

## UNIT THREE: NATURAL RESOURCE BASE OF AFRICA

### Introduction to the Natural Resource Base of Africa

In the previous unit, you learned about the climate of Africa. This unit will focus on Africa's natural resources, examining the continent's endowment of resources such as water, soil, minerals, vegetation, and wildlife. Understanding these resources is crucial for their sustainable management, ensuring that they continue to support life and development for future generations.

**What Are Natural Resources?** Natural resources are parts of the environment that humans can extract and use for their benefit. These resources are vital for life on Earth, providing both consumptive uses, like food and fuel, and public-good services, like clean air and water. However, simply having these resources isn't enough; they must be used wisely to avoid depletion or degradation.

Natural resources are divided into two main categories:

1. **Renewable Resources:** These can be replenished naturally at a rate that matches or exceeds their use by humans. Examples include sunlight, wind, and water.
2. **Nonrenewable Resources:** These exist in fixed amounts and can be exhausted. Examples include fossil fuels like coal and oil.

**Sustainable Use of Resources** The sustainable use of natural resources is essential. This means using resources at a rate that doesn't harm the environment or reduce their availability for future generations. Sustainable practices include conserving resources, reducing waste, and managing ecosystems carefully.

**Key Natural Resources of the World** Some of the most critical natural resources globally include:

1. **Water:** Water covers about 71% of Earth's surface, but only 2.5% is freshwater, which is crucial for drinking, agriculture, and sanitation. Most freshwater is trapped in glaciers or underground, making it a limited resource.
2. **Air:** Air, which includes oxygen, is essential for all living things. Clean air is vital for health, but pollution from human activities is a growing problem.
3. **Soil:** Soil supports plant growth by providing nutrients and is crucial for agriculture. Soil pollution and erosion threaten this resource, leading to reduced crop yields.
4. **Forests:** Forests provide oxygen, regulate carbon dioxide, and are home to a vast array of species. However, deforestation poses a significant threat to this resource.

5. **Minerals:** Minerals are vital for industrialization and technological advancement. They are nonrenewable, making recycling and careful management crucial.
6. **Oil:** Oil is a critical energy resource but is nonrenewable and contributes to environmental pollution. There is a growing need to shift to renewable energy sources.

**Overview of Africa's Natural Resources** Africa is rich in natural resources, including vast water systems, diverse soils, abundant mineral deposits, extensive forests, and unique wildlife. The management of these resources is crucial for the continent's development.

**Unit Outcomes** By the end of this unit, you should be able to:

- Identify key natural resources globally.
- Describe Africa's major drainage systems and water resources.
- Identify the main soil types and mineral resources in Africa.
- Assess the major vegetation and wildlife types in Africa.

**Sustainable Natural Resource Management** Sustainable Natural Resource Management (NRM) involves the careful and responsible use of natural resources to prevent their degradation. This includes practices like conserving biodiversity, enhancing people's skills and engagement, protecting coastal environments, and planning for effective action.

## The Niger Basin

The Niger Basin is the largest river basin in Western Africa, covering a vast area around the Niger River. The Niger River, which is about 4,200 km long, is the third longest river in Africa. It originates from the Futa Jalon highlands in Guinea and flows through several West African countries before emptying into the Atlantic Ocean in southern Nigeria. The river passes through many regions, encountering rapids that interrupt its flow at various points.

The Niger River's most significant tributary is the Benue River, which joins the Niger from its left bank in Nigeria. Historically, the middle Niger region was separated from the upper Niger by a narrow depression called the Benue Trough. This depression once became an inland lake but eventually dried up over time due to evaporation, leaving behind the inland Niger delta.

## Economic Activities in the Niger Basin

1. **Fishing:** Fishing is a vital activity along the Niger River, supporting the livelihoods of many communities. However, the discovery and exploitation

of petroleum in the Niger Delta have caused significant pollution, disrupting fishing activities.

2. **Irrigation:** The Niger Valley is heavily used for irrigation. Numerous canals have been constructed, enabling the cultivation of crops such as rice, cotton, sugarcane, and vegetables.
3. **Hydroelectric Power:** The Niger River is also a source of hydroelectric power. The largest hydroelectric project on the river is the Kainji Dam in Nigeria, completed in the late 1960s.
4. **Navigation:** The Niger River serves as a crucial transportation route. Over three-fourths of its length is navigable for commercial shipping. Large vessels can navigate the river from the Atlantic Ocean to the city of Onitsha in Nigeria, especially from June to March.

