Longhorn Secondary Geography

Learner's Book 3

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Preface

Geography Learner's Book Three has several features integrated to enhance learning and analytic skills. These features focus learners to apply skills and techniques of geography to their real-world experiences and within the environment. This book gives you the basic geographical tools and concepts needed to understand places and regions and to appreciate the connection between their own lives and those of other people in the different parts of the world.

Each chapter begins with a list of learning outcomes and key words. The content of each chapter was structured around these learning outcomes.

The chapters are written in an interactive style, often addressing the learner directly. The basic concepts are covered with real-world examples, texts in the book are brief enough to provide flexibility for additional specialised information. This book has a number of photographs, maps and illustrations which will trigger your minds to find out more information in the book by doing the activities.

A sample activity of integration is given at the end of each chapter. This will help you use all the skills, values and attitudes you have gained in each chapter. A summary of what you have learnt in each chapter is given at the end of each chapter to remind you of what has been learnt in each chapter.

Contents

Chapter 18 : Trade within and outside East Africa 1

Patterns of trade in East Africa 2
Types of Trade in East Africa 3
Visible and Invisible Trade 4
Imports and exports of East Africa 5
Problems Affecting trade in East Africa 10
Development of Import substitution industries in East Africa 11

Chapter 19 : Further skills in map reading and map use 15

Meaning of Contours 16
Describing an area from a survey map 18
Identifying Human aspects on a survey map 20
Relationships between different features on survey maps 22
Describing Relationships between different features on survey maps 22
Drawing sketch maps from survey maps 24
Drawing a Cross-section from a Contour map 25
Importance of survey maps in studying geography 28

Chapter 20 : Location and size of Africa 31

Finding out the location of Africa 32
The Size of Africa 33
The position of East Africa within Africa 34

Chapter 21 : The Relief Regions and Drainage of Africa 37

The Major Relief Regions of Africa 38
Formation of Landforms in Africa 39
Effects of landforms 44
The drainage of Africa 47
Importance of rivers and lakes to development of Africa 49

Problems the people of Africa face when using lakes and rivers.....50
How water resources are used and controlled.....50

Chapter 22 :The Climate and Vegetation of Africa.....53

The Earth-Sun Relationship.....54
Tropical, Temperate and Polar regions of the Earth.....55
The overhead sun and rising air.....56
The Inter-tropical Convergence zones (ITCZ.....57
Climate of Africa.....58
Factors influencing climate in Africa.....58
Major Climate Regions of Africa.....59
Characteristics of Climatic Regions of Africa.....60
Influence of Climate on people's way of life.....63
Modern technology versus changes in climate.....64
Vegetation of Africa.....65
People's influence on natural vegetation.....68

Chapter 23 : Forests, Forest resources and Forestry in Africa.....71

Forests of Africa.....72
Forestry in Africa.....74
Forestry in Gabon.....74
Destruction of forests in Africa.....80
Destruction of forests in Uganda.....81

Chapter 24 : Irrigation farming in Africa.....85

Irrigation Farming in Africa.....86
Gezira Irrigation Scheme.....88
Benefits of the Gezira Irrigation Scheme to Sudan.....90
Difficulties Faced by Gezira Irrigation Scheme.....91
Government Cooperation with Small Scale Farmers.....92
Position of China.....92

The climate of China 94
Irrigation Farming in China 96
Methods of irrigation in China 97
Importance of irrigation farming in china 98
Rice growing in China 99
Hydroponic farming 101
Glossary 104
References 106

Introduction

You have ever gone to a market, super market, shop or any other shopping centre. Remember the items you found there. Discuss them with your neighbour. Did you buy any items? What did you use to buy the items?

When purchasing commodities, there is exchange of goods for goods, goods for services and goods for money. In this chapter you will know the types of trade carried out with in East Africa and between East Africa and Africa and the rest of the world and the importance and difficulties of each type of trade.

Patterns of trade in East Africa

Trade involves buying and selling of goods and services for money. People of East Africa carry out both internal and external trade. Some of the products you use in everyday life are not produced within Uganda. Mention those products and note them in your books. No country in the world is self-sufficient in all its needs. This implies that every country relies on certain goods and services brought in from other countries. After doing tasks in activity 18.1, you will understand more about trade in East Africa.

Activity 18.1 Understanding trade in East Africa

In groups, move to the nearby local market or trading centre around your school and do the following tasks:

1. Identify the goods sold in the market.
2. Draw a table showing the type of goods identified in (1) and their origin.
3. Who buys these goods?
4. Find out how the prices of these goods are set.
5. Ask the traders if they sell the same type of goods season after season.
6. Find out the problems faced by the traders in the market.
7. Write a report for presentation to the rest class.

Different goods are sold in markets for example, fruits and vegetables. The prices of these goods are in most cases determined by the demand of the consumers in different seasons. After doing tasks in activity 18.2, you will understand trade patterns in Uganda

Activity 18.2 Exploring trade patterns in Uganda

Carry out a textbook or internet research and do the following tasks.

1. What kind of goods are exported from Uganda?
2. What kind of goods are imported to Uganda? Give reasons to support your answers in (1).

3 In your opinion, compare the volume of Uganda's imports to her exports.

4 What do you think can happen to Uganda if her exports are less compared to imports?

5 Present your work to the rest of the class through a discussion.

You have learnt that Uganda carries out both internal and international trade. Internal trade is carried out among the different communities with in the same country. On the other hand, international trade is carried out between Uganda and other countries.

International trade involves the **import** and **export** of goods and services whereby imports are goods that Uganda buys from other countries and exports are goods that Uganda sells to other countries. After doing tasks in activity 18.3, you will understand more about the types of trade in East Africa.

Types of Trade in East Africa

Trade can be classified into various types in relation to the way goods move from one destination to another and how they are exchanged.

Activity 18.3 Finding out different types of trade in East Africa

In groups; read the text below and do the tasks that follow.

Mr Odeke is a farmer who used to grow crops and rear rabbits on a large scale. One day it rained heavily to the extent that wind blew off some iron sheets from his main house. The next morning Mr Odeke collected his old iron sheets from the neighbouring village and carried them to his home.

His worry was to get money to pay someone to fix the iron sheets. When he discussed with the wife, she remembered that one of their neighbours Mr John is a good builder and had all along wished to buy rabbits for his children to rear.

Mr. Odeke therefore, decided to trade rabbits with John the builder so that he fixes his roof. Fortunately Mr. John agreed to fix the roof and Mr Odeke's problem was solved.

1 Identify the kind of trade Mr Odeke and John carried out?

2 What are the advantages of the kind of trade carried out by Mr John and Mr Odeke?

3 Discuss the disadvantages of this kind of trade.

4 Present your work to the rest of the class through a discussion.

Can you imagine what the situation would be if there was no money?

How would we get the things we need? The only option would be to exchange goods for goods. This was the system which was followed in the ancient times when there was no money. This type of trade is called **Barter.**

Through this kind of trade, people got food and clothing by trading different items for items. Even today, we still use barter trade. You might have observed your friends exchanging items for example a chocolate for a cookie or a banana for a pancake. This is a form of trade because you are exchanging something you have for something you need.

Visible and Invisible Trade

Trade can also be categorised into **visible** and **invisible trade.** After doing tasks in activity 18.4, you will understand the meaning of visible and invisible trade.

