

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

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## BURUNDI

In recent years, Burundi, which is a small Central African country, has been known to produce columbium (niobium)-tantalum ore, gold, kaolin, tin, and tungsten ore, most of which has been designated for export (table 1). Additionally, the country has been known to produce limestone, peat, sand, and gravel for domestic consumption.

Burundi has numerous deposits of gold, particularly in Mabayi in the northwest, Muyinga in the northeast, Cankuzo in the east, and Tora-Ruzibazi in the west, where artisanal mining takes place. The Government has been trying to transfer technical skills to the artisanal miners; these efforts could raise the productivity of the gold mining sector and increase state revenues. Other efforts to develop the gold mining industry came from Burundi Mining Corp., which was a joint venture between the Government and private companies to explore the possibility of producing gold at Muyinga on a commercial basis (African Mining, 1998). The Muyinga deposit has estimated resources of 60 metric tons (t) of gold (Africa Energy & Mining, 1999).

In the northern provinces of Kayanza and Kirundo, deposits of cassiterite, columbite-tantalite, and wolframite associated with pegmatites are found. Artisanal mining of these minerals, which began over 30 years ago, has been contributing a small but increasing share of Burundi's export earnings (African Mining, 1998). Comptoirs Miniers de Burundi was mining these minerals and aimed to increase levels of production.

Burundi has notable resources of nickel and vanadium. Musongati, which was the largest deposit, was reported to have a nickel laterite resource of about 185 million metric tons (Mt) that grades 1.31% nickel, 0.08% cobalt, and 0.17% copper (0.8% nickel cutoff grade). The Nyabikere deposit has a laterite resource of 46 Mt that grades 1.45% nickel. The Waga deposit has resources estimated to be 35 Mt that grade 1.38% nickel. The deposit of vanadiferous titanio-magnetite in the Mukanda-Buhoro region has resources of nearly 10 Mt that grade 0.63% vanadium (African Mining, 1998).

Burundi is known to have deposits of rare-earth elements. From 1948 to 1978, 5,000 t of bastnäsite (an ore mineral for rare-earth elements) was produced at mines in Gakara. Operations were stopped to permit an evaluation of reserves. Resources of 5,000 t of rare-earth deposits have been found in five other regions of Gakara. Exploration projects for rare earths were also taking place at Murago and Nyanza-Lac, where these elements are found in monazite with heavy minerals, such as ilmenite, rutile, and zircon (African Mining, 1998).

A phosphate rock deposit in the region of Matongo was estimated to have resources of 17 Mt that grade 11% P<sub>2</sub>O<sub>5</sub>. Burundi's limestone deposits at Busiga and Ruzizi have resources of 2 Mt that grade 40.32% CaO and 2.2% MgO. Resources of other industrial minerals included 16.1 Mt of kaolin, 5.1 Mt of quartzite, and 730,000 t of feldspar in the northern part of the country (African Mining, 1998).

Deposits of platinum-group metals are known to exist in the regions of Nyabikere, Rutovu, and Waga. Deposits of uranium have also been discovered (U.S. Central Intelligence Agency, 2000a).

Since 1993, development of Burundi's resources has been inhibited owing partially to civil unrest and social strife. These conditions and economic sanctions imposed on Burundi by the Democratic Republic of the Congo, Ethiopia, Kenya, Rwanda, Tanzania, Uganda, and Zambia have negatively affected the country's economy and hindered foreign investment. According to the International Monetary Fund (1997, p. 46), Burundi's economy contracted by 23% between 1993 and 1996.

Although the economic sanctions were lifted in 1999, internal strife continued to hurt Burundi's economy. In May 2000, Andover Resources NL halted its feasibility study of the nickel mine at Musongati owing to risks to its personnel; this ended the possibility of starting mining operations before 2002. At the end of 2000, the civil war showed no signs of abating.

In 1999, Burundi's gross domestic product (GDP) amounted to about \$4.2 billion at purchasing power parity, which was a decrease of about 1% compared with that of 1998 (U.S. Central Intelligence Agency, 2000a). The per capita GDP at purchasing power parity was \$730. Manufacturing accounted for 7% of the GDP in 1999; construction, 5%; and mining and energy, about 1% total (International Monetary Fund, 2000a, p. 6).

