

# Unit 1-4 Geography grade 10

December 15, 2024

## Contents

|                                         |    |
|-----------------------------------------|----|
| Unit 1: Landforms of Africa             | 2  |
| Unit 2: Climate of Africa               | 4  |
| GLOSSARY - Unit 2                       | 8  |
| Unit 3: Natural Resource Base of Africa | 11 |
| Unit 4: Population of Africa            | 15 |
| GLOSSARY - Unit 3 and 4                 | 19 |



Join telegram channel  
<https://t.me/grade9to12ethiopia>

## Unit 1: Landforms of Africa

### 1.1 Overview of the World's Major Landforms

- **Landforms:** Physical features on the Earth's surface that form the terrain.
- **Types of Landforms:**
  - **Major:** Mountains, Plateaus, Plains
  - **Minor:** Hills, Gorges, Valleys, Basins
- **Formation Processes:**
  - **Internal Processes:** Tectonic plate movement and volcanic activities.
  - **External Processes:** Erosion by water and wind.
- **Continents:** Large landmasses. Earth has seven continents from largest to smallest: Asia, Africa, North America, South America, Antarctica, Europe, and Oceania (Australia).
- **Oceans:** Large areas of salt water between continents. The five oceans are: Arctic, Atlantic, Indian, Pacific, and Southern.
- **Coastal Land Features:**
  - **Islands:** Land completely surrounded by water.
  - **Peninsulas:** Land with water on three sides and connected to the mainland on the fourth.
  - **Isthmuses:** Narrow strips of land connecting two larger landmasses.
- **Mountains:** The largest elevated landforms with steep sides and high peaks.
- **Plateaus:** Large areas of raised land that are flat on top.
- May be formed by volcanic activity.
- **Plains:** Large areas of flat, low land.

## 1.2 Location and Related Features of Africa

- **Boundaries:** Africa is bounded by the Mediterranean Sea, Red Sea, Gulf of Aden, Indian Ocean, and Atlantic Ocean.
- **Equator:** Africa is divided in half by the Equator.
- **Size:**
  - Second largest continent.
  - Covers 6% of the Earth's total surface and 20% of its land area.
  - Population about 1.3 billion people in 2020 or 16% of the world's population.
- **Sovereign States:** Africa is home to 54 recognized sovereign states.
  - Climatic and physical conditions repeat themselves on either side of the Equator.

## 1.3 Major Landforms of Africa

- **Major Landform Regions of Africa:**
  - African Alpine System
    - \* **Atlas Mountains:** Extends from Morocco to Tunisia forming mountain chains including Anti-Atlas, High Atlas, Middle Atlas, Rif Mountains, Tell Atlas, and Sahara Atlas.
  - African Massif
    - \* **The Sahara:** Largest hot desert in the world covering whole of north of Africa with sand dunes called **erg** and flat surface sheet of pebbles called **reg**.
    - \* **The Sahel:** Vast semiarid region south of the Sahara with grasslands and savannahs.
    - \* **The Savanna:** Transitional region with few trees and shrubs between rainforests and Sahel grasslands.
    - \* **The Tropical rainforest:** Dense forest near the equator also known as equatorial rainforest.
  - East African Highlands and Rift System
    - \* **The Rift Valley and African Great Lakes:** Series of lakes in the East African Rift Valley including freshwater and salty lakes.

- \* **The Ethiopian and Eritrean Highlands:** High plateau divided by the Great Rift Valley.
- Southern Africa Platform
- \* **Mountains and desert systems of Southern Africa:** Includes Ukhahlamba (Drakensberg) escarpment, Kalahari desert and Namib desert.
- **Effects of Landforms on Ecosystem Patterns and Processes:**
  - Landforms create unique areas which divide countries and continents.
  - Landforms influence ecological potential by affecting the distribution of resources and organisms
  - They may also modify climate (macroclimate or microclimate).

