

BURUNDI, COMOROS, MALAWI, MAURITIUS, REUNION, RWANDA, AND SEYCHELLES

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BURUNDI

In recent years, Burundi, which is a small country in Central Africa, has been known to produce columbium (niobium)-tantalum ore, gold, kaolin, tin, and tungsten ore, most of which have been designated for export (table 1). The country has also been known to produce limestone, peat, and sand and gravel for domestic consumption. Additionally, Burundi has resources of cobalt, copper, feldspar, nickel, phosphate rock, platinum group metals (PGM), quartzite, rare-earth elements (REE), uranium, and vanadium. More extensive information on the mineral deposits in Burundi can be found in the 2000 Minerals Yearbook, volume III, Mineral Industries of Africa and the Middle East.

In 2001, Burundi's gross domestic product (GDP) amounted to about \$4.7 billion at purchasing power parity, and the per capita GDP at purchasing power parity was about \$700. Burundi's GDP increased by 2.4% in 2001 after falling by 0.1% in 2000 and by 1% in 1999. In 2001, manufacturing accounted for 5% of the GDP; construction, 4%; and mining and energy, about 1% (International Monetary Fund, 2002a, p. 7; 2002e, p. 174; 2002a^{§1}, b[§]; United Nations, 2002, p. 1).

In 2000, the Government introduced a new law aimed at increasing the output of artisanally mined minerals. The ad valorem tax on cassiterite, colombite-tantalite, and wolframite was cut to 3% from 7%, and on gold, to 0.3% from 0.75%. The export tax on wolframite was cut to 1% from 5%; on colombite-tantalite, to 2% from 5%; and on gold, to 0.2% from 1.5%. The export tax on cassiterite increased to 3% from 1%. Previously, the holder of an exploration/exploitation permit was required to post a bond of \$60,000 and pay a fee of \$50,000 per year. Under the new legislation, the bond is no longer required, and the license fee has been reduced to \$10,000 per year (Songore, 2001).

In the northern provinces of Kayanza and Kirundo, Comptoirs Miniers de Burundi S.A. (COMEBU) mined deposits of cassiterite, colombite-tantalite, and wolframite. COMEBU also sought joint-venture partners to exploit deposits of gold, kaolin, marble, nickel, phosphate rock, and rare earths. Tin output fell by 73% from 1997 to 2001; exports of tin fell to 4,706 kilograms (kg) in 2000 from 18,408 kg in 1999. Production of colombite-tantalite increased to 122,537 kg in 2001 from 46,000 kg in 1997; the value of colombite-tantalite produced

amounted to about \$2.49 million in 2001 (International Trade Centre, 2001; Mathias Sebahene, Burundi Ministry of Energy and Mines, written commun., 2002).

Burundi Mining Corporation (a joint venture between the Government and local private companies) held the mining titles to most of the largest gold deposits in Burundi. The deposits in the northeastern part of the country are believed to be exploited by artisanal miners. In 2001, Burundi's production of gold amounted to 415 kg (table 1). In recent years, the civil war has compelled the few companies involved in gold exploration to declare force majeure (Resource Information Unit, 2001, p. 61; Mathias Sebahene, Burundi Ministry of Energy and Mines, written commun., 2002).

Civil strife also has prevented the exploitation of Burundi's nickel resources. In 2001, Argosy Minerals Inc. sought a joint-venture partner to develop the Musongati nickel deposit but did not lift the force majeure it declared in April 2000 owing to continuing instability.

International Cement Review (2001a) estimated that Burundi's cement consumption amounted to 30,000 metric tons per year (t/yr) from 1999 to 2001. All the country's cement demand was met through imports; cement was sourced from Tanzania, Uganda, and Zambia. The 25,000-t/yr clinker-grinding facility near Bujumbura was reportedly damaged following rioting in 1996.

The state-owned Office National de la Tourbe (ONATOUR) was responsible for the production and distribution of peat. Shortages of fuel oil and spare parts impaired ONATOUR's production in 1997 and 1998. In 1999, production increased to 20,000 t before falling in 2000 and 2001 (table 1); the domestic market could absorb only 12,000 t/yr.

Burundi has no identified resources of coal, natural gas, or petroleum. The country does not have production facilities for petroleum products; all petroleum demand was met through imports. In 2001, consumption of petroleum products amounted to 48,093 t, which was an increase from 39,888 t in 1997 (International Monetary Fund, 2002a, p. 16).

