

Sub-Saharan Africa: Physical Geography



Sub-Saharan Africa is the first region we've studied that extends south of the Equator. Look at the region's latitudinal position.

Sketch in the Equator, the Tropic of Cancer and the Tropic of Capricorn

Over 80% of the continent of Africa lies in the **low / middle / high** latitude belt.

Subregions

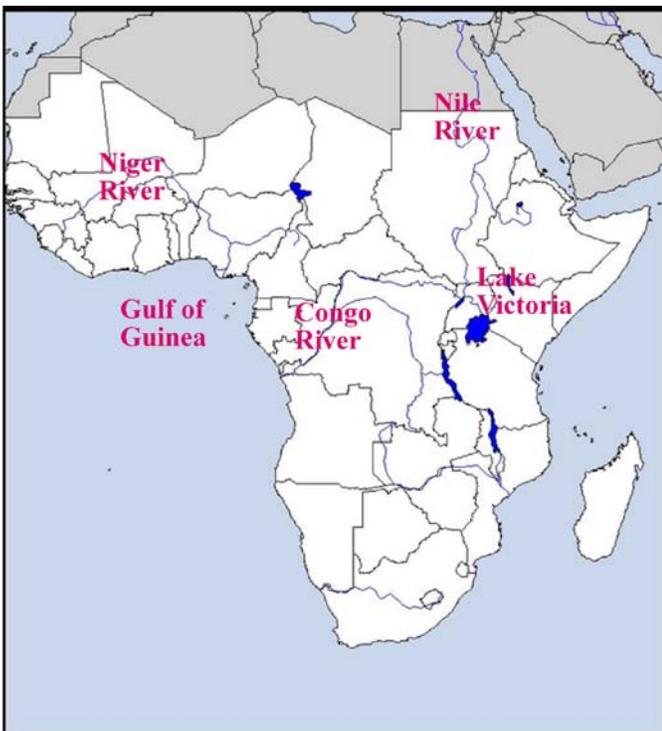
I divide Africa into four subregions. Outline and label each on the map at left:

West Africa: Nigeria, the most populous country of Africa, as well as Ghana, Cote d'Ivoire (Ivory Coast), Burkina Faso, Niger, Mali, Senegal, Guinea, Benin, Togo, Sierra Leone, Liberia, Mauritania, Guinea-Bissau, and Gambia. The entire region is home to more than one out of three Sub-Saharan Africans.

West Africa varies a lot from north to south. Along the coasts, it is accessible, arable, and densely populated. The physical geography of this area could contribute to a vibrant trading economy and wealth. The potential for wealth is further enhanced by mineral wealth for the region has both diamonds and oil. Unfortunately, the region is wracked by civil wars and ethnic conflict that are spurred on to a large extent by the mineral wealth itself. In the north, deserts and steppes lessen accessibility and arability and the population is much lower.

East Africa: East Africa is the birthplace of the human race. Within East Africa lies the rift valley, the longest crack on the earth's surface. The region also includes the African Horn (the part that looks like a rhinoceros's horn). The coasts of East Africa front the Indian Ocean. The mainland countries of East Africa are Ethiopia, Tanzania, Kenya, Uganda, Mozambique, Malawi, Rwanda, Somalia, Burundi, Eritrea, and Djibouti. There are also island countries: Madagascar is the biggest and there are a number of smaller island countries.

Central Africa: In the south, Central Africa is the home of the Congo River and tropical rainforests. The region dries out toward as it extends further from the Equator. The largest country is the Democratic Republic of Congo. Central Africa includes the Republic of Congo, Gabon, Equatorial Guinea, Cameroon, and the Central African Republic, Chad and Sudan to the north; to the south is Angola. Note: The Democratic Republic of Congo used to be known as Zaire. It is the larger of the two "Congos."



Southern Africa: This is the only subregion that dips into the middle latitudes. Because of this and because of the immense non-fuel mineral wealth, this region has attracted more European settlement with its consequent problems. This subregion includes South Africa, Lesotho, Swaziland, Namibia, Botswana, Zimbabwe and Zambia.

