# **Africa**

## **Economy**

With the exception of South Africa and the countries of North Africa, all of which have diversified production systems, the economy of most of Africa can be characterized as underdeveloped. Africa as a whole has abundant natural resources, but much of its economy has remained predominantly agricultural, and subsistence farming still engages more than 60 percent of the population.

Until the beginning of the 20th century this system of farming relied on simple tools and techniques, as well as on traditional organization of the family or community for its labour. Because of poor transport and communications, production was largely for domestic use. There was little long-distance trade, and wage labour was virtually unknown. The small size and vast heterogeneity of polities at that time also made exchanges very limited. There were, however, notable exceptions, especially in western Africa, where for many centuries societies had engaged in long-distance trade and had elaborate exchange and craft facilities, communications, and a political infrastructure to maintain their trade routes.

Africa experienced considerable economic development during the 20th century, and, while this provided many benefits, it also gave rise to a number of serious problems. The first significant changes occurred under colonial rule in the first half of the century: wage labour was introduced, transportation and communications were improved, and resources were widely developed in the colonial territories. The legacy of this, however, has been that the export of two or three major agricultural products or minerals—such as peanuts, [petroleum](https://www.britannica.com/science/petroleum), or copper—has come to provide most of the foreign-exchange earnings for nearly all African countries. Fluctuations in the prices of these commodities have made the economies of these countries vulnerable and fragile. The situation has been exacerbated in countries in the marginal dryland zones, where the increasing frequency of drought conditions have undermined agricultural productivity.

The second major change was the vigorous promotion of industrial development, often with foreign assistance, that took place in the two decades (1960–80) following the political independence of most African countries. The political fragmentation of the continent, however, also became a major constraint to industrial growth, because it created numerous small markets. Consequently, most African countries became saddled with excess industrial capacity, coupled with enormous foreign debts incurred in large part to build this capacity.

In nearly all African countries a poor economic situation has been aggravated by rapid population growth, which has kept per capita gross domestic product low or in some cases caused it to decline. Thus, any hope for improving economic conditions in most of Africa rests on two factors: population control within individual countries to give their economies the chance to grow; and the organization of groups of states into regional economic blocs in order to create internal markets large enough to sustain growth.

## **Resources**

## **Mineral resources**

Africa’s known mineral wealth places it among the world’s richest continents. Its very large share of the world’s mineral resources includes coal, petroleum, natural gas, uranium, radium, low-cost thorium, iron ores, chromium, cobalt, copper, lead, zinc, tin, bauxite, titanium, antimony, gold, platinum, tantalum, germanium, lithium, phosphates, and diamonds.

Major deposits of coal are confined to four groups of coal basins—in Southern Africa, North Africa, the Democratic Republic of the Congo, and Nigeria. Proven petroleum reserves in North Africa occur in Libya, Algeria, Egypt, and Tunisia. Exploration has been concentrated north of the Aïr–Ahaggar massifs; there may also be major Saharan reserves to the south. The other major oil reserves are in the western coastal basin—mainly in Nigeria and also in Cameroon, Gabon, [Equatorial Guinea](https://www.britannica.com/place/Equatorial-Guinea), and the Republic of the Congo—and in Angola and South Sudan.

Natural gas reserves are concentrated in basins of North Africa and coastal [central Africa](https://www.britannica.com/place/central-Africa).

Southern Africa is said to be one of the world’s seven major uranium provinces. In South Africa the unusual degree of knowledge of reserves derives from the joint occurrence of uranium with gold, a condition that also decreases the cost of production. Other countries with significant uranium deposits are Niger, Gabon, the Democratic Republic of the Congo, and Namibia.

## **Metallic deposits**

In North Africa reserves of iron ore are concentrated in the Atlas Mountains and in the western Sahara. Egypt, however, has medium-grade reserves, of which the most important are at Al-Baḥriyyah Oasis. The ore deposits in Morocco and Tunisia, which were once of considerable importance, have been severely depleted. Africa’s most significant iron reserves are to be found in western and Southern Africa. It is the sedimentary Precambrian rocks, particularly in western Africa, that have proved the basis of Africa’s role as a major world producer of iron ore. The most significant deposits are in Liberia in the Bomi Hills, Bong and Nimba ranges, and Mano valley; in the extension into Guinea of the Nimba–Simandou ranges, where hematites have been located; in Nigeria and [Mauritania](https://www.britannica.com/place/Mauritania), which have large deposits of low-grade ore; and in Gabon, where extensive reserves are present in the northeast. In Southern Africa most iron ore reserves lie in South Africa itself. The chief deposits are at Postmasburg, in the Bushveld Complex, at Thabazimbi, and in the vast low-grade deposits of [Pretoria](https://www.britannica.com/place/Pretoria). There are also substantial reserves in Zimbabwe.

Africa’s reserves of minerals used as ferroalloys in the steel industry are even more striking than its enormous share of world iron ore reserves. This is particularly true of chromium. Almost the entire world reserve of chromium is found in Southern Africa and, to a much lesser extent, in western and northeastern Africa. The highest concentrations are found in Zimbabwe, at [Great Dyke](https://www.britannica.com/place/Great-Dyke). South Africa contains the largest deposits of chromite. As compared with these two sources, reserves elsewhere in Africa are relatively small.

[Manganese](https://www.britannica.com/science/manganese) reserves are also considerable. In South Africa reserves of contained manganese are found in the Kalahari Manganese Field and elsewhere. The [Mouanda](https://www.britannica.com/place/Mouanda) deposit in southeastern Gabon is thought to be among the largest in the world. Ghana is another important source of manganese, having both low-grade and high-grade reserves. Elsewhere in western Africa, manganese deposits are situated in [Burkina Faso](https://www.britannica.com/place/Burkina-Faso) and Côte d’Ivoire, as well as in the Democratic Republic of the Congo and in [Cameroon](https://www.britannica.com/place/Cameroon). In North Africa manganese is found in Morocco and Algeria.

Africa’s contribution to world resources of other ferroalloys is, by comparison, insignificant. Nickel is of some importance, occurring in other metalliferous ores in Southern Africa.

Most of Africa’s copper is contained in the Central African [Copperbelt](https://www.britannica.com/place/Copperbelt-region-Africa), stretching across [Zambia](https://www.britannica.com/place/Zambia) and into the Katanga (Shaba) area of the Democratic Republic of the Congo. Accompanying minerals vary with the geologic layer, but cobalt dominates. Outside the [Copperbelt](https://www.britannica.com/place/Copperbelt-region-Africa) a number of countries have lesser but still significant reserves of copper.

Only Nigeria, the Democratic Republic of the Congo, and South Africa contain tin reserves of any significance. Although it is difficult to consider Africa’s reserves of lead and zinc separately, of the two, lead ores are considerably more widespread. North Africa is the largest traditional producing region. African reserves of zinc metal are located along the Moroccan-Algerian frontier, in the Copperbelt in the Democratic Republic of the Congo, in Nigeria, in Zambia, and in Namibia.

Africa has about one-fourth of the world’s reserves of [bauxite](https://www.britannica.com/science/bauxite), the chief aluminum ore. Virtually all of this occurs in a major belt of tropical laterite stretching some 1,200 miles from Guinea to [Togo](https://www.britannica.com/place/Togo). The largest reserves are in Guinea.

