prospect Plc of the United Kingdom was granted a 3-year exploration license for platinum at Daleti and Tulu Dimtu. The company was also granted a prospecting license for Yubdo, which had produced 2,700 kg of platinum in the past. Mineral analysis indicated that gold, palladium, and rhodium also occurred at Yubdo. Golden Prospect began negotiations with potential joint-venture partners for further exploration work (Resource Information Unit, 2001b).

Abay Natural Resources Development Plc produced fire opal in North Shewa; five other companies were engaged in exploration and mining. Sales of fire opal were concentrated in

Asia, especially in Japan. Abay sold its products at the Hong Kong Jewellery and Watch Fair and plans to market some of its product through such international auction houses as Christie's and Sotheby's. Cutting and polishing was done in Hong Kong and India; the company planned to develop a cutting industry in Ethiopia that used domestic labor. Other semiprecious and ornamental stones produced in Ethiopia included amethyst, peridot, and rose quartz. Ethiopia also has deposits of agate, aquamarine, chalcedony, chrysoprase, emerald, garnet, jasper, obsidian, ruby, sapphire, and spinel (Henricus, 2002).

Salt producers in Ethiopia included Afdera Salt Works Association, Duck Table Salt Processors Plc, and Palm & Salt Association. In 2000, the value of salt produced in Ethiopia amounted to about \$6.84 million (Getachew Tesfaye, Ethiopia Ministry of Mines and Energy, written commun., 2001).

From 1995 to 2000, Ethiopia's consumption of diammonium phosphate (DAP) fell to 191,493 t from 202,312 t. During the same period, the consumption of urea increased to 98,524 t from 44,411 t. Ethiopia's consumption of DAP was expected to increase to 240,000 t in 2001 and 320,000 t in 2002. Urea consumption was expected to increase to 128,000 t in 2001 and 168,000 t in 2002. All Ethiopia's nitrogen and phosphate fertilizers were imported. In recent years, the Geological Survey of Ethiopia has explored for phosphate rock in the western part of the country (Gebre-Selassie, 2000; World Bank, 2001a, p. 3).

In March 2001, Sicor Inc. of the United States signed agreements to develop the Gazoil Ethiopia project at a cost of \$1.4 billion. Sicor planned to build a natural gas to liquids plant for the production of about 183,000 t/yr of ammonia. The ammonia would be used in the domestic production of urea. The Gazoil project would also generate electricity and produce diesel, gasoline, kerosene, and jet fuels (Weeden, 2001).

At the end of 2001, Ethiopia was totally dependent upon imports to meet its demand for petroleum. In fiscal year 2000-01, Ethiopia imported 8.33 Mbbl of petroleum products, which was an increase from 7.81 Mbbl in fiscal year 1999-00 and 7.73 Mbbl in fiscal year 1998-99. Automotive diesel oil accounted for 56% of petroleum imports in fiscal year 2000-01; jet fuel, 21%; gasoline, 13%; and residual fuel oil, 10% (National Bank of Ethiopia, 2001§). The International Monetary Fund (2002a, p. 32) predicted that the value of fuel imports would fall to \$236 million in fiscal year 2002-03 from \$292 million in fiscal year 2000-01 and then increase to \$278 million by fiscal year 2005-06.

In 2001, Ethiopia signed an agreement with the Governments of Djibouti and Sudan in which the Ethiopian Electric Power Company (EEPSCO) would export electricity to Djibouti and Sudan. Sudan agreed to supply Ethiopia with benzene and petroleum products (Africa Energy Intelligence, 2001d).

In fiscal year 2000-01, Ethiopia produced 1,811.7 GWh of electricity, which was an increase from 1,688.8 GWh in fiscal year 1999-00 and 1,652.9 GWh in fiscal year 1998-99. Hydroelectric sources accounted for 98.8% of power generated; thermal sources, 0.9%; and geothermal sources, 0.3%. At the beginning of 2000, Ethiopia's hydroelectric capacity was 377.8 MW; thermal, 40.3 MW; and geothermal 7.3 MW (Teklemariam and others, 2000; National Bank of Ethiopia, 2001§).

Ethiopia's exploitable hydroelectric energy potential could be 162,000 MW. In 2001, Enerco of Italy signed a memorandum of understanding with EEPSCO to build three new hydroelectric plants at a cost of \$350 million to \$410 million. The Genale plant was expected to have a capacity of 162 MW; the Bilbi Moya, 75 MW; and the Awash IV, 40 MW. Bilbi was expected to be operational by the end of 2003, and Awash IV, in 2004. EEPSCO awarded a contract to Midroc Ethiopia to build a 150-MW hydroelectric plant on the Gojeb River (Africa Energy Intelligence, 2001c, 2002; World Resources Institute and others, 1996, p. 288).

The geothermal potential of the Ethiopian Rift has been estimated to be 700 MW, which included the central Afar with 260 MW; the Lakes District, 170 MW; the Denkali Depression, 150 MW; and the Southern Afar, 120 MW. The Aluto-Langano geothermal powerplant in the lakes District had a capacity of 7.3 MW; the Government planned to increase capacity at the plant to 30 MW. Other areas of geothermal exploration include Tendaho, which is located in the Northern Afar (Teklemariam and others, 2000).