Traditional fuels, such as firewood, charcoal, and agricultural residues, were used mostly for household and cooking needs. These fuels accounted for about 90% of Burundi's total energy requirements. Burundi's estimated resources of dried peat totaled 36 Mt; the current domestic market can absorb only 12,000 metric tons per year (t/yr) (African Mining, 1998). The state-owned company Office National de la Tourbe (ONATOUR) was responsible for the production and distribution of peat. Further exploitation of Burundi's peat resources is highly likely in the future owing to the depletion of the country's forests. The United Nations Food and Agriculture Organization (FAO) estimated that Burundi experienced an average deforestation rate of 9% per year during the 1990s; this was by far the highest rate in Africa (Afrol.com, January 24, 2001, World deforestation rate slows down—Outside Africa,

accessed March 15, 2001, at URL [http://www.afrol.com/Categories/Environment/env055\\_fao\\_deforestation.htm](http://www.afrol.com/Categories/Environment/env055_fao_deforestation.htm)).

Most of Burundi's electricity was provided by hydroelectric power sources (98.43%), and the remainder was provided by fossil fuels (1.57%) (U.S. Central Intelligence Agency, 2000a). More than 80% of Burundi's electricity was generated by the Mugere and Rwegura stations. In 1999, Burundi's power production fell from 109.6 gigawatthours (GWh) to 98.3 GWh. This decrease of 11.4% was due to bad weather conditions, especially the drought that struck Burundi and its neighbors (Africa Energy & Mining, 2000).

In late 2000, Burundi and Rwanda jointly decided to build a hydroelectric power station on the Ruzizi River. Construction of the station was contingent upon approval from donor nations and institutions (African Energy Intelligence, 2000). Burundi's known exploitable potential hydroelectric energy was 1,366 megawatts (MW) (World Resources Institute and others, 1996, p. 288).

Burundi's transportation network comprised about 15,000 kilometers (km), of which slightly more than 1,000 km were paved. In March 2000, the Government reduced the weight limit of tanker trucks that bring fuel into the country in an attempt to preserve the country's crumbling roads (MBendi Information Services, 2000, Burundi—Oil and gas industry, accessed January 8, 2001 at URL <http://www.mbendi.co.za/indy/af/bu/p0005.htm>). The major waterway was Lake Tanganyika, which had a port at Bujumbura.

The outlook for the country's minerals industry and economy appeared static pending the resolution of political and social issues. If these issues can be resolved, the outlook for the minerals industry will depend heavily upon the global market; Burundi's domestic market is limited by its severe poverty. Gold and tin prices are unlikely to change substantially in 2001, and prices for tantalum are expected to rise owing to rapid growth in the market for electronic capacitors. Tungsten prices are also likely to increase because supply met only 80% of demand from 1997 to 1999. Prices started to rise in 2000 owing to declining shipments from stockpiles that were not fully replaced by production (MBendi Information Services, February 20, 2001, New report examines the tungsten industry, accessed February 27, 2001, at URL [http://www.mbendi.co.za/a\\_sndmsg/news\\_view.asp?P=0&PG=15&I=16666&M=0](http://www.mbendi.co.za/a_sndmsg/news_view.asp?P=0&PG=15&I=16666&M=0)). Other developments in 2000 that are likely to encourage growth included Burundi's joining with 19 other nations to form Africa's first free trade area (FTA) and pledges by the World Bank and other international donors to give \$440 million in reconstruction aid to Burundi.

## 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 1998, the GDP of Comoros amounted to about \$410 million at purchasing power parity. The per capita GDP at purchasing power parity was \$725. The economy did not grow in 1998 (U.S. Central Intelligence Agency, 2000b). The International Monetary Fund (2000b, p. 2) estimated that manufacturing accounted for about 4% of GDP in 1999, and construction and public works, 6%.

In 2000, the mineral industry of Comoros continued to be limited to the production of common construction materials,

such as clay, sand, gravel, and crushed stone, for local consumption. Cement was imported from Kenya and South Africa. Quantities were not available but were presumably very low because no significant construction projects had been noted in the press since the early 1980s. Geothermal energy resources are known within the territory.

The outlook on minerals output, however, was not expected to change significantly. The former French colony was dependent on imports to meet all its energy and cement needs. The economy of Comoros was based on the export of agricultural products, chiefly spices. Trade is likely to be boosted by the Government's decision to join the FTA. Political instability in recent years has continued to have a negative effect on the economy.