Half of the world reserves of cobalt can be found in the [Democratic Republic of the Congo](https://www.britannica.com/place/Democratic-Republic-of-the-Congo). A continuation of the geologic formation into Zambia gives the country sizable reserves of cobalt content. The only other deposit of any importance is found in Morocco.

The titanium ores, ilmenite and rutile, are widely distributed in Africa but are rarely considered as minable reserves. A major source is the Sherbro deposit in Sierra Leone. Almost all of Africa’s antimony resources lie in the Murchison Range of South Africa. The major concentrations of beryllium are in Madagascar, Mozambique, the Democratic Republic of the Congo, Zimbabwe, Rwanda, Uganda, and South Africa. The principal sources of cadmium are in Namibia and the Democratic Republic of the Congo. Deposits of mercury are restricted to North Africa, notably to Tunisia and, more particularly, Algeria.

[Gold](https://www.britannica.com/science/gold-chemical-element) and allied metals are widely disseminated, reaching their greatest concentrations in South Africa, where reserves of gold probably constitute about half of the world total. Gold is also found in Zimbabwe, in the Democratic Republic of the Congo, and in Ghana. There are numerous alluvial sources of gold in Burundi, Côte d’Ivoire, and Gabon. South Africa has the most important deposit of [platinum](https://www.britannica.com/science/platinum) of the world’s market economies. Silver reserves of the continent are not important.

Africa contains a major share of world reserves of tantalum, and the Democratic Republic of the Congo has most of these reserves. African reserves of niobium (columbium; a steel-gray metallic element resembling tantalum in its chemical properties that is used in alloys) are relatively small. Nigeria, however, is an important world producer.

One of Africa’s many sources of zirconium (a metallic element resembling titanium chemically) is the [Jos Plateau](https://www.britannica.com/place/Jos-Plateau) in Nigeria. Greater reserves, however, are contained in deposits on the Senegal coast; on the east coast of South Africa; in Madagascar; at Sherbro, Sierra Leone; and in the Nile delta.

Another rare metal of which Africa contains a majority of world reserves is germanium, concentrated in the Democratic Republic of the Congo and in Namibia. Africa also has large deposits of lithium, the largest of which are found in the Democratic Republic of the Congo.

## **Nonmetallic deposits**

Clays are widespread and are found in North Africa, where brick and pottery clays occur in Algeria and Morocco; in western and central Africa, where clays are located in [Togo](https://www.britannica.com/place/Togo) (ceramic), the [Central African Republic](https://www.britannica.com/place/Central-African-Republic), and Côte d’Ivoire (ceramic); and in East and Southern Africa.

Kaolin (china clay) occurs in Algeria. Outside North Africa it is widespread. In western Africa it occurs most notably in Nigeria’s Jos Plateau, as well as in Mali, Ghana, and Guinea. Similar deposits occur in central and East Africa, as well as in Southern Africa.

Bentonite (a clay formed from decomposed volcanic ash, which is able to absorb large quantities of water and to expand to several times its usual size) is found in the Moroccan Atlas Mountains and in Tanzania, Kenya, and South Africa. The continent’s principal reserve of fuller’s earth (an absorbent clay) is in Morocco.

Economically important mica deposits occur primarily in Southern Africa (South Africa, Zimbabwe, and Tanzania) and in Madagascar.

Africa has none of the world’s major reserves of sulfur. It reaches economic concentrations only in South Africa’s Witwatersrand, in Zambia’s Copperbelt, and in Morocco. Large quantities of sodium deposits remain to be evaluated. Sodium chloride is the principal salt, the largest deposit being in the Danakil Plain of [Ethiopia](https://www.britannica.com/place/Ethiopia). The principal sources of salt in Africa, however, are inland or coastal basins, from which it is extracted by the evaporation of salt water. Major coastal reserves of this type lie along the North African Mediterranean coast and along the Red Sea and Indian Ocean coasts of East Africa and Madagascar. Inland, the chief reserves are in the Oran Sebkha, a salt pan region in Algeria; in Botswana around Lake Makarikari; and in Uganda.

Another important sodium mineral is [natron](https://www.britannica.com/science/natron), or sodium carbonate. Natron is more limited in occurrence, but Africa contains several significant deposits. It is found in [Lake Magadi](https://www.britannica.com/place/Lake-Magadi), Kenya, and in [Lake Natron](https://www.britannica.com/place/Lake-Natron), Tanzania, as well as in western Africa, where beds have been deposited from the waters of Lake Chad.

North Africa has been a traditional exporter of [phosphates](https://www.britannica.com/science/phosphate-mineral), and western Africa has large reserves. Morocco and Western Sahara together have vast reserves. The Río de Oro region in Western Sahara contains huge deposits, and a major development at Bu-Craa has been established. Algeria and Tunisia also have reserves. To the east, phosphate-bearing sediments outcrop on the Red Sea coast. The Thiès deposit in Senegal is of particular interest in constituting the world’s only source of aluminum (as opposed to calcium) phosphate. Other phosphate deposits occur in Togo, Nigeria, Tanzania, Uganda, and Malawi.

The [potash](https://www.britannica.com/science/potash) deposits in the Republic of the Congo are the largest in Africa. The other large reserve is in Ethiopia.

Madagascar has the world’s largest known accumulation of flake graphite deposits. Continuations of these high-quality deposits in Mozambique and southeastern Kenya contain further reserves of graphite.

While deposits of low-grade sand suitable for construction and engineering work are widely distributed, reserves of sands with a sufficiently high silica content for glass manufacture are more localized. There are deposits in western Africa (Côte d’Ivoire, Liberia, Nigeria, and Ghana), East Africa (Uganda and Tanzania), and South Africa. Glass sands are also found in Egypt.

Kyanite (cyanite), a mineral aluminum silicate used as a refractory, occurs most typically in Southern Africa. Apart from South African reserves, there are deposits in Kenya, Malawi, Ghana, Cameroon, and Liberia.

Of the abrasive substances, industrial [diamonds](https://www.britannica.com/topic/diamond-gemstone) are most closely associated with Africa. The continent contains some 40 percent of the total world reserves. The stones are found in a number of major belts south of the Sahara. The principal known reserves of diamonds in their primary form are in the South African Vaal belt. Elsewhere in Africa, primary deposits are found in Tanzania, [Botswana](https://www.britannica.com/place/Botswana), and [Lesotho](https://www.britannica.com/place/Lesotho).

Another major belt of diamondiferous rocks encircles the [Congo River](https://www.britannica.com/place/Congo-River) basin and includes the world’s largest deposit, located in the Democratic Republic of the Congo, which contains the majority of Africa’s reserves of industrial diamonds. The same belt has secondary deposits that occur elsewhere in that country as well as in the Central African Republic and Angola. In western Africa known reserves are located primarily in alluvial gravel fields. They are found in Sierra Leone, Guinea, Côte d’Ivoire, Liberia, and Ghana.

A considerable proportion of the world reserves of [corundum](https://www.britannica.com/science/corundum) (a common mineral, aluminum oxide, notable for its hardness) is located in Southern Africa. The principal deposits are in Zimbabwe, South Africa, Mozambique, Madagascar, and Malawi.