Activity 18.4 Understanding visible and invisible trade

In groups, study photographs A-D in Figure 18.1 and do the tasks that follow.

Figure 18.1: Examples of visible and invisible trade

1. Describe what is taking place in each of the photographs A-D in Figure 18.1.
2. What kind of trade is shown in each of the photographs A-D in Figure 18.1? Give reasons for your answer.
3. Discuss the advantages and disadvantages of the type(s) of trade identified in (2).
4. Present your findings to the rest of the class through a discussion.

You have learnt that East Africa has visible and invisible trade. Visible trade consists of the imports and exports of physical goods whereas invisible trade consists of the importation and exportation of services. Tourism is a very good example of invisible trade while coffee export and petroleum imports are good examples of visible trade.

Imports and exports of East Africa

In some cases, countries or regions carry out trade amongst themselves or trade with other partners outside or beyond their boundaries. When East African countries carry out trade amongst themselves without exporting goods to overseas countries this is called **regional trade**. For regional trade to take place, countries and regions involved always sign agreements. Such agreements are called **Trade agreements.** East African countries formed a common trade agreement. This is called the **East African Community.**

After doing tasks in activity 18.5, you will understand the main exports of Uganda to the members of the East African Community.

Activity 18.5 Understanding the main exports of Uganda

In groups, study the word search game in Figure 18.2 and do the tasks that follow.

y	i	s	t	e	r	v	o	s	e	r	t	e	a	m
c	e	t	o	d	l	v	o	i	r	f	y	g	e	o
c	o	g	c	d	c	o	i	r	e	l	o	w	e	r
m	p	e	e	c	o	f	f	e	e	o	e	g	y	r
b	i	n	e	t	t	i	g	e	r	w	z	a	g	y
a	k	e	n	y	a	f	r	i	c	e	k	f	j	i
s	y	i	e	m	a	b	q	o	e	r	y	h	n	s
k	i	g	r	x	s	b	l	g	r	s	k	i	i	s
r	n	h	y	u	a	i	l	e	d	r	c	d	i	y
e	r	b	j	k	y	v	x	e	s	i	x	e	s	i
t	u	o	o	c	c	a	b	o	t	a	r	s	e	s
w	i	r	a	u	a	e	i	r	e	q	v	e	e	p
e	r	e	n	k	f	b	e	i	u	l	p	y	d	y
s	o	f	i	b	y	r	a	n	e	r	e	d	g	o
z	u	j	a	j	o	a	g	o	l	d	e	r	t	p

Figure 18.2: Main exports of Uganda

1 Identify the main exports of Uganda.
2 Make a list of agricultural and non-agricultural exports of Uganda.
3 What are the contributions of Uganda's exports to;
   (a) Intra-regional trade. (b) International trade.
4 Swap your work with another group and make comments.
5 Present your work to the rest of the class through a discussion.

You have realised that Uganda mostly exports agricultural products, that is, 80 percent of her total exports. The most important export is coffee, followed by tea, cotton and fish. Uganda's main export partners are Sudan, Kenya, DR Congo, Netherlands, Germany, South Africa and United Arab Emirates. After doing tasks in activity 18.6, you will understand the main imports and exports of East African countries.

Activity 18.6 (a) Exploring the main imports and exports of East African countries

In groups, study photographs A-H in Figure 18.3 and do the tasks that follow.

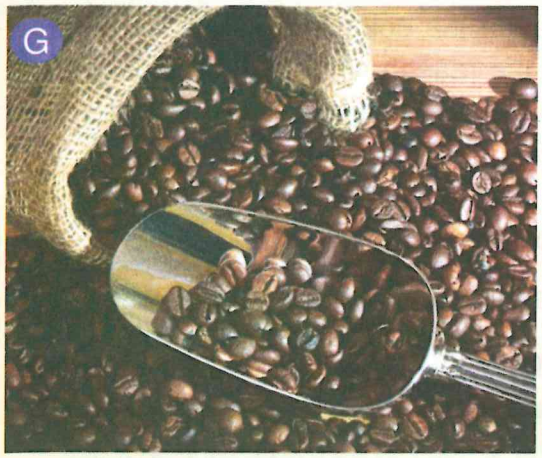


Figure 18.3: Main imports and exports of East African countries

1 Identify the main imports and exports of East African countries shown in photographs A-H in Figure 18.3.

2 What other imports and exports of East African countries are not shown in Figure 18.3?

Activity 18.6 (b) Use table 18.1 to do the tasks that follow.

Table 18.1: Main imports and exports of East Africa

Main exports	Country of origin	Country of destination
1. Cut Flowers	Uganda	Netherlands
2.		
3.		
4.		
5.		

Main imports	Country of origin	Country of destination
1.		
2.		

1. Copy table 18.1 showing main imports and exports of East Africa, countries of origin and destination of main imports and exports in your note books and fill it accordingly.
2. Describe the trade pattern indicated in table 18.1.
3. Give your opinion on the trade patterns described in (2).
4. Swap your work with another group and make comments on each other's work.
5. Present your work to the rest of the class through a discussion.

You have learnt that Countries of East Africa mainly export unprocessed products. You can name some of them. This is because the colonial masters wanted raw-materials for their home industries. This is the reason why they introduced crops such as coffee and cotton. These were traditionally called **cash crops.** After doing tasks in activity 18.7, you will find out the imports and exports of Tanzania.

Activity 18.7 Finding out imports and exports of Tanzania

In groups; study the statistics in table 18.1 and do the tasks that follow.

Table 18.2: Tanzania's main exports and imports

Exports	Million US$	Imports	Million US$
Coffee	137.8	Machinery and equipment	458.5
Cotton	137.6	Consumer goods	361.8
Cashew nuts	93.8	Industrial raw materials	349.3
Minerals	50.4	Petroleum	158.4
		Building materials	42.5

Source: Economist Intelligence Unit. 1997. Country Profile, Tanzania. The Unit: London.

1 Draw a graph to represent the information shown in table 18.1.

2 Identify the type of good which is;

(a) exported most (b) imported most

2 What kind of goods are usually more expensive and why?

3 In which ways can East Africans improve on the value of the goods that they export?

4 Present your work to the rest of the class through a discussion for groups to critique each other's work.

You have realised that when you export commodities in their raw form, they fetch little revenue as compared to when exporting processed products. The process of improving on commodities to have more quality is called **value addition.**

Countries of East Africa are making efforts to add value onto their products so that they fetch high revenue when they are exported.

Countries of East Africa always struggle to boost their exports. This is why they are trying to set-up manufacturing industries.

When countries export more than they import, they save a lot of foreign exchange.

After doing tasks in activity 18.8, you will understand the different terms used in trade.

Activity 18.8 Understanding the terms used in trade

In pairs; carry out a textbook or internet research on terms used in trade and do the tasks that follow.

1 What do you understand by the following;
   (i) Terms of trade
   (ii) Balance of trade
   (iii) Balance of payments
   (iv) Favourable and unfavourable balance of payments
   (v) Favourable and unfavourable balance of trade
2 What benefits is a country likely to get when it exports more goods than it imports?
3 Discuss the dangers a country is likely to face when it imports more goods and services than it exports.
4 In which other ways can a country earn foreign exchange if it does not export goods and services overseas?
5 Present your findings to the rest of the class through a discussion.

