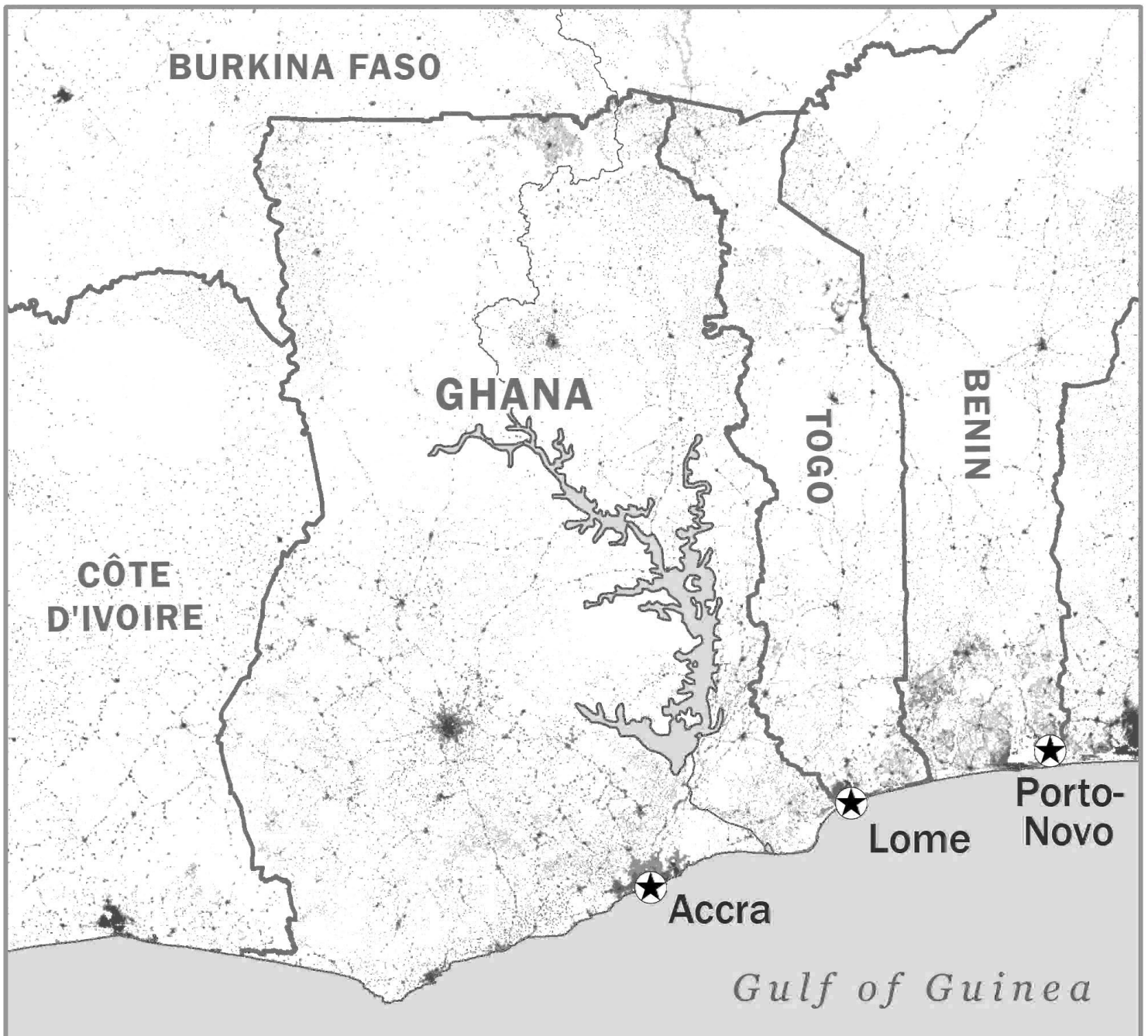


SECTION

5

GHANA'S PHYSICAL ENVIRONMENT



# HUMAN AND ENVIRONMENT

## Physical Settings and People

### Introduction

This section deals with the geographical location of Ghana and its physical characteristics. It covers Ghana's location, administrative divisions, relief, and drainage. Your lesson today covers the location, size and administrative regions of Ghana. When you were in JHS, you were introduced to the location and size of Ghana. You also acquired the skill of drawing the map of Ghana. In this section, you will draw the map of Ghana and use it to describe its location in West Africa and identify the administrative regions. You will know the relative and absolute location of Ghana and where all the 16 regions are located within the country.

Ghana is a diverse country with a range of geographical features that have significantly shaped its landscape and natural resources. In this section, you will study the relief and drainage features of Ghana. You will also find out that these geographical features have both economic importance and also present certain challenges. Understanding Ghana's relief and drainage features is essential for appreciating its diverse geography, natural resources, and the various development challenges it faces.

### At the end of this section, you should be able to:

- Draw the outline map of Ghana and describe the location and size and indicate the administrative regions.
- Discuss the major relief and drainage features of Ghana and their importance and challenges to development

### Key Ideas:

- In absolute terms, Ghana is located between latitudes  $4^{\circ}44'N$  and  $11^{\circ}10'N$ . and longitudes,  $3^{\circ}15'W$  and  $1^{\circ}11'E$ .
- In relative terms, Ghana is located in West Africa, within the African continent and positioned between the countries of Burkina Faso in the North, Cote d'Ivoire (Ivory Coast) in the West, and Togo in the East, and the South, sea or the Gulf of Guinea
- The total land area of Ghana is about 238,539 square kilometres (km<sup>2</sup>).
- Ghana is divided into 16 Administrative Regions and 261 Districts.]
- Relief refers to the variances in height of the land in a defined area.
- A physiographic region refers to a defined area with almost uniform relief characteristics such as landforms, vegetation, and other natural features.
- Ghana is divided into seven physiographic regions.
- Drainage refers to rivers, streams, and other water bodies that are found in a given area or region.
- Relief and drainage systems are of importance to humans.

# GHANA'S LOCATION, SIZE AND ADMINISTRATIVE REGIONS

## Geographical Location of Ghana

Ghana as a country, has both absolute and relative locations. You should try and distinguish between absolute and relative location. Absolute location refers to a precise point on the Earth or any other defined space where an object is found (located), based on the grid system (longitudes and latitudes). Do you remember your lesson on longitudes and latitudes? You learnt that these imaginary lines together, help to locate the exact position of an object or location of a place. It means to find the absolute location of a place, you need to identify the specific coordinates, such as latitude and longitude. Relative location, on the other hand, describes where an object or a place is located in relation to familiar features or landmarks. For example, if you are giving directions to a friend to locate your home, you may make reference to a popular object or landmark near your house as a reference point to help your friend locate your house. Simply, the absolute location of Ghana is the exact position based on longitudes and latitudes while the relative location of Ghana is its position with reference to nearby features or objects. With this understanding, you can go ahead and identify the absolute and relative location of Ghana.

**Absolute Location or Position of Ghana:** Ghana is located between latitudes  $4^{\circ}44'N$  and  $11^{\circ}10'N$ . What this means is that the southernmost point of Ghana is located on latitude  $4^{\circ}44'N$  (North of the Equator) while the northernmost part is located on  $11^{\circ}10'N$  (North of the Equator). In terms of longitudes, Ghana's westernmost point is located on longitude  $3^{\circ}15'W$  while the extreme eastern point lies on longitude  $1^{\circ}11'E$ . The Greenwich Meridian passes through Yendi in the Northern Region and Tema in the Greater Accra Region. Look at the map below, Figure 5.1. Have you identified what has just been described above?