[Pumice](https://www.britannica.com/science/pumice) is found in areas of volcanic activity such as the Atlantic islands, the coastal Atlas Mountains of northeastern Morocco, and the [East African Rift System](https://www.britannica.com/place/East-African-Rift-System), notably in Kenya, Tanzania, and Malawi. Joint reserves, however, constitute only a small percentage of the world total.

Reserves of building materials are characterized by their wide distribution, to such an extent that the commercial status of such deposits depends more on their location relative to areas of development than on their extent and quality. While almost all African countries have reserves of building materials, knowledge of such reserves is strictly related to the country’s level of development, and no meaningful estimate of the size of reserves can be made.

[Granite](https://www.britannica.com/science/granite) is located in Morocco and Nigeria, and there are vast reserves in Burkina Faso. Quartzite (a granular rock, consisting essentially of quartz) is important as a building stone in Uganda and the Democratic Republic of the Congo. Dolerite (a coarse-grained basalt) is produced in South Africa and basalt, which is crushed for use in road construction, in Senegal. Marble is found in Mali, Togo, Nigeria, and South Africa.

[Limestone](https://www.britannica.com/science/limestone) is important because of its use in the cement industry, and deposits are fairly widespread. North Africa is a particularly important source. In western Africa a belt of limestone runs from the Central African Republic to the Atlantic coasts, with major outcrops in northern Nigeria, Niger, Burkina Faso, and Mali. Elsewhere there are deposits in Nigeria, Benin, Togo, and Ghana. East African deposits include those in Kenya, Tanzania, Uganda, and Zambia; there are also deposits in South Africa.

North Africa has major reserves of [gypsum](https://www.britannica.com/science/gypsum) on the Mediterranean coast, as well as in outcrops along the Gulf of Suez and the Red Sea. Somalia has one of the largest known deposits. Eastern Africa and Madagascar have further reserves, and in western and Southern Africa superficial deposits are particularly important—for instance, north of [Nouakchott](https://www.britannica.com/place/Nouakchott), Mauritania.

Many of the major deposits of the most important commercial gem mineral, the diamond, have already been described above in the discussion of industrial diamonds. One major deposit, however—that of Namibia—consists almost entirely of gem diamonds.

There is no other gem mineral in Africa of comparable importance to these [diamond](https://www.britannica.com/topic/diamond-gemstone) reserves. Deposits of a number of such stones are found, however, especially in Southern and eastern Africa, where diamond fields contain beryl, garnets, amethyst, rose quartz, topaz, opal, jasper, emeralds, and other stones. Madagascar contains a large deposit of garnet. Tourmaline is found in Madagascar and Namibia. Agate is particularly associated with the volcanic areas of eastern and Southern Africa and malachites with the Katanga Copperbelt, while sapphires are found with diamonds in Ghana.

Africa contains no major world deposits of talc, but the mineral is found in Morocco, Nigeria, Sudan, Zimbabwe, and South Africa. Reserves of asbestos are much more important, and Southern Africa has a number of deposits of world significance.

Major deposits of fluorite, or fluorspar (a common mineral, calcium fluoride, used as a flux in metallurgy), are particularly associated with deposits of lead and zinc. In South Africa the chief deposit is in the northeastern part of the country. North African reserves lie primarily in Tunisia and Morocco.

Africa produces a very small share of the world supply of diatomite (a fine siliceous earth, used as an abrasive). The most important deposit is in Kenya.

## **Water resources**

In general, the seasonal distribution of river flow in Africa reflects the seasonal rainfall pattern; the amount of groundwater entering the river channels during the dry season is comparatively small. Important modifications in the flow of some rivers are caused by the presence of large lakes and swamps, which act as natural storage reservoirs, by the construction of dams on their courses, and by the incidence and severity of drought.

## **Surface water**

Although the surface area of Africa is about one-fifth of Earth’s land surface, the combined annual flow of African rivers is only about 7 percent of the world’s river flow reaching the oceans.

North Africa’s few perennial rivers originate in the mountains of the Maghrib, and their water is used extensively for irrigation. The large number of wadis, or ephemeral watercourses, to be found throughout the Sahara and the eastern Mediterranean coastal lands become filled with water as a result of the rare and erratic storms that occur over mountainous areas; otherwise they remain dry.

From the relatively well-watered areas of western and equatorial Africa, the Sénégal, the Niger, the Logone–Chari, and the Nile rivers flow through the drier inland zones. Of these, the [Niger River](https://www.britannica.com/place/Niger-River), originating in the [Fouta Djallon](https://www.britannica.com/place/Fouta-Djallon) region of Guinea, is retarded in the lake and swamp area south of [Timbuktu](https://www.britannica.com/place/Timbuktu-Mali) in Mali, and the Logone–Chari feeds Lake Chad.

The [Nile](https://www.britannica.com/place/Nile-River), the world’s longest river, receives more than 60 percent of its water from the Ethiopian Plateau, although its source is much farther south in the mountains of Burundi. Since the completion of the Aswan High Dam, only a small proportion of the river’s total flow reaching Egypt enters the Mediterranean Sea.

A number of rivers flowing in a more or less southerly direction into the Atlantic Ocean drain the southern part of western Africa. Many flow rapidly over bedrock before entering the coastal plains, draining into the system of lagoons and creeks along the coast. During the dry season the upper reaches of these rivers are without water, but in Guinea, Sierra Leone, and Liberia, where the dry season is fairly short, the rivers flow throughout the year.

In the well-watered western part of equatorial Africa the total average annual flow of the Congo River is enormous: some 44 trillion cubic feet. River flow at the lower end of the basin has two maxima: one that corresponds with the rainy season north of the equator, the other with the rainy season that occurs when it is summer in the Southern Hemisphere. The waters in the lower reaches of the river are slightly acid after traversing the large swamps situated in the centre of the basin.

East Africa’s many lakes stretch along the [East African](https://www.britannica.com/place/East-African-lakes) Rift Valley from the Red Sea to the mouth of the Zambezi River. Evaporation from most of them exceeds their surface rainfall, and in consequence their outflow is less than the quantities brought in annually by their tributaries. They often govern river flow by acting as storage reservoirs—decreasing the flood flow and increasing the dry-season flow. A number of the rift valley lakes are situated in closed basins and contain high percentages of dissolved salts. The largest of these are Lakes Rudolf (Turkana), Natron, and Eyasi.

Rainfall over much of Southern Africa is small, and the majority of the rivers originating there have an intermittent flow. Some large perennial rivers (e.g., the Okavango, the Zambezi, and the Orange) flow from areas of abundant rainfall into the drier zones.

## **Groundwater**

The conditions under which groundwater is found and the quantity and quality of groundwater reserves are closely related to geologic structure. Large inland depressions in Africa’s basement rock, having been filled with sedimentary layers of continental origin, sometimes form important groundwater reservoirs, notably those in the Taoudeni–Niger region, in the central Sahara between the Atlas and Ahaggar mountains; in the Libyan Desert; and in Chad, the Congo basin, the Karoo area of South Africa, and the Kalahari.

The East African plateaus usually contain little or no quantities of groundwater, and aquifers (geologic formations containing water)—generally of local importance—are found only in humid areas where the crystalline rock is weathered or fractured.

The chalky shales (rocks of laminated structure formed by the consolidation of clays) and dolomitic limestones (those containing calcium magnesium carbonate), which sporadically cover the basement rock, may contain important aquifers; those in Zambia and South Africa are major sources of water.