You have learnt that different terms are used in trade for example balance of payments, terms of trade and balance of trade. If a country has been importing more goods than exporting for a long period, it could be going into debt.

On the other hand, if its imports are less than it exports, it earns more money than it spends on goods from other countries. This is called **favourable balance of trade**.

When a country imports more than it exports, this means it must borrow from other countries to pay for the extra imports. This situation is called **unfavourable balance of trade**. Therefore, it is better for countries to export more than they import.

Importance of trade in development of East Africa

Trade is an important activity and brings in revenue which is used for development. You can share with your friends the facilities that have been constructed by your government. Some of the money used to put up these facilities was got from trade.

After doing tasks in activity 18.9, you will understand how trade has contributed to development of East Africa.

Activity 18.9 Finding out the importance of trade in the development of East Africa

In pairs, carry out a text book or internet research and do the tasks that follow.

1 What is the percentage of foreign exchange that East Africa earns from;
   (a) Agricultural products. (b) Manufactured goods. (c) Tourism.
2 How has East Africa benefited from international trade?
3 Exchange your work with another pair and make comments.
4 Present your work to the rest of the class through a discussion.

You have learnt that trade brings in foreign exchange. Foreign exchange is used in the construction of transport and communication networks like roads and railways.

Revenue from trade is invested in local industrialisation, in the building of schools and colleges, hospitals and barracks. Further more trade increases competition and lowers world commodity prices. This provides benefits to consumers by raising the purchasing power of their own income, and leads to a rise in consumer surplus.

Trade also breaks down domestic monopolies, as companies face competition from more efficient foreign firms. It provides employment opportunities to the people of a country. It also allows access to goods and services that might be of higher quality and lower cost than the locally manufactured. Trade avails a variety of goods on the market for consumption and promotes agricultural development.

Problems Affecting trade in East Africa

Most countries have problems which limit their trade activities. East Africa similarly has challenges affecting its trade activities within and with other countries. After doing activity 18.10, you will understand the problems affecting trade in East Africa.

Activity 18.10 Understanding problems affecting trade in East Africa

In groups, carry out a text book or internet research on problems affecting trade in East Africa and do the tasks that follow.

1. Explain the problems affecting the development of trade within East Africa.
2. Suggest ways through which problems affecting trade in East Africa can be overcome.
3. Discuss other problems affecting trade in East Africa.
4. Exchange your work with your neighbour and comment on each other's work.
5. Present your work to the rest of the class through a discussion.

You have learnt that there are a number of challenges which limit the development of trade in East Africa. You might have noted limited infrastructure, including connectivity in rural areas, although the government has been investing heavily in infrastructure. East Africa's road and rail systems are in poor condition, and access to electricity is limited.

Taxes also affect trade especially if trade agreements are not adhered to. Similarity in goods produced which results into flooding of goods and stiff competition on the market, Trade embargo where some products are being banned from some East African coutries. High tarrifs imposed on the exporting and importing of goods within East Africa.

With such problems therefore, East African countries have come up with different stategies to solve the problems as you will find out after doing activities 18.11 and 18.12.

Development of Import substitution industries in East Africa

You have learnt that East Africa has for long depended on the importation of manufactured goods from other countries. Do you do remember the countries from which Uganda imports most of her products?

When countries set up manufacturing industries to make similar products like those they import, they save a lot of revenue. Entrepreneurship can play an important role in this process. After doing tasks in activity 18.11, you will understand why it is important for East African countries to set up manufacturing industries.

Activity 18.11 Describing import substitution industries

Individually carry out a text book or internet research, on import substitution and do the tasks that follow.

1. Explain what you understand by import substitution industries?
2. Why should East Africa develop import substitution industries?
3. What are the problems hindering the development of import substitution industries in East Africa?
4. Exchange your work with your neighbour and make comments.
5. Present your work to the teacher for further guidance.

You have realised that import substitution is an idea of blocking imports of manufactured goods that can be easily manufactured by the importing countries. This is basically done by setting up industries that manufacture similar commodities.

By doing this, the country will have substituted imports and this is called **import substitution**. Countries of East Africa like Uganda have started on the process by setting up local industries. Uganda is encouraging Ugandans to buy Ugandan manufactured goods. This policy of buying Ugandan goods is called **Buy Uganda Build Uganda.**

Trade Agreements

You might have entered an agreement or witnessed your friends entering an agreement when trying to exchange an item for another for example a ball for a calculator. Further more you could have heard or watched different heads of state signing trade agreements on television. These agreements are usually signed so that certain rules and regulations concerning trade among countries are observed.

Countries also sign trade agreements so as to reduce or remove taxes concerning trade. You can recall some countries that have signed such agreements. Have you ever heard about trade agreements in East Africa? After doing tasks in activity 18.12, you will understand more about trade agreements in East Africa.

Activity 18.12 Understanding trade agreements in East Africa

In groups, study figure 18.4 and do the tasks that follow.

Figure 18.4: Flag

1 (a) Identify the symbol shown in figure 18.4.
(b) What does the symbol identified in (1) represent?
2 How important is the symbol in signing trade agreements?
3 Why is it easier for countries to sign trade agreements with groups of countries that have joined together?
4 What are the likely challenges faced by countries which trade with each other without signing trade agreements into a block?
5 Exchange your work with another group and make comments.
6 Present your work to the rest of the class through a discussion.

You have learnt that the East African Community is a regional grouping of Kenya, Uganda, Tanzania, Burundi, Rwanda, South Sudan and Democratic Republic of Congo. Its headquarter is in Arusha, in the United Republic of Tanzania.

It was created to promote trade through removing trade restrictions such as taxes and to provide a wider market for goods and services and regional cooperation between the member countries.

Sample Activity of Integration

Uganda has always been exporting at least 350,000 tonnes of maize to Kenya annually. On 5th March 2021, Kenya imposed a total ban on importation of maize from Uganda citing high level of aflatoxins which make maize unfit for human and animal consumption. This led to a surplus of maize in uganda which caused a reduction in prices, low consumption resulting into wastage.

Task:

You are the Minister of Trade and Industry for Uganda and you have been asked to intervene in this matter. Write an advice note of about 400 words to the two governments on matters of trade.