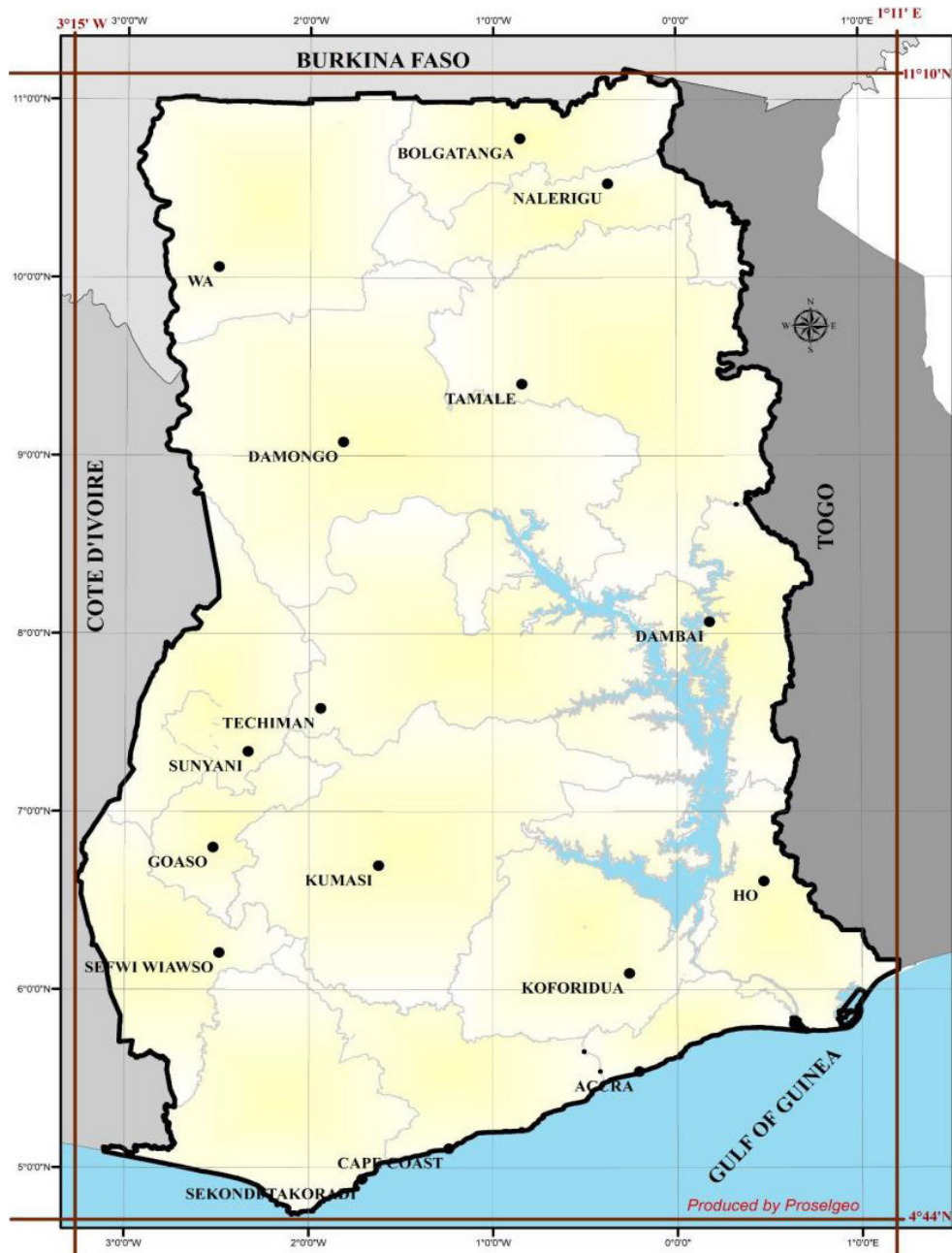


Fig. 5.1: Absolute location of Ghana (Proselgeo.com, 2024)

**Relative Location or Position of Ghana:** Ghana is a country in the African continent. It is situated in West Africa, on the coast of the Gulf of Guinea, a large inlet of the Atlantic Ocean. Ghana is bounded by the countries of Burkina Faso in the North, Cote d'Ivoire (Ivory Coast) in the West, and Togo in the East. In the South, Ghana is bounded by the sea, mostly referred as the Gulf of Guinea. The description above gives the relative location of Ghana. You see, no mention was made of latitudes and longitudes but the nearby countries were used as reference or landmarks. With reference to Figure 5.1, you observed that the countries that share common borders with Ghana were used to describe the relative location of Ghana.

### Activity 5.1

1. On a map of Ghana, use a pencil and mark the following:
  - a. The northernmost point and its latitude.
  - b. The southernmost point and its latitude.
  - c. The westernmost point and its longitude.
  - d. The easternmost point and its longitude.
2. Use the points you have marked on your map and their latitude and longitude to describe the absolute location of Ghana.

## The Size of Ghana

Ghana occupies a total land area of about 238,539 square kilometres (km<sup>2</sup>). What this means is that, if Ghana is a perfect square, it will measure 238,539 km on each side, but you know that the shape of Ghana is roughly rectangular with Cape Three Points located at the southernmost point in the Western Region. The distance from the North to the South is about 672 km and from East to West is about 534 km. The country's population is 30.8 million people (GSS, 2021). Ghana is the eighth largest country in West Africa by landmass. It is about one-fourth the size of Nigeria. The coastline of Ghana stretches over 500km or approximately 560km (Dadson 2021) along the Atlantic Ocean.

Ghana is a former British colony. The country attained independence on the 6th of March 1957. Before independence, Ghana was known as the Gold Coast (given by the Portuguese Traders), but was changed to Ghana upon attaining independence. Ghana became a Republic on 1st July 1960. Administratively, the country is divided into sixteen (16) Regions, 261 Metropolitan, Municipal and District Assemblies (MMDAs) and 275 electoral constituencies. Figure 5.2 shows the 16 Administrative Regions in Ghana.

REGION	CAPITAL	REGION	CAPITAL
1. Ashanti	Kumasi	9. Volta	Ho
2. Brong Ahafo	Sunyani	10. Western	Sekondi-Takoradi
3. Central	Cape Coast	11. Savannah	Damongo
4. Eastern	Koforidua	12. Bono East	Techiman
5. Greater Accra	Accra	13. Oti	Dambai
6. Northern	Tamale	14. Ahafo	Goaso
7. Upper East	Bolgatanga	15. Western North	Sefwi Wiawso
8. Upper West	Wa	16. North East	Nalerigu

