



2015 Minerals Yearbook

AFRICA SUMMARY [ADVANCE RELEASE]



Base modified from ESRI ArcGIS online world countries (generalized) map data, 2017
 Mercator Auxiliary Sphere projection
 World Geodetic System 1984 datum

Figure 1. Map of the sub-Saharan region of Africa. The countries covered in this report (with the exception of Cabo Verde, which is not shown) are labeled on the map; bordering countries are shown in gray and not labeled.

THE MINERAL INDUSTRIES OF AFRICA

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Africa is richly endowed with mineral resources. The 51 independent nations and other territories of sub-Saharan Africa and adjacent islands covered in this chapter encompass a land area of 23.8 million square kilometers, which is more than twice the size of the United States, and were home to about 1.01 billion people in 2015 (fig. 1, facing page; table 1). For many of these countries, mineral exploration and production constitute significant parts of their economies and remain keys to future economic growth. In 2015, Africa's share of world production of mined cobalt was 56%; chromite, about 54%; manganese, 50%; gold, about 19%; uranium, 13%; mined copper, 10%; anthracite and bituminous coal, 4%; lithium, 3%; and aluminum, 1%. Africa also accounted for about 50% of the world's diamond production by volume and between 49% and 55% by value (fig. 2; IDEX Magazine, 2016; Jaskula, 2017).

The U.S. Geological Survey (USGS) acknowledges and expresses its sincere appreciation to the following Government agencies, international institutions, and private research organizations for providing mineral production statistics, basic economic data, and mineral exploration and other mineral-related information:

For mineral production statistics—

- Algeria—Ministry of Industry and Mines;
- Botswana—Department of Mines;
- Burkina Faso—Ministry of Energy, Mines, and Quarries;
- Liberia—Department of Mines;
- Mauritius—Statistics Mauritius;
- Namibia—Ministry of Mines and Energy;
- Rwanda—Ministry of Natural Resources;
- Senegal—National Agency of Statistics and Demography;
- Seychelles—Seychelles Energy Commission;
- South Africa—Department of Mineral Resources;
- Tanzania—Ministry of Energy and Minerals; and
- Togo—Head Office of Mining and Geology.

For basic economic data—the International Monetary Fund.

For exploration and other mineral-related information—the Metals Economics Group (MEG) in Canada.

General Economic Conditions

In 2015, the real gross domestic product (GDP) of sub-Saharan Africa increased by 4.2% compared with an increase of 5.8% in 2014. The worldwide GDP increased by 2.7% in 2015. In Sierra Leone, the GDP decreased by 20.6% in 2015 after increasing by 4.6% in 2014 and 20.7% in 2013. The high growth rate in 2013 was mostly attributable to the opening of new iron ore mines; the decrease in 2015 was partially attributable to the closure of the mines. Nigeria's GDP increased by 2.7% in 2015 compared with an increase of 6.3% in 2014. The lower growth rate was partially attributable to decreased crude petroleum

production resulting from lower world crude petroleum prices (table 2).

Investment Data

In South Africa, numerous producers are planning new mines and plants and capacity expansions of existing operations for cement, chromite, coal, copper, diamond, ferrovanadium, fluorspar, gold, ilmenite, iron ore, manganese ore, nickel, platinum-group metals (PGMs), phosphate fertilizers, rare-earth elements, rutile, uranium, vanadium, zinc, and zircon. Projects included the extension of the life of the Venetia diamond mine, which was estimated to cost \$2.1 billion. Other countries in Africa also had substantial planned investments in new mineral projects. For the Kamoanga copper project in the Democratic Republic of the Congo [Congo (Kinshasa), also known as the DRC], capital costs in the first phase of the project were estimated to be \$1.4 billion. The Liganga iron ore and steel project in Tanzania had an estimated cost of \$1.7 billion (Magomba, 2014; Cornish, 2016; Modern Mining, 2016).

Legislation

In 2015, the Government of Burkina Faso adopted an amended mining code. The Government of Gabon enacted a new mining code at the end of January. The Senate of Kenya passed a new mining code in 2015; the bill was awaiting the President's signature at yearend.

Uganda had a moratorium on the export of unprocessed minerals; the Government lifted the moratorium for all minerals except for copper and iron in August 2015. In July, the Government of Zambia reduced the increased royalty rates that became effective in January. The Government of Zimbabwe suspended the new export tax on ores and concentrates containing PGMs in July after introducing the tax in January.

Exploration

Exploration activity, as defined by Africa's exploration budgets reported by SNL Metals & Mining (SNL), decreased to about \$1.2 billion in 2015 from about \$1.7 billion in 2014 (SNL Metals & Mining, 2015). Based on site data compiled by the USGS, active gold and silver projects accounted for approximately 45% of Africa's reported exploration projects in 2015; copper, 11%; PGMs, 7%; diamond and graphite, 6%; manganese, 5%; iron ore and uranium, 4% each; and other minerals, 12%. Table 3 is a list of selected exploration projects.

Commodity Overview

This report includes a regional production table (table 4) and mineral commodity outlook tables (tables 5 through 20). In tables 5 through 20, estimates for the production of major

mineral commodities for 2016 and beyond have been based upon supply-side assumptions, such as announced plans for increased production, new capacity construction, and bankable feasibility studies. The outlook tables in this summary chapter show historic and projected production trends; therefore, no indication is made about whether the historic data are estimated or reported and revisions are not identified. Data on individual mineral commodities in tables in the individual country chapters are labeled to indicate estimates and revisions. The outlook segments of the mineral commodity tables are based on projected trends that could affect current (2015) producing facilities and on planned new facilities that operating companies, consortia, or Governments have projected to come online within indicated timeframes. Forward-looking information, which includes estimates of future production, exploration and mine development, cost of capital projects, and timing of the start of operations, are subject to a variety of risks and uncertainties that could cause actual events or results to differ significantly from expected outcomes. Projects listed in the following section are presented as an indication of industry plans and are not a USGS prediction of what will take place.

Metals

Aluminum and Bauxite and Alumina.—In 2015, Africa accounted for 6% of world bauxite production (table 4). Africa's bauxite production decreased by about 3% in 2015 compared with that of 2014. Guinea accounted for about 87% of Africa's bauxite production in 2015; Sierra Leone, 7%; and Ghana, 5%. Africa's bauxite production is likely to double between 2017 and 2021 (table 5).

