The Mineral Industry of Other West African Countries

By George A. Morgan[1]

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BENIN

Output of minerals was insignificant in 1981 and made a negligible contribution to the gross national product (GNP), estimated at $1.2 billion.[2] Agriculture accounted for 40% of GNP and manufacturing accounted for 10%. The chief source of income was indirect taxes levied on traffic through the Port of Cotonou, an entrepôt.

Trade statistics for Benin were incomplete and dated. Major trading partners were France and other members of the European Communities. Benin was a member of the West African Monetary Union and as such must coordinate its foreign currency, reserves, interest rate structure, and fund transfer with other member countries. Its currency, the Communauté Financière Africaine franc (CFAF), was fixed to the French franc.

Wage controls remained in effect. Private-sector minimum wages had been frozen since 1974 but were raised 15% in 1980. Public sector wages have been frozen since 1966 and were due to increase about 10% to 15%.

COMMODITY REVIEW

Cement.—Two cement plants were in operation using imported clinker. The plant of Société des Ciments du Benin (SCB) has been in operation since 1970. SCB was 80% Government controlled; the remainder was controlled by private French interests. Capacity was 240,000 tons per year, and production was about 150,000 tons in 1981.

The Société Nationale des Ciments (SONACI) was 100% Government owned. Production began in 1979 with output of 107,000 tons compared with a capacity of 200,000 tons. The company continued to experience difficulty in 1981. Output by both SCB and SONACI was distributed by the quasi-public Société Beninoise des Materiaux de Construction and the Société Provinciale de Commercialisation des Produits Manufactures.

A $125 million joint Nigerian-Benin cement project continued in the Pobe region. A clinker plant was under construction and was to utilize local limestone. Planned ca-

pacity was 500,000 tons per year.

Electric Power.—About 92% of all electric power consumed was imported through Togo from the Akasambo-Volta River hydroelectric complex in Ghana. Communauté Electrique du Benin, a joint Togolese-Benin company, provided for the transmission. Agreements permitted Benin to draw up to 25 megawatts per year for a period of 25 years.

Benin had a total generating capacity of 19.5 megawatts, consisting of two 8-megawatt diesel generators at Cotonou, a diesel generator of about 3-megawatt capacity at Parakou, and a 0.5-megawatt generator at Bohicon-Abomey.

Petroleum.—Oil was discovered in the Seme Oilfield in 1968 about 15 to 20 kilometers offshore in 30 to 50 meters of water. Exploitation of the field was being financed by a guarantee from the Norweigan Guarantee Institute for Export Credits. The guarantee required that most equipment and services be purchased in Norway.

Two storage tanks with 40,000-cubic-meter capacity each were being constructed. They will be filled with oil via a 14-kilometer, 6-inch crude oil pipeline. A 3-kilometer, 20-inch pipeline will be used for a tanker boarding facility offshore. Output of 15,000 barrels per day was planned.

Other Minerals.—Phosphate resources amounting to 4.5 million tons were located at Mekrou. No exploitation was underway. Gold, chromite, and iron mineralization have also been found in Benin.

Table 1.—Other countries of West Africa: Production of mineral commodities[1]

Country[2] and commodity[3]	1977	1978	1979	1980[p]	1981[e]
BENIN					
Cement, hydraulic[4] ---- metric tons	200,000	200,000	151,000	160,000	160,000
Salt, marine[e] ---- do.	300	300	350	400	400
Stone: Gravel[e] ---- do.	18,000	20,000	21,000	22,000	22,000
CAPE VERDE ISLANDS					
Cement, hydraulic[e] ---- do.	4,000	15,000	15,000	15,000	16,000
Pumice and related volcanic materials ---- do.	15,000	15,000	16,000	16,000	16,000
GUINEA					
Aluminum:					
Bauxite, gross weight thousand metric tons	10,841	10,456	13,700	10,330	10,000
Alumina ---- do.	562	610	660	708	700
Diamond:					
Gem[e] ---- thousand carats	25	25	27	12	12
Industrial[e] ---- do.	55	55	58	26	26
Total ---- do.	[e]80	[e]80	[e]85	38	38
IVORY COAST					
Diamond:					
Gem[e] ---- do.	7	--	5	(5)	--
Industrial[e] ---- do.	11	10	32	(5)	--
Total ---- do.	18	10	37	(5)	--
Petroleum:					
Crude oil ---- thousand 42-gallon barrels	--	--	--	90	90
Refinery products:					
Gasoline ---- do.	2,166	2,210	[e]2,200	2,091	2,091
Kerosine and jet fuel ---- do.	1,388	1,117	[e]1,100	1,248	1,248
Distillate fuel oil ---- do.	3,235	3,678	[e]3,600	2,768	2,768
Residual fuel oil ---- do.	4,482	4,344	[e]4,300	4,995	4,995
Liquefied petroleum gas ---- do.	[e]122	182	[e]180	93	93
Refinery fuel and losses ---- do.	[e]451	521	[e]500	482	482
Total ---- do.	[e]11,844	12,052	[e]11,880	11,677	11,677
MALI					
Cement, hydraulic ---- metric tons	35,174	34,400	26,758	20,000	20,000
Gold, mine output, metal content ---- troy ounces	[e]932	965	[e]1,000	[e]1,500	1,500
Salt[e] ---- metric tons	4,500	4,500	4,500	4,500	4,500
Stone:					
Granite ---- square meters	8,088	6,000	415	--	--
Marble ---- do.	217	400	400	500	500
Limestone ---- metric tons	394	495	500	4,600	4,600
NIGER					
Cement, hydraulic ---- do.	40,000	[e]40,000	38,000	[e]38,000	38,000
Gypsum ---- do.	3,000	2,720	2,720	[e]2,720	2,720
Salt[e] ---- do.	1,000	900	900	3,000	3,000

See footnotes at end of table.

Table 1.—Other countries of West Africa: Production of mineral commodities[1] —Continued

Country[2] and commodity[3]	1977	1978	1979	1980[p]	1981[e]
NIGER —Continued					
Stone, sand and gravel:					
Limestone, not further described metric tons	60,000	NA	NA	NA	NA
Gravel cubic meters	[e]180,000	[e]180,000	180,000	180,000	180,000
Sand do.	[e]6,000	[e]6,000	6,000	6,000	6,000
Tin, mine output, metal content metric tons	130	125	125	56	50
Uranium concentrate, U_3O_8 content do.	1,440	2,060	3,740	4,100	4,500
SENEGAL					
Cement, hydraulic do.	330,000	357,000	380,688	386,234	385,000
Clays: Fuller's earth (attapulgite) do.	3,405	6,930	13,000	3,978	3,900
Gold troy ounces	--	[e]250	--	NA	NA
Petroleum refinery products:					
Gasoline thousand 42-gallon barrels	[e]1,038	502	1,141	1,057	1,057
Jet fuel and kerosine do.	[e]666	616	1,095	1,101	1,101
Distillate fuel oil do.	[e]1,551	2,248	1,319	1,178	1,178
Residual fuel oil do.	[e]2,148	1,883	2,121	1,985	1,985
Other do.	[e]58	57	102	87	87
Refinery fuel and losses do.	[e]216	[e]256	235	188	188
Total do.	[e]5,677	[e]5,562	6,013	5,596	5,596
Phosphate rock and related products:					
Crude:					
Aluminum phosphate thousand metric tons	275	204	184	224	224
Calcium phosphate do.	1,596	1,555	1,651	1,408	1,408
Manufactured:					
Aluminum phosphate, dehydrated do.	69	48	78	132	132
Other[6] do.	6	6	10	8	8
Salt metric tons	140,000	140,000	140,000	140,000	140,000
Stone:					
Basalt cubic meters	[e]168,500	100,000	NA	NA	NA
Marble (cipoline) do.	[e]250	[e]150	NA	NA	NA
TOGO					
Phosphate rock, beneficiated product thousand metric tons	2,857	2,827	2,920	2,933	2,900
Petroleum refinery products:					
Gasoline thousand 42-gallon barrels	--	[e]435	673	544	544
Kerosine and jet fuel do.	--	[e]280	432	347	347
Distillate fuel oil do.	--	915	1,417	621	621
Residual fuel oil do.	--	[e]290	440	725	725
Minor products, refinery fuel and losses do.	--	[e]130	[e]200	99	99
Total do.	--	[e]2,050	3,162	2,336	2,336
Salt metric tons	--	650	650	600	600
Stone: Marble, dimension square meters	NA	23	NA	NA	NA

[e]Estimated. [p]Preliminary. NA Not available.

[1]Includes data available through Oct. 12, 1982.

[2]In addition to the countries listed, The Gambia, Guinea-Bissau, and Upper Volta, which are covered in the text of this chapter, presumably produce modest quantities of a variety of crude construction materials (clays, stone, and sand and gravel) and may produce minor amounts of other mineral commodities (most notably gypsum, lime, and salt), but output is not reported quantitatively and available information is inadequate to make reliable estimates of output levels.

[3]In addition to the commodities listed, modest quantities of unlisted varieties of crude construction materials (clays, stone, and sand and gravel) presumably are produced, but output is not reported quantitatively and available information is inadequate to make reliable estimates of output levels.

[4]Output apparently based entirely on imported clinker.

[5]Revised to zero.

[6]Products marketed under the trade names "Balifos," "Phospal," and (in 1980 only) "P 125" (the latter described as crushed aluminum phosphate).

CAPE VERDE ISLANDS

Output of mineral-related commodities in 1981 was confined to salt and construction materials. The Banque Africaine de Développment (BAD) provided $37.2 million[1] in aid for six projects involving infrastructure development. BAD was also interested in construction of a cement plant on the island of Maio. Limestone and pozzolana available locally would supply the plant.

THE GAMBIA

No mineral production of significance occurred in The Gambia in 1981. Known deposits of ilmenite, rutile, and zircon in beach sands were not mentioned for exploitation. Agriculture accounted for most of the estimated $200 million[4] GNP.

There was no oil and gas exploration activity. Chevron Overseas Petroleum Co. (United States) and Compagnie Française des Pétroles S.A. (Total) continued to hold their concessions. Their Jemmah 1 well was plugged as dry in 1979.

GUINEA

The mining sector accounted for 20% of a GNP of $1.5 billion[5] in 1981, and about 95% of export earnings. Bauxite was the principal mineral produced. Several large-scale mining projects were either proposed for study or progressed further in their realization.

Foreign exchange for the purchase of food and gasoline and for financing state-controlled industries and agricultural projects was provided by the export of mineral-related products. Foreign debt was over $1.5 billion. Approximately 50% of foreign debt was from bilateral clearing accounts with other centrally planned economies. The remainder was mainly short- and medium-term debt. The Government derived its revenue through taxes on mineral exports and gross profits. In addition, it received a share in the net profit as a joint venture partner in both Compagnie des Bauxites de Guinée (CBG) and the Société d'Économie Mixte Friguia. CBG alone provided about 75% to 80% of foreign exchange earnings.[6]

The Government attempted to reduce inefficiences in various sectors through several measures. In October, it eliminated state-holding companies and provided for separate earnings and loss statements for each company. Formerly, such reports from all companies were combined. It also created the Ministry of Small and Medium Sized Enterprises for local private enterprises, particularly those involved in diamond extraction. Credit to the private sector was increased for the first time in several years. However, the state continued to set both producer and retail prices in all sectors. It also planned to make the syli fully convertible. Currently a parallel exchange rate exists for the syli.