Water Bodies and Rivers

One of the easiest ways to find the Rift Valley on a map that does not explicitly indicate it is to look for Africa's lakes. In the Rift Valley are the largest lakes of the Continent. Most are long and narrow, like Lake Baikal, which lies in Russia's rift zone. On the map at left, notice Lake Victoria, the world's second largest lake (by area, not by volume) after Lake Superior. Besides being one of the headwaters of the Nile, Lake Victoria is critically important to the countries that share its waters. It provides drinking water, hydroelectric power, cheap transportation routes within the region, and a source of food and livelihood through fishing.

Over the last decade, water levels in the lake have dropped due to prolonged regional drought and to mismanagement of water resources. Additionally, millions of gallons of untreated sewage flow into the lake every week. Fish and other aquatic animals are

vulnerable to disease and genetic mutation. All of this makes the population around Lake Victoria highly vulnerable. This area, which has good arability and internal accessibility, is home to over 30 million people, giving it the highest rural population density in the world.

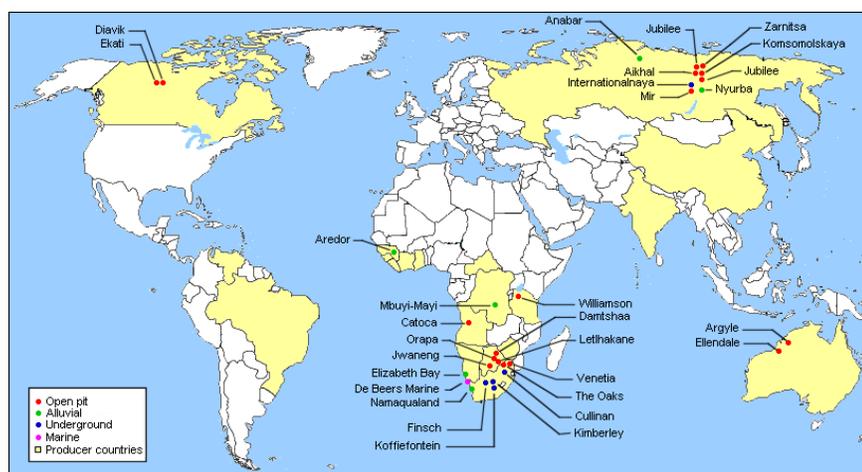
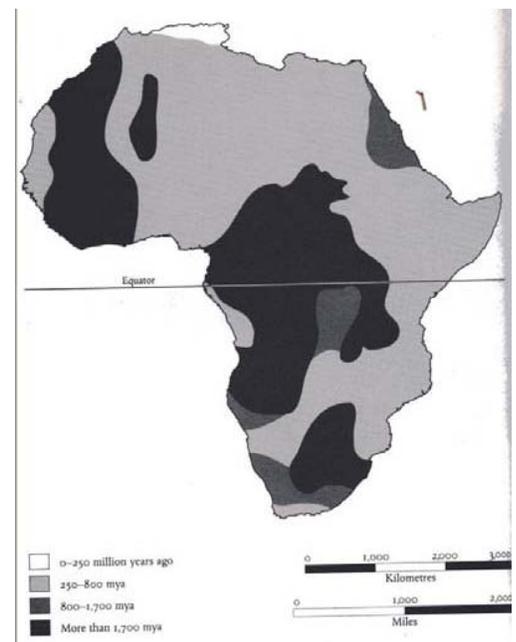
On the map on the previous page, find the Nile River, the Congo River, and the Niger River. The Congo River is the second largest river by volume after the Amazon River of South America. Like the Congo, it is a tropical rainforest river. Its headwaters are in the mountains of the rift valley and the river flows west and empties into the Gulf of Guinea.

Africa has a shortage of navigable rivers because even the major ones are interrupted by rapids and waterfalls on the edges of the shield plateaus. Look at the Water Power Map on page 57 of the Atlas. The rivers may not be navigable, but they provide huge hydropower potential. Notice that almost all of that potential is undeveloped. What are some of the barriers to hydropower development in Sub-Saharan Africa?

Landforms

Africa is the most tectonically stable continent. Look at the tectonic map on pages 8 & 9 of the Atlas. Notice that there are no plate boundaries cutting through the region. The region has three major cratons – ancient masses of rock that form the base of a continent – that you can see on the map at right. One lies in West Africa, stretching north from the coasts of the Gulf of Guinea. The second, called the Congo Craton, takes up most of the center of the continent. The Kraapvaal Craton is the smallest of the tree and makes up most of southern Africa. The ancient rocks that make up these cratons are more than 1.7 **billion** years old.