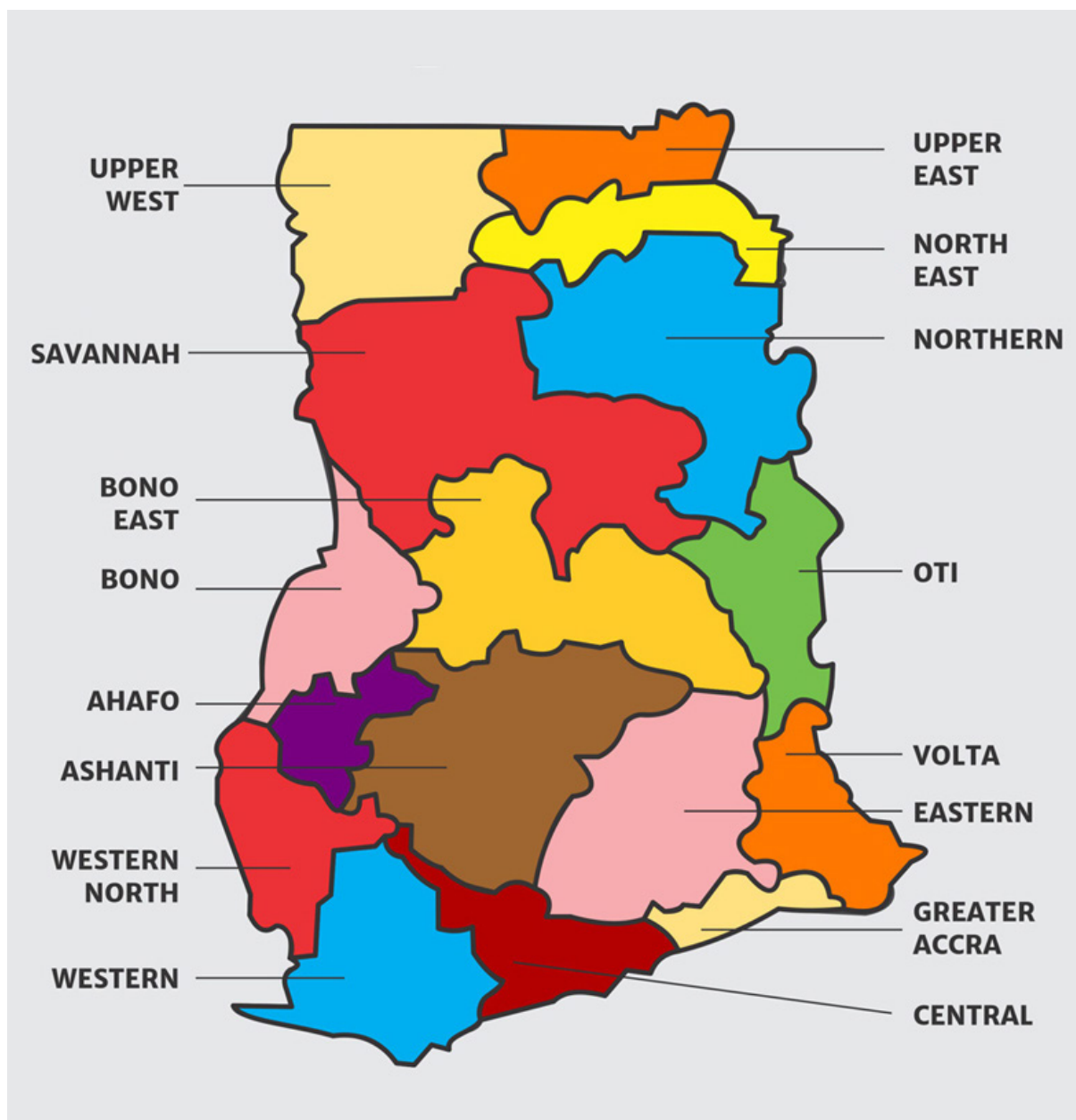


Fig. 5.2: Administrative divisions or regions of Ghana



Fig. 5.3: Political Map of Ghana, showing the 16 Administrative Regions and their capitals

Visit the links below to access different maps of Ghana in connection with this topic



If you cannot access the video, check your school or local library or look for an internet café near your home.

### Activity 5.2

1. a. Find a blank map of Africa, locate and label Ghana. Discuss Ghana's geographical Position.
  - b. On the same map, identify and label Ghana's immediate neighboring countries.
2. In class, pair with a friend. Find an atlas or go to the internet and pick a map of Ghana that has a scale. Use the map to perform the following tasks:
  - a. Calculate the distance from Cape Three Point to Bawku
  - b. Calculate the distance along the coast from Half-Assini through to Aflao
  - c. Calculate the distance from the westernmost point to the easternmost point
  - d. Use the information you have obtained to describe the size of Ghana

**Clue: Refer to your lesson on the conversion of scales and calculation distances using latitudes**

3. Sketch the map of Ghana and indicate the following:
  - a. Latitude  $5^{\circ}\text{N}$
  - b. Latitude  $11^{\circ}\text{N}$
  - c. The Greenwich Meridian
  - d. Longitude  $3^{\circ}\text{W}$
  - e. Longitude  $1^{\circ}\text{E}$ .
  - f. The Gulf of Guinea
  - g. Ghana's immediate neighbouring countries
  - h. How does the map and the information on it help you to describe the absolute and relative location of Ghana?
4. List the Administrative Regions in Ghana and provide their respective capitals
  - a. Which of these regions is your school located?
  - b. Refer to a political map of Ghana and describe the relative location of your region.



5. Match the under-listed with their corresponding items in the table below.
- Former name of Ghana before independence.
  - 238,539
  - Total population of Ghana from the 2021 Census.
  - Total distance from the westernmost to the easternmost point of Ghana.
  - Shares border with Ghana in the North.
  - Sixteen.
  - Ghana's boundary along the coast.
  - Cote d'Ivoire.

1	Ghana's total land area in km <sup>2</sup>	
2	Gold Coast	
3		Distance of 534 km
4	Number of Administrative regions	
5	Burkina Faso	
6		Shares border with Ghana in the West
7	30.8 million people	
8		Gulf of Guinea

6. With your knowledge of absolute and relative location, explain how you will give directions to someone visiting your school for the first time.

## RELIEF AND DRAINAGE IN GHANA

### Relief

In Geography relief is a term used to describe the variations in the height of land over a defined area. It could also mean the differences in height of the Earth's surface, such as mountains, spurs, valleys, plains, ridges and plateaux. Ghana can be divided into two areas which have different relief, that is **highlands** and **lowlands**.

### Highlands

The term "highlands" generally refers to elevated, mountainous regions of land that are significantly higher in elevation or height than the surrounding areas. The highlands cover approximately 50% of the total land area of Ghana. The highlands usually range between 450 m and 900 m above sea level.

The highlands are grouped into the following:

- a. The central highlands lie between Koforidua and Wenchi forming the Kwahu – Mampong Koforidua Ridge. Two prominent highlands on this ridge include the Kintampo Ridge and the Kwahu – Mampong highlands.
- b. The North–Eastern highlands are called Gambaga escarpment.
- c. The North–Western highlands are also called the Bole – Wa’ – Lawra Hills. The Wa escarpment or scarp is located on these highlands.
- d. Akuapem – Togo ranges have a height up to about 800 metres above sea level. Afadjato (885 metres) is located on this range.

## Lowlands

The term “lowlands” refers to land areas that are relatively flat or gently sloping, and are situated at a lower elevation compared to the surrounding regions. The lowlands have a height ranging between 150 – 300 metres above sea level.

It is grouped into two.

### a. The coastal lowlands

Coastal lowlands refer to the low-lying areas of land that are located along the coastline, adjacent to the ocean or other large bodies of water. The coastal lowlands stretch from Half Assini in the Western Region to Denu in the Volta region rising to a height of about 100 – 150 metres above sea level.