## MALAWI

In recent years, Malawi, which is a small Central African country, has produced cement, coal, crushed stone for aggregates, dolomite, and limestone for domestic consumption (table 2). The country also produced small amounts of lime and artisanal salt. Malawi has been known to produce various gemstones, such as agate, amethyst, aquamarine, garnet, rubies, and sapphires. Coal from the Mchenga Mine and limestone were essential components of the country's cement and lime industries. The production of stone for aggregate and cement was a major component of Malawi's mineral industry. The country has known deposits of apatite, bauxite, corundum, granite, graphite, kaolin, kyanite, monzanite, phosphate rock, pyrite, salt, silica sand, tourmaline, uranium, and vermiculite.

In 1999, Malawi's GDP amounted to about \$9.4 billion at purchasing power parity, and the per capita income was \$940. Economic growth was 4.2% in 1999 (U.S. Central Intelligence Agency, 2000c). The World Bank (2000, p. 9) estimated the cost of rising oil prices to be 0.4% of Malawi's GDP in 2000 and 0.3% of its GDP in 2001. According to the International Monetary Fund (2001a, p. 51), manufacturing accounted for 13% of GDP in 1999; construction, 2%; and mining and quarrying, 1%. Mining and quarrying grew sharply from 1994 to 1999 owing to higher output of aggregates, cement, and coal (table 2; Coakley and Mobbs, 2001).

In 1999, Malawi's official mineral exports amounted to nearly \$1 million, 95% of which was attributable to gemstones. Malawi exported gemstones to China, Germany, Italy, Japan, Norway, South Africa, and Thailand. Actual gemstone exports through informal channels exceeded \$2 million (Malunga, 2000).

Malawi's precious and semiprecious gemstones were produced by artisanal miners who worked in 14 of Malawi's 25 districts. Quartz feldspar pegmatites, especially those in Chitipa, Mwanza, Mzimba, Nsanje, Ntcheu, and Rumphi contain amethyst, aquamarine, and rhodolite. Ruby and sapphire are found mainly in Mwanza, Nsanje, and Ntcheu (Ministry of Energy and Mining, 1997).

Malawi has five identified subbituminous coal fields. The Livingstonia coal field in northern Malawi (where the Mchenga coal mine is located) has estimated resources of 2 Mt of coal. The Livingstonia field has the coal with the lowest known average ash content and the highest known average calorific value in Malawi. In 1997, the largest consumers of Malawi's coal were the cement, soap, and textile industries (Ministry of Energy and Mining, 1997). Output dropped at the Mchenga

Mine in 1999 owing to aging machinery and an inability to obtain spare parts expeditiously.

The Ngaga coal field in northern Malawi was estimated to have resources of 15 Mt of coal, and the Mwabvi coal field's resources were estimated to be 4.7 Mt. The other known coal fields were the Lengwe in southern Malawi and the Nthalire in North Rukuru (Ministry of Energy and Mining, 1997).

Bauxite deposits on Mulanje Mountain were estimated to have a resource of nearly 29 Mt that grades 43.3%  $\text{Al}_2\text{O}_3$  (Ministry of Energy and Mining, 1997). Malawi and Mozambique have discussed plans for using the Mulanje bauxite to supply Mozambique's Mozal aluminum plant. The project will require an investment of \$800 million to start mining operations (Africa Mining Intelligence, 2000).

The Kayerekera uranium deposit in the North Rukuru Basin has a resource of more than 11,000 t of  $\text{U}_3\text{O}_8$  from ore that grades 0.17% (Ministry of Energy and Mining, 1997, p. 5). Paladin Resources Ltd., which is the Australian mining company that acquired a 90% interest in the Kayerekera project in 1999, believed that recent developments in metallurgy and engineering, better infrastructure, and an improved investment environment in Malawi justify a new feasibility study on this deposit (African Mining, 2000).

In southern Malawi, Kangankunde Hill has an estimated resource of 11 Mt of monazite and strontianite that grades 2.0% rare-earth oxides (especially oxides of cerium, lanthanum, neodymium, and praseodymium) and 8% strontium (Ministry of Energy and Mining, 1997).