## Unit 2: Climate of Africa

### 2.1 Overview of World Climatic Regions and Types

- **Climate:** Average weather conditions over a long period (30 years or more).
- **Weather:** Short-term atmospheric conditions such as temperature, precipitation, and humidity.
- **Climatic Zones:** Spacious areas with a climatic similarity in an east-west direction.
- **Climatic Regions:** A continuous geographic area with similar climatic characteristics.
- **Climate Classification:** Schemes to help people know what types of conditions a region usually experiences.
- **Global Climate Zones:**
  - **Tropical Zone:** From  $0^{\circ}$  -  $23\frac{1}{2}^{\circ}$  (between the tropics). High solar radiation; warm and moist with frequent cloud cover.
  - **Subtropics Zone:** From  $23.5^{\circ}$ - $40^{\circ}$ . Receives the highest radiation in summer; low moisture.
  - **Temperate Zone:** From  $40^{\circ}$ - $60^{\circ}$ . Cooler temperatures than subtropics; regular distribution of precipitation.
  - **Cold Zone:** From  $60^{\circ}$ - $90^{\circ}$ . Receives less heat due to low sun angle; very low temperatures and long days in summer.

### 2.1.1 Climate Classifications

- **Ancient Greek Classification:** Divided each hemisphere into three zones: torrid (tropical), temperate, and frigid.
- **Modern Classification:** Splits the Earth into approximately five major types: tropical, dry, temperate, continental, and polar considering altitude, air pressure, wind patterns, latitude and geographical characteristics.
- **Köppen Classification:** Categorizes climates based on general temperature profiles related to latitude, using mean monthly and annual values of temperature and precipitation.
  - **Five Principal Climate Groups:** A (humid tropical), B (dry), C (humid middle-latitude, mild winters), D (humid middle-latitude, severe winters), E (polar), and H (highland).
  - Groups A, C, D, E are defined by temperature, Group B by precipitation, and H by altitude.

## 2.2 Climate Types and Zones of Africa

- **Climate Types of Africa:**
  - Equatorial climate, tropical wet and dry climate, tropical monsoon climate, semi-arid climate (semi-desert and steppe), desert climate (hyper-arid and arid), and subtropical highland climate.
  - Temperate climates are rare, except at very high elevations and along the fringes of the continent.
- **Climate Zones in Africa:**
  - The Equatorial (Tropical Wet Climate) Region
  - The Tropical Wet-and-Dry Region
  - Semi-arid Climatic Region
  - Hot Desert Climatic Region
  - Humid Subtropical Climatic Region
  - Mediterranean Climate Region
  - The Warm Temperate East Coast Climate Region
  - Warm Temperate Continental Climate Region
  - The Mountain Climatic Region

- **Characteristics of Climate Zones in Africa**

- Climate is regulated by the apparent movement of the sun and associated winds.
- There is symmetrical climate zones in Africa consisting of central equatorial, tropical, hot deserts, and Mediterranean zones.

### 2.2.1 Types and Characteristics of Climate Zones in Africa

- **The Equatorial Climate Region:** Lowland area within latitudes 5°N and 5°S of the equator. High temperatures throughout the year, low temperature range, often heavy cloud cover, high humidity and receives convectional rainfall.
- **The Tropical Wet-and-Dry Region:** (Savanna climate). Seasonal rainfall with a wet and a dry season. The harmattan wind is common. Regions with equatorial climate have less temperature fluctuation than the tropical wet-and-dry region.
- **Semi-arid Climatic Region:** Region fringing the desert areas, within reach of ITCZ, receiving little rainfall and temperatures like the desert region.
- **The Hot Desert Climatic Region:** Very high temperatures, with large diurnal temperature range, and little or no rainfall.
- **Humid Subtropical Climatic Region:** Found in eastern side of continents between 20° and 35° north and south latitudes characterized by high temperature with warm and wet climate.
- **Mediterranean Climate Region:** Called Warm Temperate Western Margin Climate, found in shores of Mediterranean Sea, and South-Western tip of Africa, with wet winters and dry summers.
- **The Warm Temperate East Coast Climate Region:** Experienced along eastern coast of South Africa with warm and wet climate with low winter temperatures.
- **Warm Temperate Continental Climate Region:** Experienced in the interior of South Africa with low rainfall and large annual temperature range.
- **The Mountain Climatic Region:** Includes highlands of Kenya, Ethiopia, and lake region of East Africa. Similar to warm temperate upland climate with low temperature and high rainfall.