Africa's production of refined aluminum decreased by 6% in 2015. South Africa accounted for about 51% of Africa's aluminum output in 2015; Mozambique, 41%; and Cameroon, 4%. The production of refined aluminum is expected to increase by 4% by 2017 and subsequently to remain unchanged until at least 2021 (table 6).

Cobalt.—In 2015, Africa's cobalt mine production increased by about 5% compared with that of 2014. Between 2005 and 2015, production increased by an average of more than 8% per year. In 2015, Congo (Kinshasa) accounted for 84% of Africa's cobalt mine production; Zambia, 6%; and Madagascar, 5%. Africa's cobalt mine production is expected to increase by an average of between 8% and 9% per year from 2015 to 2021 (table 7).

Copper.—Africa's copper mine production decreased by nearly 4% in 2015 compared with that of 2014. Between 2005 and 2015, production increased by an average of 11% per year. In 2015, Congo (Kinshasa) accounted for 51% of Africa's copper mine production; Zambia, 37%; and South Africa, 4%. Africa's copper mine production is expected to increase by an average of more than 7% per year from 2015 to 2021 (table 8).

The production of Africa's refined copper decreased by about 1% in 2015. Between 2005 and 2015, production increased by an average of 11% per year. In 2015, Congo (Kinshasa) accounted for 62% of Africa's refined copper production; Zambia, 33%; and South Africa, 5%. The production of refined

copper is expected to increase by an average of between 7% and 8% per year from 2015 to 2021 (table 9).

Gold.—Africa's gold mine production increased by about 2% from 2014 to 2015. In 2015, South Africa accounted for 23% of Africa's gold production; Ghana, 20%; Sudan, 13%; Tanzania, 7%; and Burkina Faso, Congo (Kinshasa), and Mali, 6% each. Gold mine production in Africa is expected to increase by an average of more than 2% per year from 2015 to 2021 (table 10).

Iron and Steel.—Africa's production of crude steel decreased by about 2% in 2015 compared with that of 2014. In 2015, South Africa accounted for 81% of regional crude steel production; Nigeria, 8%; and Kenya, 5%. Crude steel production is expected to increase by about 3% per year from 2015 to 2021 (table 12).

Iron Ore.—In 2015, the iron content of ore produced in Africa was 58.5 million metric tons (Mt) compared with 74.3 Mt in 2014. Most of the decrease was attributable to the closure of mines in Sierra Leone. South Africa accounted for 80% of continental output in 2015; Mauritania, 12%; and Liberia, 5%. The iron content of ore produced in Africa is expected to increase to about 89 Mt by 2021 (table 11).

Nickel.—Africa's nickel mine production increased by about 7% from 2014 to 2015. Between 2005 and 2015, production increased by an average of between 4% and 5% per year. South Africa accounted for about 41% of Africa's nickel mine production in 2015; Madagascar, 39%; Zimbabwe, 12%; and Botswana, 8%. Nickel mine production is expected to increase by an average of between 3% and 4% per year from 2015 to 2021 (table 13).

Platinum-Group Metals.—From 2014 to 2015, Africa's production of mined platinum and palladium increased by 42% and 35%, respectively. South Africa, which was the continent's dominant producer of PGMs, accounted for 92% and 88% of the production of platinum and palladium, respectively, in 2015. Africa's production of platinum is expected to increase by an average of nearly 3% per year each from 2015 to 2021 (tables 14, 15).

Tin.—In 2015, Africa's tin mine production decreased by about 23% compared with that of 2014. In 2015, Congo (Kinshasa) accounted for 67% of Africa's tin mine production, and Rwanda, 30% (table 16). Rwanda produced a small amount of refined tin in 2015 (table 17). Tin mine production is expected to increase by an average of 22% per year from 2015 to 2021.

Industrial Minerals

Diamond.—Africa's diamond production decreased by about 6% in 2015 compared with that of 2014 (table 18). Between 2005 and 2015, production decreased by an average of more than 4% per year. Botswana accounted for 34% of Africa's diamond output by volume in 2015; Congo (Kinshasa), 26%; Angola, 15%; South Africa, 14%; Zimbabwe, 6%; and Namibia, 3%. The production of diamond in Africa is expected to increase by an average of between 1% and 2% per year from 2015 to 2021 (table 18).

Lithium.—Zimbabwe was Africa's only producer of lithium minerals. In 2015, production at the Bikita Mine was estimated to have remained unchanged. Lithium mineral production at the Bikita Mine is likely to increase by about 30% by 2021 (table 19).

Mineral Fuels

Coal.—Africa’s coal production decreased by nearly 4% in 2015. South Africa, accounted for 94% of regional coal output in 2015; Mozambique, 3%; and Zimbabwe, 2%. Africa’s coal production is expected to increase by more than 5% per year from 2017 to 2021 (table 20).

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TABLE 1
AFRICA: AREA AND POPULATION IN 2015

Country or territory	Area ¹ (square kilometers)	Estimated population ² (thousands)
Angola	1,246,700	27,859
Benin	110,622	10,576
Botswana	566,730	2,209
Burkina Faso	273,800	18,111
Burundi	25,680	10,199
Cameroon	472,710	22,835
Cape Verde	4,033	533
Central African Republic	622,984	4,546
Chad	1,259,200	14,009
Comoros	2,235	777
Congo (Brazzaville)	341,500	4,996
Congo (Kinshasa)	2,267,048	76,197
Côte d'Ivoire	318,003	23,108
Djibouti	23,180	927
Equatorial Guinea	28,051	1,175
Eritrea	101,000	5,870 ¹
Ethiopia	1,000,000	99,873
Gabon	257,667	1,930
Gambia, The	10,120	1,978
Ghana	227,533	27,583
Guinea	245,717	12,092
Guinea-Bissau	28,120	1,771
Kenya	569,140	47,236
Lesotho	30,355	2,175
Liberia	96,320	4,500
Madagascar	581,540	24,234
Malawi	94,080	17,574
Mali	1,220,190	17,468
Mauritania	1,030,700	4,182
Mauritius	2,030	1,263
Mayotte	374 ³	208 ³
Mozambique	786,380	28,011
Namibia	823,290	2,426
Niger	1,266,700	19,897
Nigeria	910,768	181,182
Reunion	2,512 ³	793 ³
Rwanda	24,668	11,630
Sao Tome e Principe	964	196
Senegal	192,530	14,977
Seychelles	455	93
Sierra Leone	71,620	7,237
Somalia	627,337	13,908
South Africa	1,214,470	55,012
South Sudan	644,329	11,882
Sudan	1,861,484	38,648
Swaziland	17,204	1,319
Tanzania	885,800	53,880
Togo	54,385	7,417
Uganda	197,100	40,145
Zambia	743,398	16,101
Zimbabwe	386,847	15,777
Regional total	23,769,603	1,008,525
World total	148,940,000	7,355,220

¹Source: U.S. Central Intelligence Agency, The World Factbook.