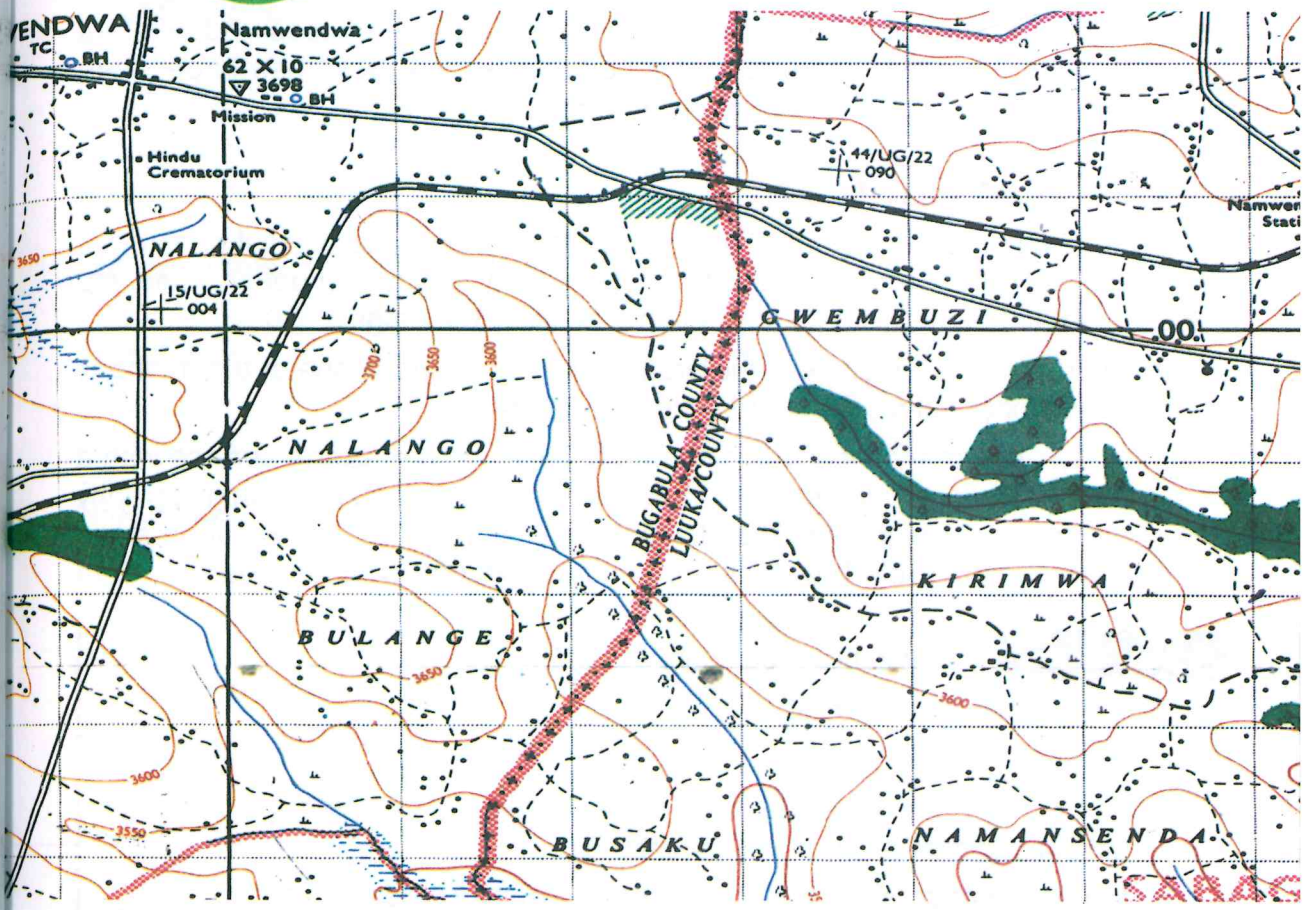
Chapter Summary

In this chapter you have learnt that;

- Trade involves the transfer of goods and services from one person or entity to another often in exchange for money.
- There are different types of trade which include, barter trade, visible and invisible trade, regional trade, foreign trade and international trade.
- The main exports of East African countries are cut flower, coffee, cotton and cashew nuts, the main imports include; machinery, vehicles and pharmaceutical equipments.
- East African Countries signed agreements to allow free trade without paying custom duties and therefore formed the East African Community
- The East African Community is a regional intergovernmental organisation of the Republics of Kenya, Uganda, the United Republic of Tanzania, Republic of Burundi and Republic of Rwanda with its headquarters in Arusha, Tanzania.
- Trade increases competition and lowers world prices, this provides benefits to consumers by raising the purchasing power of their own income, and leads to a rise in consumer surplus.

Chapter 19

Further skills in map reading and map use



Key words

- contour
- cross section
- human features
- relief features
- spot height
- steep slope
- vertical interval
- prospects
- physical features

After studying this chapter, you should be able to;

- understand what a contour is
- use contours to describe the relief of an area
- recognise physical and other features on conventional survey maps and photographs
- use contours to show physical features on maps and draw cross-sections from simple contour maps
- understand how to use a survey map to find out about the geography of an area
- use survey maps to describe the relief, drainage, vegetation, farming, settlements, transport and other human activities of an area
- use a sketch map to show the areas on a map
- appreciate the usefulness of survey maps in studying geography

Introduction

In Senior One, you learnt that a map is a representation of physical and human features of a particular area on a sheet of paper as seen, drawn and printed from above using symbols. You also learnt about maps, their uses and different types of scales. In this chapter you are going to learn how to use large scale maps or survey maps to find out about areas.

Meaning of Contours

In Senior One you learnt about using contours to tell the nature of relief of an area. When you look at the landscape layout in the area near your school or home you will observe that the landscape layout is not of the same height.

What features can you identify in the area? Use of contours is one of the methods used to show physical features and altitude on a map.

Contours are imaginary lines which cannot be seen on the earth's surface with a human eye. You can remember other imaginary lines you learnt about in geography and share with your neighbour. After doing tasks in activity 19.1, you will understand more about contours and how they are used to show relief of an area.

Activity 19.1 Understanding contours

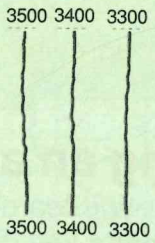
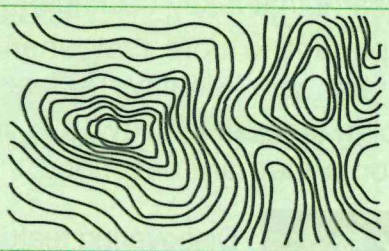
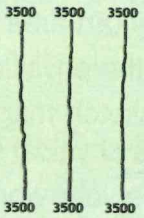
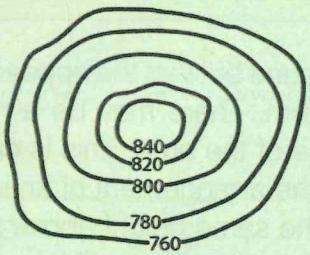
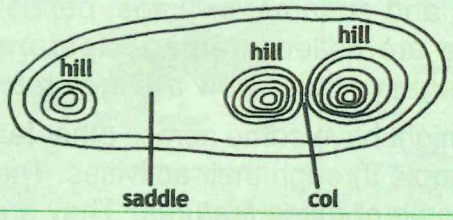
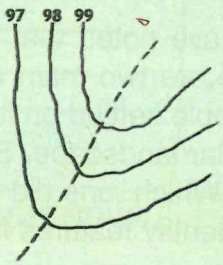
In groups do the following tasks.

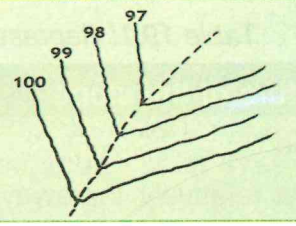
1. Create a heap of soil.
2. Place a ruler upright on the heap of soil and using a stick, spot and mark different heights using 2 cm interval.
3. Record them carefully until the top most part is reached.
4. Move to the opposite side of the heap of soil and do the same thing, following the same interval.
5. Join marks made at 2 cm interval on the heap of soil and then join them to make circles around it.
6. Look from right above the heap of soil and you will be in position to see the circles around it at all one time.
   (a) What do you understand by the term a contour?
   (b) How are contours numbered?
   (c) Present your work to the rest of the class through a discussion

You have learnt that relief on a map is described by interpreting the nature of contours and spot heights. Contours are numbered depending on the vertical interval of a particular map. Contours are numbered in an increasing order.