### b. The interior lowlands (Volta basin)

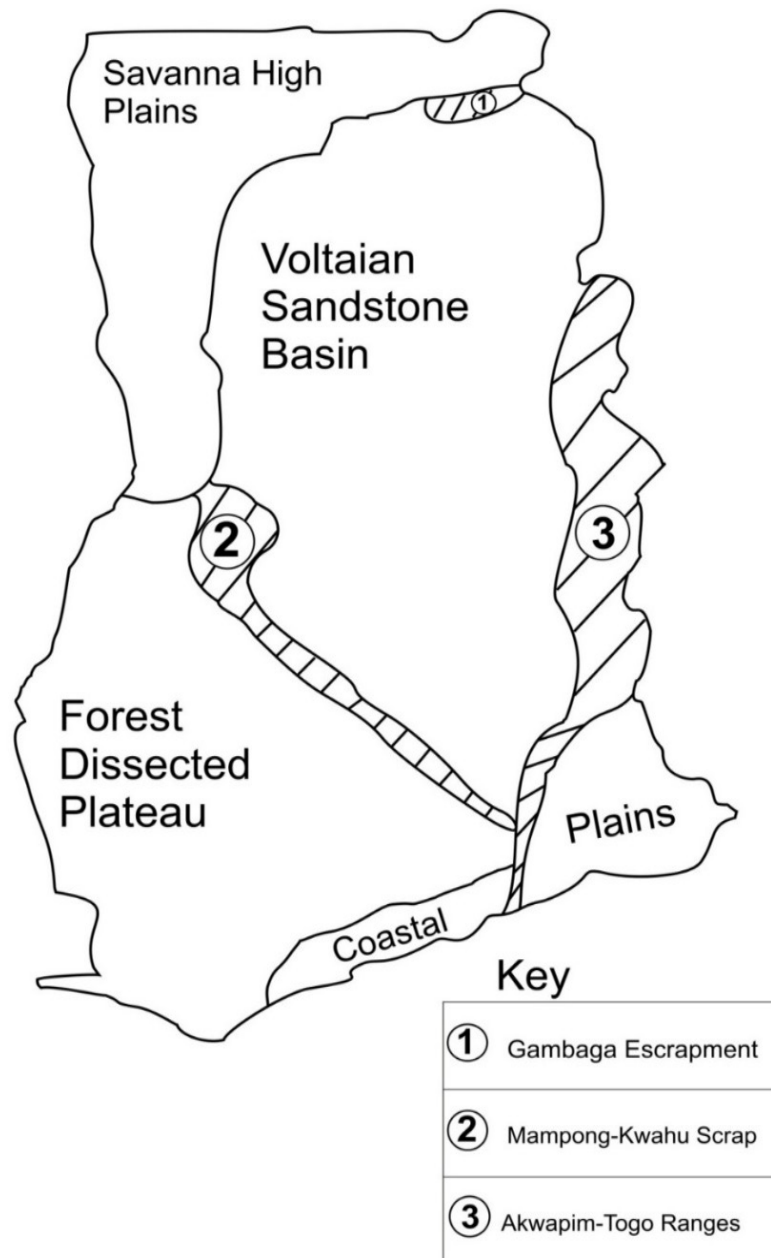
Interior lowlands refer to large, relatively flat, or gently rolling stretches of land that are situated in the interior regions of Ghana, away from the coastal areas. This is made up of gently sloping or flat-bedded sandstones, shale and mudstone. It concedes with the Voltaian sandstone basin rising to about 300 metres, known as the Tamale Hills.

## Physiographic Regions in Ghana

A physiographic region refers to a geographic area with almost uniform relief characteristics such as landforms, vegetation, and other natural features. It also refers to the distinct geographical and topographical areas that make up the landscape of the country. It can also be defined as a geographic area that is defined by its distinct physical and natural features, such as landforms, climate, vegetation, and other natural features, which are shaped by the geological history and processes of the area.

Ghana is divided into the following physiographic regions:

1. The Coastal Plains
2. The Forest Dissected Plateau
3. The Savannah High Plains
4. The Voltaian Sandstone Basin
5. Akuapem – Togo Ranges
6. The Gambaga Escarpment
7. Southern Voltaian Plateau



**Fig. 5.4:** The seven Physiographic Regions

## 1. Coastal Plains

The coastal plains of Ghana refer to the low-lying, flat or gently sloping areas located along the Southern Coastline of the country, bordering the Gulf of Guinea.

**Location:** The coastal plains stretch from Half-Assini (Western Region) to Denu (Volta region). It is divided into two, that is, the South-East Coastal plains and the South-West Coastal plains. The South-East Coastal Plains cover the Southeastern part of the Ghanaian coastline, stretching from the Volta estuary to the border with Togo. That of the South-West Coastal Plain covers the Southwestern part of the Ghanaian coastline, from the Ankobra River to the border with Côte d'Ivoire.

### Characteristics of the Coastal Plains

- a. There are several hills and ridges which form features called inselbergs (isolated mountains rising abruptly from a flat plain) scattered within these zones
- b. Average height is less than 100m above sea level.
- c. Presence of bays, cliffs and headlands.
- d. Volta delta has spits and bars.
- e. East coastal plains are dominated by isolated rounded hills called inselbergs. e.g Shai Hills, Ningbo and Osudoku.
- f. It is full of lagoons and swamps.
- g. The land is relatively flat and undulating.
- h. It is broad at the east and narrow at the west.
- i. The south-east coastal plains are flat and gently sloping.

## 2. Forest Dissected Plateau

The “Forest Dissected Plateau” is a physiographic region in the Central and western parts of Ghana, characterised by a unique landscape and ecological features.

**Location:** The Forest Dissected Plateau is found in the forest zone stretching along Eastern, Western, Western North, Central, Ashanti and parts of the Bono, Bono East and Ahafo Regions. The underlying rocks are Tarkwaian and Birimian (named after Tarkwa and River Birim).

### Characteristics of the Forest-Dissected Plateau

- a. Average height is between 240m and 300m above sea level.
- b. The region is drained by rivers such as Tano, Ankobra, Birim, Pra, Afram, Offin, Bia and others.
- c. The underlying rocks are Tarkwaian and Birimian rocks.
- d. The Tarkwaian rock area is hilly and rugged, but the Birimian rock area is gentle.
- e. The dense forest protects the land against excessive erosion.

## 3. Savannah High Plains

The “Savannah High Plains” is a physiographic region in Ghana that is characterized by its distinct landscape rising to about 300m above sea level.

**Location:** The savannah high plain is a gently sloping stretch of land located in the four northern regions (i.e., Northern, North-East, Upper East and Upper West Regions). On the other hand it stretches from Bamboi, through Bole, Wa and Lawra in the Northwest and Tumu, Bolgatanga, Bawku and Gambaga in the Northeast.

### Characteristics of the Savannah High Plains

- a. The land rises to about 180 – 300m above sea level.
- b. It is dominated by small, rounded hills or inselbergs especially near Upper West (e.g., Tumu) and Upper East.
- c. It has a gently rolling surface.
- d. The small round hills are made up of granite rocks.

## 4. The Voltaian Sandstone Basin

The Voltaian Sandstone Basin is the largest physiographic region located in the Central and the Eastern part of Ghana and stretches to the North. It consists of gently dipping or flat-bedded sandstone, shale, mudstone and pebble beds and varies in height from 100 to 200m above sea level.

**Location:** The Voltaian sandstone basin occupies about 47.3% of the total land area of Ghana covering areas like Volta, Ashanti, parts of Bono, Bono East, Ahafo, and parts of Northern as well as Upper East Region. It is the largest of all the regions.

### Characteristics of the Voltaian Sandstone Basin

- a. The Voltaian sandstone basin is an extensive area between 60 – 150m above sea level.
- b. It is composed of sandstone, shale, limestone and mudstone.
- c. It is drained by the Volta River with its tributaries like Afram, Oti, Sene, Daka, Black and White Volta.

## 5. The Akuapem -Togo Ranges

The Akuapem – Togo ranges are a narrow belt of ridges and hills that stretch from the mouth of river Densu (West of Accra), following a north-easterly direction, across the Volta region, through Togo. It is also called the Togo–Atakora Mountains.