## The Zambezi Basin

The Zambezi River, approximately 3,540 km long, is another significant river in Africa, flowing through a basin of about 1,199,164 square kilometers. The river is characterized by numerous waterfalls, with the most famous being Victoria Falls. After passing through Victoria Falls, the river winds through deep gorges cut out of basalt, eventually entering Kariba Gorge, which spans more than 28 km.

Two main tributaries, the Kafue and the Luangwa Rivers, join the Zambezi from its left bank downstream from Kariba. The Zambezi River forms a delta about 60 km wide as it approaches its mouth.

## Economic Activities in the Zambezi Basin

1. **Navigation:** Due to natural barriers like sandbars, shallowness, and rapids, the Zambezi River is not very important for navigation. However, about 2,600 km of the river is navigable by small boats.
2. **Hydroelectric Power:** The Zambezi River is a significant source of hydroelectric power, particularly at the Kariba Dam, located at Kariba Gorge on the border between Zambia and Zimbabwe.

## The Orange Basin

The Orange Basin is drained by the Orange River, the longest river in South Africa. The river flows across almost the entire width of South Africa, from the highlands in the east through the Kalahari depression in the west, eventually emptying into the South Atlantic Ocean. The Vaal River, a major tributary, joins the Orange River, and together they have a combined length of about 2,092 km.

## Economic Activities in the Orange Basin

1. **Navigation:** Navigation is impossible along the Orange River due to its irregular flow, interruptions by falls and rapids, and silting in its channels and mouth.
2. **Irrigation and Hydroelectric Power:** Large irrigation and hydroelectric projects along the Orange River have faced challenges due to the enormous amount of waterborne silt, which clogs reservoirs and reduces the storage capacity of dams.

## The Chad Basin

The Chad Basin is the largest inland drainage area in Africa, with Lake Chad as its main water body. Lake Chad is a shallow lake located on the borders of Chad, Niger, and Nigeria in north-central Africa. The lake's size varies seasonally, ranging from about 10,360 km<sup>2</sup> to 25,900 km<sup>2</sup>. The lake is fed by three major streams: the Komadugu, Yobe, Logone, and Chari Rivers. However, these rivers are at risk of having their waters diverted by other drainage systems.

## Economic Activities in the Chad Basin

1. **Fishing, Agriculture, and Animal Husbandry:** The economy of the Lake Chad region is based primarily on fishing, subsistence and commercial agriculture, and animal husbandry. The people in the region produce crops like sorghum, corn, millet, beans, and vegetables. They also rely on forest products such as gum arabic, honey, beeswax, and firewood.
2. **Challenges:** The decline of forested areas and the explosive growth of cattle populations have adversely affected the production of these resources.

## Subtropical Category

### *1. Subtropical Humid Forest*

This vegetation zone is found along the east coast of Southern Africa, between 25°S and 34°S. The coastal regions here receive moderately high rainfall, well-distributed throughout the year, ranging from 800 to 1200 mm annually. The mean temperature during the coldest month varies between 7°C and 15°C. As one moves inland, the climate changes quickly. The natural vegetation in this

region is mostly evergreen or semi-evergreen forests. However, where rainfall is insufficient to support forests, the vegetation shifts to evergreen and semi-evergreen bushland and thicket.

## **2. Subtropical Dry Forest**

The subtropical dry forests are found in regions with a Mediterranean climate in North and South Africa. These areas experience a long dry summer season lasting 3 to 6 months, with most of the rainfall occurring in winter. The annual rainfall ranges between 400 and 1000 mm.

## **3. Subtropical Steppe**

The subtropical steppe forms a transitional zone in northern Africa, separating the subtropical dry forests from the Sahara Desert. Rainfall here varies from 200 to 500 mm, with a long dry and hot season lasting 6 to 11 months. The mean temperature of the coldest month is always above 7°C. The vegetation is mainly dominated by acacia trees.

## **4. Subtropical Mountain Systems**

These systems are found in both northern and southern Africa. In northern Africa, they are located in the Atlas Mountains, which extend over 3000 km from northern Morocco to Tunisia, parallel to the Mediterranean coast. The altitude of these mountains reaches up to 1500 meters in Tunisia, 2500 meters in Algeria, and 4165 meters in Morocco. In southern Africa, these systems are found in the Highveld Region, which is over 1000 meters in altitude, bordered by the Ukhahlamba (Drakensberg) mountains that rise to more than 3000 meters. The lower slopes of the Atlas Mountains are covered with mixed forests, including deciduous oaks. In contrast, the Highveld region in southern Africa is mostly grassland, while the Ukhahlamba slopes are home to evergreen montane forests with trees like Podocarpus.