COMMODITY REVIEW

Bauxite and Alumina.—CBG exported about 9.3 million tons of ore in 1981 plus 113,000 tons of calcined bauxite for use in abrasives. A feasibility study was underway for increasing calcined bauxite capacity from 120,000 to 240,000 tons per year.

Exports of alumina by the Société d' Économie Mixte Friguia were about 700,000 tons. Capacity for alumina production may be increased to 1.3 million from 700,000 tons per year. Participation by foreign investors was critical to the plan.

About 90% of production by the Office des Bauxite de Kindia was exported to the U.S.S.R. under long-term agreement. The remainder was shipped to Eastern Europe to settle arrears on bilateral clearing accounts. The Soviet financed and operated company suffered power supply interruptions and materials shortages, which resulted in the loss of 3 months' output in 1981.

Diamond.—Output of diamonds was by individually licensed artisanal miners. The miners were permitted to lease small plots and to employ up to 50 workers. Output was turned over to the Central Bank for marketing through the Guinea Diamond Exchange.

The Association pour la Récherche et l'Exploitation du Diamont et de l' Or (AREDOR) was established for exploiting diamond-bearing alluvial gravels in the Kissendongou region near Sierra Leone. Participation in the company was by the Government of Guinea, 50%; Bridge Oil Ltd., 45%; Simonius Vischer, 2.5%; and Industrial Diamond Co., 2.5%. Construction of the main plant for treating 400,000 cubic meters per year by 1983 was begun. Capital requirements were $59 million. The current agreement permits Bridge Oil to purchase 70% of production and the Government 30%. If the Government does not exercise its right, the remaining partners can purchase the Government's share of output.

Iron Ore.—Agreement was reached between the Government of Guinea and United States Steel Corp. in which United States Steel would be responsible for management, operations, and engineering of the Miferguí-Nimba iron ore project near the border with Liberia.

A Kaiser Engineers and Constructors Co.

feasibility study of the project envisioned 15 million tons per year of output of natural sinter feed containing 66.5% iron. Cutoff grade from an opencast operation was to be 60% iron. A below-ground crusher would yield a minus 200-millimeter product. Secondary crushing at the surface would produce a minus 35-millimeter product. A 6.5-kilometer-long conveyor would transport crushed ore to a storage and tertiary crushing facility for final product reduction to minus 6 millimeters. Transport was to be through Liberia via a 265-kilometer-long railroad. The loading quay and ore-handling facilities at Buchanan in Liberia were being enlarged to handle the additional tonnage. An 8,000-ton-per-hour shiploader was included in the port expansion.

Cost of the project was estimated at $990 million. Canada and the International Bank for Reconstruction and Development (World Bank) were each contributing $250 million. Potential ore purchasers included Nigeria, 5 million tons; Algeria, 1.75 million tons; and Libya, 2.5 million tons.

Petroleum.—Bridge Oil reached agreement with Guinea to explore for oil and gas onshore and offshore commencing in 1983 for 3 years. The company was to invest $15 million annually, according to the terms of the agreement.

Uranium.—Exploration by the Compagnie Générale des Matières Nucléaires (COGEMA), a subsidiary of the French Bureau de Récherches Géologiques et Minières (BRGM), on sediments in the northern part of the country was completed in 1981. No commercially interesting deposits were found. Crystalline rock in the same area was to be studied by a group composed of Davy McKee Corp., Soarberg Interplan, and the Nigerian and Moroccan Governments.

GUINEA-BISSAU

Excluding some clay, stone, and gravel, there was no mineral production in Guinea-Bissau in 1981. The country had a GNP estimated at $180 million.[7] Seafood was the main export item while foodstuffs and fuel were the main import items. Few Government-controlled firms operated at a profit. Companies were asked to review their wage scales, which were considered high in view of the poor productivity. Foreign assistance for research on several minerals was underway. Libya agreed to provide petroleum technicians for training supervisory personnel in Guinea-Bissau's national oil company.

COMMODITY REVIEW

Bauxite.—Soviet assistance was to be provided for a technical-economic study of bauxite at Boe. The program was to commence in early 1982.

Petroleum.—The Government completed an assessment of possible offshore drilling zones. The decision to proceed with a request for exploration bids was based on data from research conducted between 1958 and 1973 and on a recent seismic study. The study was financed by a World Bank loan of $6.8 million. A petroleum law and tax law was to be in effect by April 1982.

Phosphate Rock.—BRGM confirmed a phosphate find in northern Guinea-Bissau and reported that it warranted further exploration. The Fonds d'Aide de Cooperation of France financed BRGM's research.

IVORY COAST

There was no nonfuel mineral production of significance in the Ivory Coast in 1981. However, a number of exploration and research programs were in progress, and several projects for exploitation of gold and diamond were likely. Oil production, which commenced in August 1980, increased, and additional oil production facilities were being built.

The overall economy continued to be depressed because of low agricultural prices and exports, increased debt, and inefficiencies in public sector companies. Both imports and exports declined. Gross domestic product (GDP) was estimated at $9.8 billion.[8] The debt service ratio continued to increase and reached 34.2% in 1981. An International Monetary Fund loan of $560 million was granted to the Ivory Coast in return for an economic readjustment program.

The Government initiated measures to either sell or abolish parastatal corporations. Other state companies were operated by private concerns on Government contract. There were no restrictions of capital

and profits of foreign companies. The investment code was liberal, and incentives of tax privileges and customs exemptions could be negotiated on a case-by-case basis.

COMMODITY REVIEW

The Société pour le Developpement Minière de la Côte d'Ivoire (SODEMI) explored for metallic sulfides, gold, and uranium in the regions of Toulepleu and Aboisso. Anomalies detected by airborne electromagnetic survey were selected for drilling. Prospecting in the vicinity of Seguela located gold and tungsten mineralization. Copper and molybdenum anomalies found by geochemical surveys in the region of Guehielbi were reported to be from disseminated sulfides, mainly pyrrhotite, with subordinate chalcopyrite and pyrite.

The Uranium Department, formerly in the Société Nationale d'Operation Petroliére de la Côte d'Ivoire, was transferred to SODEMI. The department conducted uranium prospecting in the Bouake and Boundiole regions, but with negligible results. Thorium and uranium were found in the region of Odienne. The uranium was in association with granite.

BRGM had three exploration permits. Exploration was for massive sulfides of copper, lead, zinc, and silver, as well as gold and uranium in the Birimmian volcanosedimentary basins.

Diamond.—The Compagnie des Mines et des Materiaux (COMIMAT S.A.) discovered a diamond deposit in the region of Tortiya. COMIMAT S.A. was issued a permit for exploration and was expected to commence development during 1982.

Gold.—The cost of development of a gold deposit at Ity was under study. A consortium was to exploit the deposit, commencing in 1985. The Compagnie Minière de Côte d'Ivoire (COMICI) obtained three permits to explore for gold. COMICI's primary interest was quartz veins and elluvial and alluvial material, particularly in Nero.

Petroleum.—Production from the small Belier Field commenced in August 1980 from a single offshore platform. Current capacity was not expected to exceed 15,000 barrels per day. However, the possibility of reinjection of associated natural gas may modify future recovery. Most of the oil went directly to the Ivorian Refining Co. for refining.

The Espoir Field was discovered in April 1980. It was larger than the Belier Field and would have a number of recovery wells. Output was scheduled to commence in 1982.

Table 2.—Ivory Coast: Exports of mineral commodities

(Metric tons unless otherwise specified)

Commodity	1978	1979	Destinations, 1979	
			United States	Other (principal)
METALS				
Aluminum metal including alloys, all forms	1,300	1,624	--	Niger 685; Upper Volta 435; Cameroon 179; Togo 113.
Copper metal including alloys:				
Scrap	r1,046	1,023	--	Hungary 343; Belgium-Luxembourg 245; United Kingdom 122.
Semimanufactures	(1)	38	NA	NA.
Iron and steel metal:				
Scrap	19,031	21,714	--	Italy 9,864; Spain 9,660; France 2,120.
Unwrought and semimanufactures	1,649	2,499	--	Mali 386; Niger 287; Upper Volta 265; Cameroon 142; France 131.
Lead:				
Oxides and hydroxides	1	3	NA	NA.
Metal including alloys:				
Scrap	547	776	NA	France 274; United Kingdom 168; Belgium-Luxembourg 90.
Unwrought and semimanufactures	270	375	94	United Kingdom 173.
Nickel metal including alloys:				
Scrap	--	22	NA	NA.
Semimanufactures	(1)	1	NA	NA.
Tin metal including alloys, scrap	--	10	NA	NA.
Titanium: Oxides and hydroxides	2	1	NA	NA.
Zinc metal including alloys:				
Scrap	5	966	NA	France 961.
Semimanufactures	--	1	NA	NA.
Other:				
Ash and residue, metal-bearing value, thousands	--	$1	NA	NA.

See footnotes at end of table.

Table 2.—Ivory Coast: Exports of mineral commodities —Continued

(Metric tons unless otherwise specified)

Commodity	1978	1979	Destinations, 1979	
			United States	Other (principal)
METALS —Continued				
Other —Continued				
Alkali, alkaline-earth, rare-earth metals	--	29	NA	NA.
Metalloids	--	101	NA	NA.
NONMETALS				
Abrasives, n.e.s.: Grinding and polishing wheels and stones value, thousands	$5	$23	NA	NA.
Barite and witherite	--	1,628	--	All to Niger.
Cement	2,996	25,344	NA	Upper Volta 14,344; Mali 10,720.
Chalk	5	2	NA	NA.
Clays:				
Crude	3	168	NA	NA.
Products:				
Nonrefractory	243	57	NA	NA.
Refractory including nonclay brick	4	18	--	Congo 10.
Diamond: Industrial value, thousands	--	$38	NA	NA.
Diatomite and other infusorial earth	5	--		
Fertilizer materials:				
Crude	--	416	NA	NA.
Manufactured	289	541	NA	Upper Volta 403.
Ammonia	15	36	NA	NA.
Gypsum and plasters	--	34	NA	NA.
Lime	207	235	NA	NA.
Magnesite value, thousands	--	$5	NA	NA.
Pigments, mineral:				
Natural, crude	1	--		
Iron oxides, processed	--	1	NA	NA.
Salt and brine	53	1,013	--	Upper Volta 1,000.
Sodium and potassium compounds, n.e.s.:				
Caustic potash	--	9	NA	NA.
Caustic soda	54	49	NA	NA.
Soda ash	10	29	NA	NA.
Stone, sand and gravel	1,071	234	NA	NA.
Sulfur:				
Elemental, all forms	2	40	NA	NA.
Sulfuric acid	129	85	NA	NA.
Talc, steatite, soapstone, pyrophyllite	2	1	NA	NA.
Other:				
Crude	13	28	NA	NA.
Building materials of asphalt, asbestos and fiber cements, unfired nonmetals	--	16	NA	NA.
MINERAL FUELS AND RELATED MATERIALS				
Asphalt and bitumen, natural	--	13	NA	NA.
Carbon black	5	9	NA	NA.
Coal and briquets: Briquets	4	--		
Coke and semicoke	--	5	NA	NA.
Hydrogen, helium, rare gases	1	NA	NA	NA.
Petroleum refinery products:				
Gasoline thousand 42-gallon barrels	688	782	--	Mali 438; Upper Volta 341.
Kerosine and jet fuel do.	203	237	--	Mali 129; Upper Volta 107.
Distillate fuel oil do.	1,272	841	15	France 240; Mali 151; Spain 130.
Residual fuel oil do.	1,328	1,457	29	France 250; Greece 249; Upper Volta 211.
Lubricants do.	104	138	--	Ghana 33; Upper Volta 22; Niger 19; Mali 16.
Other:				
Liquefied petroleum gas do.	13	16	--	Upper Volta 7; Niger 4; Mali 3.
Unspecified do.	12	22	NA	Upper Volta 11; Mali 4; Niger 4.
Mineral tar and other coal-, petroleum-, and gas-derived crude chemicals	10	7	NA	NA.