### 2.2.2 Factors Controlling Climate of Africa

- **Latitude and Solar Radiation:** Temperature is high throughout the continent because of its location relative to the equator.
- **Pressure Systems, Winds, and the Intertropical Convergence Zone (ITCZ):** Subtropical High-Pressure Belts dictate surface winds and rainfall. The ITCZ is where two wind systems converge on the equator.
  - The Harmattan is dry and cool and blows over Sub-Saharan Africa from about November to April from the north, and the Monsoon is the warm southwest winds from the south.
  - The ITCZ shifts with the sun and influences rainfall distribution.
- **Major Ocean Currents:** Influence temperature and moisture by dragging water in their direction.
  - Warm ocean currents provide moisture and cause rain in the coasts. Examples: Warm Guinea currents and Warm Mozambique currents.
  - Cool ocean currents cause dry conditions due to deprivation of the wind's moisture. Example: Cool Canary Currents and Cool Benguela currents.
- **Distribution of Land and Water:** Large water bodies modify climates; inland areas have extreme temperature variations due to lack of moderating water bodies called continental climates.
- **Altitude:** Air temperature decreases with altitude (Lapse Rate), making mountainous regions cooler.

### 2.3 Benefits of Climate for Life of People of Africa

- **Climate Impact on Life:** Climate influences settlement, livelihood, resource endowments, health and wellbeing.
- **Climate and Agriculture:** Agriculture, being climate-dependent, is the backbone of Africa's economy. Climate variability and change affects crop production.
- **Climate and Health:** Climate change impacts human health through its influence on environmental and social determinants.
- **Climate and Water Resources:** Climate affects water availability and the levels of streams and rivers.

## 2.4 Climate Change and its Challenges to Africa's Development Vision

- **Climate Variability vs. Climate Change:**
  - Climate variability occurs with or without human intervention, while climate change is a long-term shift caused by human activities.
- **Climate Change in Africa:** Africa is extremely vulnerable to climate change due to:
  - Dependence on climate-sensitive ecosystem goods for livelihoods.
  - Less developed agricultural production systems.
  - Limited adaptive capacity to the impacts of climate change.
  - Exacerbates existing issues such as poverty and food insecurity.
  - Creates pressure on agriculture, water supply, health and political stability.
  - Two most extensive land based end of century projected decreases in rainfall anywhere on the planet occur over Africa, particularly in North and South Africa
- **Consequences:** Higher temperatures, rising sea levels, changing rainfall patterns, and increased climate variability affecting the population, agriculture, and economy of the continent.

## GLOSSARY - Unit 2

- **Climate:** The average weather conditions in an area over a long period of time.
- **Weather:** The state of the atmosphere at a given time and place, with respect to heat or cold, wetness or dryness, calm or storm, clearness or cloudiness.
- **Climate Zone:** A large area of the Earth that is classified based on temperature and precipitation.
- **Climate Region:** A continuous geographic area characterized by similar climatic conditions.
- **ITCZ:** The Intertropical Convergence Zone, a region near the equator where wind systems converge.

- **Equator:** An imaginary circle around the Earth that is equidistant from the north and south poles, dividing the planet into the Northern and Southern hemispheres.
- **Tropic of Cancer:** The northernmost latitude at which the sun can appear directly overhead, 23.5 degrees North of the equator
- **Tropic of Capricorn:** The southernmost latitude at which the sun can appear directly overhead, 23.5 degrees South of the equator
- **Ocean Current:** A continuous, directed movement of sea water, generated by forces acting upon the water.
- **Continental Climate:** A climate found in the interior of continents with large temperature ranges between summer and winter.
- **Maritime Climate:** A climate associated with coastal areas which have mild temperatures throughout the year.
- **Lapse Rate:** The rate at which atmospheric temperature decreases with an increase in altitude.
- **Chemical Weathering:** The weakening and subsequent disintegration of rock by chemical reactions.
- **Leaching:** The process by which soluble substances are washed out of soil by water.
- **Macroclimate:** The climate of a large region or area
- **Microclimate:** The climate of a small area or region.
- **Climate Variability:** The way in which climatic conditions differ from a long-term average, including natural climate patterns and climate extremes,
- **Climate Change:** A change in the state of the climate system, identified by changes in the average conditions and the variability of its properties, that persists for an extended period, typically decades or longer, due to natural and/or anthropogenic processes and drivers.