In 2001, Burundi's power production rose to 107.8 gigawatthours (GWh) from 99.2 GWh in 2000; most power was generated from hydroelectric sources. In the same year, the country consumed 108.8 GWh, which was an increase from 100.8 GWh in 2000 and 92.2 GWh in 1997. Imports were sourced from Congo (Kinshasa). Industrial consumption of electricity fell to 43.5 GWh in 2001 from 44.5 GWh in 1997 (International Monetary Fund, 2002a, p. 16). In July 2000, the Burundi National Assembly voted to open the electricity sector

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

to competition and to end the monopoly of the state electric utility.

Burundi's transportation network comprised about 14,500 kilometers (km) of highways, of which slightly more than 1,000 km was paved. The major waterway was Lake Tanganyika, which had a port at Bujumbura.

Economic growth was expected to be 3.4% in 2002 and 5% in 2003 (International Monetary Fund, 2002e, p. 174). High rates of GDP growth may lead to increased demand for such local construction materials as gravel, limestone, and sand. The severe environmental problems of deforestation may lead to increased demand for peat for use as fuel and in the exploitation of domestic phosphate rock resources to raise agricultural productivity. The outlook for columbium (niobium), tantalum, tin, and tungsten depends heavily upon the resolution of political instability and the global market; Burundi's domestic market is limited by the severe poverty of the country.

Columbium (niobium) demand is driven primarily by the steel and aerospace industries. Global consumption of finished steel was predicted to fall by about 0.7% in 2002 and rise by 2.3% per year from 2003 to 2006. The world market for gold was expected to show little change in the near future. Modest decreases in mine production by 2003 were likely to be offset by falling demand. Tin consumption was expected to decline by about 1% in 2002 and to increase by nearly 3.6% in 2003. Cemented carbides represent the greatest end use of tungsten. Future consumption depends upon the strength of the aerospace, construction, mining, oil and gas drilling, semiconductor, and other manufacturing industries (SG Securities Ltd., 2001, p. 19, 22; Shedd, 2002, p. 81.5; MEPS (International) Ltd., 2002§).

The outlook for unexploited commodities in Burundi, such as nickel, REE, and vanadium, also depended upon world market conditions. Increased demand for nickel and modest increases in nickel production capacity in 2003 were expected to lead to rising nickel prices. Global demand for rare-earth oxides was expected to increase to 100,000 t in 2005 from 74,000 t in 1999. Vanadium is expected to be in oversupply at least through 2003 or 2004; demand is unlikely to exceed 73,000 t/yr vanadium pentoxide equivalent, and production capacity from lower cost secondary sources totals more than 81,000 t/yr (Mining Journal, 2001b; SG Securities Ltd., 2001, p. 17-18; Chegwidan and Kingsworth, 2002).

COMOROS

The Federal Islamic Republic of the Comoros is located on three main islands in the Mozambique Channel about two-thirds of the way between northern Madagascar and northern Mozambique. In 2001, the GDP of Comoros amounted to about \$930 million at purchasing power parity; GDP per capita at purchasing power parity was about \$1,300 (United Nations, 2002, p. 2; International Monetary Fund, 2002a§, b§).

In recent years, political instability had a negative effect on the economy; in 2001, the GDP rose by 1.9% after falling by 1.1% in 2000 and rising by 1.9% in 1999 and 1.2% in 1998. The recession was particularly severe in the manufacturing and construction and public works sectors. In 2000, construction and public works accounted for about 6% of the GDP; manufacturing, 4%; and electricity, gas, and water, 2% (International Monetary Fund, 2001, p. 23; 2002e, p. 174).

In 2001, the mineral industry of Comoros continued to be

limited to the production of common construction materials, such as clay, sand and gravel, and crushed stone, for local consumption. Cement was imported from Kenya and South Africa. The International Monetary Fund (2001, p. 53) estimated that cement imports rose to 41,542 t in 2000 from 25,094 t in 1999 and 24,504 t in 1998. Imports of iron and steel products fell to 2,633 t in 2000 from 3,300 t in 1999 and 3,223 t in 1998.

The production of electricity increased to 35 GWh in 2000 from 34.9 GWh in 1999 and 29.0 GWh in 1998. Comoros had an installed capacity of 12.7 megawatts (MW) in 2000. Officially reported consumption of electricity fell to 18 GWh in 2000 from 22 GWh in 1999. Problems with power losses and fraud have been increasing in recent years. Imports of petroleum products increased to 17,893 t in 2000 from 17,144 t in 1999 and 16,663 t in 1998 (International Monetary Fund, 2001, p. 32, 53). Geothermal energy resources are known to exist within the territory.