### Characteristics of the Akuapem-Togo Ranges.

- a. The ranges are broken by the Volta Gorge at Ajena.
- b. The average height of the land is about 450 m above sea level.
- c. The height rises to between 600m and 900m above sea level.
- d. The highest mountain in Ghana (Mt. Afadja) is located within this range.
- e. It is drained by many tributaries of the Volta River such as Asukawkaw, Alabo and others.

## 6. The Gambaga Escarpment

The Gambaga Escarpment is an important physiographic region that consists of horizontal layers of sandstone that mark the Northern limits of the Voltaian Sandstone Basin.

**Location:** This scarp lies between the Savannah High Plains and the Voltaian Sandstone Basin at the north-eastern part of the country.

### Characteristics of the Gambaga Scarp

- a. The average height is about 450m above sea level.
- b. The Gambaga scarp is made up of a horizontal layer of sandstone that extends from East to West.
- c. The north-facing slope is steeper with undulating edges, but the south-facing slope descends into the Voltaian basin.

## 7. Southern Voltaian Plateau

Southern Voltaian Plateau is a distinctive region in Ghana characterised by its gently rolling landscape, sandstone bedrock, river systems, and a mixture of vegetation types that support various human activities, from agriculture to conservation.

The Southern Voltaian Plateau consists of horizontal layers of sandstone. It has many escarpments. It runs southeast to northwest. It has an average height of not less than 450 metres above sea level. The escarpment has steep slopes to the south and gentle slopes to the north.

### Characteristics of the Southern Voltaian Plateau

- a. The Southern Voltaian Plateau has a relatively flat or gently rolling landscape, with elevations or heights above 450 meters above sea level.
- b. The bedrock of the Southern Voltaian Plateau is mainly made up of sandstone, a type of sedimentary rock.
- c. The plateau is drained by several major river systems, including the Pra, Offin, and Birim rivers.
- d. The vegetation of the Southern Voltaian Plateau is a mixture of semi-deciduous forests, woodlands, and savannas (grasslands with scattered trees).

## Importance of mountains

1. **Help in the formation of Orographic or relief rainfall:** Mountains can force air to rise, cool, condense, and form clouds, leading to the formation of orographic rainfall on the windward side of the mountains.
2. **Sources of minerals:** Many valuable mineral resources are found in mountainous regions. Gold, diamond, iron ore, and bauxite deposits are often located in mountainous landscapes. Examples of mining towns in Ghana include Obuasi, Tarkwa Bogoso and Konongo.

3. **Tourist attractions:** Mountains, hills, and escarpments create unique natural landscapes that attract tourists. Mt. Afadja and the Gambaga Escarpment are examples of popular tourist destinations due to their impressive elevations or heights, scenic views, and opportunities for hiking and outdoor recreation.
4. **Source of some rivers:** Mountains serve as the source or headwaters for rivers. Examples of mountains that serve as sources of rivers include Akwapim Togo Ranges for river Densu, Kwahu Plateau for river Prah and Birim etc.
5. **Serve as windbreaks:** The presence of mountains can create a barrier that blocks and slows down wind, providing a windbreak effect. This can protect nearby areas from the effect of strong winds.
6. **Serve as political boundaries:** Mountain ranges have often been used to define political boundaries between districts, regions or countries.
7. **Site for settlement:** The elevated terrain or area, access to water resources, and defensive advantages of mountainous regions have made them attractive sites for human settlements, for example, people settling on the Kwahu and Akuapem Togo ranges.
8. **Site for telecommunication masts:** Mountains are often chosen as sites for telecommunication masts and towers, as they provide better line-of-sight coverage and signal transmission for TV stations and other communication networks.
9. **Site for agricultural activities:** The unique microclimate and soil conditions in mountainous regions, such as the Kwahu and Akuapem areas, can be suitable for certain agricultural activities, such as the cultivation of cash crops and the grazing of livestock.

## Socio-economic Problems posed by Highlands

1. **Limited land for the development of human settlement:** The Highlands often have steep, rugged terrain or areas with limited flat and arable land. This makes it difficult to build large-scale human settlements and infrastructure, constraining population growth and economic development.
2. **Increases soil erosion:** The mountainous landscape of the Highlands makes the soil prone to erosion, especially during heavy rainfall. This can degrade the land, reducing agricultural productivity and making it harder to sustain human communities.
3. **Unsuitable for mechanised agriculture:** The uneven terrain or area and slopes of the Highlands make it challenging to use large-scale agricultural machinery such as ploughs, combine harvesters etc. This limits the ability to efficiently cultivate crops and can lead to lower yields and higher labour demands.
4. **Limited transportation network:** Constructing roads, railways, and other transportation infrastructure in the Highlands is difficult and expensive due to the

rugged terrain. This can isolate communities, restrict the movement of goods and people, and hinder economic integration with other regions.

5. **Prone to various natural hazards:** The Highlands are often situated in geologically active regions, making them prone to natural disasters such as landslides, avalanches, and earthquakes. These hazards can damage infrastructure, disrupt local communities, and pose significant risks to human safety and well-being.

## Importance of lowlands

1. **Communication and Transportation:** Lowland areas typically have accessible transportation routes, such as roads, railways, and waterways, which facilitate communication and the movement of people, goods, and services.
2. **Grazing Grounds:** The flat and open nature of the lowlands provides good grazing grounds for animals, supporting livestock farming and pastoral activities. This can be an important source of livelihood and sustenance for local communities.
3. **Mineral Resources:** Lowland areas, especially river valleys and floodplains, can be a source of valuable mineral resources, such as alluvial gold, rock salt, and crude oil.
4. **Sand Winning:** Lowlands often have abundant sources of sand, which is an essential material for construction and various other industries. The accessibility of the sand resources makes lowland areas suitable for sand-winning activities.
5. **Human Settlement:** The flat, open, and well-connected nature of lowlands makes them more favourable for human settlement compared to rugged highland areas.
6. **Agricultural Activities:** The fertile soils like the alluvial soil of lowland areas are generally well-suited for agricultural activities, such as crop cultivation. This can contribute to food production and the economic livelihoods of local communities.

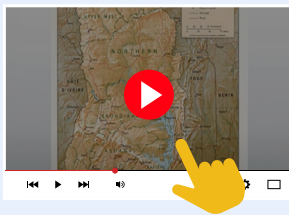
## Socio-economic Problems posed by lowlands

1. **Prone to flooding:** Some lowland areas are susceptible to flooding during heavy rainfall or seasonal flooding, as they are located at the lowest points of the landscape. Example Accra plains.
2. **Inaccessibility to transport routes:** Lowland areas do not support the development of communication lines such as roads and rail transportation.
3. **Poorly drained areas can be unsuitable for some farming practices:** Lowlands areas can make the cultivation of crops very difficult due to the marshy nature of the land.
4. **Harbour insects such as mosquitoes that can cause diseases:** The stagnant water and moist conditions commonly found in lowland areas can provide an ideal breeding ground for insects, such as mosquitoes, that can transmit various diseases like malaria.



### Activity 5.3

1. With the help of an atlas, draw the physiographic regions of Ghana. Explain to your friend in class how these regions are different from each other.
2. Use a map or an atlas to identify and describe the relief regions of Ghana.
3. Using a blank map of Ghana, label the major physiographic regions, such as the Coastal Plains, Akwapim-Togo Ranges, Voltaian Plateau, and Northern Savanna.
4. Visit the link below or critically do thorough search on the internet by selecting any four relief regions of Ghana. Create a presentation on its location, characteristics, and importance, using visual aids, such as maps, diagrams, or photographs, discuss your findings to your friend in your class.