Join telegram channel  
<https://t.me/grade9to12ethiopia>

## Unit 3: Natural Resource Base of Africa

### 3.1 Overview of Major Natural Resources of the World

- **Natural Resources:** Parts of the environment people can extract and exploit.
- **Purpose of Natural Resources:** Provide life support by providing consumptive use and public-good services.
- **Renewable Resources:** Can be replenished as quickly as humans use them (e.g., sunlight, wind).
- **Non-renewable Resources:** Resources that exist in fixed amounts (e.g., fossil fuels like petroleum and coal).
- **Sustainable Use:** Using resources in a way that does not lead to long-term degradation of the environment.
  - It helps maintain the potential to meet the needs of present and future generations.
- **Natural Resource Management (NRM):** Sustainable utilization of major natural resources.
  - Key strategies of sustainable NRM include: land management, water management, conserving biodiversity, skill development, protecting marine and coastal environment, and high quality planning.
- **Major Natural Resources of the World:**
  - **Water:** The most important natural resource; the fresh form is a limited resource that is essential for all living things.
  - **Air:** Provides oxygen for respiration, regulates temperature, and carries wind energy.
  - Air also regulates the winds which are renewable resources used for energy.
  - **Soil:** Provides nutrients for plant growth and is important for the nitrogen cycle.
  - **Forest:** Produce oxygen, help regulate climate and provide habitats and are sources of medicines.

- **Minerals:** Important for industrialization, construction purposes, and making electronics, and are either metallic or nonmetallic.
- **Oil:** A non-renewable resource used for transportation and manufacturing and also the cause of pollution, wars and conflict.

### 3.2 Major Drainage and Water Resources in Africa

- **Drainage Basin:** An area of land where surface water converges to a single point at a lower elevation.
  - Also called catchment, catchment area, catchment basin, drainage area, river basin and water basin.
  - A drainage basin also consists of parts such as tributaries, confluences and outlets.
  - **Watershed:** Refers to a divide that separates one drainage area from another drainage area.
- **Major Drainage Basins of Africa:**
  - The Nile Basin
    - \* The longest river in the world with its main headstream rising from Lake Victoria and its right-wing tributary rising from Ethiopian Plateau.
    - \* The Nile River has limited use for transportation; the upper courses of the river has high hydroelectricity potential.
  - The Congo Basin
    - \* The second-largest river by volume in the world, its river valley is often constricted by gorges, and is an important navigational system of the continent.
    - \* Its hydroelectric potential is high.
  - The Niger Basin
    - \* The largest river basin in western Africa with an inland delta, fishing and irrigation is important.
    - \* Most of the river used by commercial shipping.
  - The Zambezi Basin
    - \* A major river in south Africa with spectacular waterfalls.
    - \* The main river is not important for navigation but possesses high hydroelectric potential.

- The Orange Basin
  - \* The longest river in South Africa flowing through Kalahari depression, navigation is impossible due to irregular flow and silting.
- The Chad Basin
  - \* The largest inland drainage area in Africa, seasonal size variation and is a source of fishing, subsistence and commercial agriculture.
- **Problems Facing African Water Resources:**
  - Problems faced include: seasonal fluctuations of the volume of the rivers due to low rainfall and irregular rainfall, excessive flows of water in some rivers, great swamps and periodic flooding, and climate variation and change.
  - Solutions to manage the above problems include: sustainable use of water resources, efficient use of water, recycling waste water, reducing water loss in irrigation, and storing water in dams and ponds.

### 3.3 Main Types of Soils and Mineral Resources in Africa

- **Soil:** A complex mixture of weathered minerals, organic and inorganic compounds, living organisms, air, and water.
  - Soil formation is based on environmental factors.
  - It has key environmental, social and economic function, supply water and nutrients for plant growth and act as a medium for growing food, fiber and timber and support wild life.
- **Soil Types of Africa:**
  - **Arenosols:** Easily erodible, sandy soil with low water and nutrient holding capacity, found mainly in deserts and beaches.
  - **Leptosols:** Shallow soil over hard rock or gravelly material mostly found in mountainous and desert regions.
  - **Cambisols:** Only moderately developed soils lacking distinct horizons, found in many places in Africa.
  - **Ferralsols:** Strongly weathered soils with low nutrient-holding capacity, found in high rainfall areas.
  - **Calcisols:** Soils with high accumulation of calcium carbonates, found in dry areas.