The outlook on minerals output was not expected to change significantly because Comoros has very limited natural resources. Domestic consumption of resources is likely to be constrained by severe poverty and slow economic growth. The International Monetary Fund (2002e, p. 174) predicted that the GDP would increase by 3.5% in 2002 and 3% in 2003. A constitutional referendum aimed at ending the crisis over the secession of the island of Anjouan was scheduled for late 2001. Import dependence and deforestation may lead to exploitation of the country's geothermal resources.

MALAWI

In recent years, Malawi, which is a small country in southern Africa, has produced cement, coal, crushed stone for aggregates, dolomite, lime, and limestone for domestic consumption (table 1). The country has been known to produce and export various gemstones, such as agate, amethyst, aquamarine, garnet, ruby, and sapphire. Artisanal miners produced clay, salt, and sand. Malawi has deposits of bauxite, granite, graphite, kaolin, kyanite, monazite, phosphate rock, pyrite, silica sand, titanium, tourmaline, uranium, and vermiculite. More extensive information on the mineral deposits in Malawi can be found in the 2000 Minerals Yearbook, volume III, Mineral Industries of Africa and the Middle East.

In 2001, Malawi's GDP amounted to about \$8.8 billion at purchasing power parity, and the per capita income at purchasing power parity was nearly \$800. The GDP fell by 1.5% in 2001 after rising by 1.7% in 2000, by 4% in 1999, and by 3.3% in 1998. In 2000, manufacturing accounted for 11% of the GDP; construction, 2%; electricity and water, 1%; and mining and quarrying, 1%. From 1995 to 2000, the output of the mining and quarrying sector increased by 302% (International Monetary Fund, 2002b, p. 58; 2002e, p. 174; 2002a§, b§; United Nations, 2002, p. 4).

In 2001, Malawi's official mineral exports amounted to nearly \$500,000, of which 41% was attributable to gemstones and industrial corundum. Gemstone exports were understated because of smuggling. Mineral imports, which included cement, coal, kaolin, and lime, amounted to about \$6 million (Malawi Director of Mines, 2002, p. 4-7). In 2000, the value of imported petroleum products rose to \$104.9 million from \$66.1

million in 1999.

Paladin Resources Ltd. (2002, p. 10) planned to start a feasibility study on the Kayerekera uranium deposit in the first quarter of 2002. Depending on the results of the study, construction of the mine could start in late 2003. Paladin estimated that the project would produce 1,000 t/yr of uranium oxide (U₃O₈) and export revenue of \$30 million to \$34 million per year.

Allied Procurement Agency had a license for titanium sands at Chipoka in Salima; the company planned to start a mineral processing pilot plant in the near future. Crown Minerals held a license for titanium sands at Tengani in the Nsanje district (Malawi Director of Mines, 2002, p. 13-14).

In October 2000, BHP Billiton Plc discussed the possible exploitation of the Mulanje Mountain bauxite resources. The company also planned to review other bauxite deposits in the country with the goal of increasing national reserves to 50 million metric tons (Mt). Lisungwe Mineral Resources Ltd. (a subsidiary of Agricola Resources Ltd.) explored for chrome, gold, nickel, and PGM in the Kirk Range area. Albidon Ltd. of Australia explored for PGM at Bimbili River and Linthipe. Placer Dome Inc. funded copper and nickel exploration work on Ngala Hill (Malunga, 2001; Malawi Director of Mines, 2002, p. 13).

Portland Cement Company operated a clinker plant at Changalume and a clinker grinding plant at Blantyre. After falling in 2000 because of equipment rehabilitation, national cement production increased by 16% in 2001 (table 1). Shayona Cement Corporation opened a new plant at Livwezi in Kasungu which contributed to the rise in output. The value of cement production amounted to \$14.64 million in 2001. Small amounts of cement were imported from Tanzania, Zambia, and Zimbabwe. Basic infrastructure projects and private housing construction were major sources of cement demand (International Cement Review, 2001b; Malunga, 2001; Malawi Director of Mines, 2002, p. 1, 17).

Malawi's imports of fertilizers fell to 17,600 t in 2001 from 57,200 t in 2000 and 150,200 t in 1998. The country's consumption of fertilizers was estimated to be 150,000 t/yr. In September 2000, Optichem (2000) Ltd. resumed the production of fertilizers at a dormant plant in Blantyre. This company was a 5-year joint venture between Mauritius Chemical and Fertilizer Industry Ltd. (MCFI) and Malawi Development Corporation (MDC). At the end of 2005, MCFI would have the option of acquiring the factory, which had a capacity of 40,000 t/yr of compound fertilizer (Malawi Development Corporation, 2001§).