[r] Revised. NA Not available.
[1] Less than 1/2 unit.

Table 3.—Ivory Coast: Imports of mineral commodities

(Metric tons unless otherwise specified)

Commodity	1978	1979	Sources, 1979	
			United States	Other (principal)
METALS				
Aluminum:				
Oxides and hydroxides	3	(1)	NA	NA.
Metal including alloys, all forms	8,564	7,581	14	Cameroon 5,888; France 721; Spain 421.
Chromium: Oxides and hydroxides	23	15	NA	NA.
Copper:				
Matte and speiss	--	2	NA	NA.
Metal including alloys, all forms	1,500	1,659	NA	France 1,341; Belgium-Luxembourg 271.
Iron and steel metal:				
Scrap	209	(1)	NA	NA.
Pig iron, sponge iron, powder, shot	138	24	NA	NA.
Ferroalloys:				
Ferromanganese	15	17	NA	NA.
Unspecified	7	11	NA	NA.
Steel, primary forms	10,874	9,446	NA	France 9,444.
Semimanufactures:				
Bars, rods, angles, shapes, sections	78,325	54,244	NA	France 37,271; Spain 7,463; Italy 5,031.
Universals, plates, sheets	59,189	70,298	NA	France 47,367; Japan 15,590; Belgium-Luxembourg 5,722.
Hoop and strip	1,737	1,842	131	France 1,321; Japan 147; Sweden 80.
Rails and accessories	2,766	1,928	NA	France 1,920.
Wire	3,577	2,683	NA	France 1,384; Belgium-Luxembourg 479; Senegal 414.
Tubes, pipes, fittings	48,438	16,433	22	West Germany 6,288; France 5,732; Malaysia 1,526.
Castings and forgings, rough	16	2,017	--	Canada 767; France 644; Italy 489.
Lead:				
Oxides and hydroxides	204	146	--	All from France.
Metal including alloys, all forms	187	326	NA	France 300.
Magnesium metal including alloys, all forms value, thousands	$1	$1	NA	NA.
Manganese:				
Ore and concentrate	1,078	1,103	NA	Mexico 1,101.
Oxides and hydroxides	1,102	1,353	NA	France 543; Ireland 310; United Kingdom 210.
Mercury 76-pound flasks	145	29	NA	NA.
Nickel metal including alloys, all forms	11	299	44	France 149; Israel 48; Italy 36.
Platinum-group metals including alloys, unwrought and partly wrought value, thousands	$7	$7	NA	NA.
Silver metal including alloys, unwrought and partly wrought do.	$1,063	$1,057	NA	France $923; Hong Kong $74.
Tin metal including alloys, all froms	24	29	NA	France 25.
Titanium: Oxides and hydroxides	404	427	NA	Australia 129; United Kingdom 74; France 71.
Tungsten metal including alloys, all forms	--	3	NA	NA.
Uranium and thorium ores and concentrates value, thousands	--	$1	NA	NA.
Zinc:				
Oxides and hydroxides	70	37	NA	NA.
Metal including alloys, all forms	4,080	5,294	NA	Belgium-Luxembourg 2,960; France 2,292.
Other:				
Ores and concentrates	3	27,293	NA	France 27,283.
Alkali, alkaline-earth, rare-earth metals	7	2	NA	NA.
Metalloids	8	14	NA	NA.
Base metals including alloys, all forms	10	5	NA	NA.
NONMETALS				
Abrasives, n.e.s.:				
Natural: Corundum, emery, pumice, etc	22	79	NA	France 53.
Artificial: Corundum	59	41	NA	NA.
Dust and powder of precious and semi-precious stones value, thousands	--	$1	NA	NA.
Grinding and polishing wheels and stones	154	93	NA	France 28; Italy 17; West Germany 3.
Asbestos, crude	6	7	NA	NA.
Barite and witherite	3,505	345	186	France 159.
Boron materials:				
Crude natural borates	412	302	200	NA.
Oxide and acid	1	3	NA	NA.

See footnotes at end of table.

Table 3.—Ivory Coast: Imports of mineral commodities —Continued

(Metric tons unless otherwise specified)

Commodity	1978	1979	Sources, 1979	
			United States	Other (principal)
NONMETALS —Continued				
Cement thousand tons	1,069	1,018	NA	France 580; Spain 245; Poland 142.
Chalk	3,337	3,036	NA	France 2,650.
Clays:				
Crude	873	882	NA	Senegal 209; France 206; United Kingdom 134.
Products:				
Nonrefractory	10,453	13,238	NA	Italy 4,845; France 4,783; West Germany 1,715.
Refractory including nonclay brick	777	860	NA	France 743; Belgium-Luxembourg 27.
Diatomite and other infusorial earth	384	238	NA	France 117; West Germany 71.
Feldspar, fluorspar, similar materials	5	10	NA	NA.
Fertilizer materials:				
Crude, phosphatic	9,314	6,207	NA	Senegal 6,100.
Manufactured:				
Nitrogenous	16,786	21,758	NA	France 8,702; Romania 6,268; Poland 3,000.
Phosphatic	4,559	1,750	NA	Senegal 905; France 800.
Potassic	52,868	42,487	NA	Spain 19,425; Belgium-Luxembourg 15,300; Israel 5,500.
Other including mixed	9,748	23,385	15,975	United Kingdom 5,400; Belgium-Luxembourg 1,990.
Ammonia	5,410	4,969	NA	France 3,585; United Kingdom 1,350.
Graphite, natural	3	--	--	
Gypsum and plasters	73,163	53,547	--	Spain 43,905; France 4,945; Morocco 4,696.
Lime	6,124	7,471	NA	France 3,862; Belgium-Luxembourg 3,457; United Kingdom 30.
Magnesite	1	13	NA	NA.
Mica:				
Crude including splittings and waste	9	5	NA	NA.
Worked including agglomerated splittings	1	--		
Pigments, mineral:				
Crude, natural	135	--		
Iron oxides, processed	139	15,189	NA	France 15,070; West Germany 75.
Precious and semiprecious stones value, thousands	--	$13	NA	NA.
Salt and brine	38,852	43,850	NA	Senegal 40,776; West Germany 2,721.
Sodium and potassium compounds, n.e.s.:				
Caustic potash	140	110	NA	NA.
Caustic soda	10,081	9,654	NA	France 2,129; Italy 1,800; Belgium-Luxembourg 1,599.
Soda ash	949	1,521	NA	France 1,127; West Germany 166.
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked	3,968	2,342	NA	Italy 2,337.
Worked	2,795	2,246	NA	Italy 2,048.
Dolomite, chiefly refractory-grade	5,178	4,768	NA	France 4,483.
Gravel and crushed rock	4,329	3,244	NA	Italy 2,566; West Germany 445.
Quartz and quartzite	33	162	NA	Hong Kong 159.
Sand excluding metal-bearing	189	145	NA	NA.
Sulfur:				
Elemental, all forms	8,750	7,803	NA	France 7,722.
Sulfuric acid	31	4	NA	NA.
Talc, steatite, soapstone, pyrophyllite	1,030	917	NA	France 862.
Other:				
Crude	5,491	6,890	NA	West Germany 6,806.
Slag, dross, similar waste, not metal-bearing	38,336	39,796	NA	France 39,795.
Oxides and hydroxides of barium, magnesium, strontium	1,114	5	NA	NA.
Building materials of asphalt, asbestos and fiber cements, unfired nonmetals	4,104	2,577	NA	France 2,423.
MINERAL FUELS AND RELATED MATERIALS				
Asphalt and bitumen natural	34	300	--	Mainly from France.
Carbon black	252	258	NA	France 249.
Coal, briquets, coke	110	114	NA	NA.
Hydrogen, helium, rare gases	7	NA	NA	NA.
Peat including briquets and litter	91	--		
Petroleum:				
Crude thousand 42-gallon barrels	11,955	10,418	--	Venezuela 3,904; Nigeria 2,410; Iraq 2,107; Saudi Arabia 1,275.

See footnotes at end of table.

Table 3.—Ivory Coast: Imports of mineral commodities —Continued

(Metric tons unless otherwise specified)

Commodity	1978	1979	Sources, 1979	
			United States	Other (principal)
MINERAL FUELS AND RELATED MATERIALS —Continued				
Petroleum —Continued				
Refinery products:				
Gasoline				
thousand 42-gallon barrels	467	687	--	Romania 187; France 161; Canada 149.
Kerosine and jet fuel ---do---	99	106	--	Venezuela 33; France 27; Italy 18.
Distillate fuel oil -----do---	622	434	--	Italy 161; Venezuela 92; Canada 62.
Residual fuel oil -----do---	(1)	96	--	Liberia 45; France 20; Netherlands 20.
Lubricants ---------do---	240	364	24	France 146; Trinidad and Tobago 126; Netherlands 28.
Other:				
Liquefied petroleum gas do---	19	35	--	France 8; Nigeria 7; Brazil 6; Italy 5.
Mineral jelly and wax do---	9	10	--	West Germany 6; France 2.
Bituminous mixtures do---	34	2	1	France 1.
Unspecified -----do---	267	9	--	France 4; Italy 3.
Mineral tar and other coal-, petroleum-, and gas-derived crude chemicals---	1,874	2,122	NA	Netherlands 1,700; France 399.

NA Not available.
[1]Less than 1/2 unit.

MALI

Production of stone, gold, and phosphate rock made a small contribution to a GNP of about $1.2 billion[9] in 1981. Exploration was targeted at several minerals, and mine production capacity increases for gold and phosphate rock were underway.

The availability and reliability of timely statistical data for Mali was poor. The latest trade data covered 1978 and indicated a trade deficit of $103 million. France was the principal trading partner followed by the Ivory Coast, Senegal, and the Federal Republic of Germany. Drought and limited water resources resulted in continued high imports of foodstuffs. Imports of oil products were a high-cost item and were transshipped through Senegal and the Ivory Coast. In conjunction with energy requirements, the World Bank allocated a loan of $3.7 million for financing research on bituminous shales in the Taodeni Basin.