In the [Sahara](https://www.britannica.com/place/Sahara-desert-Africa) a rock [stratum](https://www.britannica.com/science/stratum-geology) called the Continental Intercalary series, which dates from the early Cretaceous Period and which includes the Nubian sandstones of southern Egypt, is the most important water-bearing layer. It extends over very large areas and reaches a thickness of more than 3,000 feet; in Egypt and Algeria it is a major source of artesian water. In Sudan it sometimes lies directly on the Precambrian bedrock and contains underground water layers of local importance. Overlaying the Continental Intercalary series, but generally separated from it by a thick marine deposit, is a younger Tertiary layer called the Continental Terminal, which is the second largest aquifer in this area. Both these layers contain “fossil” water—i.e., water that entered the layers when rainfall in and around the Sahara was much more abundant than today. Near the surface, aquifers are found in such geologically recent deposits as alluvial deposits and sand dunes.

In the coastal areas of Senegal, Côte d’Ivoire, Ghana, Togo, Benin, Nigeria, Cameroon, Gabon, the Republic of the Congo, Angola, Mozambique, the East African countries, and Madagascar, aquifers are found in sandstone, limestone, and sand and gravel sediments. Intensive exploitation, however, may result in saltwater intrusions.

The Jurassic limestones of the mountainous area of the Maghrib are much more abundant in water sources than are dolomitic limestones. Around the cape in South Africa, sandstones and limestones contain very little water.

Yields from aquifers with good porosity, such as coastal sedimentary rocks or alluvial deposits, vary from a few cubic feet per hour in the fine-grained sands found in many parts of the continent to 35,000 cubic feet (990 cubic metres) per hour in the coarse gravels of the Nile delta. The capacity of wells in the Continental Terminal is generally somewhat lower, and those in the Continental Intercalary and the Karoo formations can also deliver moderate to high yields.

In North Africa limestones containing many cracks and fissures may yield thousands of cubic feet of water per hour, while in the Democratic Republic of the Congo, Zambia, and South Africa large yields are drawn from dolomitic limestones.

The harder sandstones, sandy shale, and quartzites of Precambrian and Paleozoic age are not generally very porous, and water is obtained only from fractured or weathered deposits. Western African, Angolan, and Tanzanian wells in these formations produce only a few cubic feet per hour. Crystalline and metamorphic rocks are almost impermeable except where fractured or weathered. Volcanic rock, especially the basalts, may yield up to 1,060 cubic feet per hour.

Most of the exploited groundwater is generally fit for consumption, because the dissolved minerals in water from shallow wells, particularly in the sandy aquifers of western Africa, are quite low. Groundwater from deeper marine layers, however—such as occurs in parts of North Africa, Mozambique, Ethiopia, and South Africa—may have a high content of dissolved salts. In moist tropical countries the water from Precambrian rocks generally contains only small amounts of dissolved minerals, whereas in the volcanic areas of East Africa groundwater may have so high a content of fluorine as to make it unfit for human consumption. There, and elsewhere in Africa, hot (possibly medicinal) springs with high mineral contents occur.

## **Availability for human use**

The pronounced seasonal character of rainfall and the fact that many rivers stop flowing during the dry season have necessitated the development of groundwater for human use, and the tapping of local aquifers has become important in many parts of the continent.

Large-scale irrigation has long been practiced mainly in North Africa, Egypt, Sudan, South Africa, Mali, Zimbabwe, and Mozambique. Medium-scale irrigation projects have been operated in Madagascar, Senegal, Somalia, and Ethiopia. In Côte d’Ivoire, Burkina Faso, Kenya, Nigeria, Ghana, and Zambia, medium- to small-scale projects have been constructed.

More than 50 river and lake basins are shared by two or more countries, and the development of their resources requires the cooperation of the basin states and several intergovernmental agencies—such as the Organization for the Development of the [Sénégal River](https://www.britannica.com/place/Senegal-River), the Niger Basin Authority, and the [Lake Chad Basin Commission](https://www.britannica.com/topic/Lake-Chad-Basin-Commission).

Several large reservoirs were built in the late 20th century, such as the Aswan High Dam, Roseires, and Khashm al-Qirbah reservoirs in the Nile basin, Kainji on the Niger, Akosombo on the Volta, Kariba on the Zambezi, Cahora Bassa on the Zambezi in Mozambique, Kossou on the Bandama in Côte d’Ivoire, Kafue on the Kafue in Zambia, and Inga I and II on the Congo River in the Democratic Republic of the Congo. At a number of man-made lakes, research centres have been set up to study resettlement problems, the full use of ecological conditions, and the control of health hazards that sometimes occur.

## **Biological resources**

Africa’s naturally occurring biological resources—its immensely varied vegetational cover, vast insect life, and diverse animal life—have been described above. When combined with cultivated crops and domestic animals, these resources represent the great bulk of the continent’s economic wealth.

## **Botanical resources**

The two most economically important types of vegetation are [forests](https://www.britannica.com/science/forest) and grasslands. Among the forested areas, the tropical forests contain much of the valuable timber. The vast equatorial lowland rainforest has the greatest variety of tree species, but the species most commercially in demand are found in the zones of broad-leaved woodlands and tropical highland forests. The true value of the forested areas, however, cannot be ascertained exactly, as original forests are progressively being converted to farming areas, and few governments have undertaken comprehensive land-use surveys to determine their present extent.

A large proportion of the land surface of Africa bears vegetation in which [grass](https://www.britannica.com/science/grassland) is an essential feature. This abundance of grass has made possible the continent’s enormous and varied populations of herbivorous mammals, both wild and domesticated. The tall and fibrous invasive grasses in forest environments and in large tracts of wooded grasslands are seldom very palatable to livestock, but, in those parts of the continent where good forage grows naturally or has been introduced, livestock raising is of great economic importance.

The Albida acacia tree of the “farmed parkland” areas of western Africa is of special economic importance. Unlike almost all other dry woodland trees, whose leaf shedding normally occurs at the onset of the dry season, the Albida appears to have a period of partial dormancy during the rainy season and springs to life only at the beginning of the dry season. At such periods its foliage is abundant and—being a palatable leguminous species—is much prized as browse for sheep, goats, and cattle. The smaller leafy branches are frequently fed to stock. The tree flowers and produces fruits, which are harvested, dried, and fed as a protein concentrate to stock at the height of the dry season.

## **Animal resources**

[Water buffalo](https://www.britannica.com/animal/water-buffalo), oxen, horses, mules, donkeys, and camels are used primarily as draft, pack, or riding animals in Africa, and they also provide milk, meat, hides, or skins. Because of its intractability and wild nature, however, the [African elephant](https://www.britannica.com/animal/African-savanna-elephant)—unlike the Asian elephant—is not used for draft or haulage purposes.

The water buffalo is an offshoot of the Asiatic buffalo (*Bubalus bubalis*); it arrived in Africa in relatively recent times and is now found almost exclusively in Egypt. The domesticated African water buffalo is used to cultivate irrigated land (mainly in the Nile delta) and to provide milk and meat.