Heavy-mineral sands exist along the western lake shore in Salima in central Malawi. The beach sands contain garnet, ilmenite, monazite, and rutile and have about 670,000 t of heavy-mineral concentrate. Along the railway line at Tengani in central Malawi, an estimated 2.5 Mt of sands grade 3% ilmenite, and 300,000 t of sands, 0.3% rutile (Ministry of Energy and Mining, 1997).

Malawi's largest deposits of columbium (niobium) are at Ilomba Hill, Chilwa Island, and Thundulu. The deposit at Ilomba Hill was estimated to have a pyrochlore resource of 100,000 t that grades 3.0%  $\text{Nb}_2\text{O}_5$ . Chilwa Island has an estimated pyrochlore resource of 375,000 t that grades 0.95%  $\text{Nb}_2\text{O}_5$ , and Thundulu has an estimated pyrochlore resource of 900,000 t that grades 0.37%  $\text{Nb}_2\text{O}_5$  (Ministry of Energy and Mining, 1997).

Malawi has considerable resources of industrial minerals. Phosphate rock deposits at Thundulu have an estimated resource of 2 Mt that grades 17%  $\text{P}_2\text{O}_5$ . The limestone deposit on Malowa Hill has a proven resource of 4.08 Mt that grades 52%  $\text{CaO}$  and 0.99%  $\text{MgO}$ ; it is suitable for the production of chemical grade lime. Proven dolomitic marble resources of 3.7 Mt grade 36.21%  $\text{CaO}$  and 12.99%  $\text{MgO}$ . The Mwanza District in southern Malawi has an estimated resource of 2.5 Mt of vermiculite (Ministry of Energy and Mining, 1997).

In central Malawi, deposits of kaolinic clays have been mined at Linthipe. The resources from this deposit were estimated to be 14.1 Mt that grade 46.7%  $\text{SiO}_2$ , 33.8%  $\text{Al}_2\text{O}_3$ , 2.0%  $\text{Fe}_2\text{O}_3$ , 1.1%  $\text{CaO}$ , 0.26%  $\text{MgO}$ , and 0.28%  $\text{K}_2\text{O} + \text{Na}_2\text{O}$ . Linthipe clay is used for the manufacture of off-white- to white-firing earthenware products and refractories by Engineering and Foundry Co. (Ministry of Energy and Mining, 1997).

Deposits of silica sand near Mchinji have an estimated resource of 1.6 Mt that grades 97.2%  $\text{SiO}_2$  and less than 0.2% iron oxide. These deposits may be suitable for the manufacture

of pale green glass. The Lake Chiuta-Chirwa sand bar was estimated to contain 25 Mt of silica sand that grades 92.7%  $\text{SiO}_2$  and 0.62% iron. The deposits may be suitable for the manufacture of brown glass containers, and further beneficiation may make the sand suitable for the manufacture of plate and window glass and reasonably clear glass containers (Ministry of Energy and Mining, 1997).

Deposits of graphite are plentiful in central Malawi. The Katengeza deposit was estimated to have resources of 2.7 Mt of ore that grade 5.83% carbon. Large graphite deposits have also been discovered at Chimutu (Ministry of Energy and Mining, 1997).

Malawi also has deposits of dimension stone. Deposits of sodalite syenite (blue granite) occur at Ilomba Hill, and a local company was exploring the possibility of producing stone blocks for export. Black granite deposits occur at Mkanda in Mchinji, central Malawi.

Malawi consumed 857 GWh of electricity in 1998. Hydroelectric power sources provided 97.61% of the country's electricity, and fossil fuel sources accounted for the remaining 2.39% (U.S. Central Intelligence Agency, 2000c). Malawi's known exploitable potential hydroelectric energy is 6,000 MW (World Resources Institute and others, 1996, p. 288). In late 2000, the Government of Malawi announced its attention to privatize petroleum marketing and distribution by 2002.

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

The outlook for Malawi's mineral industry is tied to the Government's ability to face strong challenges, such as spurring exports, improving educational and health facilities, solving the environmental problems of deforestation and erosion, and dealing with the rapidly growing problem of HIV/AIDS (U.S. Central Intelligence Agency, 2000c). These challenges may be easier to meet after the debt relief granted to Malawi by the United Kingdom (\$41 million) and the International Monetary Fund and World Bank (\$1 billion) and Malawi's decision to join the FTA. Strong global demand for Malawi's minerals would also be helpful because the country's severe poverty limits its domestic market.