COMMODITY REVIEW

Gold.—Technical assistance, which was begun in 1963 by the U.S.S.R. for gold exploration and development, resulted in the reactiviation of the Kalana Mine in the Sikasso region. An agreement signed in October between the Société Nationale de Récherches Minières (Sonarem) and the U.S.S.R. provided for a loan of about $4.35 million, payable in 10 years at 4% interest with a deferral period of 2 years. The U.S.S.R. also was to assist in the construction of a 120-kilometer-long electric transmission line linking Selingue with Kalana.

Reserves at the Kalana Mine were estimated at about 1 million troy ounces located 250 meters deep. Average grade was 0.96 to 1.28 troy ounces of gold per ton. Mine life was 15 years at a production rate of 64,300 troy ounces of gold per year. Initial production would be about 13,000 troy ounces of gold per year with byproduct silver.[10]

The Sindicat Franco-Maliende Récherches Minières, a joint-venture company including Sonarem and BRGM, was involved in gold exploration in the southeast of the country, as well as in the Kangola and Bongouni-Sikasso region.

Petroleum.—A 5-year permit to explore for oil over a 140,000-square-kilometer area in the Taodeni Basin in the north of the country was granted to Esso Oil Co.

The International Development Association (IDA) was to monitor exploration programs for oil and the evaluation of oil shale deposits. In the event exploitable oil deposits were located, IDA would establish a framework for agreement on their development.

Phosphate Rock.—The Federal Republic of Germany granted $1 million to Mali for financing a phosphate rock crushing plant

at mining operations in the Tilemsi Valley, north of Gao. Sonarem was increasing output to 10,000 tons per year and anticipated a possible future production level of 240,000 tons per year.

Table 4.—Mali: Exports of mineral commodities

(Metric tons unless otherwise specified)

Commodtiy	1976	1977	Destinations, 1977	
			United States	Other (principal)
Clays, crude	--	11	--	All to Ivory Coast.
Iron and steel metal:				
Scrap	1,001	--		
Steel, primary forms	25	--		
Petroleum refinery products:				
Gasoline, 42-gallon barrels	--	442	85	Iran 178; United Kingdom 110; France 34.
Kerosine and jet fuel, do.	--	4,797	--	Ivory Coast 3,216; United Kingdom 651; Sweden 512.
Distillate fuel oil, do.	--	134	--	All to Ivory Coast.
Mineral jelly and wax, do.	--	8	--	All to Upper Volta.
Salt and brine	226	400	--	Upper Volta 353; Ivory Coast 42; Ghana 5.
Zinc metal including alloys: Semimanufactures	--	30	--	All to France.

Table 5.—Mali: Imports of mineral commodities

(Metric tons unless otherwise specified)

Commodity	1976	1977	Sources, 1977	
			United States	Other (principal)
METALS				
Aluminum metal including alloys:				
Scrap	321	113	--	France 100; Nigeria 13.
Unwrought	37	11	--	All from India.
Semimanufactures	76	22	--	France 14; Nigeria 5.
Arsenic: Natural sulfides	15	--		
Beryllium metal including alloys, all forms	--	1	--	All from France.
Copper metal including alloys, semimanufactures	18	6	--	Mainly from France.
Iron and steel metal:				
Scrap	16	28	--	Ivory Coast 24.
Pig iron, ferroalloys, similar material	4	1	--	All from France.
Steel, primary forms	2	14	--	Do.
Semimanufactures:				
Bars, angles, shapes, sections	4,946	4,769	57	France 4,488; U.S.S.R. 142; West Germany 54.
Universals, plates, sheets	4,042	3,029	--	France 2,222; Belgium-Luxembourg 272; Japan 241.
Hoop and strip	1	54	--	Canada 39; France 15.
Rails and accessories	649	64	--	France 58; U.S.S.R. 6.
Wire	592	316	2	France 224; Belgium-Luxembourg 67.
Tubes, pipes, fittings	5,421	8,128	13	U.S.S.R. 6,325; France 1,424; West Germany 281.
Castings and forgings, rough	r3	12	--	France 5; East Germany 4; U.S.S.R. 3.
Lead:				
Oxides and hydroxides	1	--		
Metal including alloys, all forms	96	1	--	Mainly from France.
Magnesium metal including alloys, all forms	--	1	--	All from France.
Manganese: Oxides and hydroxides	49	174	--	Do.
Platinum-group metals including alloys, unwrought and partly wrought, value, thousands	$2	--		
Silver metal including alloys, unwrought and partly wrought, do.	--	$2	--	All from France.
Tin metal including alloys, all forms	(1)	1	--	Do.
Titanium: Oxides and hydroxides	2	12	--	Mainly from France.
Zinc:				
Oxides and hydroxides	2	(1)	--	All from U.S.S.R.
Metal including alloys:				
Unwrought	--	40	--	All from Belgium-Luxembourg.

See footnotes at end of table.

Table 5.—Mali: Imports of mineral commodities —Continued

(Metric tons unless otherwise specified)

Commodity	1976	1977	Sources, 1977	
			United States	Other (principal)
METALS —Continued				
Zinc —Continued				
Metal including alloys —Continued				
Semimanufactures	--	156	--	All from France.
Other: Metalloids	--	4	--	Do.
NONMETALS				
Abrasives, n.e.s.:				
Natural: Corundum, emery, pumice, etc	40	432	--	China 400; Ivory Coast 30; France 2.
Artificial: Corundum	4	--		
Grinding and polishing wheels and stones	79	7	--	France 6; West Germany 1.
Asbestos, crude	3	--		
Barite and witherite	--	4	--	All from France.
Cement	23,889	58,835	--	U.S.S.R. 22,644; Ivory Coast 16,491; Spain 9,514.
Chalk	2	1	--	All from France.
Clays:				
Crude	21	12	--	All from Senegal.
Products:				
Nonrefractory	1,448	442	--	France 254; Italy 106; Spain 40.
Refractory including nonclay brick	10	79	--	France 73; United Kingdom 4.
Fertilizer materials:				
Crude	3	--		
Manufactured:				
Nitrogenous	3,500	5,485	--	Netherlands 5,000; Niger 480.
Phosphatic	6,000	18,961	--	Netherlands 12,573; Senegal 6,342.
Potassic	--	51	--	Belgium-Luxembourg 50.
Other including mixed	12,616	2,846	15	Denmark 1,500; Netherlands 1,331.
Ammonia	8	15	--	France 14.
Gypsum and plasters	1,103	54	--	Morocco 32; France 22.
Lime	97	380	--	France 295; Ivory Coast 85.
Magnesite	2	--		
Pigments, mineral:				
Natural, crude	10	--		
Iron oxides, processed	--	5	--	Mainly from France.
Salt and brine	32,608	20,430	--	Senegal 19,409; Ivory Coast 600; Niger 411.
Sodium and potassium compounds, n.e.s.:				
Caustic potash	100	(1)	--	All from France.
Caustic soda	1,314	535	--	West Germany 432; Netherlands 60; Belgium-Luxembourg 32.
Soda ash	44	57	--	France 49; East Germany 8.
Stone, sand and gravel	r333	84	--	Belgium-Luxembourg 30; China 27; France 20.
Sulfur:				
Elemental, all forms	83	70	--	All from West Germany.
Sulfuric acid	142	46	--	France 31; Ivory Coast 8; Belgium-Luxembourg 4.
Talc, steatite, soapstone, pyrophyllite	32	--		
Other:				
Crude	--	39	--	West Germany 30; France 9.
Oxides and hydroxides of barium, magnesium, strontium	--	1	--	All from China.
Building materials of asphalt, asbestos and fiber cements, unfired nonmetals	324	142	--	U.S.S.R. 106; France 18; Senegal 17.
MINERAL FUELS AND RELATED MATERIALS				
Asphalt and bitumen, natural	34	130	--	Spain 100; Senegal 29.
Coal excluding briquets	1	--		
Coke and semicoke	--	130	--	All from West Germany.
Petroleum refinery products:				
Gasoline—42-gallon barrels	363,919	463,420	--	Ivory Coast 417,690; Senegal 34.
Kerosine and jet fuel—do	67,596	70,936	--	Ivory Coast 34,828; Senegal 31,356.
Distillate fuel oil—do	336,118	265,024	--	Ivory Coast 147,148; Senegal 92,855.
Residual fuel oil—do	41,405	171,422	--	Senegal 116,004; Ivory Coast 54,912.

See footnotes at end of table.

Table 5.—Mali: Imports of mineral commodities —Continued

(Metric tons unless otherwise specified)

Commodity	1976	1977	Sources, 1977	
			United States	Other (principal)
MINERAL FUELS AND RELATED MATERIALS —Continued				
Petroleum refinery products —Continued				
Lubricants ----------42-gallon barrels--	18,648	27,951	84	Ivory Coast 13,664; Senegal 10,766.
Other:				
Liquefied petroleum gas-------do----	2,598	3,341	--	Ivory Coast 2,123; France 1,218.
Mineral jelly and wax ---------do----	16	236	--	Netherlands 173; France 63.
Bitumen and other residues ----do----	6,748	897	--	Venezuela 869; France 28.
Bituminous mixtures ---------do----	3,345	8,248	--	Venezuela 8,211; France 36.
Mineral tar and other coal-, petroleum-, and gas-derived crude chemicals ----------	30	4	--	Belgium-Luxembourg 2; China 2.

[r]Revised.
[1]Less than 1/2 unit.

NIGER

Despite a loss in export earnings in 1981 due to a decline in price for uranium, the country's principal mineral product, a number of new mineral development projects were underway. These projects were expected to diversify and broaden the country's mineral industry base.

The mining sector accounted for about 12% of an estimated GDP of $2.1 billion[11] in 1981. External debt was estimated at $503.3 million. A negative balance of trade of almost $200 million was realized, and inflation was 15% to 70% in the year ending June 1981.

Planning for economic development has been based on anticipated revenue from sales of uranium. Uranium sales accounted for Niger's first 80% of total export earnings and 40% of Government revenue. The 5-year plan covering 1979-83 was released in March 1980 but was rearranged because of the shortfall in revenue, and a 10-year Program for Development of Niger was issued. The program's intent was to emphasize investment in the rural sector and the attainment of self-sufficiency in food production. The role of foreign investors and private enterprise was expanding to meet these goals.

An investment code has been in effect since 1974 and provides tax relief and tariff protection for foreign investors. Government participation in commercial ventures was common but not required by law. The country's currency was fixed against the French franc. Profits after taxes were available for full repatriation.

COMMODITY REVIEW

Cement.—A single cement plant was in operation at Malbaza near the border with Nigeria and had a total capacity of 40,000 tons per year. Limestone was supplied from a local quarry estimated to have reserves of 3.5 million tons. No firm commitment had been made for a new plant with a planned capacity of 200,000 tons per year. Local cement production was reported to supply a small percentage of domestic consumption.

Coal.—The Société Nigérienne du Charbon d'Anou Araren (SONICHAR) was created in 1977 with responsibility for developing a coal deposit at Anou Araren, about 50 kilometers east of Agadès. SONICHAR was 66% Nigerian Government owned with the remainder held by the Islamic Development Bank and domestic uranium mining companies. Production and stockpiling of coal at Anou Araren commenced in 1980. Total recoverable reserves were about 1 million tons of coal out of an estimated 6 million tons of proven reserves. Output was being consumed at a nearby powerplant. Coal production capacity was planned to be about 100 tons per day with full utilization of two turbines at the plant.