- **Mineral Resources of Africa:**

- Africa has a huge mineral wealth, including uranium, iron, copper, zinc, tin, and phosphates.
- It also includes platinum, cobalt, bauxite, and manganese.
- It also produces petroleum for global market.

- **Problems faced by Mineral Resources Utilization in Africa**

- The sector has suffered from the legacy of colonialism as it is the Europeans who exploited the natural resources of Africa by building railroads to take the natural resources to ports.
- Mines were owned by Europeans, Africans are denied the benefits, with poor management, lack of investment, low selling prices, political turmoil, and outdated machinery.
- The continent's raw ores are exported to other countries for manufacturing, for much less than the price of the goods made from them.

### 3.4 Major Vegetation and Wildlife of Africa

- **Vegetation (Flora):** Plant communities (forests, shrubs, grasses)

- Factors affecting vegetation distribution include: climate, landform, soils, and biotic factors.
- The main vegetation types in Africa are the Tropical and Subtropical categories.

- **Tropical Category:**

- **Tropical Rainforest:** Central Africa with high rainfall, tall dense forest.
- **Tropical Moist Deciduous Forest:** Around Guineo-Congolian basin, high rainfall, dry season noticeable.
- **Tropical Dry Forest:** Further from the equator, dry season is long, low rainfall, woodlands.
- **Tropical Shrubland:** Areas close to the tropics with low rainfall with grasses and short shrubs.
- **Tropical Desert:** Arid areas with little or no rainfall with xerophytic vegetation.

- **Tropical Mountain Forest:** High altitude areas where elevation affects temperature and vegetation.
- **Subtropical Category:**
  - **Subtropical Humid Forest:** Narrow zone along east coast of Southern Africa with high rainfall and evergreen vegetation.
  - **Subtropical Dry Forest:** In Mediterranean climates with long dry summer and rainfall in winter.
  - **Subtropical Steppe:** A continuous transitional zone from Sahara desert with low rainfall and thorny vegetation.
  - **Subtropical Mountain Systems:** In Atlas Mountain and Highveld Region of South Africa.
- **Wildlife of Africa:**
  - Includes diverse animals: mammals, birds, reptiles, fish, and insects.
  - **Mammals:** Many varieties such as elephants, rhinos, hippos, giraffes, zebras, wildebeests, and different antelopes and cats.
  - Many species of monkeys and great apes, and lemurs are found.
  - **Birds:** Many species such as eagles, hawks, owls, larks, kingfishers and many native bird species such as ostrich.
  - **Reptiles:** Lizards, tortoises, crocodiles, and many types of snakes.
  - **Insects:** Locusts, mosquitoes, tsetse flies, large butterflies, dung beetles, stick insects, driver and safari ants, and termites.
  - **Marine life:** A wide variety of fishes and other marine organisms.
- **National Parks:** Established to protect wildlife and create research, education and recreation opportunities.
  - Include Kruger National Park (South Africa), Tsavo (Kenya) and Serengeti (Tanzania).

## Unit 4: Population of Africa

### 4.1 Overview of World Population Growth and Size

- **Global Population Trends:** Population growth has increased significantly after World War II. The world's population has increased rapidly and is currently over 7 billion people.

- Asia and Africa are contributing substantially to the rapid increase in the world's population.
- **Global Population Size:** Population continues to increase, although growth rates have begun to slow.
- **Rate of Population Growth:** High growth rate in many parts of the world due to decreases in mortality rates and a reduction of fertility rates in the past recent decades.
- **Factors for High Population Growth:** Advances in medicine and better living conditions.

## 4.2 Africa's Major Demographic Trends

- **Population Size in Africa:** Second most populous continent next to Asia, with more than 1.3 billion people by the mid of 2020.
- **Population Growth in Africa:** The fastest growing population with shorter population doubling time.
  - Factors for high growth: high birth rates, high fertility rates, child birth at a young age, low rates of contraception, decline in mortality rates, and increase in life expectancy.
  - Factors for high growth: The influence of traditions and cultures on family size, and low education level.
  - Challenges of rapid population growth: insufficient food supply, inadequate healthcare, environmental degradation, increasing scarcity of freshwater, and emigration.
- **Population Change Components:** Fertility (births), mortality (deaths) and migrations (immigration or emigration).
  - The difference between deaths and births is called natural change, and the balance between immigration and emigration is known as net migration.
- **Fertility Patterns:** The occurrence of birth in the population.
  - **Total Fertility Rate (TFR):** Average number of children a woman would have during her lifetime.
  - **Crude Birth Rate (CBR):** Number of live births per 1,000 population in a year.