## MAURITIUS

The Republic of Mauritius is located about 1,000 km east of Madagascar. In 1999, the GDP of Mauritius amounted to about \$12.4 billion at purchasing power parity with per capita GDP of \$10,400. The economy grew by 4% in 1999. Manufacturing accounted for about 29% of the GDP (U.S. Central Intelligence Agency, 2000d). The mineral industry of Mauritius was a negligible factor in an economy that was based chiefly on tourism, financial services, and the export of sugar and textiles. It maintained a favorable foreign investment climate and a Free Port Authority. Mauritius joined the FTA in 2000.

Historically, mineral output consisted of the local production and use of basalt construction stone, coral sand, lime from coral, and solar-evaporated sea salt. Data on production of minerals and construction commodities was not available, but on the basis of past activity, Mauritius produced about 1 million metric tons per year of stone, 300,000 t/yr of sand, 7,000 t/yr of lime,

and 6,000 t/yr of salt. Environmental concerns regarding the mining of coral sand and its impact on coastal lagoons have been raised. All cement used in Mauritius was imported. A joint venture between Gamma Civil of Carl Ah Teck, which was a local firm, and Mehta Group of India has been launched in order to build a cement grinding plant in Mauritius.

Polymetallic nodules occurred on the ocean floor at a depth of about 4,000 meters and extended from 400 to 800 km north of Port Louis, which is northeast of Tromelin Island. The nodules averaged more than 15% each of iron and manganese and more than 0.3% of cobalt with a concentration averaging from 2 to 6 kilograms per square meter. The abundance of land-based resources of these commodities made it unlikely that these resources would be developed in the foreseeable future.

Although the country was totally dependent on imports for its energy requirements, oil possibilities of interest were east of the polymetallic nodules area offshore at shallower depth. In the 1970s, Texaco, Inc., explored the area by using geophysics and drilling; the results were inconclusive. Energy was consumed from oil-derived products (84.1%), electricity (10.5%), and coal (5.4%). Consumption of oil products was about 570,000 t in 1993, and grew at about 7% per year between 1993 and 1998 (MBendi Information Services, August 17, 1997, Mauritius—Overview—Oil industry profile, accessed September 15, 1997, at URL <http://mbendi.co.za/indy/oilg/oilmrds.htm>).

Steel reinforcing bars were made from imported ingot at three rolling mills. The near-term outlook for the exploitation of minerals other than construction materials was negligible.

## REUNION

Reunion, which is an overseas department of France, is located about 650 km east of Madagascar. It had an economy that was dominated by sugar cane exports. In 1998, the GDP of Reunion amounted to about \$3.4 billion at purchasing power parity with a per capita GDP of \$4,800. The economy grew by 3.8% in 1998 (U.S. Central Intelligence Agency, 2000e). Production of mineral commodities represented only a small part of the economy of Reunion, although little quantitative information was available. Hydraulic cement was made by grinding imported clinker. The Ciments de Bourbon S.A. cement grinding plant at Le Port, which was owned by the Holderbank Group of Switzerland, had a capacity of 400,000 t/yr. Additionally, production of basic volcanic rock and seacoast coral undoubtedly 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 central African country has also produced cement and small quantities of natural gas (table 3). 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. In 2000, the Rwandan Government privatized Régie d'Exploitation et de Développement des Mines, which was the state mining exploration company.

The deposits of methane under Lake Kivu were reported to have resources of more than 50 billion cubic meters (Worldinformation.com, 2000, Rwanda country profile, accessed March 1, 2001, at URL <http://www.worldinformation.com/World/Africa/Rwanda/profile.asp?country=250>). The country also is known to have deposits of beryllium, kaolin, and peat. Rwanda exploited its resources of beryllium from 1953 to 1985. In 1985, Rwanda produced 27 t of beryl concentrates that graded 10% BeO (Antonides and Morgan, 1993).