You can remember what you learnt in Senior One.

Table 19.1: Representation of relief features on a map.

Nature of the slope	Shape of contours
Gentle slope Contours are relatively far away from each other	
Steep slopes Contours are packed or are close to each other	
Flat areas Contours are far from each other	
Conical hills Contours are in a circular shape	
Saddle and a col These are depressions found between two hills, a narrow depression is a col and wide depression is a saddle	
U shaped valleys Contours are in u shape	

V shaped valleys. Contours are in v shape	

Describing an area from a survey map

In Senior One, you learnt that among the qualities of a good map is a key. You further learnt that a key describes what is shown on the map.

It is important to note that when describing features of an area shown on a survey map, you identify the feature and the part of the map where it is found.

After doing tasks in activity 19.2, you will discover how features found in an area shown on a map are described.

Activity 19.2 Discovering features found in an area shown on a map

In groups, study an area around your school and do the following tasks.

1. Find out the physical features found in the area.
2. Draw a sketch map of the area around your school and on it mark and name the physical features you have observed in (1).
3. Exchange your work with other groups for comments.
4. Present your work with the rest of the class through a discussion.

You have found out that the appearance of the landscape in the area around your school is not uniform. There may be a number of features. Such features form the general appearance of the area. This is called the **relief of the area**. Relief is represented on a map by the arrangement of imaginary lines. These imaginary lines are drawn joining places of the same height above sea level. These lines are called **contours.**

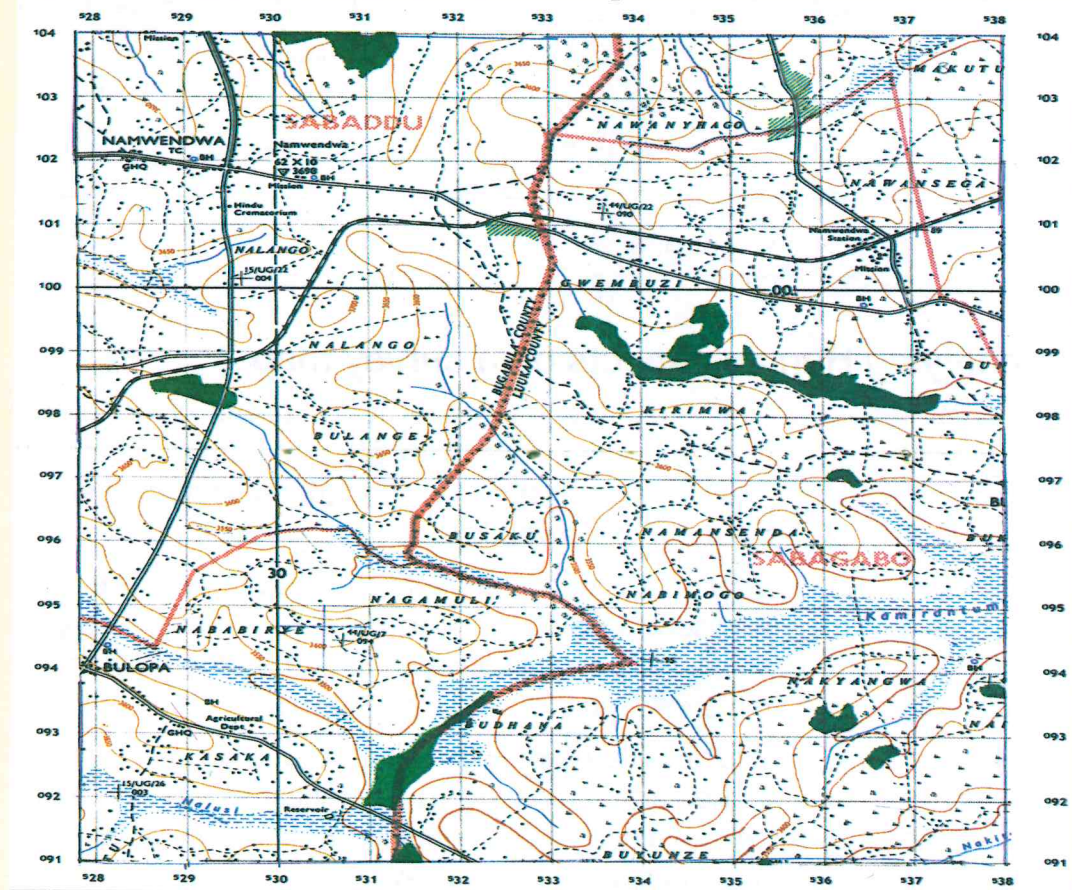
The area around your school might be having water resources such as lakes, rivers and streams, swamps, ponds, water holes, borehole, wells and springs. These are called **drainage features.** They are represented differently using different symbols. *How are they represented on a map?*

You might have come across other features which are not natural but were created by people through their activities. These are called **human made features**. *What are some of these features?* They are shown on a map using different symbols.

You might have noted that the area around your school has different vegetation types. There are two main types of vegetation; natural and planted vegetation. It also has people settled on it. A settlement pattern is a plan or layout of settlement on a particular landscape. Settlement of an area can be linear, scattered planned or grouped. Which one did you observe? After doing tasks in activity 19.3, you will be able to identify features from a survey map.

Activity 19.3 Identifying features on a survey map

In groups, study the map of Namwendwa in Figure 19.1 and do the tasks that follow.



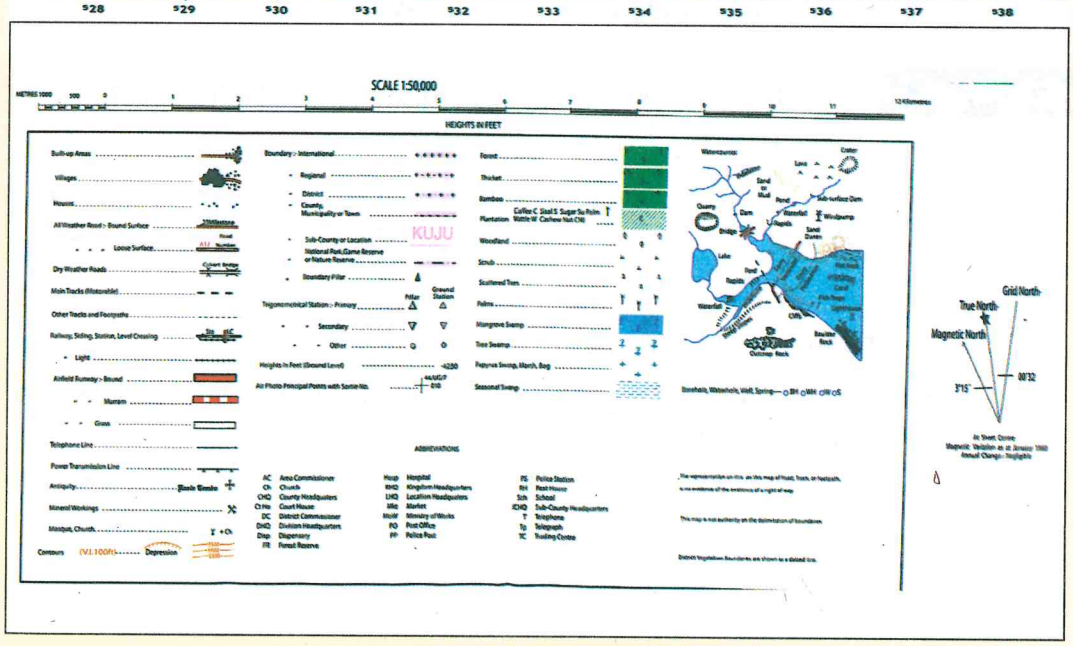


Figure 19.1: East Africa (UGANDA) NAMWENDWA

1 Identify the following features shown on the map in figure 19.1.
   (a) Relief features. (b) Drainage features. (c) Vegetation types.
   (d) Transport routes (e) Types of Settlements.
2 Exchange your work with other groups for comments.
3 Present your work to the rest of the class through a discussion.