[Oxen](https://www.britannica.com/animal/ox-mammal-Bos-taurus) are widely used in Africa for agricultural purposes, especially for plowing and cultivation; they are also trained to thresh grain, pump water, and act as pack animals. Bullock (castrated oxen) plowing is well developed in the countries of North Africa, in Ethiopia and Sudan, and farther west in Chad, in northern Nigeria, and in the savanna climatic zone of western Africa. Plowing and cultivation by oxen is also well developed in areas of eastern and Southern Africa that are free of the deadly tsetse fly. Females used for work may also be milked. Work oxen are often used for meat and to provide hides.

[Horses](https://www.britannica.com/animal/horse) and ponies are principally found in Morocco, Algeria, Tunisia, Chad, Ethiopia, Mali, Niger, Nigeria, Senegal, Burkina Faso, Egypt, South Africa, and Lesotho. Horses are used as riding or pack animals and in a number of areas are bred with donkeys to produce mules. Few are kept in areas where tsetse flies are present. Five main types of horses inhabit Africa: the Darfur pony, the Dongola horse, the Ethiopian-Galla horse, the Somalia pony, and the South African horse (including the Basuto pony). In North Africa, types also have evolved as a result of selection and crossing with exotic Arab, Barb (Barbary), and Thoroughbred horses. Arab and Thoroughbred influence may also be noted in Southern Africa.

The distribution of the ass roughly corresponds to that of the horse, except that it also extends into the livestock areas of eastern and central Africa. [Mules](https://www.britannica.com/animal/mule-mammal) are found in Algeria, Ethiopia, Morocco, Somalia, South Africa, and Tunisia, where they provide farm draft power and are used as pack animals and for riding. The ability of mules to perform work in hot, dry climates is superior to that of most other farm animals.

The [Arabian camel](https://www.britannica.com/animal/Arabian-camel), or dromedary, is widely dispersed in the drier regions of northern and eastern Africa. Although used principally as a pack animal, it also is used for land cultivation, water pumping, and human transportation. The [camel](https://www.britannica.com/animal/camel) is essentially a bush browser and, if reasonably well fed and watered, may produce about 11 to 13 pounds (5 to 6 kilograms) of milk daily, in addition to that fed to the calf. The milk is prized by the [camel](https://www.britannica.com/animal/camel) herders and their families. Camel meat and camel hides find a ready market among Muslim communities.

Cattle provide hides, and sheep, goats, and pigs provide skins. Skins of the Maradi, Sokoto, and [Kano](https://www.britannica.com/place/Kano-Nigeria) red goats from Niger and Nigeria are greatly prized by the Morocco leather trade. In the areas north and south of the tropical zone, African sheep are covered with wool, but in the tropics they are hairy. In elevated areas, such as Ethiopia, where temperatures are modified by altitude, some sheep may be partially wooled, at least on the back and buttocks. The wooled sheep of North Africa are largely of the woolly Barbary type, which was originally introduced to Africa from the Middle East.

The great herds of wild African herbivores include the principal game animals. African antelope have been important throughout human history as sources of meat and such by-products as hides and bone, and they, along with other large mammals, became prized by trophy hunters. For centuries African elephants were sought for the ivory in their tusks, but the severe reduction of their numbers by the late 20th century led to a total ban on hunting them in most African countries.

The most economically useful fishes found in African waters include many freshwater species. Important among the marine fishes are flounder, halibut, sole, redfish, bass, conger, jack, mullet, herring, sardine, and anchovy. Crustaceans are important for local consumption and for export, as are oysters (for pearls), trochus shells, corals, and sponges. The most economically important aquatic mammal is the Southern, or Cape, fur seal.

## **Agriculture**

Agriculture is by far the single most important economic activity in Africa. It provides employment for about two-thirds of the continent’s working population and for each country contributes an average of 30 to 60 percent of gross domestic product and about 30 percent of the value of exports. Nonetheless, arable land and land under permanent crops occupy only about 6 percent of Africa’s total land area.

Except for countries with sizable populations of European descent—such as South Africa, Zimbabwe, and Kenya—agriculture has been largely confined to subsistence farming and has been considerably dependent on the inefficient system of [shifting cultivation](https://www.britannica.com/topic/shifting-agriculture), in which land is temporarily cultivated with simple implements until its fertility decreases and then abandoned for a time to allow the soil to regenerate. In addition, over most of Africa arable land generally has been allocated through a complex system of communal tenure and ownership rather than through individually acquired title, and peasant farmers have had rights to use relatively small and scattered holdings. This system of land ownership has tended to keep the intensity of agricultural production low and has inhibited the rate at which capital has been mobilized for modernizing production. A number of countries have made efforts to raise productive levels by selecting better varieties of seeds and planting materials, using tractors and other mechanized equipment, or increasing the use of mineral fertilizers and insecticides. Such measures, however, have been relatively limited, and they have raised concerns about their part in accelerating soil erosion and desertification. In areas of cash crop production, land has become private rather than community property, and cultivation is intensive.

The persistence of relatively low-productivity agricultural systems over large parts of the continent also stems from a lack of integration between [crop production](https://www.britannica.com/topic/crop-production) and [animal husbandry](https://www.britannica.com/science/animal-husbandry). Traditionally, sedentary cultivators like the Hausa in Nigeria and the Kikuyu in Kenya live apart from their nomadic herdsmen neighbours (the Fulani and Maasai, respectively), with the result that over large areas of the continent farmers do not have access to animals for draft power or to manure for fertilizer. The incidence of such insect pests as the tsetse fly also discourages mixed farming in many areas.

The need to sharply increase food production to meet the demands of a rapidly growing population, however, has remained paramount. Intense research at such centres as the International Institute of Tropical Agriculture in Ibadan, Nigeria, has been directed at developing high-performing varieties of crops and designing more appropriate cropping systems. One product of such research is a genetically improved strain of [corn](https://www.britannica.com/plant/corn-plant) (maize). Corn is not in itself a balanced food, being deficient in some amino acids, but a scientific breakthrough in the mid-1960s resulted in an increase of the amino acids lysine and tryptophan in certain new varieties of corn called opaque, or high-lysine, strains. These varieties initially produced low yields, were more prone to disease and vermin, and had a soft texture that was not desirable. Breeding programs, however, corrected these defects, and the new strains began to improve the nutritional value of diets in Africa (which consist mainly of corn preparations).

## **Principal crops**

## **Cereals and grains**

Africa produces all the principal grains—corn, wheat, and rice—in that order of importance. Corn has the widest distribution, being grown in virtually all ecological zones. Highest yields per acre are recorded in Egypt and on the Indian Ocean islands of Réunion and [Mauritius](https://www.britannica.com/place/Mauritius), areas where production is under irrigation. Millet and sorghum are also produced but principally in the savanna regions of the continent. Rice production and consumption have become increasingly important and are closely associated with areas of rapid urbanization. The most important rice-producing countries are Egypt, Guinea, Senegal, Mali, Sierra Leone, Liberia, Côte d’Ivoire, Nigeria, Tanzania, and Madagascar. Wheat production was once restricted to South Africa, the countries of North Africa, and the highland zones of Ethiopia and Kenya, but new varieties have extended cultivation (under irrigation) to countries in the savanna region such as Nigeria.