At the end of 2000, Ethiopia's transportation network comprised 29,799 km of roads, of which nearly 3,890 km was paved and 25,909 km, gravel. The Ethiopian segment of the Addis Ababa-Djibouti railroad was 681 km. From 1996 to 2000, the Ethiopian Road Construction Authority invested about \$700 million and built more than 7,000 km of new roads (Gebre-Selassie, 2001).

The outlook for Ethiopia's mineral industry is favorable. Improvements in the general economic situation and the need to rebuild infrastructure are likely to increase demand for building materials. The International Monetary Fund (2002a, p. 28) predicted that the GDP would increase in fiscal year 2001-02 by 5.8%, and in fiscal year 2002-03 and fiscal year 2003-04 by 6.0%. Ethiopia's plans to expand infrastructure may increase the economic viability of its metals and industrial minerals deposits. Favorable conditions in the world minerals markets and the continuation of peace with Eritrea are also important.

Somalia

Somalia was a producer of small quantities of gypsum, salt, and sepiolite (meerschaum). Recent discoveries and artisanal mining of gemstones included amethyst, aquamarine, emerald, garnet, opal, ruby, and sapphire. The country also had deposits of feldspar, iron ore, kaolin, limestone, natural gas, quartz, silica sand, tantalum, tin, and uranium. The minerals industry made only a small contribution to Somalia's exports and to the economy in general.

Officially reported mineral and trade data have been unavailable owing to lack of a central Government from 1991 to 2000. Somaliland and Puntland (two regions in northern Somalia) have declared independence from Somalia. The new central Government created in 2000 controlled only a small portion of Mogadishu and faced serious challenges from regional warlords (Washington Post, 2001). The civil war has had considerable adverse consequences for the economy, which included the minerals sector. The war forced the closure of Somalia's cement plant and oil refinery and halted exploration for natural gas and other resources.

Emeralds were produced at Alihiley and Simodi in western Somaliland. Aquamarine was known to occur near Darburuq, Gebiley, and Lafrug; garnet, near Alihiley, Boroma, and Darburuq; and sapphire, near Gebiley. Mining of Somaliland's gemstones has been limited by a lack of modern equipment, civil strife, and damage to the infrastructure (Henricus, 2001b).

The European Community-funded non-governmental organization Progressive Interventions was working with the Government of Somaliland to exploit local gemstone resources. Issues under consideration included investment in exploration and mining equipment; training of local miners; organizing the miners and dealers into a mining and trade association; marketing the gemstones; and adding value through cutting and polishing (Henricus, 2001a).

Somalia imported all its cement, most of which was believed to be sourced from Kenya, Oman, and Saudi Arabia. The International Cement Review (2001b) estimated that Somalia's cement consumption remained unchanged at 100,000 t in 2001. The Berbera cement plant had a capacity of 300,000 t/yr but needed substantial upgrade work to resume production.

In 2000, Somalia's petroleum consumption was estimated to be nearly 1.5 Mbbl. Since the closure of Somalia's refinery in 1991, which was run by the state-owned Iraqsoma Refinery Corporation, all the country's demand for petroleum products has been met through imports. In 2001, TotalFinaElf signed a 1-year agreement with the Somali Government to explore for oil in the southern region of Lower Shabelle and the Juba Valley (Iran Daily, 2001; U.S. Energy Information Administration, 2002§).

In May 2001, the Government of Somaliland signed an agreement with Rovagold Ltd. of the United Kingdom, Continental Petroleum Engineering Company Ltd. of China, and China Petrochemical Corporation to explore for oil. Zarara Energy Ltd. of South Africa also signed an exploration agreement with the Government. Chinese firms have been reported to be involved in oil exploration in Puntland (U.S. Energy Information Administration, 2002§).

Somalia's installed electricity generating capacity amounted to 70 MW, all of which was diesel fired. The country's exploitable hydroelectric energy potential could be 50 MW. Ente Nazionale Energia Elettrica was responsible for the generation, transmission, and distribution of electricity. In October 2001, the Government signed agreements with WorldWater Corp. of the United States to develop such renewable energy sources as solar power. Prior to the civil war, the Government had planned to install wind energy systems in rural areas and turbines to connect to the electricity grid in Mogadishu. The Government of Puntland planned to privatize the electricity sector (World Resources Institute and others, 1996, p. 288; U.S. Energy Information Administration, 2002§). Somalia's transportation network comprised about 22,000 km of roads, of which 2,600 km were paved. Oil pipelines were 15 km. The principal ports and harbors were located at Bender Cassim (Boosaaso), Berbera, Chisimayu (Kismaayo), Merca, and Mogadishu.