Electric Energy.—The country's first coal-fired plant went into operation in 1981. First-stage capacity was 16 megawatts and was fired by coal supplied from the nearby Anou Araren deposit. Electricity produced was consumed mainly by domestic uranium mining companies. An $11 million loan was made by the European Investment Bank for

a period of 16 years at 8% interest to complete the second stage of the powerplant. When completed total electric generating capacity would be 32 megawatts.

Iron Ore.—The United Nations Industrial Development Organization funded a study of iron ore located at Soy. About 650 million tons of oolitic hematite, grading between 48% and 53% iron, and containing about 0.5% to 0.8% phosphorus was at the deposit. Nigeria expressed some interest in the reserve, which would require complete development of a transport network for shipment to Nigeria.

Molybdenum.—Molybdenum output commenced in 1979 as a byproduct of uranium production by Compagnie Minière d'Akouta (COMINAK). The total capacity for production of molybdenum by COMINAK was 400 tons of metal in concentrates.

Phosphate Rock.—Production of phosphate came from hand operators near Takoua. A crushing plant recently installed at Takoua was capable of producing 15 tons per day of fertilizer-grade phosphate but was poorly managed and rarely operated at optimum level.

Phosphate mineralization in the vicinity of Tapoa has been the object of study for the past 10 years. A feasibility study for production from the area neared completion. Reserves were reported at 1.25 billion tons of phosphate, of which 500 million tons was considered economically exploitable. Of three ore horizons in the deposit, the uppermost averaged 22.4% P_2O_5, while the two lower horizons ranged from 27.8% to 34% P_2O_5. Nigeria expressed interest in possible development of the deposit.

Uranium.—The Government maintained its interest in uranium exploration, development, and exploitation in Niger through the Office National des Ressources Minière (ONAREM). Two companies produced uranium in 1981, COMINAK and Société des Mines de l'Aïr (SOMAIR). Participating shareholders in these two companies each had the right to export uranium in proportion to their capital participation. ONAREM had a 31% interest in COMINAK; COGEMA, France, had 34%; Overseas Uranium Resources Development, Japan, had 25%; and Empresa Nacional del Uranio, Spain, had 10%. ONAREM also had a 33% interest in SOMAIR, while COGEMA had 26.96%; Compagnie Française des Minerais de l'Uranium had 11.79%; Minatome had 7.58%; Compagnie Minière de Mokta had 7.56%; Urangesellschaft, Federal Republic of Germany, had 6.58%, and Agip Nucléaire, Italy, had 6.53%.

SOMAIR has produced uranium from the Arlit deposit in the Agadiz Basin since 1971. Uranium, as the minerals coffinite and pitchblende, was located in a 20- to 25-meter-thick horizon of clay and sandstone, grading, 0.25% U_3O_8, with overburden ranging from 35 to 50 meters thick. Production was by acid heap leaching to produce 70% uranium contained in sodium uranite. Mill throughput was about 3,000 tons per day, with a total production capacity of 2,300 tons per year of uranium.

COMINAK commenced production in 1978 from the Akouta deposit, about 20 kilometers from Arlit. Production was from an underground operation 250 meters deep in ore grading 0.4% U_3O_8. Capacity was about 2,200 tons per year of uranium in a 70% uranium-in-magnesium uranate product.

Participation in a third company, the Société Minière de Tassa N'Taghalgue (SMTT) was shared equally by ONAREM, COGEMA, and Kuwait's Foreign Trading, Contracting and Investment Co. SMTT was established in 1978 to develop the Arni deposit near Arlit. Reserves were reported at 20,000 tons of uranium in ore, grading 0.35% U_3O_8. A feasibility study was completed for an opencast operation producing 1,000 tons per year of U_3O_8.

Exports of uranium in 1981 were estimated to be as follows in tons of uranium: France, 2,293; Libya, 1,212; Japan, 816; Spain, 300; the Federal Republic of Germany, 125; and Iraq, 100.

Table 6.—Niger: Trade of mineral commodities[1]

(Metric tons unless otherwise specified)

Commodity		1976	1977[p]
EXPORTS			
Uranium ore and concentrate		1,477	1,895
IMPORTS			
Metals:			
Aluminum metal including alloys, semimanufactures		438	288
Iron and steel metal, semimanufactures:			
Bars, rods, angles, shapes, sections		8,282	8,676
Universals, plates, sheets		2,467	1,899
Tubes, pipes, fittings		2,467	2,606
Nonmetals:			
Fertilizer materials: Natural, nitrogenous		1,150	1,412
Lime		345	368
Salt and brine		6,762	16,216
Sodium and potassium compounds, n.e.s.:			
Caustic soda		1,969	2,364
Soda ash		1,600	9,395
Sulfur: Elemental, refined		1	28,140
Mineral fuels and related materials:			
Petroleum refinery products:			
Gasoline:			
Aviation	42-gallon barrels	15,157	7,218
Motor	do.	154,003	226,992
Kerosine and jet fuel	do.	21,282	25,443
Distillate fuel oil	do.	333,865	452,151
Residual fuel oil	do.	76,457	42,458
Other:			
Liquefied petroleum gas	do.	3,457	5,556
Nonlubricating oils, n.e.s	do.	66,045	45,983
Bitumen and other residues	do.	3,333	16,192
Bituminous mixtures	do.	73,526	10,272

[p]Preliminary.
[1]Destinations and sources are not available.

SENEGAL

The mining sector was relatively unchanged in 1981. Mining and manufacturing accounted for about 20% of an estimated GDP of $2 billion[12] in 1981. The economy was in stagnation mainly because of the poor performance of the agricultural sector. Fish products became the largest export earner at 27% of total exports.

COMMODITY REVIEW

Cement.—Plant prices for cement increased 32% to $110 per ton. The new price included a value-added tax and a special tax.

Expansion of capacity by the Société Ouest Africaine des Ciments at Rufisque was planned. Capacity would increase to 875,000 tons per year compared with a current capacity of 360,000 tons per year. Cost of the expansion was estimated at $6.7 million.

Iron.—A feasibility study was underway regarding infrastructure and marketing requirements for development of the iron deposits located in the southeast near Faleme. The Société des Mines de Fer du Senegal Oriental was formed in 1975 to exploit the reserves. An exploration program completed in 1980 proved additional reserves. Primary magnetite ores from Farangalis and Goto may be used for production of acid and basic blast furnace pellets and direct-reduction pellets. Oxidized ores from Kondekouron, Kouroudiako, and Karakaene can be used for direct charging into blast furnaces and for sintering.

Reserves of proved magnetite ore at Farangalis and Goto were 135 million tons each, grading 45% iron. Magnetic separation was shown to yield a 68% iron ore concentrate. High-grade hematite ore reserves at Kondekouron and Kouroudiako were confirmed at 56 million tons and 26 million tons, respectively. An annual output of 12 million tons was recently estimated to be necessary for efficient utilization of rail and port capacity. Initial output would be for hematite for direct shipping and sinter feed.

Peat.—The Compagnie des Tourbieres du Senegal (CTS) was established with an initial capital of $370,000 for exploiting peat resources estimated at 50 million cubic meters. The central region of Niayes between Mboro and Lompoul has about 80% of the total peat resources. Peat was also

located at Casamome, the Sine-Saloum Rivers, and the delta region. Output was to supply two thermal powerplants of 30 megawatts capacity.

Petroleum.—Oil exploration continued in the Longo and Kafountine areas of Cassamance. The refinery at Mbou was to have an increase in capacity from 900,000 to 1,380,000 tons per year. A desulfurization unit was to be installed for utilization of lower cost, high-sulfur crude oil.

Phosphate Rock.—Production and export of phosphate has been mainly in the form of phosphate rock. Long-range plans for product upgrading were finalized with the letting of contracts for construction of sulfuric acid and phosphoric acid plants at Taiba. The sulfuric acid plant was to have a maximum capacity of 2,100 tons per day and the phosphoric acid plant was to have a maximum capacity of 800 tons per day.

A mixed fertilizer plant with a capacity of 680 tons per day of diammonium phosphate and 900 tons per day of granulated triple superphosphate was to be constructed at M'boo. Product markets were to be in West Africa and India. Exports of calcium phosphate in 1981 were mainly to the United Kingdom, France, Greece, and India. Production of aluminum phosphate was mainly for local use, although France received about 51,000 tons in 1981.

Table 7.—Senegal: Exports of mineral commodities

(Metric tons unless otherwise specified)

Commodity	1979	1980	Destinations, 1980	
			United States	Other (principal)
METALS				
Aluminum metal including alloys:				
Scrap	--	12	--	All to Ivory Coast.
Semimanufactures	--	1	--	All to Gambia.
Copper metal including alloys:				
Scrap	816	797	--	France 395; United Kingdom 352; Spain 35.
Unwrought and semimanufactures value, thousands	$3	--		
Iron and steel:				
Ore and concentrate	--	45	--	All to France.
Metal:				
Scrap	14,430	9,632	--	Yugoslavia 6,500; Spain 3,048; Mali 60.
Ferroalloys	--	1	--	NA.
Semimanufactures:				
Bars, rods, angles, shapes, sections	7	78	--	Gambia 56; Mauritania 11.
Universals, plates, sheets	5	9	--	Guinea-Bissau 4; Gambia 2; Mauritania 2.
Wire	140	329	--	Ivory Coast 80; Mauritania 76; Cameroon 40.
Tubes, pipes, fittings	95	27	--	Gambia 7; Mauritania 7; Guinea 4.
Castings and forgings, rough	7	5	--	Guinea 1; Mali 1.
Lead metal including alloys:				
Scrap	255	36	--	All to France.
Unwrought and semimanufactures	47	1	--	Mainly to Mauritania.
Magnesium metal including alloys, scrap	5	--		
Nickel metal including alloys:				
Scrap	3	18	--	All to France.
Semimanufactures value, thousands	--	$2	--	All to Ivory Coast.
Zinc metal including alloys:				
Scrap	--	30	--	France 24; Ivory Coast 5.
Unwrought	56	--		
Other: Metalloids	9	10	--	Gambia 9.
NONMETALS				
Abrasives, n.e.s.: Grinding and polishing wheels and stones value, thousands	$1	$4	--	France $3; Mali $1.
Cement	5,979	3,548	--	Mauritania 2,609; Guinea-Bissau 665; Mali 262.
Clays:				
Crude	4,335	5,929	--	France 5,907; Mauritania 22.
Products:				
Nonrefractory	26	27	--	Mauritania 18; Guinea 6.
Refractory including nonclay brick	40	55	--	All to Upper Volta.

See footnotes at end of table.