## **Legumes and fodder**

Fodder crops are not widely grown except in subtropical areas of North Africa and the highland zones of East and Southern Africa, where pure stands of alfalfa (lucerne) are raised. Berseem (a type of clover used for forage) is also grown in Egypt and Sudan under irrigation. Protein-rich legumes are produced widely, usually sown together with other crops. They include velvet beans, cowpeas, soybeans, and lablab (hyacinth beans). In North Africa broad beans and vetches are also produced. Peanuts (groundnuts) are grown widely in western Africa, both for domestic consumption and for export.

## **Tubers and root crops**

Cultivation of the hardy cassava has expanded tremendously, particularly in western and central Africa; it has displaced the cultivation of yams in many areas and has ceased to be regarded as just famine reserve. Potatoes are cultivated in the higher elevations of such countries as Ethiopia, Kenya, and Madagascar, as well as in areas of Mediterranean climates in North and South Africa. Sweet potatoes have a more tropical and subtropical distribution, while the plantain is grown extensively in the tropical forest zones.

## **Fruits and vegetables**

Among the important fruits are bananas, pineapples, dates, figs, olives, and citrus; the principal vegetables include tomatoes and onions.

The banana is well distributed throughout tropical Africa, but it is intensively cultivated as an irrigated enterprise in Somalia, Uganda, Tanzania, Angola, and Madagascar. Also widely cultivated is the pineapple, which is produced as a cash crop in Côte d’Ivoire, the Congo basin, Kenya, and South Africa.

A typical tree of desert oases, the date palm is most frequently cultivated in Egypt, Sudan, and the other countries of North Africa. The fig and olive are limited to North Africa, with about two-thirds of the olive production being processed into olive oil.

The principal orange-growing regions are the southern coast of South Africa and the Mediterranean coast of North Africa, as well as Ghana, [Swaziland](https://www.britannica.com/place/Swaziland), Zimbabwe, the Democratic Republic of the Congo, and Madagascar. The largest yields are produced in countries where basin irrigation is practiced. South Africa is the largest producer of grapefruit, followed by Sudan.

Tomatoes and onions are grown widely, but the largest-producing areas border the Mediterranean. Large vegetables, such as cabbages and cauliflowers, are grown in the same region, from where it is possible to export some quantities to southern Europe. Important vegetables of tropical Africa include peppers, okra, eggplants, cucumbers, and watermelons.

## **Beverage crops**

Tea, coffee, cocoa, and grapes are all grown in Africa. Kenya, Tanzania, Malawi, Zimbabwe, and Mozambique are the largest producers of tea, while Ethiopia, Uganda, Côte d’Ivoire, Tanzania, and Madagascar are the major producers of coffee. Cocoa is essentially a tropical forest crop. Its cultivation is concentrated in western Africa, with the principal producers being Côte d’Ivoire, Ghana, Nigeria, and Cameroon. All these crops are largely grown for export. Sharp price fluctuations caused African countries to form international cartels with other producing countries in an effort to regulate the market and negotiate better prices. Grapes are produced in northern Africa and in South Africa, essentially for the making of wine for European markets.

## **Fibres**

Large areas of Africa raise cotton for textile manufacture. The principal producing countries include Burkina Faso, Nigeria, Egypt, Zimbabwe, and Mali. Sisal production is also important, especially in the eastern African countries of Ethiopia, Tanzania, Kenya, and Madagascar, as well as in Mozambique, Angola, and South Africa. Some countries, notably Nigeria, promote the cultivation of kenaf (one of the bast fibres).

## **Other cash crops**

The oil palm, producing palm oil and palm kernels, grows widely in secondary bush in the tropical forest zones. There are large plantations in Nigeria, Côte d’Ivoire, and the Democratic Republic of the Congo. Coconuts are important in the [Comoros](https://www.britannica.com/place/Comoros), Ghana, Côte d’Ivoire, Mozambique, Nigeria, and Tanzania. Kola nuts are grown principally in the forested regions of Nigeria, Ghana, Côte d’Ivoire, Sierra Leone, and Liberia. The cashew tree is grown to a limited extent in East Africa and to a lesser extent in the coastal countries of western Africa. Rubber is produced principally in Nigeria and Liberia. Tobacco is widely cultivated as an export crop in Zimbabwe, Malawi, Tanzania, Nigeria, and South Africa. Sugarcane is also widely grown but largely for domestic consumption. Major producers include South Africa, Egypt, Mauritius, and Sudan.

## **Livestock and fishing**

Cattle, sheep, and goats form the bulk of livestock raised. Except in South Africa, most of these animals are raised essentially for meat. Sheep in the north and south are also kept for their wool; South Africa alone produces half of the entire continental production, much of the clip from Merino or crossbred Merino sheep. In the tropical areas, however, other livestock products include hides and skins. It is estimated that the annual output of hides is in the range of 10 percent of the total population of cattle, while that of sheepskins and goatskins is approximately 25 percent. The number of game hides and skins processed and sold annually is not accurately known. Except in South Africa, Zimbabwe, and Kenya, production of milk and milk products is grossly insufficient to meet domestic needs. Poultry production, however, has increased tremendously, and everywhere stocks have nearly doubled since the 1960s. Nigeria, Ethiopia, Morocco, South Africa, and Sudan are the countries with the largest poultry stocks.

Fishing is important on the local level in all countries bordering the sea or inland bodies of water. Commercial ocean fishing is practiced most widely by the countries near the rich fishing grounds of the west coast—South Africa, Namibia, Angola, Nigeria, Ghana, Senegal, and Morocco. Herring, sardines, and anchovies contribute most to the ocean catch, followed by jack, mullets, sauries, redfish, bass, and conger in tropical waters and cod, hake, haddock, tuna, bonitas, and bullfish in northern and southern waters. Inland countries with well-developed fisheries include Malawi, Uganda, Chad, Côte d’Ivoire, and Mali; tilapia and other cichlids constitute the largest catch in inland waters. Some countries, such as Nigeria, have developed both marine and freshwater fishing industries. A number of commissions have been established to monitor and control fishery development on the continent.

## **Industry**

The countries of North Africa, unlike those of the rest of the continent, have wide-ranging and ancient traditions of [manufacture](https://www.britannica.com/technology/manufacturing). At the end of the 19th century, however, Africa as a whole was regarded solely as a potential source of raw materials or as a natural market for Europe. In the course of time, limited industrialization tended to converge around the relatively large expatriate settlements, where technical considerations operated in favour of the industrialization of some areas and transport costs constituted the dominant development factor in others. Though [World War II](https://www.britannica.com/event/World-War-II) led to acceleration in the process of industrial development, by 1950 the total factory output of manufacturing industries (excluding South Africa) still remained small.

After 1950 output rapidly increased. The substantial increase and its range were attributable to such factors as increased demand, the substitution of home-produced for imported goods, the encouragement of manufacturing by individual African administrations, and an influx of development capital and petrodollars. Major weaknesses nevertheless were evident, among them high capital costs, the political division of Africa into more than 50 countries, which inhibited mass production and mass marketing, and a scarcity of skilled personnel.

Despite its expansion since about 1950, the relative significance of manufacturing remains considerably smaller than in the more-advanced countries and smaller also than in continental Asia and in Latin America. Furthermore, the share of manufacturing in the gross domestic product varies widely in different African countries. At the lower end of the spectrum are countries such as Equatorial Guinea, Guinea, and Niger, and at the upper end of the spectrum are countries such as Egypt, Algeria, and [South Africa](https://www.britannica.com/place/South-Africa). The total output of manufacturing in South Africa alone, however, is nearly 50 percent of the output in the remainder of the continent.