Optichem was expected to mine local raw materials, such as the Tundulu phosphate rock deposits. MDC estimated that the feasibility study and other work necessary to implement the Tundulu project would last until 2005; mining and processing of the ore was expected to cost about \$6.2 million. The Centre for Development of Enterprise (CDE), which is an institution supported by the European Union and the African, Pacific, and Caribbean Group of States, promised to assist in financing the Tundulu phosphate rock project. Other minerals projects that the CDE agreed to finance included the Kangankunde rare earths, the Mabalabo talc, the Salima titanium sands, and the Mwanza vermiculite (Malunga, 2001; Malawi Development Corporation, 2001§).

MDC also sought financing for the Bwanje Valley limestone

project to produce high-grade hydrated lime and pulverized limestone. MDC estimated the cost of the project to be \$12 million; implementation was expected in 2003 and 2004. Other companies involved in lime limestone and granite exploration and production included Granites Ltd., Multi Royal Mining Company, Raval Building Contractors, and Zalewa Lime Company (Malawi Director of Mines, 2002, p. 13-14; Malawi Development Corporation, 2001§).

In 2001, Agricola reopened the Chimwadzulu ruby and sapphire mine and reported the recovery of "outstanding" rubies. The company planned to cut and polish rough ruby and sapphire from the mine. Resources of ruby at Chimwadzulu were estimated to be 247 kg, of which 59 kg were indicated and 188 kg were inferred. Total corundum resources were estimated to be 7,960 kg, the majority of which was sapphire that required heat treatment. Preliminary testing indicated that only 5% of the rough sapphire may be economic (David Williamson Associates Ltd., 2001; Mining Journal, 2001a).

Lisungwe received a new prospecting license for a 100-square-kilometer area about 15 km east of Chimwadzulu; this area contains deep-pink ruby. Mofa Enterprise was prospecting for tourmaline in Mangochi. In 2000, amethyst and aquamarine accounted for most of Malawi's gemstone production. A newly discovered deposit of yellow and yellow-green tourmaline produced about 1,000 carats per month in 2001 (Boehm, 2001; Malunga, 2001; Mining Journal, 2001a; Malawi Director of Mines, 2002, p. 13).

Malawi has no identified resources of natural gas or petroleum. The country does not have production facilities for petroleum products; all petroleum demand was met through imports. Coal Products Ltd. operated the Mchenga coal mine, which was privatized in 1999. After falling for the fourth consecutive year in 2000, Malawi's production of coal increased slightly in 2001. The value of domestic coal production amounted to \$1.39 million in 2001. Coal Products Ltd. also explored for coal near Chombe. Malawi Minerals Ltd. held exploration licenses for coal and coalbed methane gas (Malawi Director of Mines, 2002, p. 1, 12-14).

In October 2000, the Electricity Supply Commission of Malawi (ESCOM) increased its hydroelectric capacity to 285 MW from 220.7 MW with the inauguration of the Kapichira plant; thermal capacity was 21.4 MW. Lack of investment in the distribution network caused disruptions that reduced power availability to about 90%. From 1995 to 1999, ESCOM's production of electricity increased to 1,021 GWh from 857.5 GWh; the company accounted for 90% of total electricity generated in Malawi (Malunga, 2001; National Statistical Office of Malawi, 2001, p. 49-50).

Malawi had about 28,400 km of roads, of which approximately 5,300 km was paved; the rail network covered nearly 800 km. Railways were managed by CFM/SDCN, which was the Mozambican railway company. Waterways included Lake Malawi and the Shire River.

Because most of Malawi's minerals industry was for local consumption in 2001, the short-term outlook for most currently produced minerals depends on the state of the domestic economy. The International Monetary Fund (2002e, p. 174) predicted that Malawi's economy would grow by 1.8% in 2002 and by 4.5% in 2003. Deforestation may lead to increased coal production for local energy use.

The outlook for the gemstone industry depends mostly upon

world market conditions. In general, gemstone sales were expected to remain stable or show a slight increase in 2002, although demand for aquamarine and yellow tourmaline was expected to be strong. Agricola's production of ruby was expected to be 28 kg in 2001 and 33 kg in 2002 (David Williamson Associates Ltd., 2001; Jewellery News Asia, 2001).