You have found out how the different features on the map of Namwendwa are represented. The identification of these is made possible by the use of contour lines.

Identifying Human aspects on a survey map

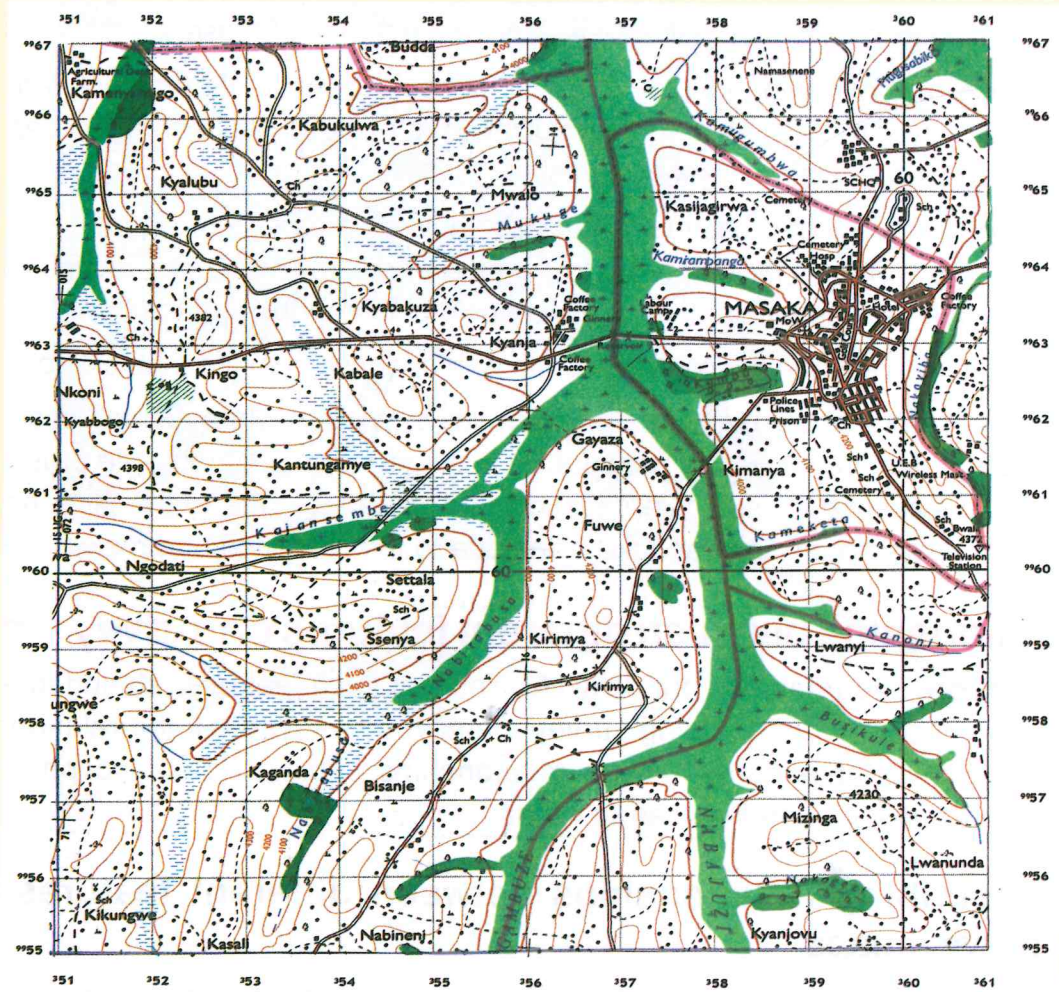
Using survey maps, we can identify economic activities taking place in an area shown on it. These economic activities are not so different from the ones carried out in your area or that you have ever visited. You can now make a list of economic activities carried out in the area where you live.

Since a map is a representation of part or the whole of the earth's surface on paper what you see on a map represents what is on the actual earth surface. This explains why in geography you can as well study a survey map and tell the problems faced by people living in the area shown on that very map extract.

In life people always want to develop new things using the available resources. This means that every area on the earth`s surface has a potential for development. The potential is the prospect for development. After doing tasks in activity 19.4, you will be able to understand human aspects on a survey map.

Activity 19.4 Identifying economic activities in an area shown on a map extract

1 Giving evidence from the map in figure 19.2,
   (a) Identify the economic activities carried out by the people of Masaka.
   (b) (i) Identify the problems faced by people living in the area shown on the map.
   (ii) Giving evidence from the survey map, why do you think people living in this area are experiencing these problems?
   (iii) As a geographer, what kind of advice can you give to these people to overcome the problems in (1).
   (c) (i) Identify the prospects for development of the area shown on map extract.
   (ii) Why do you think people living in this area need to develop it?
2 Exchange your work with another group and make comments
3 Present your work to the rest of the class through a discussion.



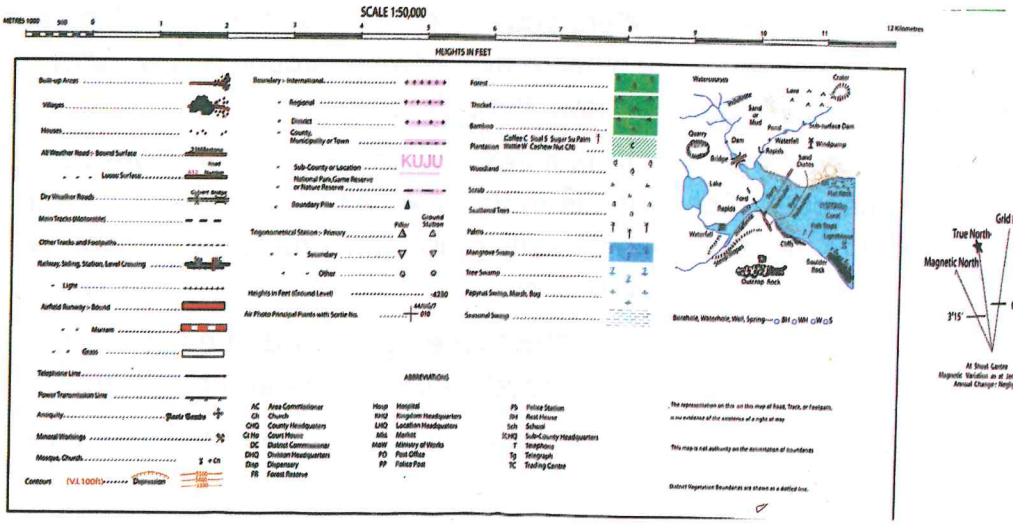


Figure 19.2 : East Africa (UGANDA) MASAKA

You have realised that some economic activities found in the area where you stay are similar to those identified from the area shown on the map of Masaka.