²Source: The World Bank, 2017 World Development Indicators Database.

³Source: Embassy of France in Washington, DC.

TABLE 2
AFRICA: GROSS DOMESTIC PRODUCT^{1,2}

Country	Gross domestic product in 2015 based on purchasing power parity		Real gross domestic product growth rate (percent)		
	Gross value (billion dollars)	Per capita (dollars)	2013	2014	2015
	Angola	184.8	6,985	6.8	4.8
Benin	22.4	2,061	7.2	6.4	2.1
Botswana	35.2	16,546	11.3	4.1	-1.7
Burkina Faso	30.7	1,716	5.7	4.2	4.0
Burundi	7.8	831	5.9	4.5	-4.0
Cameroon	72.7	3,147	5.6	5.9	5.8
Cape Verde	3.4	6,399	0.8	0.6	1.1
Central African Republic	3.0	628	-36.7	1.0	4.8
Chad	30.6	2,642	5.8	6.9	1.8
Comoros	1.2	1,522	3.5	2.0	1.0
Congo (Brazzaville)	62.7	12,550 ³	8.5	9.5	6.9
Congo (Kinshasa)	30.2	396 ³	3.3	6.8	2.6
Côte d'Ivoire	80.6	3,399	9.3	8.8	9.0
Djibouti	3.1	3,210	5.0	6.0	6.5
Equatorial Guinea	34.8	29,617 ³	-4.1	-0.5	-7.4
Eritrea	8.7	1,387	3.1	5.0	4.8
Ethiopia	162.2	1,808	9.9	10.3	10.4
Gabon	34.6	18,653	5.5	4.4	3.9
Gambia, The	3.3	1,658	4.8	0.9	4.3
Ghana	115.4	4,292	7.3	4.0	3.9
Guinea	15.0	1,216	1.5	1.1	0.1
Guinea-Bissau	2.7	1,659	3.3	1.0	5.1
Kenya	142.2	3,218	5.7	5.3	5.6
Lesotho	6.7	3,464	3.6	3.4	2.5
Liberia	3.8	875	8.7	0.7	0.0
Madagascar	35.5	1,466	2.3	3.3	3.1
Malawi	20.4	1,126	5.2	5.7	3.0
Mali	35.7	2,191	2.3	7.0	6.0
Mauritania	16.0	4,307	6.1	5.6	0.9
Mauritius	24.7	19,534	3.2	3.6	3.5
Mayotte	NA	NA	NA	NA	NA
Mozambique	33.3	1,192	7.1	7.4	6.6
Namibia	25.6	11,224	5.7	6.5	5.3
Niger	19.0	1,077	5.3	7.1	3.5
Nigeria	1,093.9	6,121	5.4	6.3	2.7
Reunion	NA	NA	NA	NA	NA
Rwanda	21.2	1,879	4.7	7.6	8.9
Sao Tome e Principe	0.6	2,986	4.3	4.1	4.0
Senegal	36.8	2,456	3.6	4.3	6.5
Seychelles	2.5	26,277	5.0	6.2	5.7
Sierra Leone	10.1	1,603	20.7	4.6	-20.6
Somalia	1.4 ⁴	131 ⁴	2.6 ⁴	3.4 ⁵	2.7 ⁵
South Africa	727.8	13,230	2.5	1.7	1.3
South Sudan	23.7	1,995	29.3	2.9	-0.2
Sudan	168.7	4,388	5.2	1.6	4.9
Swaziland	11.0	8,340 ³	4.8	3.6	1.1
Tanzania	138.7	2,910	7.3	7.0	7.0
Togo	10.9	1,497	6.1	5.4	5.3
Uganda	80.1	2,009	4.0	5.2	5.0
Zambia	62.2	3,835	5.1	4.7	2.9
Zimbabwe	28.1	1,985	4.5	3.9	1.1
Regional total	3,726	3,694 ³	5.8 ⁶	5.8 ⁶	4.2 ⁶
World total	114,870	15,618	2.6	2.7	2.7

See footnotes at end of table.

TABLE 2—Continued
AFRICA: GROSS DOMESTIC PRODUCT^{1,2}

NA Not available.

¹Source: International Monetary Fund, World Economic Outlook Database, April 2017.

²Gross domestic product listed may differ from that reported in individual country chapters owing to differences in the source or date of reporting.

³Calculated as gross domestic product divided by population.

⁴Source: United Nations data for 2014.

⁵Source: U.S. Central Intelligence Agency, The World Factbook.

⁶Annual change in regional gross domestic product.

TABLE 3
AFRICA: SELECTED SIGNIFICANT EXPLORATION SITES IN 2015

Country	Type ¹	Site	Commodity ²	Company	Resource ^{2,3}
Burkina Faso	F	Banfora	Au	Gryphon Minerals Ltd.	826,000 oz Au (R).
Do.	E	Batie West	Au	Centamin plc.	2 Moz Au (D).
Do.	P	Bissa	Au	Nord Gold SE	2.1 Moz Au (R).
Do.	P	Essakane	Au	IAMGOLD Corp.	3.4 Moz Au (R).
Do.	P	Mana	Au	SEMAFO Inc.	2.0 Moz Au (R).
Do.	F	Natougou/Bougou	Au	do.	1.3 Moz Au (R).
Cote d'Ivoire	P	Agbaou	Au	Endeavor Mining Corp.	1 Moz Au (R).
Eritrea	P	Bisha	Zn, Cu, Au, Ag	Nevsun Resources Ltd.	1.17 Mt Zn, 250,000 t Cu, 604,000 oz Au, 34 Moz Ag (R).
Ghana	CM	Bibiani	Au	Resolute Mining Ltd.	1.3 Moz Au (D).
Do.	P	Presstea (Bogoso)	Au	Golden Star Resources Ltd.	656,000 oz Au (R).
Guinea	P	Siguiri	Au	AngloGold Ashanti Ltd.	2.5 Moz Au (R).
Mali	D	Fekola	Au	B2Gold Corp.	3.7 Moz Au (R).
Do.	LP	Kalama	Au	Avnel Gold Mining Ltd.	2.7 Moz Au (D).
Do.	P	Tabakoto/Segala	Au	Endeavor Mining Corp.	725,000 oz Au (R).
Mozambique	D	Balama	Graphite	Syrah Resources Ltd.	13 Mt graphite (R).
South Africa	E	Waterberg	Pt, Pd, Au, Rh	Platinum Group Metals Ltd.	3.8 Moz Pt, 7.8 Moz Pd, 950,000 oz Au, 374,000 oz Rh (D).
Sudan	E	Block 14 (Galat Sufar)	Au	Orea Gold Inc.	1.6 Moz Au (D).
Do. Ditto.					