5. When discussing the contrasting relief features of Ghana, one might argue that highlands are more significant than the lowlands. Prepare your arguments by researching and gathering evidence to support your viewpoint. Consider aspects such as their socio-economic impact on the environment, economy, and daily life of the people. Present your viewpoints clearly, using specific evidence and examples to strengthen your argument. Discuss your viewpoints with your friends in your class.
6. Select any highland area and any lowland area in your district or region and explain the difference to your siblings or parents under the following headings:
  - a. Differences
  - b. Usefulness/importance to the people
  - c. Challenges/problem
7. Based on your knowledge of relief regions of Ghana, describe the nature or relief of your school, and compare this with the nature of the land in your local community. What are the challenges associated with each of these areas?

## Drainage of Ghana

Drainage refers to all kinds of water bodies that occupy an area. The water bodies found in the country are rivers, lakes, seas, lagoons and streams. Figure 5.5 shows some principal rivers in Ghana.



Fig. 5.5: Principal Rivers in Ghana

### Some Principal Rivers in Ghana

1. **River Volta:** It is the largest and longest river in Ghana. It takes its source from the Sikasso Plateau or Moshi Highlands in Burkina Faso. Its mouth is at Ada, Greater Accra region. It is drained by tributaries such as the White Volta, Mawli, Daka, Oti, Dayi to the right bank and Black Volta, Tain, Pru, Sene, and Afram to the left bank. Dams such as Akosombo, Kpong, and Bui are constructed on the Volta River.
2. **River Pra:** It takes its source from Kwahu-Mampong Ridge and flows into the Gulf of Guinea. It flows into the sea at Shama in the Western region. Its tributaries include River Offin, Birim and Anum.

3. **Bia, Tano and Ankobra Rivers:** Located at the southwestern part of Ghana, Bia and Ankobra Rivers take their source from the Forest Dissected Plateau. River Tano takes its source from Wenchi Plateau near Techiman, flows through parts of Bono and Ahafo, Western region and enters the sea through the Aby lagoon in the Republic of Côte d'Ivoire. River Ankobra flows into the sea at a place near Axim. River Bia's mouth is at Lake Ayame in the Republic of Côte d'Ivoire.
4. **Densu, Ayensu, Narkwa and Amissah Rivers:** These rivers take their source from Atiwa-Atwiredu Range in the Eastern Region.
5. **Kulpawn, Sisili, Kornin, Red Volta, White Volta, Morago:** These rivers drain the northern part of Ghana and serve as tributaries to the White Volta

## Lakes in Ghana

A lake is a large body of water completely surrounded by land. Ghana has artificial lakes such as Lake Volta, Weija and Tadane. Lake Bosomtwi as the only natural lake in Ghana.

### Lake Volta

The Volta Lake is the largest human-made lake in Ghana and one of the largest reservoirs in the world. It is located in the south-eastern part of the country and spans across the regions of Volta, Eastern, and Greater Accra. The lake was created as a result of the construction of the Akosombo Dam on the Volta River in the 1960s. The Volta Lake covers an area of about 8,502 square kilometres (3,283 square miles) and stretches approximately 400 kilometres (250 miles) from the Akosombo Dam in the north to the Atlantic Ocean in the south. It is a significant water body, providing hydroelectric power, irrigation, and transportation for the country.



## Lake Bosomtwi

Lake Bosomtwi is a natural lake located in the Ashanti region of Ghana. It is situated about 30 kilometres southeast of Kumasi. The lake is one of the few meteorite impact craters in the world and is believed to have been created by a meteorite strike about 1.07 million years ago. Lake Bosomtwi is surrounded by lush greenery, hills, and picturesque landscapes, making it a popular tourist destination and a serene getaway for visitors. The lake itself is approximately 8 kilometres in diameter and reaches depths of up to 78 metres, making it one of the largest natural lakes in Ghana.



## Lagoons in Ghana

A lagoon is a shallow body of water that is separated from a larger body of water, such as a sea or an ocean, by a barrier such as a sandbar, coral reef, or barrier island. It is usually found along coastal areas and is characterised by its calm and relatively stagnant waters. Examples of lagoons in Ghana are Keta Lagoon, the largest, Songor, Sakumono, Amisa, Muni and Avu Lagoon.



## Characteristics of Rivers in Ghana

- a. Seasonal variations in volume: Some rivers in Ghana increase in volume during the wet season and dry up during the dry. Season example river Ayensu, Densu, Tano etc.
- b. Seasonal colour changes Some rivers become muddy during the wet season and clearer during the dry season.
- c. Presence of debris and some of these debris are floating materials
- d. Shallowness of rivers: Some of the rivers are not too deep.
- e. Presence of irregularities: Some of the rivers have the presence of rapids and waterfalls.
- f. North to south direction of flow.
- g. Presence of sandbars and spits especially at the estuary or mouth of the river.
- h. Evidence of river capture. An example is River Prah which has captured the headwaters of River Amisa.

## Economic importance of rivers/lakes in Ghana

1. **Hydroelectric Power Production:** Much of Ghana's electrical energy comes from hydroelectric power from the Volta River through the Akosombo, Kpong and Bui dams. These provide hydroelectrical power to meet Ghana's industrial and domestic needs.
2. **Irrigation:** Rivers and lakes provide a reliable source of water for irrigation, allowing farmers to cultivate crops throughout the year and increase agricultural productivity. Some examples of irrigation projects are the Okyereko Irrigation project on river Ayensu, Dawhenya on the Volta River and Tono Irrigation on White Volta.
3. **Transportation Purposes:** Navigable rivers and lakes in Ghana serve as important transportation routes, enabling the movement of goods and people by boat or ferry, especially in areas with limited road infrastructure. Some navigable rivers in Ghana include the Volta, Pra and Afram. For example the Volta river is navigable from Akosombo to Yapei.
4. **Source of Minerals:** Some rivers and lakes in Ghana are source of valuable minerals which are extracted and contribute to the country's economic development. For example, river Birim is rich in diamonds while the Pra, Bonsa and Ankobra are rich in gold.
5. **Domestic Water Supply:** Rivers and lakes are crucial sources of water for drinking, cooking, and other domestic uses for communities living near these water bodies.
6. **Industrial Water Supply:** Industries, such as mining, manufacturing, and processing plants, rely on the water from rivers and lakes for their operations, supporting economic activities.
7. **Tourist Attraction:** Some lakes and rivers like Lake Volta, Lake Bosomtwi, Volta River, etc attract number of tourist both domestic and international. Tourist

attractions help Ghana's economy by bringing in money from visitors who spend on hotels, meals, and fun activities. This supports local shops and creates jobs. More tourists also lead to better roads and services, which helps the economy grow

8. **Source of Employment:** The various economic activities related to rivers and lakes, such as fishing, transportation, tourism, and mineral extraction, provide employment opportunities for the local population.
9. **Source of food:** Rivers and lakes such as the Volta, Pra, Lake Bosomtwi and Densu among others are a source of fish and other aquatic resources that provide food and sustenance for the people of Ghana.

## Problems/Factors that limit the use of rivers/lakes in Ghana

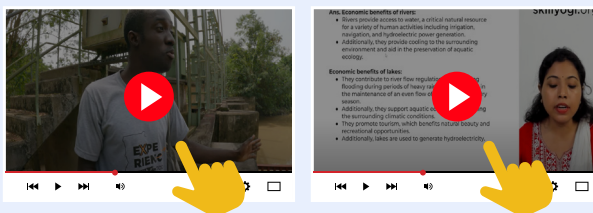
1. Inadequate skilled river management personnel.
2. Presence of rapids and waterfalls.
3. Seasonal flow of rivers.
4. Presence of pests and diseases.
5. Shallow depth of rivers.
6. Presence of tree stumps and floating vegetation.