These activities are evidenced by different symbols for example livestock farming evidenced by symbols of dairy farms and cattle dips. While tourism can be evidenced by national and game parks.

You have realised that problems facing people in an area shown on map may be similar to the problems facing people in the area where you live. This explains why a map is a true representation of part or the whole of the earth's surface.

It is important to support the problems given with evidence from the map extract.

You have learnt that plans to carry out activities in an area when natural resources are put into use are known as **prospects.** It is important to support the prospects given with evidence for example irrigation can take place due to the presence of a river or a swamp, mining can take place due to the presence of a rock outcrop.

Relationships between different features on survey maps

Features are interrelated in our daily life. Think of such features relating to each other in your community. Using survey maps you can also tell the relationship between different features. These relationships can be human to physical, physical to physical and human to human.

Describing Relationships between different features on survey maps

You could have realised that physical features are connected in one way or the other. For example in the area where you live or around your school, there might be a feature which influences the other. A river flowing through a river valley means that the valley dictates that a river flows through it.

You could have noted that human features and physical features are connected in one way or the other. For example in the area where you live or around your school, you might have seen people setting up farm structures on gentle slopes or developing fish ponds in a valley or swamp.

You could have noted that human features are connected to each other to each in one way or the other. For example roads attract trade and commerce.

You will realise such and many other relationships between features on survey maps after doing tasks in activity 19.5.

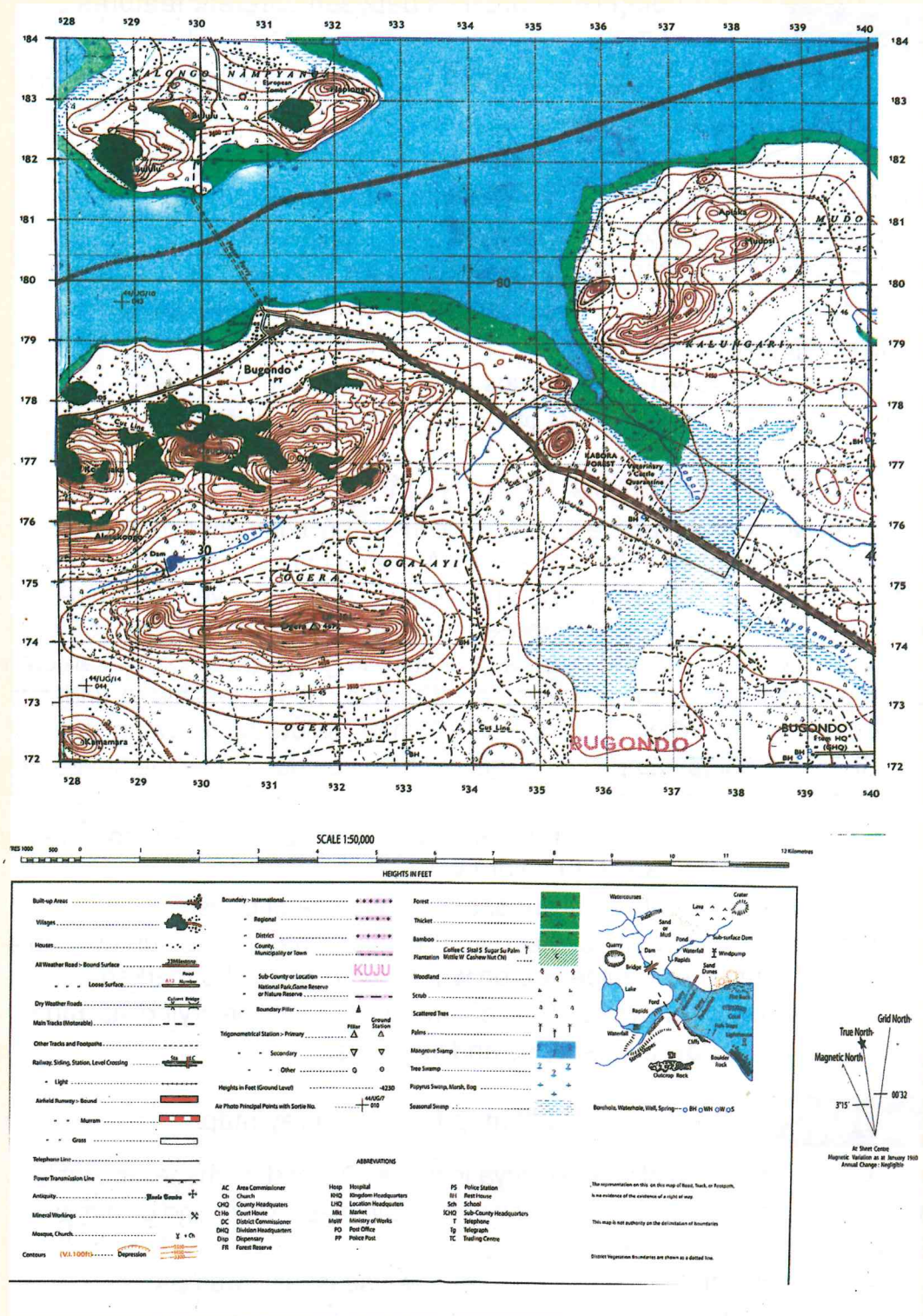


Figure 19.5: East Africa (UGANDA) BUGONDO

Activity 19.5 Describing Relationships between different features on survey maps

In groups, study the map extract of Bugondo in figure 19.5 and do the tasks that follow.

1 Describe the relationship between;

(a) Relief and drainage
(b) Relief and settlement
(c) Drainage and vegetation
(d) Drainage and settlement
(e) Transport and trade
(f) Drainage and communication
(g) Relief and vegetation
(h) Relief and transport
(i) Drainage and transport
(j) Settlement and transport
(k) Settlement and communication

2 Swap your work with other groups for comments.

3 Present your work to the rest of the class through a discussion.

Drawing sketch maps from survey maps

In Senior One you learnt that everything found in our environment can be drawn on a map or it can be sketched in form of a map. A sketch map is a drawing of anything. It can be of a classroom or a compound, a village, country or even the whole world. Sketches can be drawn when one looks at a map. In Art and Design, you look at objects and draw them out and call that a sketch. In geography too you can draw a sketch map from a survey map or topographical map. This helps you to understand more about the areas. When drawing a sketch map, follow the following steps.

(i) Study the survey map given. This will help you determine the shape of the map to be drawn.
(ii) Count the boxes of the map both horizontally and vertically to determine the shape of the sketch to be drawn.
(iii) Draw an outline with a similar shape on a piece of paper
(iv) Plot on it the major grids; these are the thick lines on the survey map and name them. These guide you on where features will be marked.
(v) Using a pencil draw out the features in the outline trying as much as possible to follow their shapes and locations.