The outlook for many of Malawi's unexploited mineral commodities is also tied to strong global demand because the country's severe poverty limits its domestic market for bauxite, columbium (niobium), graphite, REE, titanium, and uranium. Demand for titanium dioxide (TiO₂) pigment is expected to increase by about 3% to 4% per year from 2002 to 2006. About 95% of all titanium minerals is consumed to produce TiO₂ pigment. Prices of U₃O₈ are expected to remain in the \$9 to \$12 per pound range for several years and are unlikely exceed \$18 per pound by 2010. The development of new uranium mines is possible in the short term and probable in the long term; consumption was about 53,000 t/yr, and stockpiles will eventually be depleted if production continues to remain below 35,000 t/yr (Gambogi, 2001; Metal Bulletin, 2001; Pool, 2001). Information on the global market outlook on columbium (niobium) and REE can be found in the section on Burundi.

MAURITIUS

The Republic of Mauritius is about 1,000 km east of Madagascar. In 2001, the GDP of Mauritius amounted to about \$14.4 billion at purchasing power parity, and the per capita income at purchasing power parity was about \$12,000. The GDP increased by 7.2% in 2001 after rising by 2.6% in 2000, 5.3% in 1999, and 6% in 1998. Manufacturing accounted for about 21% of the GDP; construction, 5%; and electricity, gas, and water, 2%. The mining and quarrying industry was a negligible factor in the economy (International Monetary Fund, 2002c, p. 38; 2002e, p. 174; 2002a§, b§; United Nations, 2002, p. 4).

Historically, mineral output consisted of local production and use of basalt construction stone, coral sand, lime from coral, and solar-evaporated sea salt. The production of salt and sand declined by 19% and 11%, respectively, in 2000. In April 2001, the Government announced plans to ban sand extraction from the Port Louis lagoon to protect the marine environment and tourist industry; the ban would become effective in October 2002. Other sources of sand for the construction industry included rock sand and basalt sand (Ackbarally, 2001§; N. Rummun, Mauritius Ministry of Agriculture, Food Technology, and Natural Resources, written commun., 2001).

International Cement Review (2001c, p. 206) estimated that Mauritius consumed 670,000 t of cement in 2001; this was an increase from 620,000 t in 1999 and 650,000 t in 2000. All the country's cement was imported, mainly from Asian or Middle Eastern countries.

Steel reinforcing bars (rebar) and welded mesh were made from imported ingot at three rolling mills. Imports of billet were sourced mainly from South Africa, and rebar and welded mesh were exported to Comoros, Madagascar, and Reunion. In late 2000, Consolidated Steel Ltd., which was a rebar producer in Port Louis, postponed its plans to install its own raw steelmaking facilities until the Government completed the phaseout of tariffs on its products (Metal Bulletin, 2000).

Mauritius Chemical and Fertilizer Industry Ltd. was the

country's only producer of fertilizers. In 2000, fertilizer production increased to 87,400 t from 85,300 t in 1999 and 83,200 t in 1998 (table 1). Imports of potassic fertilizers rose to 29,380 t in 2000 from 27,208 t in 1999 and 28,801 t in 1996 (British Geological Survey, 2002, p. 219).

In 2000, Mauritius imported about \$33.74 million of diamond. Rough gems accounted for \$16.42 million; cut gems, \$10.09 million; and industrial, \$7.23 million. In the same year, Mauritius exported about \$35.41 million of diamond. Rough gems accounted for \$227,000; cut gems, \$34.77 million; and industrial, \$415,000 (British Geological Survey, 2002, p. 79, 83). Companies engaged in diamond cutting in Mauritius included Adamas Ltd., Mauridien Ltd., and MS Contracting Ltd.

Mauritius has no identified resources of fossil fuels. Imports of coal increased to 222,423 t in 2000 from 128,879 t in 1999 and 38,482 t in 1996. Gamma Civic Ltd. operated an asphalt plant; the demand for all other petroleum products was met through imports. In fiscal year 2000-2001, the value of imported petroleum products amounted to nearly \$220 million (British Geological Survey, 2002, p. 58; International Monetary Fund, 2002c, p. 74).

Production of electricity totaled 1,657.1 GWh in 2001, which was an increase from 1,564.9 GWh in 2000 and 1,251.8 GWh in 1997. The country's effective plant capacity increased to 513.9 MW in 2001 from 370 MW in 1997. During the same period, production by the Central Electricity Board (CEB) fell to 946.9 GWh from 1,103.5 GWh. Fossil fuels and hydroelectric power sources provided 95.7% and 4.3%, respectively, of national production in 2001. From 1997 to 2001, energy purchased from sugar and other factories increased to 710.2 GWh from 148.3 GWh (International Monetary Fund, 2002c, p. 50).