¹CM—Care-and-maintenance status; D—Approved for development; E—Active exploration; F—Feasibility work ongoing/completed; LP—Exploration at site with limited production; P—Exploration related to existing producing operation.

²Abbreviations used in this table for commodities include the following: Ag—silver; Au—gold; Cu—copper; Pd—palladium; Pt—platinum; Rh—rhodium; Zn—zinc. Abbreviations used in this table for units of measure include the following: Moz—million troy ounces; Mt—million metric tons; oz—troy ounces; t—metric tons.

³Data as of December 30, 2015, based on 2015 data reported from various sources; D—demonstrated (measured + indicated); R—proven + probable. Resource data have not been verified by the U.S. Geological Survey.

TABLE 4
AFRICA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2015¹
(Thousand metric tons unless otherwise specified)

Country	Metals										
	Aluminum		Chromite, mine output, gross weight	Cobalt, mine output, Co content (metric tons)	Copper, mine output, Cu content	Gold, mine output Au content (kilograms)	Iron and steel		Lead, mine output, Pb content (metric tons)	Manganese ore, mine output, Mn content	
	Bauxite	Metal ²					Iron ore, gross weight	Steel, crude			
Angola	--	--	--	--	--	--	--	--	--	--	
Benin	--	--	--	--	--	--	--	--	--	--	
Botswana	--	--	--	316	9	756	--	--	--	--	
Burkina Faso	--	--	--	--	--	35,223	--	1,100 ^e	--	23 ^e	
Burundi	--	--	--	-- ^e	--	500 ^e	-- ^e	--	--	--	
Cameroon	--	60	--	--	--	1,800 ^e	--	--	--	--	
Central African Republic	--	--	--	--	--	60 ^e	--	--	--	--	
Chad	--	--	--	--	--	14	--	--	--	--	
Congo (Brazzaville)	--	--	--	--	--	150 ^e	--	--	--	--	
Congo (Kinshasa)	--	--	--	64,000 ^e	996	37,000 ^e	--	653	--	--	
Côte d'Ivoire	--	--	--	--	--	19,441	--	--	--	133	
Djibouti	--	--	--	--	--	--	--	--	--	--	
Equatorial Guinea	--	--	--	--	--	--	--	--	--	--	
Eritrea	--	--	--	--	62	1,390	--	--	--	--	
Ethiopia	--	--	--	--	--	10,600	--	130 ^e	--	--	
Gabon	--	--	--	--	--	1,301	--	--	--	--	
Ghana	1,026	29	--	--	--	130,424	--	--	--	2,010	
Guinea	16,303	--	--	--	--	17,000	--	--	--	416	
Kenya	--	15 ^e	--	--	--	300	--	390 ^e	--	--	
Lesotho	--	--	--	--	--	--	--	--	--	--	
Liberia	--	--	--	--	--	482	4,900 ^e	--	--	--	
Madagascar ^e	--	--	230	4,000	--	--	--	--	--	--	
Malawi	--	--	--	--	--	--	--	--	--	--	
Mali	--	--	--	--	--	40,900	--	--	--	--	
Mauritania	--	--	--	--	45	8,618	11,610	2 ^e	--	--	
Mauritius	--	--	--	--	--	--	--	--	--	--	
Mozambique	5	558	--	--	--	250	--	--	--	--	
Namibia	--	--	--	--	11	6,069	--	9,300	--	21 ^e	
Niger	--	--	--	--	--	1,220	--	--	--	--	
Nigeria ^e	--	--	--	--	--	7,900	2,000	620	12,000	--	
Rwanda	--	--	--	--	--	--	--	15	--	--	
Senegal	--	--	--	--	--	5,670	--	--	--	--	
Seychelles	--	--	--	--	--	--	--	--	--	--	

See footnotes at end of table.

TABLE 4—Continued
AFRICA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2015¹

(Thousand metric tons unless otherwise specified)

Country	Metals											
	Aluminum		Chromite, mine output, gross weight	Cobalt, mine output, Co content (metric tons)		Copper, mine output, Cu content	Gold, mine output Au content (kilograms)		Iron and steel		Lead, mine output, Pb content (metric tons)	Manganese ore, mine output, Mn content
	Bauxite	Metal ²		mine output, gross weight	mine output, Co content (metric tons)		mine output, Cu content	Au content (kilograms)	Iron ore, gross weight	Steel, crude		
Sierra Leone	1,334	--	--	--	--	--	106	2,624	--	--	--	--
South Africa	--	695	15,656	2,900 ^e	77	144,504	72,806	6,400 ^e	34,573	5,900	--	--
South Sudan	--	--	--	--	--	--	--	--	--	--	--	--
Sudan	--	--	100	--	--	82,400	70,000	--	--	--	--	11
Swaziland	--	--	--	--	--	--	--	--	--	--	--	--
Tanzania	26	--	--	--	18 ^e	46,008	--	200	--	--	--	--
Togo	--	--	--	--	--	15,568 ³	72	--	--	--	--	--
Uganda	--	--	--	--	--	13	9 ^e	73 ^e	--	--	--	--
Zambia ^e	--	--	--	4,600 ⁴	712	4,240 ⁴	--	91	--	--	--	45
Zimbabwe	--	--	208	355	8	20,023	--	--	--	--	--	--
Total	18,694	1,357	16,194	76,171	1,938	639,930	164,021	7,921	57,626	8,559	--	--
Share of world total	6.3%	1.2%	53.4%	56.4%	9.5%	19.5%	4.7%	0.5%	1.1%	49.8%	--	--
United States	NA	1,590	--	--	1,380	214,000	46,100	78,800	367,000	--	--	--
Share of world total	NA	1.5%	--	--	6.8%	6.5%	1.3%	4.6%	6.9%	--	--	--
World total	297,000	109,000	30,300	135,000	20,400	3,280,000	3,480,000	1,700,000	5,300,000	17,200	--	--

See footnotes at end of table.