Table 7.—Senegal: Exports of mineral commodities —Continued

(Metric tons unless otherwise specified)

Commodity	1979	1980	Destinations, 1980	
			United States	Other (principal)
NONMETALS —Continued				
Fertilizer materials:				
Crude:				
Phosphatic thousand tons	1,817	1,443	--	United Kingdom 394; Finland 200; France 192; Greece 170.
Potassic	1,100	--		
Manufactured:				
Nitrogenous	858	815	--	Mali 400; Guinea-Bissau 355; Mauritania 60.
Phosphatic	86,881	148,130	--	France 81,645; China 27,015; United Kingdom 14,790.
Potassic	250	2	--	All to Mali.
Other including mixed	25,648	38,611	--	Guinea-Bissau 17,098; Mali 15,313; Gambia 6,185.
Ammonia	23	30	--	Gambia 20; Ghana 5; West Germany 3.
Gypsum and plasters	55	533	--	Ivory Coast 394; Mali 132; Mauritania 6.
Lime	--	101	--	All to Mauritania.
Salt and brine	112,924	125,846	--	Ivory Coast 45,896; Cameroon 20,449; Niger 17,164.
Sodium and potassium compounds, n.e.s.:				
Caustic potash	9	3	--	Gabon 1.
Caustic soda	171	79	--	Mali 62; Mauritania 16.
Soda ash	--	76	--	Ivory Coast 72; Mali 4.
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked	4,377	9,464	--	All to Gambia.
Worked	--	1	--	All to Guinea-Bissau.
Gravel and crushed rock	6,089	1,510	--	All to Gambia.
Quartz and quartzite value, thousands	$20	--		
Sand other than metal-bearing	13	167	--	Mali 164.
Sulfur: Sulfuric acid	23	12	--	Mali 6; Mauritania 6.
Other:				
Crude	3	--		
Building materials of asphalt, asbestos and fiber cements, unfired nonmetals	390	376	--	Mauritania 180; Gambia 125; Guinea-Bissau 72.
MINERAL FUELS AND RELATED MATERIALS				
Coal and briquets: Briquets	--	10	--	All to Mali.
Petroleum refinery products:				
Gasoline thousand 42-gallon barrels	254	280	--	Mauritania 136; Mali 37; Guinea-Bissau 36.
Kerosine and jet fuel do	1,115	777	--	Mauritania 47; Mali 28; Guinea-Bissau 15.
Distillate fuel oil do	358	1,946	--	Mali 1,558; Guinea-Bissau 117.
Residual fuel oil do	145	128	--	Mali 94.
Lubricants do	85	85	--	Nigeria 36; Mali 14; Mauritania 11.
Other:				
Liquefied petroleum gas 42-gallon barrels	7,157	2,900	--	Mauritania 1,984; Gambia 592; Guinea 186.
Mineral jelly and wax do	16	8	--	Mainly to Ivory Coast.
Bitumen and other residues do	270	(1)	--	All to Mauritania.
Bituminous mixtures do	48	(1)	--	Do.
Mineral tar and other coal-, petroleum-, and gas-derived crude chemicals value, thousands	$1	--		

NA Not available.
[1]Less than 1/2 unit.

Table 8.—Senegal: Imports of mineral commodities

(Metric tons unless otherwise specified)

Commodity	1979	1980	Sources, 1980	
			United States	Other (principal)
METALS				
Aluminum:				
Oxides and hydroxides	200	577	--	West Germany 567; France 10.
Metal including alloys:				
Scrap	8	--		
Unwrought	--	39	--	All from France.
Semimanufactures	251	258	(1)	Cameroon 68; France 61; Italy 57.
Chromium: Oxides and hydroxides	8	--		
Copper metal including alloys:				
Unwrought	2	15	--	Italy 10; France 5.
Semimanufactures	1,109	71	--	France 67; Italy 2.
Iron and steel metal:				
Pig iron, ferroalloys, similar material	8	37	--	All from France.
Steel, primary forms				
value, thousands	$11	$1	--	Do.
Semimanufactures:				
Bars, rods, angles, shapes, sections	28,769	20,872	--	France 11,856; Italy 4,135; United Kingdom 2,047.
Universals, plates, sheets	11,882	8,312	(1)	France 6,812; United Kingdom 1,051; Japan 223.
Hoop and strip	96	71	--	West Germany 20; France 18; United Kingdom 15.
Rails and accessories	94	1,133	--	France 1,011; Norway 90; United Kingdom 21.
Wire	1,395	942	--	France 822; United Kingdom 74; China 24.
Tubes, pipes, fittings	5,313	4,883	50	France 2,898; China 1,067; Netherlands 174.
Castings and forgings, rough	367	148	(1)	France 145; Italy 2.
Lead:				
Oxides and hydroxides	54	44	--	France 33; Netherlands 6; West Germany 5.
Metal including alloys, unwrought and semimanufactures	5	45	--	All from France.
Manganese:				
Ore and concentrate	2	2	--	Do.
Oxides and hydroxides	322	314	--	All from Gabon.
Nickel metal including alloys, semimanufactures	203	3,169	(1)	United Kingdom 3,044; Italy 87; France 34.
Silver metal including alloys, unwrought and partly wrought				
value, thousands	$854	$41	--	France $34; Switzerland $6; United Kingdom $1.
Tin metal including alloys, unwrought and semimanufactures	9	5	--	France 4; United Kingdom 1.
Titanium: Oxides and hydroxides	104	145	--	West Germany 73; France 26; United Kingdom 15.
Zinc:				
Oxides and hydroxides	38	18	--	France 15; United Kingdom 3.
Metal including alloys:				
Unwrought	34	--		
Semimanufactures	71	1	--	All from France.
Other:				
Alkali, alkaline-earth, rare-earth metals	15	5	--	Do.
Metalloids	6	9	(1)	West Germany 7; France 1; Italy 1.
Metals including alloys, unwrought and semimanufactures	20	9	--	Mainly from Spain.
NONMETALS				
Abrasives, n.e.s.:				
Natural: Corundum, emery, pumice, etc	3	43	--	France 42.
Artificial: Corundum	9	--		
Grinding and polishing wheels and stones	19	24	--	France 15; Italy 5; West Germany 2.
Asbestos, crude	1,459	1,177	--	U.S.S.R. 599; Canada 575.
Barite and witherite	54	2	--	All from France.
Boron materials:				
Crude, natural borates	454	700	700	
Oxide and acid	6	3	--	All from France.
Cement	13,673	4,591	--	France 4,101; Poland 435; Spain 55.
Chalk	2,253	1,452	--	France 1,422; West Germany 30.
Clays:				
Crude	718	488	--	France 271; Togo 96; Benin 76.
Products:				
Nonrefractory	5,119	2,891	--	Italy 1,597; France 1,086; Spain 109.
Refractory including nonclay brick	954	964	--	France 536; West Germany 218; Morocco 176.

See footnotes at end of table.

Table 8.—Senegal: Imports of mineral commodities —Continued

(Metric tons unless otherwise specified)

Commodity	1979	1980	Sources, 1980	
			United States	Other (principal)
NONMETALS —Continued				
Diamond: Industrial value, thousands	$14	$3	--	All from Brazil.
Diatomite and other infusorial earth	170	39	--	All from France.
Fertilizer materials:				
Natural	22	--		
Manufactured:				
Nitrogenous	21,776	6,174	--	France 2,920; United Kingdom 2,500; West Germany 754.
Phosphatic	100	103	--	United Kingdom 100; West Germany 2.
Potassic	19,938	15,374	--	France 8,102; East Germany 7,077; United Kingdom 122.
Other including mixed	5	5	--	West Germany 3; France 2.
Ammonia	10,676	8,514	--	Ireland 3,322; Netherlands 1,762; United Kingdom 1,694.
Graphite, natural	(1)	1	--	All from France.
Gypsum and plasters	6,426	4,824	--	Morocco 4,810; France 14.
Lime	2,264	1,734	--	France 1,000; West Germany 660; United Kingdom 74.
Magnesite	3	--		
Mica:				
Crude including splittings and waste	--	5	--	All from France.
Worked including agglomerated splittings	2	2	--	Mainly from France.
Pigments, mineral: Iron oxides, processed	64	109	--	West Germany 89; Spain 10; United Kingdom 8.
Precious and semiprecious stones:				
Synthetic value, thousands	$1	--		
Salt and brine	144	464	--	Italy 300; Netherlands 65; France 46.
Sodium and potassium compounds, n.e.s.:				
Caustic potash	16	4	--	All from France.
Caustic soda	9,802	6,166	--	East Germany 2,949; West Germany 1,209; France 892.
Soda ash	810	712	--	France 347; West Germany 277; United Kingdom 59.
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked	400	22	--	Italy 20; West Germany 1.
Worked	569	417	--	Italy 300; France 114.
Gravel and crushed rock	8	65	--	West Germany 34; France 28.
Quartz and quartzite	2	11	--	All from France.
Sand other than metal-bearing	56	42	--	Do.
Sulfur:				
Elemental:				
Crude	6	9	--	Do.
Refined	18,209	14,293	--	Poland 14,291; France 2.
Sulfuric acid	103	65	--	Netherlands 45; United Kingdom 19.
Talc, steatite, soapstone, pyrophyllite	180	115	--	France 111; Italy 3.
Other:				
Crude	95	114	--	All from France.
Oxides and hydroxides of barium, magnesium, strontium	4	5	--	All from West Germany.
Building materials of asphalt, asbestos and fiber cements, unfired nonmetals	1,650	1,102	2	France 680; United Kingdom 196; Morocco 168.
MINERAL FUELS AND RELATED MATERIALS				
Asphalt and bitumen, natural	--	21	--	All from France.
Carbon black	67	15	--	France 14; West Germany 1.
Coal, all grades including briquets	25	20	--	All from Poland.
Coke and semicoke	711	356	--	France 276; United Kingdom 80.
Petroleum:				
Crude thousand 42-gallon barrels	5,616	5,582	--	Nigeria 2,047; Iraq 1,853; Algeria 779.
Refinery products:				
Gasoline do.	218	599	--	United Kingdom 312; Saudi Arabia 64.
Kerosine and jet fuel do.	239	293	--	United Kingdom 71; France 55; Netherlands 44.
Distillate fuel oil do.	354	212	--	Saudi Arabia 96; Venezuela 40.
Residual fuel oil do.	1	65	--	Trinidad and Tobago 5.
Lubricants do.	11	10	(1)	United Kingdom 1.

See footnotes at end of table.

Table 8.—Senegal: Imports of mineral commodities —Continued

(Metric tons unless otherwise specified)

Commodity	1979	1980	Sources, 1980	
			United States	Other (principal)
MINERAL FUELS AND RELATED MATERIALS —Continued				
Petroleum —Continued				
Refinery products —Continued				
Other:				
Liquefied petroleum gas thousand 42-gallon barrels	15	21	--	United Kingdom 10; Algeria 4.
Mineral jelly and wax do	7	7	(1)	United Kingdom 5; West Germany 1.
Bitumen and other residues do	35	37	--	Venezuela 33; France 2.
Bituminous mixtures do	29	18	(1)	Venezuela 12; Spain 6.
Mineral tar and other coal-, petroleum-, and gas-derived crude chemicals	174	123	--	Netherlands 61; United Kingdom 44; France 13.

[1]Less than 1/2 unit.

TOGO

Phosphate remained the principal mineral material produced in Togo in 1981. Poor market conditions led to a sharp reduction in production.