The economy of Mauritius is likely to continue to grow rapidly in the near future. The International Monetary Fund (2002e, p. 174) predicted that the GDP would increase by 5.3% in 2002 and by 4.9% in 2003. In the short run, the growth in the minerals sector is likely to be restricted to construction materials. Offshore oil exploration has been inconclusive, and polymetallic nodules on the ocean floor are unlikely to be developed in the foreseeable future.

REUNION

Reunion, which is an overseas department of France, is about 650 km east of Madagascar. Production of mineral commodities represented only a small part of the economy of Reunion, although little quantitative information was available.

Reunion's imports of potassic fertilizers fell to 900 t in 2000 from 1,800 t in 1996. The country imported an estimated 2,900 t/yr of salt from 1996 to 1999 (British Geological Survey, 2002, p. 219, 232). Hydraulic cement was made by grinding imported clinker. The Ciments de Bourbon S.A. cement grinding plant at Le Port (owned by Holcim Ltd.) had a capacity of 400,000 t/yr. International Cement Review (2001d, p. 248) estimated that Reunion's cement production was 400,000 t/yr in 2000 and 2001, which was an increase compared with 380,000 t/yr in 1998 and 1999. Imports, which were mainly clinker, were estimated to be 540,000 t in 2001 and 520,000 t in 2000. Additionally, production of volcanic rock and seacoast coral continued to meet local construction needs. Little change in

future mineral activity is anticipated.

RWANDA

In recent years, Rwanda's mineral industry has produced gold ores and concentrates of columbium (niobium)-tantalum, tin, and tungsten, most of which has been designated for export. This small country in Central Africa has also produced cement and small quantities of natural gas (table 1). The Rwandan mineral industry consisted mostly of a number of small cooperatives and individual artisanal miners that produced ores and concentrates from scattered locations generally in a zone about 30 km wide that extends east-west through Kigali. The country is also known to have deposits of beryllium, kaolin, and peat.

In 2001, Rwanda's GDP amounted to about \$7.4 billion at purchasing power parity. The GDP grew by 6.7% in 2001 after increasing by 6% in 2000, 7.6% in 1999, and 8.9% in 1998. Per capita income at purchasing power parity was \$900. In 2000, manufacturing accounted for 9% of the GDP; construction, 7%; and mining and quarrying, less than 1%. From 1995 to 2000, output in the mining and quarrying sector grew by 355% in real terms. During the same period, the post-civil-war repair of Rwanda's infrastructure caused output in the construction sector to grow by 118% (Banque Nationale du Rwanda, 2001, p. 32; International Monetary Fund, 2002e, p. 174; 2002a§, b§; United Nations, 2002, p. 5).

COPIMAR, which was a group of many small miners' cooperatives, and Régie d'Exploitation et de Développement des Mines (REDEMI) produced ores of columbium (niobium), tantalum, tin, and tungsten. Colombite-tantalite was produced from numerous mines near Gikongoro, Kamonyi (in the Province of Gitarama), Kayenzi, Kibongo, Shyorongi, and Taba. Concentrating facilities were located at Gatumba.

In 2001, the value of colombite-tantalite produced in Rwanda amounted to \$36.15 million. In 2000, rising prices for colombite-tantalite caused production to increase to 561 t from 147 t in 1999; the number of mining licenses for colombite-tantalite increased to 15 from 3 in the same period. Falling prices caused output to fall to 241 t in 2001 (B.M. Marcel, Rwanda Ministry of Energy, Water, and Natural Resources, written commun., 2001, 2002).

In 2001, exports of colombite-tantalite amounted to \$44 million. In 2000, exports of colombite-tantalite increased to nearly 603 t at a value of \$11.3 million from 330 t at a value of \$4.6 million in 1999 and 54 t at a value of \$600,000 in 1995. Exports of colombite-tantalite and other minerals accounted for 18% of Rwanda's total exports in 2000 (Banque Nationale du Rwanda, 2001, p. 105; Kamuze, 2002).

Cassiterite was mined at Gatumba and Shyorongi. REDEMI operated a cassiterite processing facility at Rutongo. In 2001, falling prices for tin caused output to fall to 171 t from 276 t in 2000. From 1995 to 2000, exports of cassiterite increased to 365 t from 247 t; the value remained unchanged at \$900,000 (Banque Nationale du Rwanda, 2001, p. 105; B.M. Marcel, Rwanda Ministry of Energy, Water, and Natural Resources, written commun., 2001, 2002).