TABLE 4—Continued
AFRICA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2015¹

(Thousand metric tons unless otherwise specified)

Country	Metals—		Industrial minerals					Mineral fuels		
	Continued Zinc, mine output, Zn content (metric tons)		Cement, hydraulic	Diamond, natural (thousand carats) ⁵	Graphite (metric tons)	Phosphate rock, gross weight	Coal, anthracite and bituminous	Petroleum, crude (thousand 42-gallon barrels)	Uranium, U ₃ O ₈ content (metric tons)	
Angola	--		5,500 ^e	9,016	--	--	--	666,490	--	
Benin	--		1,800	--	--	--	--	--	--	
Botswana	--		260 ^e	20,824	--	--	2,066	--	--	
Burkina Faso	62,000		263	--	--	--	--	--	--	
Burundi	--		95 ^e	--	--	--	--	--	--	
Cameroon	--		1,600	2	--	--	--	34,974	--	
Central African Republic	--		--	36	--	--	--	--	--	
Chad ^e	--		200	--	--	--	--	30,000	--	
Congo (Brazzaville)	--		700 ^e	40	--	--	--	94,268	--	
Congo (Kinshasa)	14,193		399	15,753	--	--	4,000 ^e	8,247	--	
Côte d'Ivoire	--		32	15	--	--	--	17,160	--	
Djibouti	--		450 ^e	--	--	--	--	--	--	
Equatorial Guinea	--		--	--	--	--	--	105,000 ^e	--	
Eritrea	--		330 ^e	--	--	--	--	--	--	
Ethiopia	--		7,800 ^e	--	--	--	--	--	--	
Gabon	--		150 ^e	NA	--	--	--	83,184	--	
Ghana	--		3,000 ^e	174	--	--	--	37,461	--	
Guinea	--		500 ^e	167	--	--	--	--	--	
Kenya	--		6,353	--	--	--	--	--	--	
Lesotho	--		--	304	--	--	--	--	--	
Liberia	--		298	74	--	--	--	--	--	
Madagascar ^e	--		240	--	7,800	--	--	95	--	
Malawi	--		550 ^e	--	--	--	100 ^e	--	--	
Mali	--		--	--	--	--	--	--	--	
Mauritania	--		788 ^e	--	--	--	--	1,933	--	
Mauritius	--		--	--	--	--	--	--	--	
Mozambique	--		1,585	--	--	--	7,500 ^e	600	--	
Namibia	123,672		796	2,053	--	--	--	--	3,529	
Niger	--		51	--	--	--	--	--	4,900	
Nigeria ^e	--		20,500	--	--	--	221	5,459	--	
Rwanda	--		190 ^e	--	--	--	140	773,459 ⁴	--	
Senegal	--		4,615	--	--	1,062	--	--	--	

See footnotes at end of table.

TABLE 4—Continued
AFRICA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2015¹

(Thousand metric tons unless otherwise specified)

Country	Metals—			Industrial minerals				Mineral fuels		
	Continued Zinc, mine output, Zn content (metric tons)	Cement, hydraulic	Diamond, natural (thousand carats) ⁵	Graphite (metric tons)	Phosphate rock, gross weight	Coal, anthracite and bituminous	Petroleum, crude (thousand 42-gallon barrels)	Uranium, U ₃ O ₈ content (metric tons)		
Seychelles	--	--	--	--	--	--	--	--		
Sierra Leone	--	324	500	--	--	--	--	--		
South Africa	29,040	13,000	8,233	--	1,852	252,176	--	528		
South Sudan	--	--	--	--	--	--	54,020	--		
Sudan	-- ^e	3,708	--	--	--	--	38,325	--		
Swaziland	--	--	--	--	--	158	--	--		
Tanzania	--	3,135	216	--	20 ^e	282	--	--		
Togo	--	1,462	(6)	--	1,150	--	--	--		
Uganda	--	2,330	--	--	--	--	--	--		
Zambia ^e	--	2,390	--	--	--	150	--	--		
Zimbabwe	--	1,300 ^e	3,491	6,362	9 ^e	4,336	--	--		
Total	228,905	86,694	60,898	14,162	4,093	271,129	1,950,844	8,957		
Share of world total	1.6%	2.1%	48.7%	1.1%	N.A.	4.0%	5.6%	12.5%		
United States	825,000	84,200	--	--	27,400	1,020,000	3,160,000	2,260		
Share of world total	5.9%	2.0%	--	--	10.5%	15.0%	9.0%	3.2%		
World total	13,900,000	4,180,000	125,000	1,310,000	261,000	6,810,000	35,000,000	71,700		

^eEstimated; estimated data, U.S. data, and world totals are rounded to no more than three significant digits. NA Not available. -- Zero or zero percent.

¹Totals may not add owing to independent rounding. Percentages are calculated on unrounded data. Table includes data available as of September 22, 2016.

²Primary and secondary production.

³Data reported by Government of Togo as gold exports that predominantly include artisanal gold mine production transiting Togo from neighboring countries and to a lesser extent, domestic artisanal mine production. Data may include gold from other than artisanal sources.

⁴Reported figure.

⁵Gemstones and industrial diamond.

⁶Less than 1/2 unit or 1/2 percent.

TABLE 5
AFRICA: HISTORIC AND PROJECTED BAUXITE MINE PRODUCTION, 2005–2021¹

(Thousand metric tons, gross weight)

Country	2005	2010	2014	2015	2017 ^c	2019 ^c	2021 ^c
Ghana	727	595	906	1,026	1,300	1,500	1,800
Guinea	14,600	15,900	17,258	16,303	15,500	26,000	33,000
Mozambique	10	9	3	5	--	--	--
Sierra Leone	--	1,090	1,161	1,334	1,300	1,300	1,300
Tanzania	2	39	26	26	70	70	70
Total	15,300	17,600	19,400	18,700	18,000	29,000	36,000

^cEstimated. -- Negligible or no production.

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

TABLE 6
AFRICA: HISTORIC AND PROJECTED PRIMARY AND SECONDARY ALUMINUM METAL PRODUCTION, 2005–2021¹

(Thousand metric tons)

Country	2005	2010	2014	2015	2017 ^c	2019 ^c	2021 ^c
Cameroon	87	76	93	60	80	80	80
Ghana	--	--	24	29	33	35	35
Kenya ²	2	13	17	15	15	15	15
Mozambique	555	557	567	558	570	570	570
Nigeria	--	21	--	--	--	--	--
South Africa	846	807	745	695	720	720	720
Total	1,490	1,470	1,450	1,360	1,420	1,420	1,420

^cEstimated. -- Negligible or no production.