The Rwandan minerals industry (along with the rest of the country's economy) collapsed in 1994 owing to internal strife, and recovery has been inhibited by continuing instability. A series of massive population displacements, a nagging Hutu extremist insurgency, and Rwandan involvement in two wars during the past 4 years in the Democratic Republic of the Congo continue to hinder Rwanda's efforts (U.S. Central Intelligence Agency, 2000f). Other difficulties include a domestic market limited by a poverty rate of 65%, a shortage of skilled labor, and high transportation costs owing to the landlocked nature of the country (Wolfensohn, 2001). The recent increase in oil prices exacerbated Rwanda's problems with transportation costs and undermined the competitiveness of its exports. The World Bank (2000, p. 9) estimated the cost of rising oil prices and falling export prices to be 1.4% of Rwanda's GDP in 2000 and 1.2% of its GDP in 2001.

In spite of these difficulties, Rwanda has recovered most of the output lost in 1994. The World Bank estimated that the Rwandan economy grew at a rate of 5.2% in 2000 (Wolfensohn, 2001). The economic recovery has been particularly strong in the agricultural and construction sectors; the manufacturing sector has stagnated in the past 2 years. In 1999, Rwanda's GDP amounted to about \$5.9 billion at purchasing power parity, which was an increase of about 5.3% from that of 1998. The per capita income at purchasing power parity was \$720 in 1999 (U.S. Central Intelligence Agency, 2000f).

The International Monetary Fund (2001b, p. 4) estimated that manufacturing accounted for 11% of the GDP in 1999; construction, 8%; and mining, less than 1%. Tungsten and tin ores and concentrates accounted for 5% of Rwanda's exports (Worldinformation.com, 2000, Rwanda country profile, accessed March 1, 2001, at URL <http://www.worldinformation.com/World/Africa/Rwanda/profile.asp?country=250>).

Although the subsistence farming sector's energy needs were met by wood and charcoal, the exploitation of Rwanda's peat deposits may become necessary in the future owing to the depletion of the country's forests. The FAO estimated that Rwanda experienced an average deforestation rate of 3.9% per year during the 1990s; this was the third highest rate in Africa (Afrol.com, January 24, 2001, World deforestation rate slows down—Outside Africa, accessed March 15, 2001, at URL [http://www.afrol.com/Categories/Environment/env055\\_fao\\_deforestation.htm](http://www.afrol.com/Categories/Environment/env055_fao_deforestation.htm)).

Rwanda's industries and urban areas were the primary consumers of the 165 GWh of electricity used in 1998. Production of electricity totaled 159 GWh—hydroelectric power sources provided 97.48%, and fossil fuels, 2.52% (U.S. Central Intelligence Agency, 2000f). Rwanda's known exploitable potential hydroelectric energy is 3,000 MW (World Resources Institute and others, 1996, p. 288). In 2000, the privatization of Etablissement Public de Production, de

Transport et de Distribution d'Electricité, d'Eau et de Gaz ended the Government's monopoly over the production and distribution of water, gas, and electricity.

Rwanda's transportation network comprised about 12,000 km of roads, of which 1,000 km were paved. As of 1999, the country had no rail network. Lake Kivu was navigable by shallow-draft barges and native craft. Transportation costs are among the highest in Africa.

The outlook for Rwanda's mineral industry depends on the resolution of political instability and favorable world market conditions for columbium (niobium)-tantalum, gold, tin, and tungsten. Although domestic markets were limited, continued growth in the Rwandan economy could help the situation in the long run. Developments in 2000 that were conducive to faster economic growth included Rwanda's joining the FTA, the World Bank's grant of \$15 million to deal with worsening terms of trade, and the decision by the International Monetary Fund and World Bank to grant \$810 million in debt relief to Rwanda.

## SEYCHELLES

The Republic of Seychelles is a group of 40 granitic and 50 or more coralline islands that is located northeast of Madagascar in the Indian Ocean. In 1999, the GDP of Seychelles amounted to about \$590 million at purchasing power parity with a per capita GDP of \$7,500. The economy grew by 1.8% in 1999. Manufacturing accounted for about 24% of the GDP (U.S. Central Intelligence Agency, 2000g). In 2000, Seychelles joined the FTA.

Mineral production in Seychelles consisted mostly of unspecified quantities of construction materials—clay, coral, sand, and stone. Although output of guano, which is a phosphate fertilizer that comprises bird droppings, ceased in the mid-1980s, a 5,000-t/yr-capacity plant remained, and small production was unofficially reported during the mid-1990s. Cement requirements were met from imports.