Manufacturing in Africa tends to concentrate on comparatively simple items and on those where some special advantage is available to the African producer, although the range of products has widened. Industrial production includes electric motors, transport equipment, and tractors, while airplanes are also assembled. The leading heavy industries are chemical and petroleum, coal, rubber, and metal manufacture. Most industrial plants, however, are of the relatively simple kind, being engaged in food processing or in manufacturing textiles, leather products, and cement or other building materials.

The [mining](https://www.britannica.com/technology/mining) industry is an increasingly significant source of national income, foreign exchange, and raw materials for the development of local processing industries. The industry is very unevenly distributed: more than half of mineral earnings came from North Africa alone, and nearly one-fourth came from Southern Africa.

Except in South Africa, iron and steel are used mostly for construction rather than for engineering. There are integrated iron and steel plants in Algeria, Tunisia, Egypt, Zimbabwe, and South Africa, while smaller production facilities—often based on the transformation of scrap—exist in several other countries.

[Petroleum-refining](https://www.britannica.com/science/petroleum) capacity is based on domestic crude oil output in a few cases and on imported crude oil in others. In some countries the development of the petrochemical industry followed the establishment of refineries. In 1965 there were only three major petrochemical complexes in Africa—in Zimbabwe, Egypt, and South Africa. By the late 20th century several more countries had large refinery capacities, including Algeria, Ghana, Kenya, Libya, Morocco, Nigeria, Senegal, Sudan, and Tunisia.

Most of the [textiles](https://www.britannica.com/technology/textile) are processed in bleaching, dyeing, and printing establishments that form an integral part of composite spinning and weaving units. With the exception of Egypt, producers have concentrated on the home market and on the manufacture of cotton textiles. Although African countries export textiles, their imports are usually larger. Rayon–synthetic and woolen materials are, for the most part, imported. Ready-made clothing, both domestic and imported, has emerged as a major market factor.

Most African countries have cement plants, the leading producers being South Africa and Algeria. The transport costs of cement make its price variable. Prices are lowest on the North African coast, somewhat higher on the west and east coasts, and highest in the inland countries.

By far most of Africa’s wood output is used for fuel. Sawmills, however, are distributed throughout the continent. Plants for the manufacture of plywood, particleboard, and fibreboard have a considerable amount of excess capacity. The pulp and paper industry is concentrated in North Africa and in Southern Africa, although a number of small paper mills have been established in other parts of the continent. The main products of the paper industry proper comprise newsprint, printing and writing papers, paper and paperboard, and industrial paper. The bulk of the output of all paper products is directed to national markets.

## **Power**

A spectacular development in the use of electric energy took place in the second half of the 20th century, partly because of the growth of the petroleum industry and partly because of the establishment of large [hydroelectric](https://www.britannica.com/science/hydroelectric-power) plants and some thermoelectric plants. The increased quantity and quality of electric energy gave rise to problems of transmission and distribution. Unlike thermoelectric plants, which may be sited where the consumer demand is greatest, sites of hydroelectric installations are not flexible, and the type of transmission lines in use has therefore changed. Although in the 1950s it was common practice to use lines with transmission voltages of less than 220 kilovolts, transmission lines were later built that could handle higher voltages. In Nigeria, for example, 330-kilovolt lines were strung; similar lines were used in Zimbabwe’s system, which feeds [Harare](https://www.britannica.com/place/Harare) and Bulawayo in Zimbabwe, as well as the Copperbelt in Zambia. This same system is interconnected in the north with the large Katanga (Shaba) region hydroelectric power stations in the Democratic Republic of the Congo. The construction of high-tension lines to supply power to the Katanga Copperbelt was completed in 1982. Much of the power for Egypt’s population centres is supplied by lines from such hydroelectric power stations as that at the Aswan High Dam. Construction of 533-kilovolt lines to transmit power from the Cahora Bassa hydroelectric station in Mozambique to South Africa was completed in 1974. The possibility of supplying landlocked states with energy from the large hydroelectric plants in the coastal states is more likely to be considered in the future.

A number of steam power stations are located in ports and cities near the coasts. The largest installations of this kind operate in [Tunis](https://www.britannica.com/place/Tunis), Tunisia; [Casablanca](https://www.britannica.com/place/Casablanca-Morocco) and Oujda, Morocco; [Dakar](https://www.britannica.com/place/Dakar), Senegal; [Abidjan](https://www.britannica.com/place/Abidjan), Côte d’Ivoire; and Lagos, Nigeria. Steam power stations using coal are by far the most common, especially in South Africa.

Electric energy consumption in large urban centres, especially when they are near coastal towns and mining areas where industrial activity has taken shape, has increased considerably. Although some countries have extended networks to the rural areas or increased the numbers of isolated low-powered stations and independent networks, progress in rural electrification has not been especially noteworthy.

## **Trade**

## **Internal trade**

Intra-African trade records frequently understate the amount of trade—partly because of the lack of adequate statistics and partly because of the high rate of smuggling, which allows a substantial amount of traditional border trade to continue unrecorded. Apart from this, commerce between African states has been handicapped by a tendency for trade to remain concentrated within the common-currency areas and trade zones that developed among African countries during the colonial era, by the often inadequate means of transport and communication, by the lack of complementary agricultural or other products, and by the limited development of manufacturing industries.

Much of the intra-African trade consists of consumables—food, drinks, tobacco, sugar, cattle, and meat. The growth of industrialization in some countries, however, has been accompanied by an increase in the trade of durable and nondurable manufactured goods. There has also been a large amount of reexport trade between the coastal and inland states, especially in machinery, transport equipment, and spare parts.

Common-currency and trade zones that have evolved through the granting of preferences or the operation of common currencies inherited from former colonial powers include: the Economic and Monetary Community of Central Africa (CEMAC), which comprises Cameroon, Gabon, the Central African Republic, Equatorial Guinea, Chad, and the Republic of the Congo and is part of the larger Economic Community of Central African States (CEEAC), which also includes Angola, Burundi, the Democratic Republic of the Congo, and [Sao Tome](https://www.britannica.com/place/Sao-Tome) and Principe; the [Economic Community of West African States](https://www.britannica.com/topic/Economic-Community-of-West-African-States) (ECOWAS), consisting of Benin, Burkina Faso, Cape Verde, Côte d’Ivoire, [The Gambia](https://www.britannica.com/place/The-Gambia), Ghana, Guinea, [Guinea-Bissau](https://www.britannica.com/place/Guinea-Bissau), Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo; the Common Market for Eastern and Southern Africa (COMESA), consisting of Burundi, Comoros, the Democratic Republic of the Congo, Djibouti, Egypt, [Eritrea](https://www.britannica.com/place/Eritrea), Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, [Seychelles](https://www.britannica.com/place/Seychelles), Sudan, Swaziland, Uganda, Zambia, and Zimbabwe; the East African Community, comprising Kenya, Uganda, Tanzania, Rwanda, and Burundi; the [Southern African Development Community](https://www.britannica.com/topic/Southern-African-Development-Community) (SADC), comprising Angola, Botswana, the Democratic Republic of the Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe; and the [Arab Maghreb Union](https://www.britannica.com/topic/Arab-Maghrib-Union) (UMA), grouping Algeria, Libya, Mauritania, Morocco, and Tunisia.