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

²Egypt produced primary and secondary refined aluminum; production was from primary sources in all other African aluminum-producing countries, with the exception of Kenya, which also produced secondary refined aluminum.

TABLE 7
AFRICA: HISTORIC AND PROJECTED COBALT MINE PRODUCTION, 2005–2021¹

(Co content in metric tons)

Country	2005	2010	2014	2015	2017 ^c	2019 ^c	2021 ^c
Botswana	326	272	196	316	--	--	--
Congo (Kinshasa)	24,500	60,000	61,000	64,000	64,000	95,000	110,000
Madagascar	--	--	3,400	4,000	4,700	4,700	4,700
South Africa	400	1,800	2,800	2,900	2,700	2,800	2,900
Zambia	9,300	8,648	4,600	4,600	6,000	6,000	6,000
Zimbabwe	281	79	358	355	400	400	400
Total	34,800	70,800	72,400	76,200	78,000	110,000	125,000

^cEstimated. -- Negligible or no production.

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

TABLE 8
AFRICA: HISTORIC AND PROJECTED COPPER MINE PRODUCTION, 2005–2021¹

(Cu content in thousand metric tons)

Country	2005	2010	2014	2015	2017 ^c	2019 ^c	2021 ^c
Botswana	31	48	38	9	2	55	94
Congo (Kinshasa)	97	420	1,030	996	1,100	1,500	1,600
Eritrea	--	--	89	62	25	61	40
Mauritania	--	37	33	45	34	30	30
Namibia	10	--	5	11	16	16	16
South Africa	89	103	88	77	81	82	85
Tanzania	4	6	18	18	13	12	12
Zambia	447	672	708	712	880	950	1,050
Zimbabwe	3	5	8	8	9	9	9
Total	680	1,290	2,020	1,940	2,200	2,700	3,000

^cEstimated. -- Negligible or no production.

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

TABLE 9
AFRICA: HISTORIC AND PROJECTED REFINED COPPER METAL PRODUCTION, 2005–2021¹

(Thousand metric tons)

Country	2005	2010	2014	2015	2017 ^c	2019 ^c	2021 ^c
Congo (Kinshasa)	--	261	878	878	840	1,200	1,200
Namibia	--	--	--	--	16	16	16
South Africa	99	81	79	77	65	66	68
Zambia	399	528	483	472	870	900	900
Zimbabwe	7	5	3	--	--	3	5
Total	508	875	1,440	1,430	1,800	2,200	2,200

^cEstimated. -- Negligible or no production.

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

TABLE 10
AFRICA: HISTORIC AND PROJECTED GOLD MINE PRODUCTION, 2005–2021¹

(Au content in kilograms)

Country	2005	2010	2014	2015	2017 ^c	2019 ^c	2021 ^c
Botswana	4	1,774	958	756	1,000	1,000	1,000
Burkina Faso ²	625	22,939	36,199	35,223	32,000	35,000	35,000
Burundi	--	300	500	500	500	500	500
Cameroon	1,000	1,600	1,500	1,800	1,800	1,800	1,800
Central African Republic	15	59	60	60	100	5,000	5,000
Chad	150	(3)	14	14	14	14	14
Congo (Brazzaville)	120	150	150	150	150	150	150
Congo (Kinshasa)	7,200	12,000	31,000	37,000	33,000	39,000	39,000
Côte d'Ivoire ²	1,335	5,310	17,350	19,441	21,000	21,000	21,000
Equatorial Guinea	200	(3)	(3)	(3)	(3)	(3)	(3)
Eritrea	25	50	905	1,390	2,700	5,100	5,400
Ethiopia	4,376	6,773	11,970	10,600	11,000	16,000	16,000
Gabon	300	--	1,012	1,301	1,500	1,600	1,600
Ghana ²	66,852	76,332	137,090	130,424	120,000	120,000	130,000
Guinea ²	25,097	15,217	16,955	17,000	14,000	16,000	18,000
Kenya	616	2,355	200	300	200	200	200
Liberia	27	666	620	482	5,800	7,800	7,800
Madagascar	10	46	--	--	2,700	2,700	2,700
Mali ²	44,230	38,653	40,900	40,900	42,000	46,000	50,000
Mauritania	--	8,305	9,625	8,618	10,000	14,000	26,000
Mozambique	63	106	197	250	200	200	200
Namibia ⁴	2,703	2,675	1,938	6,069	6,600	6,600	6,600
Niger	4,962	1,950	732	1,220	1,000	1,100	1,200
Nigeria	30	3,718	7,200	7,900	9,300	9,300	9,300
Rwanda ⁵	10	3	160	319	350	350	350
Senegal	600	4,381	6,588	5,670	7,000	9,000	9,000
Sierra Leone ⁶	53	270	43	106	100	100	100
South Africa	294,671	188,702	151,622	144,504	150,000	160,000	150,000
Sudan	3,625	26,317	73,300	82,400	100,000	100,000	100,000
Swaziland	--	--	--	--	300	600	600
Tanzania	47,270	39,448	40,481	46,008	40,000	36,000	40,000
Togo ⁷	6,179	10,452	20,583	15,568	16,000	16,000	17,000
Uganda	46	4	24	13	3,000	3,000	3,000
Zambia	440	3,410	4,800	4,240	5,300	6,000	6,300
Zimbabwe	14,024	9,619	15,385	20,023	23,000	26,000	27,000
Total	527,000	484,000	630,000	640,000	660,000	710,000	730,000

^cEstimated. -- Negligible or no production.

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

²Excludes production from artisanal mining.

³Gold was produced, but available information was inadequate to make reliable estimates of output.

⁴Does not include gold produced as a byproduct of copper mining.

⁵Fiscal year data.

⁶From artisanal mining for the years 2005 and 2010 only.

⁷May include artisanal gold production from neighboring countries; however, available information was inadequate to make reliable estimates of the output that originated from these countries.