The outlook for Somalia's mineral industry is for little change in the short run. The Governments of Puntland and Somaliland have not gained international recognition, and the central Government in Mogadishu faces serious obstacles to

unifying the country, much less repairing the damage from the civil war. Other problems include weak infrastructure and a domestic market that is limited by severe poverty. In the long run, an end to the civil war; investment in education, health, and infrastructure; favorable world market conditions; improvements in mining technology; and other conditions amenable to private foreign investment could lead to greater exploitation of Somalia's mineral resources.

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TABLE 1
ERITREA, ETHIOPIA, AND SOMALIA: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Country and commodity	1997	1998	1999	2000	2001 e/
ERITREA					
Basalt	489,686	403,219	251,991 r/	122,928 r/	129,000
Cement e/	60,000	50,000	57,000 r/	45,000	47,300
Clays:					
Common e/	80,000	80,000	88,476 r/ 3/	63,427 r/ 3/	66,600
Kaolin	4,670	3,809	1,138 r/	943 r/	990
Coral	96,535	245,112	86,762 r/	74,130 r/	77,800
Gold kilograms	612	573	534 r/	264 r/	270
Granite	111,062	249,829	162,146 r/	122,017 r/	128,000
Gravel	798,055	941,129	152,968 r/	115,110 r/	121,000
Gypsum	27	56	1,075 r/	330 r/	345
Laterite	585	5,881	2,171 r/	2,049 r/	2,150
Lime e/	7,000	6,000	6,000 r/	3,000	3,000
Limestone 4/	5,585	4,077	5,069 r/	2,690 r/	2,830
Marble e/	220,000	200,000	200,000 r/	100,000	105,000
Petroleum products thousand 42-gallon barrels	3,000	--	--	--	--
Pumice	754	391	153 r/	41 r/	40
Quartz	604	731	730 e/	600 e/	630
Salt	252,073	114,137	9,368 r/	47,498 r/	49,900
Sand thousand tons	2,097	2,170	809 r/	1,030 r/	1,080
Silica sand	27	--	10,065 r/	--	10,000
ETHIOPIA 5/ 6/					
Cement, hydraulic	752,000	750,000	638,266	879,962	950,000
Clays: 7/					
Brick e/	6,000	6,000	80,865 3/	224,093 3/	242,000
Kaolin (China clay)	3,512	378	681	1,654	1,790
Other clay cubic meters	NA	NA	23,750	23,000 e/	24,800
Columbite-tantalite, ore and concentrate:					
Gross weight kilograms	20,000	20,000	49,630	64,940	78,700
Nb content do.	NA	NA	4,960	6,490	7,870
Ta content do.	6,500	6,500	29,300	38,800	47,000 3/
Diatomite	150	125	140	140 e/	150
Feldspar e/	5,000	5,000	391 3/	285 3/	310
Gold, mine output, Au content kilograms	3,000	2,500	4,905	5,177	5,200
Gypsum and anhydrite, crude	120,000	120,000	35,983	46,798	50,500
Lime	2,500	3,000	2,991	3,769	3,800
Pumice e/ 7/	325,000	325,000	135,400 3/	156,466 3/	169,000
Salt, rock e/	1,000	1,000	56,400 3/	56,400 3/	60,900
Scoria e/	250,000	250,000	281,164 3/	287,000	310,000
Soda ash, natural	15,000	15,000	4,745	4,745	5,000
Stone, sand and gravel: e/ 7/					
Construction stone, crushed thousand tons	750	1,000	3,407 3/	3,459 3/	3,740
Dimension stone 8/	40,000	130,000	130,000	100,000	108,000
Granite	NA	NA	126 3/	140	150
Limestone thousand tons	3,300	3,400	846 3/	1,197 3/	1,300
Sand 9/ do.	1,600	2,500	1,600 3/	1,853 3/	2,000
Silica sand	7,000	7,000	6,061 3/	5,601 3/	6,050
Other stone	NA	NA	10,162 3/	15,768 3/	17,000
SOMALIA 10/ e/					
Gypsum	1,000	1,500	1,500	1,500	1,500
Salt, marine	800	600	1,000	1,000	1,000
Sepiolite (meerschau)	6	6	6	6	6

e/ Estimated. r/ Revised. NA Not available. -- Zero.

1/ Estimated data are rounded to no more than three significant digits.

2/ Includes data available through March 29, 2002.

3/ Reported figure.

4/ For other than cement.

5/ Data are for year ending July 7 of the year listed.

6/ In addition to the commodities listed, some lignite, semiprecious gemstones, steel semimanufactures, and talc reportedly were produced, and silver and platinum were reportedly contained in gold ingots from the Lega Dembi Mine, but information is inadequate to estimate output.

7/ When reported as volume or pieces, conversions to metric tons are estimated.

8/ Includes marble. Production of marble was estimated to be 13,900 t in 1996 and reported to be 6,014 t in 1999 and 6,662 t in 2000.

9/ May include gravel.

10/ In addition to the commodities listed, various crude construction materials (e.g., clays, sand and gravel, crushed and dimension stone) and limestone for lime manufacture and/or agriculture are presumably produced; available information, however, is inadequate to make estimates of output.