Look at the Landforms Map on pages 6 & 7 of your Atlas. The dominant landform of Sub-Saharan Africa by far is shield. This is the most extended area of shield in the world. This basic fact of geology has a distinct impact on the region. First, many of the soils of the region are infertile because of the resistant metamorphic rocks that dominate shield landforms. Second, because of the resistant rock of the shields, Africa is a series of plateaus at different elevations. These plateaus make transportation difficult. Africa has a shortage of navigable rivers because even the major ones are interrupted by rapids and waterfalls on the edges of the shield plateaus. Look at the Water Power Map on page 57 of the Atlas. The rivers may not be navigable, but they provide huge hydropower potential. Notice that almost all of that potential is undeveloped. What are some of the barriers to hydropower development in Sub-Saharan Africa?



Due the dominance of shield landforms, South Africa has rich reserves of metals and gemstones. The map at left shows the major diamond-producing areas in the world. All are found in areas with shield landforms. Notice how many important producer areas are found in Africa. The most important diamond-producing subregion of Africa is in the south. Africa produces over two-thirds of the world's diamonds by value. Botswana alone produces over 25%. In addition to diamonds, Africa also has about 25% of the world's gold, 20% of the world's copper, 40% of the world's cobalt and almost 60% of the world's platinum group metals.

Africa doesn't have much iron – at least when compared to its other mineral wealth. South Africa is a leading iron producer in the region, but has less than 1% of the world's reserves. Africa may not have much iron, but it has lots of ferroalloys. Ferroalloys are metals added to iron to make steel that is lighter, stronger, and rust resistant. Look at the Ferroalloy Map at the bottom of page 54 of the Atlas. Africa is an important producer of three major ferroalloys. It produces over 50% of chromite, about a third of both vanadium and manganese.

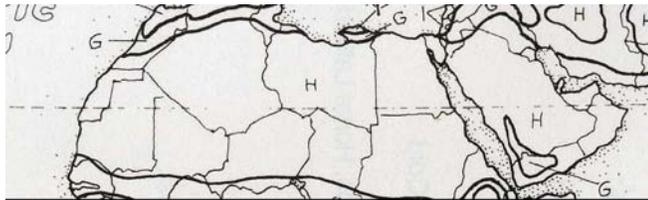
The Great Rift Valley

The second major landform area of Sub-Saharan Africa is rifted shield. We have already talked about the Rift Valley. The Great Rift Valley is the longest crack on the earth's surface. The Rift Valley is a series of canyons that is over 4000 miles long, cutting across the Horn of Africa and forming a "J" with a tail in East Africa. This area of rifted shield was created millions of years ago when a shift in the tectonic plates ripped this part of the earth's crust. As the crust tore apart, volcanic material filled the void, creating volcanic mountains with rocks that have weathered into excellent soils. Like the rifted shield area of Russia, this rift valley is filled with long, narrow, and very deep lakes. This area is tectonically active and is associated with earthquakes, volcanoes, and mountain building. We will discuss more about the Rift Valley in the Landforms section of this handout.

High Africa is in the areas associated with the Rift Valley of East Africa and within Southern Africa. **Low Africa** is in Central, North and West Africa. You can see this very clearly in Plate 38 of the *Geography Coloring Book*. Notice how little sedimentary cover there is. The lack of sedimentary cover is particularly striking in coastal areas. Africa lacks the broad coastal plains in which good harbors are often formed. Instead, the steep plateau edges extend almost to the coast. Broader areas of sedimentary cover are found around Gambia and Senegal, the delta of the Niger River, and the southeast coast of the continent.

Fuel minerals are highly associated with sedimentary landforms. In spite of the very small amount of sedimentary cover, Sub-Saharan Africa also has oil and natural gas. These are not found in shield areas. Rather, they are found primarily in the sediments of the Gulf of Guinea. While Sub-Saharan Africa has a relatively small proportion of the world's petroleum and natural gas reserves, Nigeria and Gabon are important exporters.

Climates



Notice that the climates in the southern hemisphere are a mirror image of the climates in the northern hemisphere.

Over 80% of Africa lies in the **low / middle / high** latitudes.

The major tropical climates are tropical rainforest and tropical savanna. The primary difference between the two is that tropical rainforest has year round rainfall while tropical savanna has _____.