## Solutions to the problems that limit the use of rivers/ lakes in Ghana

1. Training and retraining of river management personnel.
2. Clearing of floating vegetation.
3. Construction of canals.
4. Removal of tree stumps.
5. The use of narrow boats.
6. Dredging of river channels.

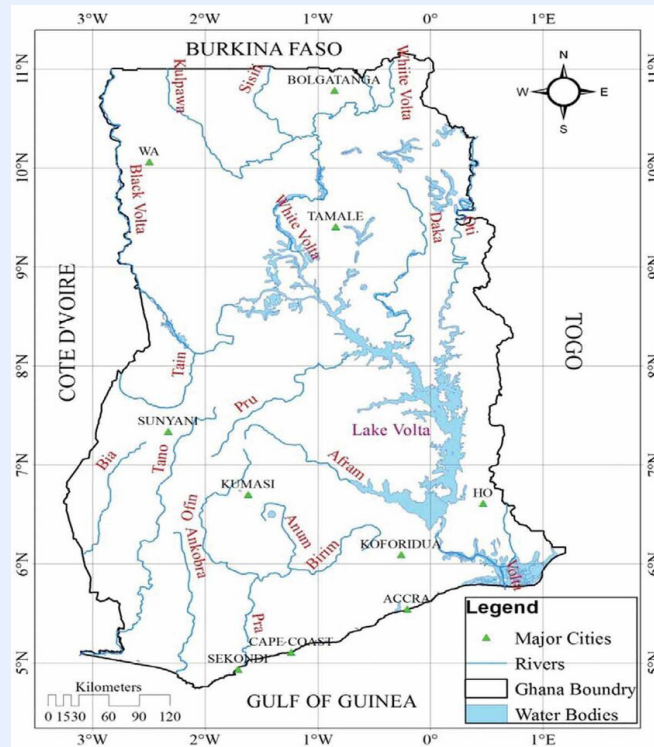
### Activity 5.4

1. Visit the links below to learn more about the economic benefits and problems associated with rivers and lakes

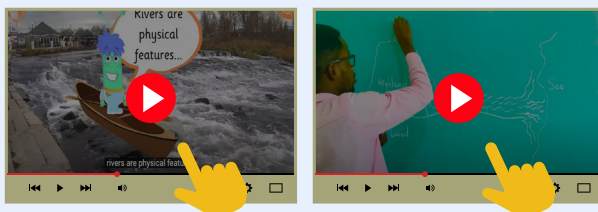


If you cannot access the video, check your school or local library or look for an internet café near your home.

2. Use a map or an atlas to identify and describe the characteristics of the principal drainage systems of Ghana.



3. Using the map above identify and name:
- The major river in Ghana.
  - River(s) found in your locality or region.
  - Name your locality or region where the river mentioned in (ii) is found.
  - Explain to a friend how the river has been beneficial to the community or region.
4. Draw a sketch map of Ghana, locate and name two artificial lakes and the only natural lake in Ghana. Take a notebook, and record information such as location, size, uses, and any unique features of each lake. After completing your notes, present your findings to a friend in class.
5. Visit the links provided below, listen carefully and answer the following questions.



- Identify the basic features or characteristics of the river.
- Briefly describe how the rivers flow.
- Identify the problems created by the flow of the river

If you cannot access the video, check your school or local library or look for an internet café near your home.

6. Visit the link provided below, listen carefully and answer the following questions.



If you cannot access the video, check your school or local library or look for an internet café near your home.



- a. Compare the nature of river Pra before and now.
- b. Explain to a friend how galamsey activities have influenced the nature of River Pra with reference to the characteristics of drainage systems in Ghana and their importance.
- c. What do you think are the future consequences of galamsey (illegal small-scale, gold mining) on rivers in Ghana?
- d. Think about how rivers can be damaged by other human activities and suggest the measures that can be taken to solve these problems.



# Review Questions

1. In class, explain to a friend the difference between Ghana's absolute and relative location using words like size, large, small, long etc.
2. With reference to a map of West Africa, describe how the size of Ghana can be compared to the size of Togo.
3. Pick a map of Ghana from an atlas or download it from the internet. Observe or study the map carefully. In your notebook, write the following:
  - a. One town in the southernmost point
  - b. One town in the northernmost point
  - c. One town in the westernmost point
  - d. One town in the easternmost point
  - e. Two towns within which the Greenwich Meridian passes
  - f. Countries that share common borders with Ghana
4. With a well-labelled map, identify the Physiographical Regions of Ghana and state any three (3) characteristics of each.
5. Explain how relief adversely affects economic activities in your locality.
6. Identify the socio-economic problems posed by rivers in your community.
7. Outline the economic benefits of Ghana's rivers to your locality.

# Answers to Review Questions

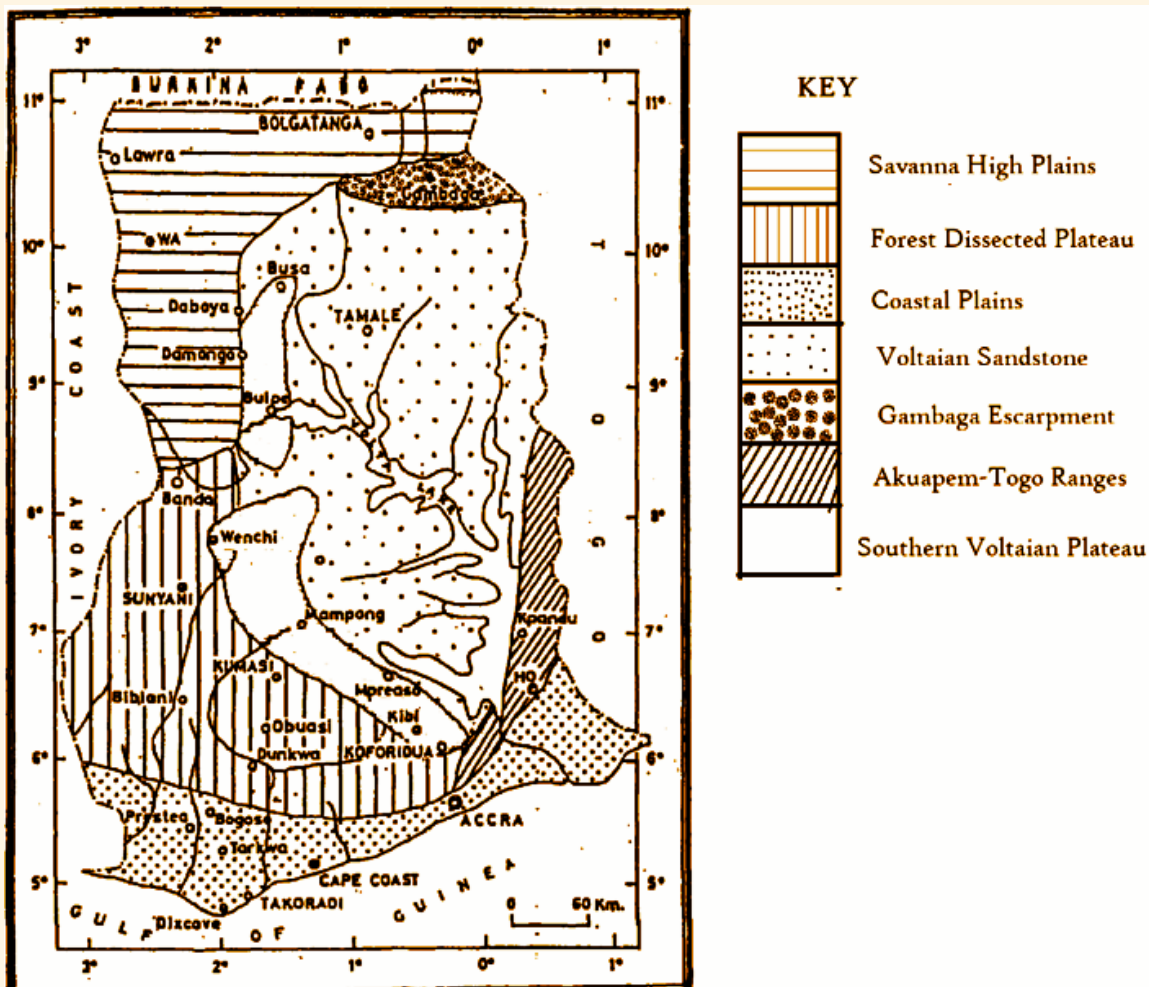
1. The absolute location of Ghana is the position based on the longitudes and latitudes on which Ghana is located. In contrast, relative location is the position of Ghana based on the nearest landmarks. For example, the absolute location of Ghana is latitudes  $4^{\circ}44'N$  and  $11^{\circ}10'N$ ; and longitudes  $3^{\circ}15'W$  and  $1^{\circ}11'E$  while in relative terms, Ghana is bounded by the countries of Burkina Faso in the North, Cote d'Ivoire in the West, Togo in the East and the Gulf of Guinea in the South.
2. Ghana has a broad rectangular shape while Togo has a narrow, oblong shape. Togo stretches 579 km from the Gulf of Guinea to the North while Ghana stretches 672km from the South to the North. Ghana has a total land area of about 238539 km<sup>2</sup> while that of Togo is 56,785 km<sup>2</sup>. Ghana's landmass projects or protrudes in the West but Togo's landmass extends narrowly to the North.
3. Reference map for Review Question 3