Granite in the bedrock of Mahe and nearby islands had some economic potential. It had been quarried for dimension stone on a trial basis by an Italian firm in the early 1980s. In 1992, Gondwana Granite of South Africa was granted a license to extract and export up to 3,000 cubic meters of granite for use in tile and statuary products. Lime and cement production from the abundant coral were under consideration. Preservationists and other environmentally concerned groups, however, opposed the granite and coral use projects. Polymetallic nodules were known to occur on the ocean bottom near the Admirante Islands.

The oil potential of the entire Seychelles region continued to be promoted by the Government-owned Seychelles National Oil Company (SNOC) through the Petroleum Mining Act of 1976. Tar balls from subsurface seeps have long been known to wash up on the beaches of Coetivy Island, Mahe, and some nearby islands. Exploration began in 1969, and by 1994, 23,150 km of seismic profiles and 27,911 km of aeromagnetic lines had been accumulated. Seychelles and Madagascar recently discussed joint efforts on oil exploration. A comprehensive report on the Seychelles geology, hydrocarbon potential, historical

exploration activity, and geophysical data availability and on the terms of SNOC's model petroleum agreement is available on the Internet (MBendi Information Services, August 17, 1997, Oil industry—Upstream profile—Seychelles, accessed September 15, 1997, at URL <http://mbendi.co.za/indy/oilg/oilgseus.stm>).

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TABLE 1  
BURUNDI: ESTIMATED PRODUCTION OF MINERAL COMMODITIES 1/ 2/ 3/

Commodity		1996	1997	1998	1999	2000
Clays, kaolin	metric tons	1,000	1,000	1,000	800	800
Columbite-tantalite, mine output, ore (30% Ta <sub>2</sub> O <sub>5</sub> ):						
Gross weight	kilograms	37,000 4/	46,000 4/	30,000 4/	42,000 4/	42,000
Ta <sub>2</sub> O <sub>5</sub> content	do.	11,000	14,000	9,000	13,000	13,000
Gold, mine output, Au content	do.	2,200	1,500	1,500	1,500	1,500
Lime	metric tons	50	50	50	50	50
Peat	do.	10,000	10,000	10,300	17,000	14,700
Tin, mine output, Sn content	do.	25 4/	(5/)	23	10	10
Tungsten, mine output, W content	do.	16	16	10	10	10

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

2/ Includes data available through June 25, 2001.

3/ In addition to the commodities listed, small quantities of cement were produced until 1996; available information, however, is inadequate to make estimates of output.

4/ Reported figure.

5/ Less than 1/2 unit.

TABLE 2  
MALAWI: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity 3/		1996	1997	1998 r/	1999 r/	2000 e/
Cement, hydraulic		91,000	175,800	134,000	186,500	198,000
Coal		69,930	63,210	54,200	43,800	44,900
Dolomite e/		1,100 r/	1,100 r/	1,210	1,330	1,360
Gemstones	kilograms	849 r/	351	934	649	665
Lime		3,150	1,940	2,600	2,900	3,080
Stone:						
Crushed for aggregate	cubic meters	58,700	162,538	182,600	71,700	76,200
Limestone, for cement		175,600 r/	258,000	171,900	171,900	183,000

e/ Estimated. r/ Revised.

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

2/ Includes data available through June 25, 2001.

3/ 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.

TABLE 3  
RWANDA: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

Commodity		1996	1997	1998	1999	2000
Cement	metric tons	42,000	60,000	58,900 r/	66,300 r/	69,600 e/
Columbite-tantalite, ore and concentrate:						
Gross weight	kilograms	97,000 r/	224,000 r/	224,000 r/	122,000 r/	83,000
Nb content e/	do.	33,000 r/	76,000 r/	76,000 r/	41,000 r/	28,000
Ta <sub>2</sub> O <sub>5</sub> content e/	do.	31,000 r/	72,000 r/	72,000 r/	40,000 r/	26,000
Gold, mine output, Au content	do.	1 r/	10 r/	17 r/	10 r/	10
Natural gas, gross e/	thousand cubic meters	970	100	100	100	100
Tin, mine output, Sn content	metric tons	260 r/	258 r/	260 r/	243 r/	345
Tungsten, mine output, W content	do.	49 r/	33 r/	149 r/	97 r/ e/	130 e/

e/ Estimated. r/ Revised.

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

2/ Includes data available through June 25, 2001.