## **External trade**

Since the outbreak of World War II there has been a considerable expansion in Africa’s overall external trade. The growth compares favourably with that of the other developing regions, such as Latin America. The value of imports, however, has outweighed exports for some time, resulting in huge trade imbalances for most African countries. The large expansion in African exports is generally attributed to the increase in the demand for primary commodities during World War II and in the immediate postwar reconstruction period. Subsequently the attainment of independence by a large number of African countries, especially in the early 1960s, followed by a bid for economic development, strengthened the export-expansion drive. Another reason for the rapid growth in African exports was the temporary increase in the price of primary commodities, although subsequently the general trend, except for petroleum, has been toward depressed commodity prices. The persistence of this situation has been part of the reason the economies of many African countries have become crippled by huge foreign debts.

## **Exports**

An important factor that influenced the growth of African exports was the discovery of petroleum in several countries, notably Libya, Algeria, Nigeria, Gabon, Angola, the Republic of the Congo, and Cameroon, and the dramatic price increases brought about by the Organization of Petroleum Exporting Countries (OPEC) in the 1970s. Other factors include the discovery and the increased exploitation of minerals that are in high demand, such as diamonds—especially in Sierra Leone, the Republic of the Congo, the Central African Republic, and the Democratic Republic of the Congo—and the exploitation of other minerals, such as uranium ore.

Since achieving independence, many African countries have made attempts to diversify external trade relations. The record of achievement has been poor, however, because Africa’s trade patterns continued to reflect the influence of traditional links with the countries of western Europe. These links were further consolidated through a series of agreements, collectively called the [Lomé Conventions](https://www.britannica.com/topic/Lome-Convention), that guaranteed preferential access to the [European Economic Community](https://www.britannica.com/topic/European-Community-European-economic-association) (precursor to the European Community and, later, the European Union) for various export commodities from African states and that provided European aid and investment funding. Nonetheless, a significant export trade developed with the United States and Japan.

In most African states one or two primary commodities dominate the export trade—e.g., petroleum and petroleum products in Libya, Nigeria, Algeria, Egypt, Gabon, the Republic of the Congo, and Angola; iron ore in Mauritania and Liberia; copper in Zambia and the Democratic Republic of the Congo; cotton in Chad; coffee in Burundi, Uganda, Rwanda, Ethiopia, Madagascar, Kenya, and Côte d’Ivoire; and sugar in Mauritius.

## **Imports**

The tremendous increase of Africa’s import trade has meant that the import bill of most African states has exceeded their export earnings; in consequence, many governments have established import restrictions or subsidized many of the required imports. The bulk of imports comes from western Europe, especially countries of the European Union, with strong trade ties persisting along former colonial lines. There has, however, been a substantial increase in imports from the United States, Japan, and South Africa. Imports are needed primarily to develop manufacturing industries and are, therefore, confined for the most part to mineral fuels, industrial goods, machinery, transport equipment, and durable consumer goods.

## **Transportation**

There were highly developed transport networks in many parts of Africa in precolonial times, and, during the colonial era that followed, these networks were restructured to penetrate into the interior from the seaports and, in the main, to serve the commercial and administrative needs of the colonial powers. Their fragmentation, which led to interregional links being but thinly developed, resulted from the juxtaposition of varied and difficult terrains, the economic artificiality of certain national frontiers, the lack of a developed intra-African trade, and the strong orientation of commodity trade with the administering countries. All of this was further complicated by the existence of vast unpopulated areas lying between the main centres.

The emergence in the 1960s of independent African governments who recognized the need to lift economies from their generally very low levels and, above all, to develop agriculture and embark on industrialization heralded improvements in economic planning, the development of transport networks, and the introduction of cheaper freight rates. But there remained a serious shortage of qualified African labour to plan and manage transport systems at the national or multinational level and, simultaneously, to keep up with the rapid development of transport technology outside Africa.

## **Animal transport**

There is some evidence that before the arrival of the camel, which was introduced into Africa via Egypt at the time of the Arab conquest, bullocks were used either as pack animals or to draw carts from the northern countries across the Sahara to the gold-producing areas of the ancient Sudan. From the 16th century onward the Portuguese developed transport inland from the coast at Mozambique, and from the 17th century first the Dutch and then British settlers from the Cape trekked northward and northeastward with their wagons. Except in such highland areas as Ethiopia, where pack animals were and still are used, the tsetse fly often prevented the use of animal transport. With the steady progress in the development of transport infrastructure in many African countries, the use of bullocks in Southern Africa, donkeys in western and North Africa, horses in northern Nigeria, and camels in western and North Africa and the Horn of Africa has been reduced, but the extent of this reduction cannot be accurately gauged.

## **Motor transport**

The arrival and rapid development of the internal-combustion engine in the 1920s transformed the collection and distribution of goods and personal travel. Roads were built, particularly in North and Southern Africa but also in parts of the west and east. World Bank loans since the 1950s, supplementing contributions to road and highway development from national budgets, have financed the building and improvement of road networks in many African countries.

## **Rail transport**

The early railways were constructed partly to facilitate the administration of interior regions and to bring supplies from ports to central consumption or distribution points and partly—especially in the south—to enable valuable minerals or commodities to reach the coast for export. In Africa, as in Europe and [North America](https://www.britannica.com/place/North-America), the major period of railway development extended from the end of the 19th century to the end of World War I. This expansion, however, was not coordinated: railways with different gauges of track were built and were operated with rolling stock of different braking and coupling systems. Thus, the colonizing powers left a difficult and costly legacy for independent African countries who wished to link themselves together. As with roads, rail networks have been improved considerably since the 1960s and, as a result, there has been a lowering of transport costs.

## **Air transport**

Air transport is well suited to Africa’s geographic vastness, and it has become the primary means of international and sometimes of national travel in Africa. During the late 1940s and the ’50s, as great advances were made in the extension and improvement of rail and road services, a new transport factor emerged in the introduction of internal and international scheduled air services. The rapid development of air transport increased the movement of goods and people and began to open up the hitherto largely closed interior of the continent. Transport became much quicker and usually cheaper. Since then, internal air services have steadily increased, and intercontinental air transport, especially of passengers, has developed greatly. The largest international airports include those at Casablanca, Morocco; Las Palmas, Canary Islands; [Cairo](https://www.britannica.com/place/Cairo), Egypt; Dakar, Senegal; Abidjan, Côte d’Ivoire; Lagos, Nigeria; Douala, Cameroon; Addis Ababa, Ethiopia; Nairobi, Kenya; and Johannesburg, South Africa.

## **Navigation**

Historically, throughout the vast interior between the Sahara and the Zambezi River, people or goods were transported by canoe or boat on the great river systems of the Nile, Sénégal, Niger, Congo, Ubangi, and Zambezi rivers and on the few but very large lakes. Where conditions allowed, engine-powered craft later supplemented or displaced canoes, but further development of water transport has been slight. Also notable were the construction of lake ports and the installation of rail ferries across Lake Victoria.

Meanwhile, on the coasts, artificial harbours have been developed. New berths have been added to established port facilities, and a number of ports have been constructed. In planning new ports, the choice of site, probable costs, and the possibilities of using containers or other unitized loads have been taken into consideration.

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