COMMODITY REVIEW

Cement.—Ciment du Togo's production of cement was mainly marketed locally, but about 15% was exported to neighboring countries. Cement prices, exfactory, increased to $86.42 from $73.32 per ton.[13]

The cement clinker plant at Tabligbo, jointly owned by Ghana, the Ivory Coast, and Togo, produced about 600,000 tons of clinker for cement production.

Marble.—The Société Togolaise de Marbrerie et de Materiaux, partly Government owned, mined marble from two deposits at Gnawoulou and Pagala. Operational and financial difficulties prevented full operational capacity. The company also produced burnt brick, floor brick, and tiles.

Phosphate Rock.—Output was at about 69% of capacity in 1981 because of exceptionally poor sales. Production was intentionally limited to only that quantity that could be marketed. A credit of $5.7 million was approved by the World Bank to finance engineering work on a 1,000-ton-per-day phosphoric acid plant.[14]

Salt.—Production was by the Government-owned Société des Salines du Togo. All output was sold domestically at $128 per ton.

Table 9.—Togo: Exports of mineral commodities[1]

(Metric tons unless otherwise specified)

Commodity	1979	Destinations, 1979	
		United States	Other (principal)
METALS			
Aluminum metal including alloys, semimanufactures	5	--	All to Niger.
Copper metal including alloys, semimanufactures -- value, thousands	$1	--	All to Benin.
Iron and steel metal: Semimanufactures:			
Bars, rods, angles, shapes, sections	34	--	Niger 26; Benin 8.
Universals, plates, sheets value, thousands	$1	--	All to Niger.
Rails and accessories	4	--	Do.
Tubes, pipes, fittings	25	--	West Germany 16; France 3; Netherlands 3; Nigeria 3.
NONMETALS			
Abrasives, n.e.s.: Grinding and polishing wheels and stones -- value, thousands	$1	--	All to Netherlands.

See footnotes at end of table.

Table 9.—Togo: Exports of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1979	Destinations, 1979	
		United States	Other (principal)
NONMETALS —Continued			
Cement	36,389	--	Upper Volta 35,772; Ghana 498; Mali 115.
Clays:			
Crude	65	--	All to Senegal.
Products: Nonrefractory	19	--	Niger 17; Upper Volta 2.
Diamond: Gem, not set or strung value, thousands	$527	--	Switzerland $420; Netherlands $107.
Fertilizer materials: Crude, phosphatic thousand tons	2,692	14	France 599; Netherlands 596; Yugoslavia 407.
Gypsum and plasters	15	--	All to Niger.
Salt and brine	51	--	All to Ghana.
Stone, sand and gravel:			
Dimension stone, crude	32	--	Niger 20; Ghana 8.
Gravel and crushed rock	26	--	All to Congo.
Other:			
Crude	99	--	All to Upper Volta.
Building materials of asphalt, asbestos and fiber cements, unfired nonmetals	70	--	All to France.
MINERAL FUELS AND RELATED MATERIALS			
Asphalt and bitumen, natural	102	--	All to Benin.
Petroleum refinery products:			
Gasoline 42-gallon barrels	196,988	--	West Germany 99,374; Nigeria 93,007.
Kerosine and jet fuel do.	92,364	--	All to Nigeria.
Distillate fuel oil do.	209,992	--	Nigeria 64,924; West Germany 56,703.
Residual fuel oil do.	153,260	153,180	NA.
Lubricants do.	819	--	Ivory Coast 756; Niger 42.
Other: Liquefied petroleum gas do.	46	--	All to Ghana.

NA Not available.
[1]Data for 1978 are not available.

Table 10.—Togo: Imports of mineral commodities[1]

(Metric tons unless otherwise specified)

Commodity	1979	Sources, 1979	
		United States	Other (principal)
METALS			
Aluminum metal including alloys, semimanufactures	156	10	France 77; Ivory Coast 34; Belgium-Luxembourg 24.
Copper:			
Matte and speiss value, thousands	$2	--	All from France.
Metal including alloys:			
Unwrought	1	--	Do.
Semimanufactures	26	1	France 24.
Iron and steel metal:			
Scrap	437	--	Benin 237; France 200.
Ferroalloys	350	--	Mainly from Portugal.
Steel, primary forms	34	--	Sweden 18; China 14.
Semimanufactures:			
Bars, rods, angles, shapes, sections	8,203	--	France 6,881; West Germany 894; Italy 202.
Universals, plates, sheets	4,117	--	Japan 2,338; France 1,589; Belgium-Luxembourg 74.
Hoop and strip	96	23	France 43; West Germany 30.
Rails and accessories	245	--	Switzerland 105; West Germany 80; France 58.
Wire	282	--	France 157; Senegal 85; Belgium-Luxembourg 26.
Tubes, pipes, fittings	2,307	(2)	France 1,963; Spain 81; Czechoslovakia 62.
Castings and forgings, rough	68	--	West Germany 49; France 19.
Lead metal including alloys, semimanufactures	5	--	France 2; West Germany 2.
Platinum-group metals including alloys, unwrought and partly wrought value, thousands	$52	--	Ghana $47; France $5.

See footnotes at end of table.

Table 10.—Togo: Imports of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1979	Sources, 1979	
		United States	Other (principal)
METALS —Continued			
Silver:			
Waste and sweepings value, thousands	$7	--	All from United Kingdom.
Metal including alloys, unwrought and partly wrought do	$6	--	France $3; Ireland $2; West Germany $1.
Tin metal including alloys, semimanufactures	1	--	Mainly from Honduras.
Titanium: Oxides and hydroxides	18	--	United Kingdom 10; France 8.
Zinc metal including alloys, semimanufactures	1	--	Mainly from Ivory Coast.
Other:			
Metalloids	27	5	France 21.
Base metals including alloys, unwrought and semimanufactures value, thousands	$1	--	All from France.
NONMETALS			
Abrasives, n.e.s.:			
Artificial: Corundum	5	--	Do.
Grinding and polishing wheels and stones	2	--	France 1.
Asbestos, crude	100	--	All from China.
Barite and witherite	21	--	All from France.
Cement	76,878	--	France 38,096; United Kingdom 36,804; China 1,450.
Chalk	84	--	All from France.
Clays:			
Crude	20	--	France 19.
Products:			
Nonrefractory	1,301	10	France 552; Italy 392; Belgium-Luxembourg 168.
Refractory including nonclay brick	159	--	West Germany 148; France 11.
Diamond: Industrial value, thousands	$30	--	All from Venezuela.
Diatomite and other infusorial earth	37	--	France 22; Netherlands 15.
Fertilizer materials:			
Manufactured:			
Nitrogenous	30	--	West Germany 20; France 10.
Potassic	3	--	All from France.
Other including mixed	1,501	--	Netherlands 1,500; France 1.
Ammonia	9	--	France 5; West Germany 2.
Graphite, natural value, thousands	$1	--	All from France.
Lime	688	--	France 668; Nigeria 15; West Germany 5.
Precious and semiprecious stones other than diamond value, thousands	$50	--	All from France.
Pyrites, unroasted	4,530	--	Morocco 3,940; France 544; Ivory Coast 29.
Salt and brine	4,544	--	Ghana 4,018; West Germany 411; Upper Volta 59.
Sodium and potassium compounds, n.e.s.:			
Caustic potash	123	--	Nigeria 113; Switzerland 9.
Caustic soda	953	--	West Germany 865; France 58.
Stone, sand and gravel:			
Dimension stone:			
Crude and partly worked	285	--	China 202; France 25; Spain 25.
Worked	32	--	France 18; Belgium-Luxembourg 14.
Dolomite, chiefly refractory-grade	84	--	All from France.
Sand other than metal-bearing	3	--	Do.
Sulfur: Sulfuric acid	60	--	Belgium-Luxembourg 40; Netherlands 12.
Talc, steatite, soapstone, pyrophyllite	59	--	All from France.
Other:			
Crude	1,180	--	United Kingdom 1,019; France 159.
Oxides and hydroxides of barium, magnesium, strontium	32	--	West Germany 31.
Building materials of asphalt, asbestos and fiber cements, unfired nonmetals	1,213	--	France 782; Ghana 279; China 74.
MINERAL FUELS AND RELATED MATERIALS			
Asphalt and bitumen, natural	23	--	All from China.
Coal and briquets:			
Coal, all grades excluding briquets	10	--	All from West Germany.
Briquets of all grades of coal	175	NA	NA.
Petroleum:			
Crude thousand 42-gallon barrels	3,424	--	All from Nigeria.
Refinery products:			
Gasoline do	407	--	Netherlands 125; Venezuela 110; Saudi Arabia 66.
Kerosine and jet fuel do	92	--	Netherlands 25; Saudi Arabia 21; Venezuela 14.

See footnotes at end of table.

Table 10.—Togo: Imports of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1979	Sources, 1979	
		United States	Other (principal)
MINERAL FUELS AND RELATED MATERIALS —Continued			
Petroleum —Continued			
Refinery products —Continued			
Distillate fuel oil thousand 42-gallon barrels	359	--	Venezuela 122; Netherlands 112; Saudi Arabia 30.
Residual fuel oil do	374	--	Saudi Arabia 339; Italy 23.
Lubricants do	22	(2)	France 7; Ivory Coast 7; Netherlands 4.
Other:			
Liquefied petroleum gas 42-gallon barrels	5,464	--	Ghana 4,605; Ivory Coast 754; France 93.
Mineral jelly and wax do	409	--	West Germany 346; Nigeria 63.
Bitumen and other residues do	1,364	--	Ghana 484; Nigeria 407; Belgium-Luxembourg 314.
Bituminous mixtures do	25,022	--	Spain 17,568; Netherlands Antilles 6,121.
Mineral tar and other coal-, petroleum-, and gas-derived crude chemicals	61	--	Mainly from France.

NA Not available.
[1]Data for 1978 are not available.
[2]Less than 1/2 unit.

UPPER VOLTA

Excluding production of building materials for local use, output of mineral-related commodities was negligible in 1981. A small antimony mine was operated during the year but closed at yearend because of unprofitability. Output was insignificant.

The GDP was estimated at $1.216 billion in 1981, down from $1.358 billion[15] in 1980. A negative trade balance of $252 million was reported in 1981. Petroleum product imports accounted for $50.3 million out of a total import value of $326 million. Iron and steel imports were valued at $9.1 million.

Lead, Zinc, and Silver.—A massive sulfide deposit, averaging 4% zinc, 0.6% lead, and 2.6 troy ounces of silver per ton, was discovered in the Boromo greenstone belt, about 30 kilometers northwest of Kondougou. Discovery was by a joint United Nations and Bureau Voltaique de la Geologie et des Mines exploration team.

Manganese.—The Mining Society of Kiere was formed at Bobo-Dioulasso with a capital of $300,000 for the purpose of extracting and marketing manganese from Kiere.

[1]Physical scientist, Division of Foreign Data.