- i. One town in the southernmost point = eg. Axim, Ada, Sekondi-Takoradi, Dixcove etc.

- ii. One town in the northernmost point = Bawku, Navrongo, Tumu, Nandom etc
- iii. One town in the westernmost point = Dadieso, Half-Asini, Enchi, Dormaa Ahenkro etc.
- iv. One town in the easternmost point = Aflao, Ho, Kpando, Saboba etc.
- v. Two towns within which the Greenwich Meridian passes = Tema and Yendi
- vi. Countries that share common borders with Ghana = Togo, Burkina Faso and Cote d'Ivoire

4.



A map showing the Physiographic Regions

## Location and three characteristics each of the Physiographic Regions in Ghana

### a. Coastal Plains

**Location:** The coastal plains stretch from Half-Assini (Western Region) to Denu (Volta region). It is divided into two, that is, the South-East Coastal plains and the South-West Coastal plains.

#### Characteristics

- i. Average height below 100m above sea level.
- ii. East coastal plains are dominated by isolated rounded hills called inselbergs. e.g Shai Hills, Ningo and Osudoku.
- iii. The land is relatively flat and undulating.

### b. Forest Dissected Plateau

**Location:** The Forest Dissected Plateau is found in the forest zone stretching along Eastern, Western, Central, Ashanti and parts of the Brong-Ahafo Regions. The underlying rocks are Tarkwaian and Birimian (named after Tarkwa and River Birim).

#### Characteristics

- i. Average height between 240m and 300m above sea level.
- ii. The region is drained by rivers such as Tano, Ankobra, Birim, Pra and others.
- iii. The Tarkwaian rock area is hilly and rugged, but the Birimian rock area is gentle.

### c. Savannah High Plains

**Location:** The savannah high plain is a gently sloping stretch of land located in the four northern regions (i.e., Northern, North-East, Upper East and Upper West Regions).

#### Characteristics

- i. The land rises to about 180 – 300m above sea level.
- ii. It is dominated by small, rounded hills or inselbergs especially near Upper West (e.g., Tumu) and Upper East.
- iii. The small round hills are made up of granite rocks.

### d. The Voltaian Sandstone Basin

**Location:** The Voltaian sandstone basin occupies about 47.3% of the total land area of Ghana covering areas like Volta, Ashanti, Brong Ahafo, and parts of Northern as well as upper East Region. It is the largest of all the regions.

### **Characteristics**

- i.** The Voltaian sandstone basin is an extensive area 60 – 150m above sea level.
- ii.** It is composed of sandstone, shale, limestone and mudstone.
- iii.** It is drained by the Volta River with its tributaries like Afram, Oti, Sene, Daka, Black and White Voltas.

### **e. The Akuapem -Togo Ranges**

**Location:** The Akuapem – Togo ranges are a narrow belt of ridges and hills that stretch from the mouth of river Densu (West of Accra), following a north-easterly direction, across the Volta region, through Togo. It is also called the Togo–Atakora Mountains.

### **Characteristics**

- i.** The average height of the land is about 450 m above sea level.
- ii.** The height rises to between 600 and 900 m above sea level.
- iii.** The highest mountain in Ghana (Afadjato) is located within this range.

### **f. The Gambaga Escarpment**

**Location:** This scarp lies between the Savannah High Plains and the Voltaian Sandstone Basin at the north-eastern part of the country.

### **Characteristics of the Gambaga Scarp**

- i.** The average height is about 450m above sea level.
- ii.** The Gambaga scarp is made up of a horizontal layer of sandstone which extends from East to West.
- iii.** The north-facing slope is steeper with undulating edges, but the south-facing slope descends into the Voltaian basin.

### **g. Southern Voltaian Plateau**

**Location:** Located in the southern portions of the Voltaian Sandstone Basin

### **Characteristics**

- i.** The Southern Voltaian Plateau has a relatively flat or gently rolling landscape, with elevations or heights above 450 meters above sea level.
- ii.** The bedrock of the Southern Voltaian Plateau is mainly made up of sandstone, a type of sedimentary rock.
- iii.** The vegetation of the Southern Voltaian Plateau is a mixture of semi-deciduous forests, woodlands, and savannas (grasslands with scattered trees).

## **5.**

- a.** Easily inundated by rains.
- b.** Inaccessibility to transport routes during flooding.

- c.** Poorly drained areas can be unsuitable for some farming practices.
- d.** They harbour insects such as mosquitoes that can cause diseases.

**6.**

- a.** Floods
- b.** Breeding of insects
- c.** Navigation problems. Can cause accidents during river transportation
- d.** Erosion

**7.**

- a.** For hydroelectric power production.
- b.** For irrigation.
- c.** For transportation purposes.
- d.** Source of minerals.
- e.** Source of water for domestic purposes.
- f.** Source of water for industrial purposes.
- g.** Serve as a tourist attraction.
- h.** Source of employment.
- i.** Rivers provide food for the populace.

## Extended Reading

- Dadson I. Y. (2021). *Integrated Human and Regional Geography* (2<sup>nd</sup> Ed), UCC Press: Cape Coast.

## References

1. Amankwaa, O.P.J (2002) Ghana, A Human Geography Takoradi, Ghana: St. Francis Press Ltd.
2. Bunnet, R. B. and Okunrotifa, P. O. (1986 and 1999) General Geography in Diagrams for West Africa Hong Kong: Longman Group.
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## Acknowledgements



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