TABLE 11
AFRICA: HISTORIC AND PROJECTED BENEFICIATED IRON ORE PRODUCTION, 2005–2021¹

(Fe content in thousand metric tons)

Country	Average grade	2005	2010	2014	2015	2017 ^c	2019 ^c	2021 ^c
Congo (Brazzaville)	61%	--	--	--	--	3,000	11,000	22,000
Guinea	37% to 55%	--	--	--	--	--	2,800	4,000
Kenya	60%	--	17	--	--	12	42	42
Liberia	34% to 61%	--	--	3,000	2,753	1,800	2,400	2,400
Mauritania	59% to 72%	7,000	7,500	8,645	7,198	8,600	11,000	11,000
Mozambique	50%	--	--	--	--	--	--	330
Nigeria	36% to 56%	20	23	1	1	1	1	1
Sierra Leone	58% to 65%	--	--	11,300	1,500	4,700	4,800	4,900
South Africa	62% to 65%	24,900	36,900	51,000	47,000	42,000	43,000	43,000
Sudan	45%	--	--	21	32	--	--	--
Swaziland	45%	--	--	268	--	--	--	--
Tanzania	52%	--	--	--	--	--	--	1,000
Togo	30%	--	NA	27	22	20	20	20
Uganda	61% to 67%	--	2	27	6	34	230	340
Zimbabwe ²	51%	185	--	--	--	--	--	--
Total	XX	32,100	44,400	74,300	58,500	60,000	75,000	89,000

^cEstimated. NA Not available. XX Not applicable. -- Negligible or no production.

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

²Average iron content for Zimbabwe prior to 1996 was 61%; since 1996, the average grade has been 51%.

TABLE 12
AFRICA: HISTORIC AND PROJECTED CRUDE STEEL PRODUCTION, 2005–2021¹

(Thousand metric tons)

Country	2005	2010	2014	2015	2017 ^c	2019 ^c	2021 ^c
Congo (Kinshasa)	110	NA	NA	NA	NA	NA	NA
Ethiopia	60	150	130	130	700	700	700
Kenya	--	290	410	390	350	350	350
Mauritania	1	5	2	2	5	5	5
Mozambique	--	--	--	--	--	--	330
Nigeria	100	100	600	620	620	620	620
Rwanda	NA	15	15	15	15	15	15
South Africa	9,494	7,617	6,550	6,400	6,100	6,100	6,100
Tanzania	NA	190	190	200	210	210	870
Uganda	30	59	67	73	98	270	370
Zambia	--	40	91	91	95	95	95
Zimbabwe	107	14	--	--	--	--	--
Total	9,900	8,480	8,060	7,920	8,200	8,400	9,500

^cEstimated. NA Not available. -- Negligible or no production.

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

TABLE 13
AFRICA: HISTORIC AND PROJECTED NICKEL MINE PRODUCTION, 2005–2021¹

(Ni content in metric tons)

Country	2005	2010	2014	2015	2017 ^c	2019 ^c	2021 ^c
Botswana	39,335	24,931	16,000	12,000	--	--	--
Madagascar	--	--	43,000	55,000	58,000	58,000	58,000
South Africa	42,392	39,960	54,956	56,689	53,000	52,000	58,000
Zambia	--	2,482	--	--	25,000	31,000	37,000
Zimbabwe	8,556	6,200	16,633	16,109	17,000	19,000	19,000
Total	90,300	73,600	131,000	140,000	150,000	160,000	170,000

^cEstimated. -- Negligible or no production.

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

TABLE 14
AFRICA: HISTORIC AND PROJECTED PALLADIUM MINE PRODUCTION, 2005–2021¹

(Pd content in kilograms)

Country	2005	2010	2014	2015	2017 ^c	2019 ^c	2021 ^c
Botswana	NA	3,328	1,120	1,200	--	--	--
South Africa	82,961	82,222	58,410	82,691	80,000	85,000	95,000
Zimbabwe	3,879	6,916	10,138	10,055	12,000	16,000	16,000
Total	86,800	92,500	69,700	94,000	92,000	100,000	110,000

^cEstimated. NA Not available. -- Negligible or no production.

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

TABLE 15
AFRICA: HISTORIC AND PROJECTED PLATINUM MINE PRODUCTION, 2005–2021¹

(Pt content in kilograms)

Country	2005	2010	2014	2015	2017 ^c	2019 ^c	2021 ^c
Botswana	NA	560	190	200	--	--	--
Ethiopia	--	8	--	5	5	5	5
South Africa	163,711	147,790	93,991	139,125	140,000	150,000	160,000
Zimbabwe	4,834	8,639	12,483	12,564	15,000	20,000	20,000
Total	169,000	157,000	107,000	152,000	155,000	170,000	180,000

^cEstimated. NA Not available. -- Negligible or no production.

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

TABLE 16
AFRICA: HISTORIC AND PROJECTED TIN MINE PRODUCTION, 2005–2021¹

(Sn content in metric tons)

Country	2005	2010	2014	2015	2017 ^c	2019 ^c	2021 ^c
Burundi	4	12	32	22	20	20	20
Congo (Kinshasa)	4,400	8,000	6,500	5,300	7,000	11,000	18,000
Niger	14	6	--	--	--	--	--
Nigeria	1,300	160	46	47	6,000	6,000	6,000
Rwanda	170	3,300	3,700	2,400	2,200	2,200	2,200
Tanzania	--	--	--	--	140	140	140
Uganda	--	32	31	135	140	140	140
Total	5,890	11,500	10,300	7,900	15,500	19,500	26,500

^cEstimated. -- Negligible or no production.

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

TABLE 17
AFRICA: HISTORIC AND PROJECTED TIN METAL PRODUCTION, 2005–2021¹

(Metric tons)

Country	2005	2010	2014	2015	2017 ^c	2019 ^c	2021 ^c
Nigeria	25	--	--	--	--	--	--
Rwanda	200	--	--	400	--	--	--
Total	230	--	--	400	--	--	--

^cEstimated. -- Negligible or no production.

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

TABLE 18
AFRICA: HISTORIC AND PROJECTED DIAMOND PRODUCTION, 2005–2021¹

(Thousand carats)

Country	2005	2010	2014	2015	2017 ^c	2019 ^c	2021 ^c
Angola	7,079	8,362	8,791	9,016	10,000	10,000	10,000
Botswana	31,890	22,019	24,677	20,824	21,000	21,000	21,000
Cameroon	12	6	4	2	1	1	1
Central African Republic	383	302	32	36	15	20	25
Congo (Brazzaville)	--	381	53	40	12	12	12
Congo (Kinshasa)	35,207	16,964	14,933	15,753	17,000	19,000	19,000
Côte d'Ivoire	300	--	1	15	20	20	20
Gabon	(2)	NA	NA	NA	NA	NA	NA
Ghana	1,013	334	242	174	150	150	200
Guinea	549	374	164	167	170	170	170
Lesotho	52	105	346	304	450	600	600
Liberia	NA	27	66	74	70	70	70
Namibia	1,902	1,693	1,918	2,053	1,700	1,700	2,000
Sierra Leone	669	438	620	500	640	660	660
South Africa	15,776	8,868	8,059	8,233	8,900	9,500	9,500
Tanzania	220	80	253	216	300	360	360
Togo	41	(2)	(2)	--	--	--	--
Zimbabwe	251	8,435	4,772	3,491	2,000	1,500	1,500
Total	95,300	68,400	64,900	60,900	62,500	65,000	65,000

^cEstimated. NA Not available. -- Negligible or no production.