- TFR in Africa has steadily declined but still high compared to other continents.
- Crude birth rates are highest in central and western Africa and lowest in northern and southern Africa.
- **Mortality Patterns:** The occurrence of death in a population.
  - **Death Rate (DR):** Number of deaths per 1000 population in a year.
  - **Crude Death Rate (CDR):** Number of deaths occurring per 1000 mid-year total population.
  - **Infant Mortality Rate (IMR):** Number of infant deaths before their first birthday per 1000 live births.
  - **Maternal Mortality Ratio (MMR):** Number of maternal deaths per 100,000 live births.
  - **Life Expectancy:** Average number of years a person is expected to live.
  - Mortality rates are higher in Africa than the other parts of the world but is declining due to better health and sanitation.
  - The major factors for high death rates are poor standard of living, low access to health facilities, poor sanitary practices, civil war, famine, poor nutrition, and high disease prevalence.
  - The death rates are still high compared to other regions of the world.

### 4.3 Population Structure

- **Age Structure:** The distribution of population into young, working, and old age groups.
  - Africa is characterized by the dominance of the young population and low old age population.
  - This is also reflected by the low median age in the continent.
- **Sex Structure:** The proportion of males to females in the overall population (Sex Ratio).
  - Expressed as the number of males for every 100 females.
  - It has an impact on other demographic elements such as marriage rate and fertility.
- **Population Pyramid:**

- A graphical method of depicting the age-sex composition of a population.
- Shows a detailed picture of the age-sex structure indicating either single age or 5-year groups.
- Basic pyramid has bars presenting age groups with males on the left, and females on the right.
- The length of the bar represents the population in that age group.

- **Types of Population Pyramids:**

- **Expansive pyramid:** A broad base showing high proportion of children and a rapid growth, with a low proportion of older people.
- **Constructive pyramid:** Lower numbers of young people, with a large elderly or aging population.
- **Stationary pyramid:** Fertility and mortality are balanced with very slow or no population growth.

- **Characteristics of the African Population:**

- High fertility and mortality rates, young population, triangular population pyramid, high age dependency ratio, low life expectancy, and high population growth rate.

#### 4.4 Distribution and Density of Africa's Population

- **Population Distribution:** The way people inhabit and occupy the earth's surface.
  - Africa's population distribution is uneven with areas of high and low density.
  - Some densely populated areas: the Nile valley of Egypt, Mauritius, Rwanda, and Burundi.
  - Factors: climate, relief, water availability, soil fertility, minerals, economic conditions, political situations and other social factors.
- **Population Density:** Average number of people living per unit area.
  - Africa's average crude population density in 2019 was about 44 people/km<sup>2</sup>.
  - Regional variations exists with Eastern and Western Africa having the highest crude density and Southern Africa with lowest.

## 4.5 Urban and Rural Settlement Patterns in Africa

- **Urbanization:** Process of increasing the area of urban centers and the proportion of people living in that area.
- **African Urbanization:** Has stark contrasts and is one of the fastest in the world with major cities and rural regions.
  - Characterized by a high degree of urban primacy, and most urbanization is unplanned.

## GLOSSARY - Unit 3 and 4

- **Natural Resources:** Materials or substances such as minerals, forests, water, and fertile land that occur in nature and can be used for economic gain.
- **Renewable resources:** Resources that can be replenished by natural process.
- **Non-renewable resources:** Resources that exist in fixed amount.
- **Sustainable use:** Using resources in a way that does not lead to long term degradation of the environment.
- **Drainage basin:** An area of land where surface water converges to a single point at a lower elevation.
- **Watershed:** A line that separates waters flowing to different rivers, basins, or seas.
- **Soil:** The upper layer of earth in which plants grow.
- **Mineral:** A solid inorganic substance of natural occurrence.
- **Vegetation:** The plants of a place or region.
- **Endemic:** (of a plant or animal) native or restricted to a certain country or area.
- **Mammals:** Animals