# **Wildlife of Africa**

Africa is renowned for its diverse and abundant wildlife, more varied than on any other continent. The diversity of wildlife in Africa is a result of its diverse climate, which ranges from extreme heat to intense cold, supporting a wide range of ecosystems.

## **1. Mammals**

Africa hosts a vast array of mammals. Herbivores such as elephants, rhinoceroses, and hippopotamuses roam the continent, alongside smaller

hoofed mammals like giraffes and African buffalo. The open plains and savannas are home to large herds of grazing animals, including zebras and wildebeests. Africa also boasts a variety of antelopes, from the massive eland to the swift gazelle and impala. Predatory mammals include large cats like lions, leopards, and cheetahs, as well as smaller felines such as servals and wildcats. Other carnivores include wild dogs, jackals, foxes, hyenas, and weasels. Primates in Africa include various monkey species, as well as great apes like chimpanzees and gorillas. Lemurs, small primates native to Madagascar, are also found on the continent, with most species being nocturnal.

Several mammals are endemic to Africa, meaning they are found nowhere else in the world. Examples include the Walia ibex, Nyala, giraffes, hippopotamuses, and the armadillo, a nocturnal animal with a pig-like body and a long snout, which it uses to feed on termites.

## **2. Birds**

Africa is home to nearly 2,000 species of birds. While many species like hawks, eagles, and kingfishers are found elsewhere in the world, several birds are unique to Africa. The continent's largest bird, the ostrich, is native to Africa. Other unique species include the hamerkop and brightly colored touracos. Some African birds, known as honey guides, are famous for leading people to honeybee nests.

## **3. Reptiles**

Africa's varied terrain supports a rich diversity of reptiles, including lizards, tortoises, crocodiles, and numerous snakes. Some snakes, such as the mamba and Egyptian cobra, are venomous and pose a danger to humans. Madagascar is home to unique reptiles like boa constrictors and iguanas. Amphibians like salamanders and frogs, including the unusual hairy frog of Cameroon, also inhabit the continent.

## **4. Insects**

Africa's insect life is abundant and diverse, though some species are considered pests. Locusts can devastate crops, while mosquitoes transmit malaria, and tsetse flies spread sleeping sickness. Other insects include large butterflies, dung beetles, stick insects, safari ants, and termites, which build tall earthen mounds. Spiders are also common throughout Africa.

## 5. Marine Life

Africa's coastal waters teem with marine life, and the continent is home to more species of freshwater fish than any other. With around 2,000 species, Africa's freshwater ecosystems include ancient varieties like lungfish and reedfish, which can breathe air. Some species, like certain African catfish, can even move across land during rainy weather. Lake Nyasa alone hosts about 160 fish species that are found nowhere else in the world.

## National Parks in Africa

To protect its rich wildlife, many African countries have established national parks. These parks not only safeguard the wildlife but also serve scientific, educational, and recreational purposes. The oldest national park in Africa is South Africa's Kruger National Park.

National parks across Africa vary greatly in size and quality. Eastern and southern Africa are particularly famous for their wildlife parks. Notable examples include Tsavo in Kenya and Serengeti in Tanzania. Countries like Malawi, Namibia, Zambia, and Zimbabwe also have impressive wildlife preserves. However, fewer significant parks exist in western Africa.

### **Major National Parks in Africa:**

- **Selous Game Reserve (Tanzania):** 55,000 km<sup>2</sup>
- **Central Kalahari Game Reserve (Botswana):** 52,000 km<sup>2</sup>
- **Namib-Naukluft Park (Namibia):** 49,768 km<sup>2</sup>
- **Niassa Reserve (Mozambique):** 42,000 km<sup>2</sup>
- **Kafue National Park (Zambia):** 22,400 km<sup>2</sup>
- **Etosha National Park (Namibia):** 22,270 km<sup>2</sup>
- **Kruger National Park (South Africa):** 19,455 km<sup>2</sup>
- **Luvushi Manda National Park (Malawi):** 15,000 km<sup>2</sup>
- **Serengeti National Park (Tanzania):** 14,763 km<sup>2</sup>
- **Hwange National Park (Zimbabwe):** 14,651 km<sup>2</sup>