Wolframite was mined at Shyorongi. In 2001, the value of tungsten concentrates produced in Rwanda amounted to \$452,000. In 2000, rising prices for tungsten caused output to increase to 108 t from 41 t in 1999; production also increased

substantially in 2001. From 1995 to 2000, exports of tungsten concentrates increased to 144 t at a value of \$300,000 from 19 t at a value of \$100,000 (Banque Nationale du Rwanda, 2001, p. 105; B.M. Marcel, Rwanda Ministry of Energy, Water, and Natural Resources, written commun., 2001, 2002).

In 2001, the United Nations Security Council issued a report that accused Rwandan Government officials, military officers, and businessmen of illegally exploiting columbium (niobium), diamond, gold, and tantalum from Congo (Kinshasa) to enrich themselves and finance their country's military presence in Congo (Kinshasa). The Rwandan Government denied the accusations. Others accused of using their military presence to exploit Congolese mineral resources included rebel forces that operated in Congo (Kinshasa) and the Governments of Namibia, Uganda, and Zimbabwe (United Nations Security Council, 2001a, p. 16-21, 25, 29-37; 2001b, p. 6-11, 16-23).

Cimenterie du Rwanda (Cimerwa) was Rwanda's only producer of cement; the company's production increased to 83,024 t in 2001 from 42,452 t in 1996. In 2001, Cimerwa announced plans to increase production to 115,000 t/yr and to start exporting cement; local demand was expected to be only 90,000 t/yr (International Monetary Fund, 2002d, p. 10; Rubingisa, 2002§).

Rwanda has no identified resources of coal or petroleum. The country did not have production facilities for petroleum products; all petroleum demand was met through imports. In 2000, imports of energy products increased to \$62 million from \$42.6 million in 1999 and \$21.8 million in 1995. Energy imports accounted for 20% of Rwanda's total imports (Banque Nationale du Rwanda, 2001, p. 103).

Natural gas production fell by nearly 40% in 2001 after increasing by 1.5% in 2000 (table 1); inadequate infrastructure has inhibited plans to increase industrial consumption of natural gas. Gisenyi Electric and Gas Company planned to increase natural gas production from Lake Kivu starting in 2001. The company's project would increase power-generating capacity by 10 MW and would decrease Rwanda's reliance on firewood and imported electricity (Africa Energy Intelligence, 2001; Banque Nationale du Rwanda, 2001, p. 31).

In 2001, Rwanda's production of electricity amounted to 89.27 GWh, which was a decrease from 110.84 GWh in 2000 and an increase from 72.16 GWh in 1996. From 1996 to 2001, imports increased to 121.5 GWh from 82.58 GWh. Hydroelectric sources provided most of Rwanda's electricity (International Monetary Fund, 2002d, p. 11).

Rwanda's transportation network comprised about 12,000 km of roads, of which 1,000 km was paved. Lake Kivu was navigable by shallow-draft barges and native craft. Transportation costs are among the highest in Africa.

The International Monetary Fund (2002e, p. 174) predicted that Rwanda's GDP would grow by 6.5% in 2002 and by 6.2% in 2003; the improving economic situation may lead to increased consumption of construction materials. The severe environmental problems caused by deforestation may lead to exploitation of domestic peat resources. The outlook for Rwanda's mineral industry depends on the resolution of political instability and favorable world market conditions for columbium (niobium), gold, tantalum, tin, and tungsten. Information on the global market outlook on columbium (niobium), gold, tin, and tungsten industries can be found in the section on Burundi.

SEYCHELLES

The Republic of Seychelles is a group of 40 granitic and 50 or more coralline islands northeast of Madagascar in the Indian Ocean. In 2001, the GDP of Seychelles amounted to about \$900 million at purchasing power parity. The GDP contracted by 8.1% in 2001, 5.4% in 2000, and 2.8% in 1999. Mining, manufacturing, and handicrafts accounted for about 14% of the GDP; building and construction, 10%; and electricity, about 3% (Central Bank of Seychelles, 2001, p. 32; International Monetary Fund, 2002e, p. 174; 2002a§, b§).

Mineral production in Seychelles consisted mostly of production of such construction materials as clay, coral, sand, and stone. Gondwana Granite exploited local granite resources; the production of granite in Seychelles amounted to 6,044 t in 2001 and 54,788 t in 2000. Civil Construction Company Ltd. and United Concrete Products of Seychelles produced crushed rock, gravel, and sand. In 2001, the reported production of gravel and crushed rock increased by 19%, and the reported production of sand fell by nearly 33%. Cement requirements were met from imports, which were estimated to be 40,000 t/yr from 1998 to 2001 (International Cement Review, 2001e, p. 259; Mamy Razanajatovo, Seychelles Ministry of Industries and International Business, written commun., 2002).