[2]Where necessary, values have been converted from Communauté Financière Africaine francs (CFAF) to U.S. dollars at the rate of CFAF295.90=US$1.00 for 1981.
[3]Where necessary, values have been converted from Cape Verde escudos (CVEsc) to U.S. dollars at the rate of CVEsc39=US$1.00 for 1981.
[4]Where necessary, values have been converted from Gambian delasi (GD) to U.S. dollars at the rate of GD2.2=US$1.00 for 1981.
[5]Where necessary, values have been converted from Guinean syli (GS) to U.S. dollars at the rate of GS21.348=US$1.00 for 1981.
[6]U.S. Embassy, Conakry, Guinea. State Department Airgram 10, May 12, 1982, 14 pp.
[7]Where necessary, values have been converted from Guinean-Bissau pesos (GBP) to U.S. dollars at the rate of GBP35=US$1.00 for 1981.
[8]Where necessary, values have been converted from Communauté Financière Africaine francs (CFAF) to U.S. dollars at the rate of CFAF250=US$1.00 for 1981.
[9]Where necessary, values have been converted from Mali francs (MF) to U.S. dollars at the rate of MF513=US$1.00 for 1981.
[10]U.S. Embassy, Bamako, Mali. State Department Telegram 6731, Oct. 30, 1981, 1 p.
[11]Where necessary, values have been converted from Communauté Financière Africaine francs (CFAF) to U.S. dollars at the rate of CFAF275=US$1.00 for 1981.
[12]Where necessary, values have been converted from Communauté Financière Africaine francs (CFAF) to U.S. dollars at the rate of CFAF280=US$1.00 for 1981.
[13]Where necessary, values have been converted from Communauté Financière Africaine francs (CFAF) to U.S. dollars at the rate of CFAF313=US$1.00 for 1981.
[14]U.S. Embassy, Lome, Togo. State Department Airgram 7, Apr. 29, 1982, 3 pp.
[15]Where necessary, values have been converted from Communauté Financière Africaine francs (CFAF) to U.S. dollars at the rate of CFAF211=US$1.00 for 1980 and CFAF272=US$1.00 for 1981.

Table 11.—Upper Volta: Exports of mineral commodities

(Metric tons unless otherwise specified)

Commodity	1978	1979	Principal destinations, 1979
METALS			
Aluminum metal including alloys, semimanufactures	(1)	3	Cameroon 1; Ivory Coast 1.
Copper metal including alloys, scrap	8	7	All to Ivory Coast.
Iron and steel metal:			
Ferroalloys	21	33	Mainly to Ivory Coast.
Semimanufactures:			
Bars, rods, angles, shapes, sections	18	297	Niger 278; Mali 16; Ivory Coast 3.
Universals, plates, sheets	--	35	Niger 24; Ghana 10.
Tubes, pipes, fittings	3	12	Mali 6; Niger 5.
Manganese: Oxides and hydroxides	--	20	All to Ivory Coast.
Zinc metal including alloys, scrap	44	20	Do.
NONMETALS			
Abrasives, n.e.s.: Grinding and polishing wheels and stones value, thousands	--	$1	Do.
Cement	10	168	Mali 153; Ghana 15.
Clays: Products, nonrefractory	--	1	All to Niger.
Fertilizer materials: Manufactured	35	--	
Salt and brine	27	--	
Sulfur: Sulfuric acid value, thousands	$1	--	
MINERAL FUELS AND RELATED MATERIALS			
Petroleum refinery products:			
Gasoline 42-gallon barrels	136	178	All to Ivory Coast.
Kerosine and jet fuel do.	1,992	16,608	Ivory Coast 13,392; Ghana 62.
Lubricants do.	49	7	All to Ghana.

[1]Less than 1/2 unit.

Table 12.—Upper Volta: Imports of mineral commodities

(Metric tons unless otherwise specified)

Commodity	1978	1979	Sources, 1979	
			United States	Other (principal)
METALS				
Aluminum:				
Oxides and hydroxides value, thousands	$1	--		
Metal including alloys:				
Scrap	300	395	--	Nigeria 72; Ghana 64.
Unwrought	6	--		
Semimanufactures	428	534	--	Cameroon 429; France 91; Finland 1.
Chromium: Oxides and hydroxides	(1)	1	--	Mainly from France.
Copper:				
Matte and speiss	1	1	--	Do.
Metal including alloys:				
Scrap value, thousands	--	$1	--	All from Belgium-Luxembourg.
Unwrought and semimanufactures	28	54	(1)	West Germany 36; France 12; United Kingdom 6.
Iron and steel metal:				
Pig iron, cast iron, powder, shot	(1)	35	--	Mainly from France.
Ferroalloys	67	179	--	France 107; Ivory Coast 7; Ghana 6.
Steel, primary forms	58	--		
Semimanufactures:				
Bars, rods, angles, shapes, sections	5,778	4,992	1	France 4,162; West Germany 315; Belgium-Luxembourg 234.
Universals, plates, sheets	4,778	9,259	--	France 6,333; Belgium-Luxembourg 2,767.
Hoop and strip	60	198	--	France 177; Belgium-Luxembourg 10; Netherlands 10.
Rails and accessories	(1)	1,338	--	West Germany 1,176; France 162.
Wire	347	425	--	France 196; Ivory Coast 118; Belgium-Luxembourg 99.
Tubes, pipes, fittings	962	1,344	1	France 852; Japan 177; Romania 114.
Lead:				
Oxides and hydroxides	--	1	--	All from West Germany.
Metal including alloys, unwrought and semimanufactures	3	2	--	All from France.
Magnesium metal including alloys, semimanufactures	12	--		
Manganese: Oxides and hydroxides	503	1,178	--	All from France.

See footnotes at end of table.

Table 12.—Upper Volta: Imports of mineral commodities —Continued

(Metric tons unless otherwise specified)

Commodity	1978	1979	Sources, 1979	
			United States	Other (principal)
METALS —Continued				
Mercury ____ value, thousands	$1	$3	--	All from France.
Nickel metal including alloys, unwrought and semimanufactures ____ do	$1	$2	$2	
Silver metal including alloys, unwrought and partly wrought ____ do	$1	$4	--	All from West Germany.
Tin metal including alloys, unwrought and semimanufactures	2	3	--	All from France.
Titanium: Oxides and hydroxides	--	30	--	France 24; Belgium-Luxembourg 6.
Tungsten metal including alloys, all forms ____ value, thousands	--	$5	$5	
Zinc:				
Oxides and hydroxides	45	36	--	All from France.
Metal including alloys, semimanufactures	271	321	--	Do.
Other:				
Alkali, alkaline-earth, rare-earth metals	2	(1)	--	Do.
Base metals including alloys, unwrought and semimanufactures	1	3	--	Mainly from Nigeria.
NONMETALS				
Abrasives, n.e.s.:				
Natural: Corundum, emery, pumice, etc	10	1	--	All from France.
Grinding and polishing wheels and stones	13	41	(1)	Denmark 31; France 4; Ghana 4.
Barite and witherite	29	45	--	All from France.
Boron materials:				
Crude natural borates	--	1	--	Do.
Oxide and acid ____ value, thousands	--	$1	--	Do.
Cement	70,812	103,836	--	Togo 44,134; Poland 18,500; U.S.S.R. 12,526.
Chalk	211	259	--	All from France.
Clays:				
Crude	83	71	--	Do.
Products:				
Nonrefractory	932	1,017	--	France 740; West Germany 197; China 47.
Refractory including nonclay brick	50	32	--	All from France.
Diatomite and other infusorial earth	142	86	--	France 81; Belgium-Luxembourg 5.
Fertilizer materials:				
Crude	26	228	--	All from France.
Manufactured:				
Nitrogenous	4,079	2,394	127	Nigeria 828; France 667; Netherlands 470.
Phosphatic	1,023	168	130	Netherlands 37.
Potassic	174	91	--	France 60; Belgium-Luxembourg 30.
Other including mixed	11,053	20,504	--	Belgium-Luxembourg 16,076; Nigeria 2,513; Netherlands 1,007.
Ammonia	11	15	--	France 14.
Gypsum and plasters	23	52	--	All from France.
Lime	1,178	404	--	France 335; Spain 63; Ivory Coast 5.
Magnesite	2	--		
Mica:				
Crude including splittings and waste	4	8	--	All from France.
Worked including agglomerated splittings	--	6	--	Do.
Pigments, mineral: Iron oxides, processed	28	37	--	France 24; United Kingdom 12.
Salt and brine	13,573	14,439	--	Ghana 10,455; Senegal 3,228; Belgium-Luxembourg 300.
Sodium and potassium compounds, n.e.s.:				
Caustic potash	87	243	--	West Germany 180; France 40; Italy 10.
Caustic soda	1,182	1,213	--	West Germany 849; Netherlands 143; Spain 130.
Soda ash	45	77	--	West Germany 20; France 17; East Germany 15; Ireland 15.
Stone, sand and gravel:				
Dimension stone, crude and partly worked	72	53	--	Ghana 44; France 7.
Dolomite, chiefly refractory-grade	34	28	--	All from France.
Gravel and crushed rock	--	29	--	Ghana 24; France 5.
Limestone other than dimension	10	--		
Sand other than metal-bearing	--	3	--	France 2; Nigeria 1.

See footnotes at end of table.

Table 12.—Upper Volta: Imports of mineral commodities —Continued

(Metric tons unless otherwise specified)

Commodity	1978	1979	Sources, 1979	
			United States	Other (principal)
NONMETALS —Continued				
Sulfur:				
Elemental:				
Crude	12	39	--	All from France.
Refined	2	4	1	France 3.
Sulfuric acid	30	47	--	France 39; Ivory Coast 7.
Talc, steatite, soapstone, pyrophyllite	131	85	--	France 82; West Germany 3.
Other:				
Crude	9	84	--	All from France.
Slag and ash, not metal-bearing	--	5	--	Mainly from France.
Building materials of asphalt, asbestos and fiber cements, unfired nonmetals	109	143	--	All from France.
MINERAL FUELS AND RELATED MATERIALS				
Carbon black	101	145	--	Do.
Coal, all grades including briquets	1	--		
Coke and semicoke	--	1	--	All from France.
Petroleum refinery products:				
Gasoline—42-gallon barrels	417,902	426,700	--	Ivory Coast 9,588; Gabon 8,959; Venezuela 7,948.
Kerosine and jet fuel—do	101,502	98,216	--	Venezuela 8,486; Italy 7,200; Ivory Coast 5,262.
Distillate fuel oil—do	166,358	273,088	448	Ivory Coast 7,132; Venezuela 6,908; Italy 6,647.
Residual fuel oil—do	203,896	265,821	--	Ivory Coast 18,661; Italy 9,257; France 7,872.
Lubricants—do	8,848	23,310	7	Ivory Coast 18,494; France 1,890.
Other:				
Liquefied petroleum gas—do	2,854	5,626	--	Ivory Coast 824; France 186.
Mineral jelly and wax—do	1,047	1,873	--	Netherlands 1,133; France 346; West Germany 236.
Petroleum coke—do	22	--		
Bitumen—do	533	273	--	All from Netherlands.
Bituminous mixtures—do	18,186	13,259	--	Venezuela 3,103; France 103.
Mineral tar and other coal-, petroleum-, and gas-derived crude chemicals	40	22	--	Netherlands 21.

[1]Less than 1/2 unit.