Tropical rainforest climates make up about 20% of the African continent. These climates are located close to the _____ (line of latitude) where there is a year-round [**low / high**] pressure zone.

On the map at left, the number ____ corresponds to Tropical Rainforest areas. In Africa, tropical rainforests are found in the basin of the _____ River and along the Gulf of _____. This is the home of monkeys, chimps, and gorillas.

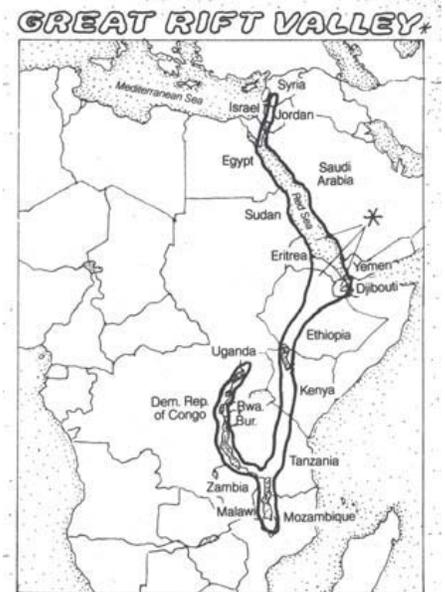
As you move poleward out of tropical rainforest climate areas, the next climate zone you encounter is tropical _____.

This climate area corresponds to the number ____ on the map

above. It makes up 40% of the African continent, making it the dominant climate area of the region. In Africa, the tropical savanna areas are characterized by tall grass vegetation. This is the home of elephants, giraffes, lions and rhinos.

As you move further poleward, a [**low / high**] pressure zone becomes dominant. Here the dominant climate is _____. This climate area corresponds to the number ____ on the map at above.

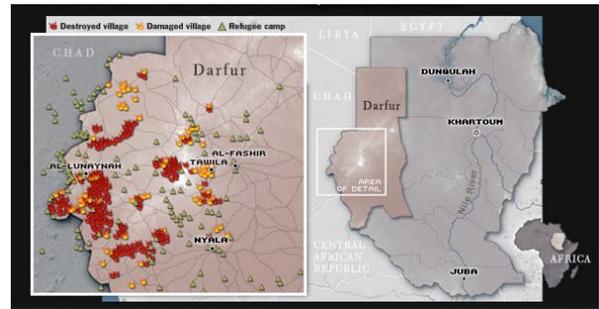
Sahel / African Transition Zone: In the northern hemisphere, steppe climates extend in a band clear across the African Continent. This is a transition zone between the desert climates of the largest desert in the world – the _____ Desert – and the tropical savanna regions to the south. Known as either the Sahel or the African Transition Zone, it is more than a climatic transition zone; it represents the transition between the Islamic cultures that dominate North Africa and the Christian and animist cultures that dominate the South. Find the Sahel climate region on the climate map and label it.



The Sahel is also the land of contrasts. North to south, the Sahel is only 200 to 400 kilometers wide, but it stretches 6000 miles across the African continent from the Senegal in the west to the Red Sea in the east. The short grasses of the Sahel provides one of the largest pastoral/herding zones in the world.¹ Home to Timbuktu, one of the most famous trading cities in the history of the world, this subregion was once the site of sophisticated trading empires which exchanged goods from sub-Saharan Africa with the rest of the world. It is now one of the poorest areas in the world.

The Darfur Region of Sudan is right in the path of this transition zone. Here Arab militias are waging a genocidal campaign against southern black Africans – many of whom are also Muslim. It is shown on the map at right.

As you move poleward from the steppe climates you encounter _____ climates. They are represented on the climate map by the number _____. These are larger in the northern hemisphere because there is a lot more landmass in the northern hemisphere. In the southern hemisphere, there is a west-coast desert called the Namib Desert. Find the Namib Desert on the map above and label it.



What factors contribute to this desert? (Refer to the climate handout if you don't remember the factors that contribute to low rainfall.) The interior desert is the Kalahari, home of the African Bushmen. Locate and label that feature on the climate map.

The highest peaks in Africa are found in East Africa around the Rift Valley. Peaks are high enough here to cause _____ climates. These are represented on the map above by the letter _____.

What factors predict the poverty or wealth of a region? What does the physical base of Africa suggest about its potential for economic development?

¹ Reader, John. 1997. *Africa: A Biography of a Continent*. New York: Vintage Books.