The production of electricity increased to 189 GWh in 2000 from 172 GWh in 1999 and 129 GWh in 1995. Imports of mineral fuels accounted for nearly 22% of total imports. The value of mineral fuel imports increased by 85% in 2000 owing to higher oil prices (Central Bank of Seychelles, 2001, p. 27, 33).

The International Monetary Fund (2002e, p. 174) predicted that the GDP of Seychelles would decline by 2.4% in 2002 and by 0.6% in 2003. The short-term outlook for mineral production is for little change. Seychelles has modest natural resources, and any newly discovered resources of petroleum and natural gas could not be exploited immediately.

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TABLE 1
BURUNDI, MALAWI, MAURITIUS, RWANDA, AND SEYCHELLES: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Country and commodity	1997	1998	1999	2000	2001
BURUNDI					
Clays, kaolin	3,539 r/	3,500 r/	1,597 r/	1,500 r/	--
Columbite-tantalum, mine output, ore (32% Ta ₂ O ₅)					
Gross weight kilograms	46,000	30,840 r/	42,149 r/	31,175 r/	122,537
Ta ₂ O ₅ content do.	13,800 r/	9,200 r/	12,600 r/	10,013 r/	39,359
Gold, mine output, Au content do.	-- r/	-- r/	-- r/	-- r/	415
Lime e/	50	50	50	-- r/ 2/	--
Peat 3/	9,000 r/	11,000 r/	20,000 r/	4,088 r/	5,000
Tin, mine output, Sn content	15 r/	9 r/	18 r/	7 r/	4
Tungsten, mine output, W content	16 e/	-- r/	-- r/	-- r/	-- e/
MALAWI 4/					
Cement, hydraulic	175,800	134,000	186,500	155,920 r/	180,785
Coal	63,210	54,200	43,800	34,250 r/	34,410
Dolomite e/	1,100	1,100 r/	1,200 r/	-- r/ 2/	-- 2/
Gemstones kilograms	351	934	649	16,390 r/	16,500 e/
Kaolin	NA	NA	NA	719	825
Lime	1,940	2,600	2,900	21,886 r/	6,177
Sodium silicate	NA	750	803	1,538	--
Stone:					
Crushed for aggregate	251,655 r/	283,055 r/	111,095 r/	80,780 r/	594,979
Dimension, crude and partly worked	NA	NA	NA	78	78
Limestone, for cement	258,000	171,900	171,900	144,000 r/ e/	167,000 e/
Vermiculite	NA	NA	NA	--	1
MAURITIUS 5/					
Fertilizers	78,600 e/	83,200	85,300	87,400	92,600 e/
Iron and steel, semimanufactures	41,800 e/	44,300	45,000	45,000	48,000 e/
Salt, sea	6,000	6,200	7,435	6,000	6,000 e/
Sand, coral	424,000 e/	437,000 e/	450,000	400,000	412,000 e/
RWANDA					
Cement	60,505 r/	58,929 r/	66,291 r/	70,716 r/	83,024
Columbite-tantalite, ore and concentrate:					
Gross weight kilograms	256,000 r/	224,000	147,000 r/	561,000 r/	241,000
Nb content do.	80,500 r/	70,500 r/	46,200 r/	176,000 r/	75,800
Ta content do.	54,100 r/	47,300 r/	31,000 r/	118,000 r/	50,900
Gold, mine output, Au content do.	10	17		10	10 e/
Natural gas, gross million cubic meters	357 r/	855 r/	1,353 r/	1,373 r/	828
Tin, mine output, Sn content	107 r/	187 r/	248 r/	276 r/	171
Tungsten, mine output, W content	57 r/	109 r/	41 r/	108 r/	148
SEYCHELLES					
Dimension stone, granite	NA	NA	NA	54,788	6,044
Gravel and crushed rock	NA	NA	NA	81,400	96,819
Sand	NA	NA	NA	12,053	8,128

e/ Estimated; estimated data are rounded to no more than three significant digits. r/ Revised. NA Not available. -- Zero.

1/ Includes data available through February 12, 2003.

2/ Reported figure.

3/ Reported on the basis of fiscal year starting on May 1.

4/ In addition to commodities listed, modest quantities of salt and unlisted varieties of crude construction materials (clays, sand and gravel, and other stone) may also be produced, but information is inadequate to make reliable estimates of output levels.

5/ In addition to the commodities listed, asphalt, basalt, and lime are also known to be produced, but information is inadequate to make reliable estimates of output levels.