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

²Less than 1 unit.

TABLE 19
AFRICA: HISTORIC AND PROJECTED LITHIUM PRODUCTION, 2005–2021

(Metric tons of Li minerals)

Country	2005	2010	2014	2015	2017 ^c	2019 ^c	2021 ^c
Zimbabwe	1,100	47,000	50,000	50,000	50,000	50,000	65,000

^cEstimated data are rounded to no more than three significant digits.

TABLE 20
AFRICA: HISTORIC AND PROJECTED SALABLE COAL PRODUCTION, 2005–2021¹

(Thousand metric tons)

Country	2005	2010	2014	2015	2017 ^c	2019 ^c	2021 ^c
Botswana	985	988	1,712	2,066	1,800	3,000	3,000
Congo (Kinshasa)	120	--	4	4	4	4	4
Ethiopia	--	20	30	30	30	30	30
Malawi	52	65	120	100	55	55	55
Mozambique	3	38	7,200	7,500	14,000	22,000	24,000
Niger	182	247	256	221	250	260	260
Nigeria	8	119	127	140	140	140	140
South Africa	244,940	254,522	261,949	252,176	240,000	260,000	280,000
Swaziland	222	146	178	158	160	160	160
Tanzania	31	(2)	254	282	650	800	4,200
Zambia	240	96	159	150	1,600	2,000	2,000
Zimbabwe	2,891	2,500	5,783	4,336	2,000	3,000	4,000
Total	250,000	259,000	278,000	267,000	260,000	290,000	320,000

^cEstimated. -- Negligible or no production.

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

²Less than 1 unit.

Sub-Saharan Africa region

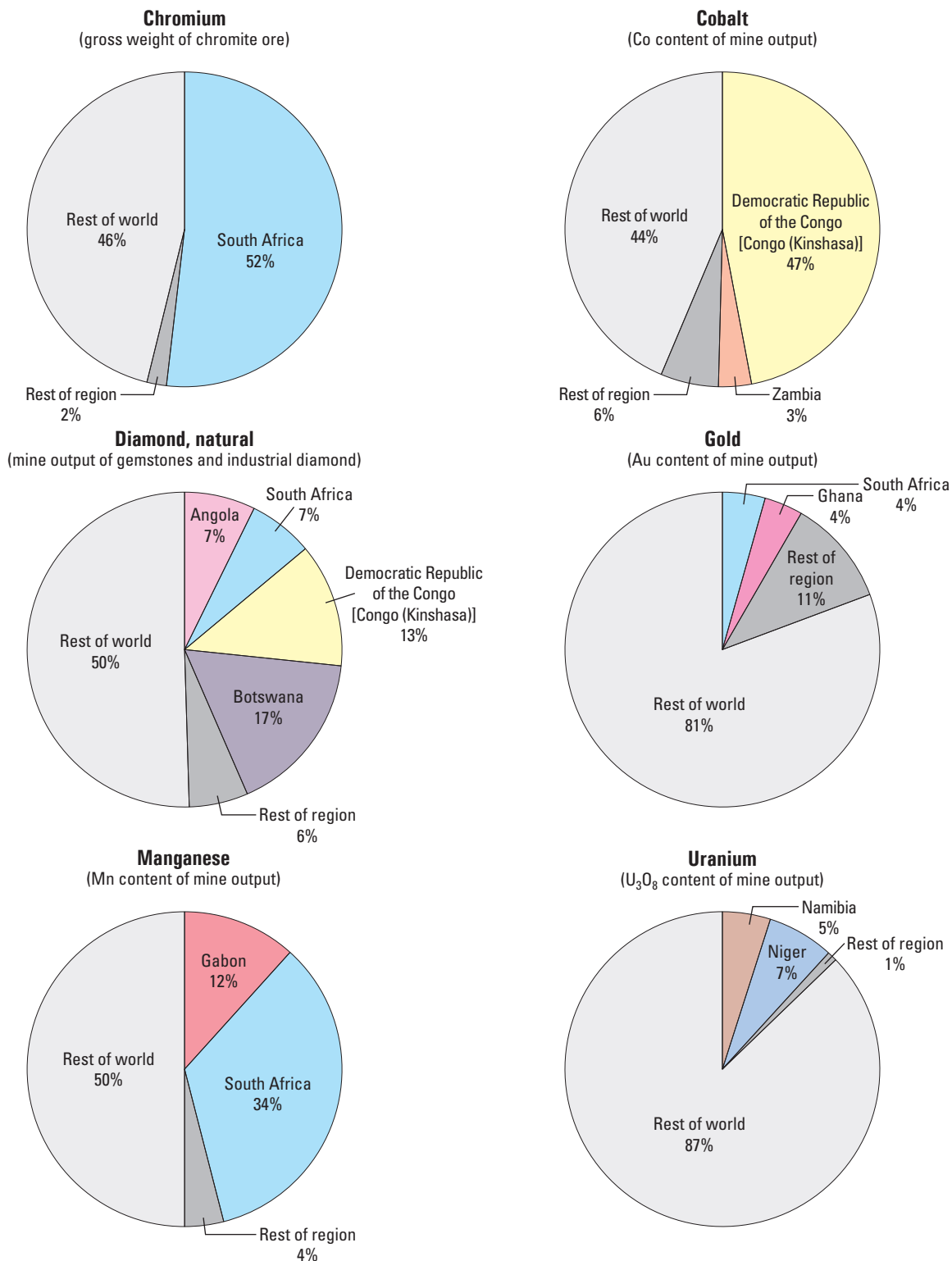


Figure 2. Pie charts showing percentage of world production of selected mineral commodities (chromium, cobalt, diamond, gold, manganese, and uranium) by countries of the sub-Saharan region of Africa in 2015. Individual countries of the region are labeled if they accounted for at least 3% of world production. Data are from table 4. Percentages may differ slightly from those shown in table 4 because of independent rounding. Also, percentages may differ from those reported in individual country chapters owing to differences in source or date of reporting.