Activity 19.6 Drawing a sketch map from a survey map

In groups, study the map of Chepsikunya in figure 19.6 and do the tasks that follow

1 Draw a sketch map of the area shown on the map extract and on it mark and name the following;

(a) All weather surface roads
(b) Any two hills
(c) Rivers Kiriki and Cheborom
(d) Two seasonal swamps
(e) Papyrus swamps
(f) Settlements

2 Present your work to the rest of the class through a discussion.

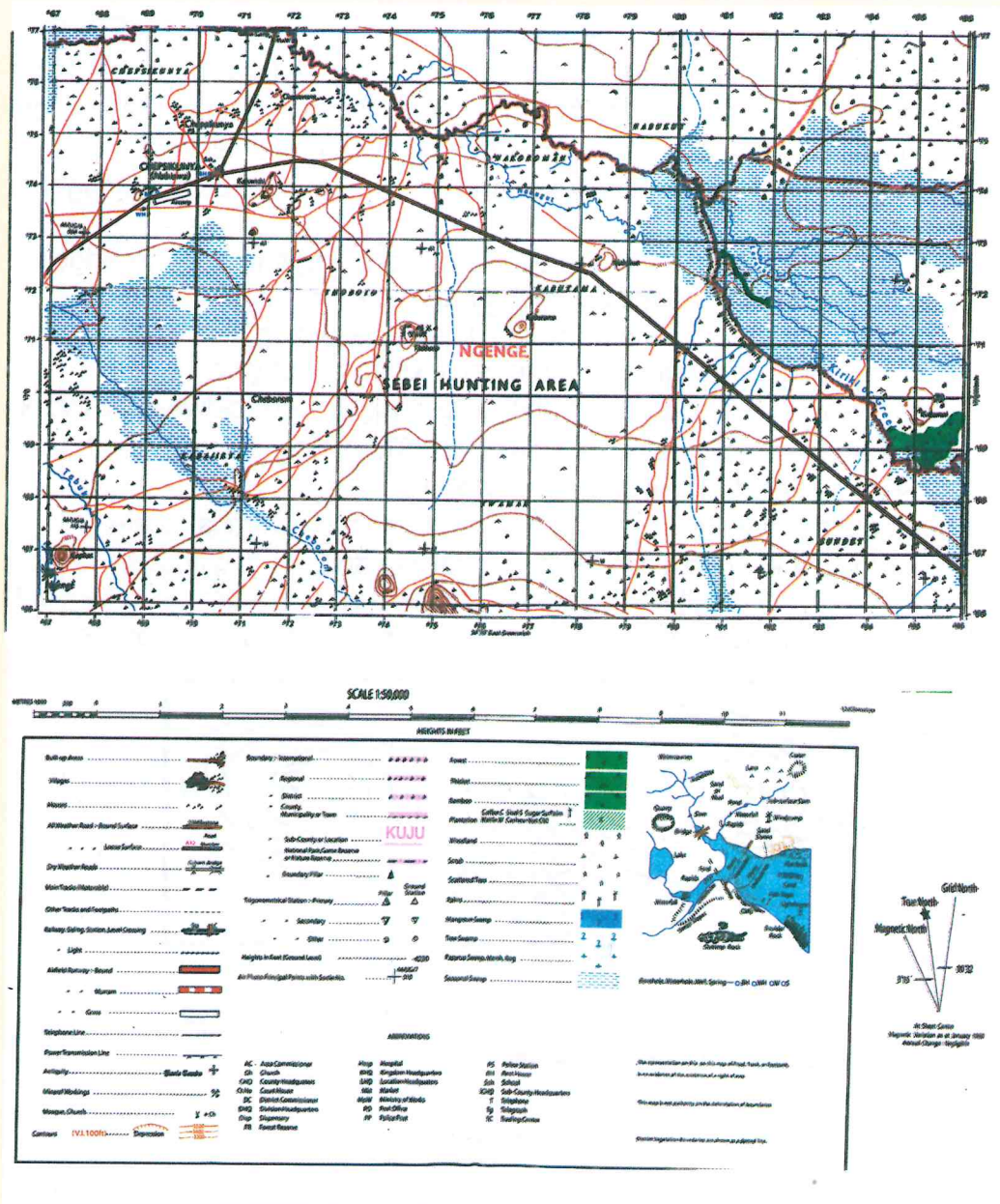


Figure 19.8 East Africa 1: 50,000 (UGANDA) CHEPSIKUNYA

You have realised that sketch maps are clearer than the original survey map. This is because a sketch map contains a few features. All the elements of a good map should be included on the sketch drawn.

Drawing a Cross-section from a Contour map

A cross-section is a diagram that represents the nature of relief of a particular area as viewed along a given line. It clearly shows changes in relief, such as the ascending and descending sections, the rugged and smooth areas as well as the steep and flat areas. It presents the outline of the land as it would be seen from sideways.

This should be by taking the following steps:

Step 1: Locate the points between which you are going to draw the cross-section.

Step 2: Take a pencil and a ruler and draw a line joining two points, A and B on the map extract between which you want to draw a cross-section.

Step 3: Take a piece of paper that has a straight edge and place the straight edge between the two points.

Step 4: Put a mark on the paper wherever a contour line touches the edge of the paper, and write the height of the contour at each mark.

Step 5: On a graph paper, draw a horizontal line representing the distance between the two points and write down the value of each contour.

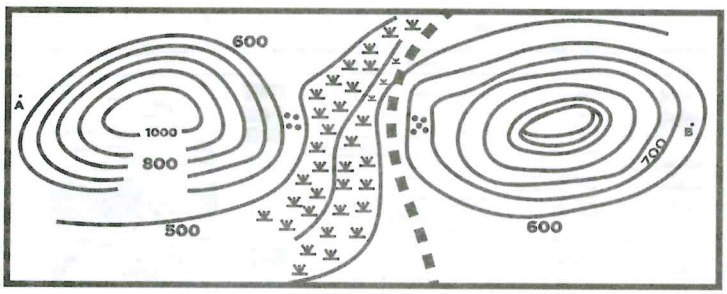
Step 6: Draw a vertical line that represents the contour heights found between the two points.

Step 7: Calculate the amplitude of the area drawn. This helps you to obtain the vertical scale to be used in cross section drawing.

Step 8: Mark out the heights on the vertical axis using the vertical scale.

Step 9: Place the paper edge along the horizontal axis and, starting from the left to right, plot the contour heights that you have marked on the paper using faint dots.

Step 10: Transfer the contour heights information on to the vertical line.



A cross-section of the area between points A and B showing two hills settlements and steep slope and river

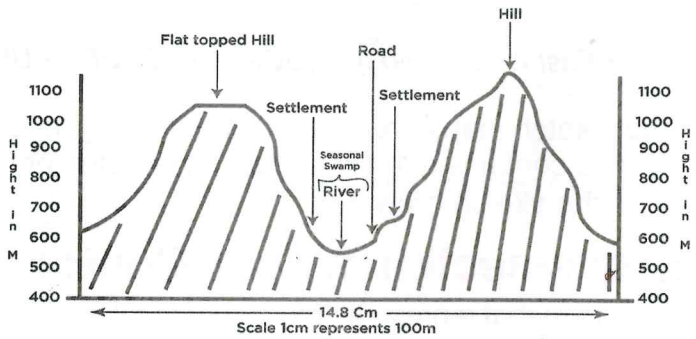
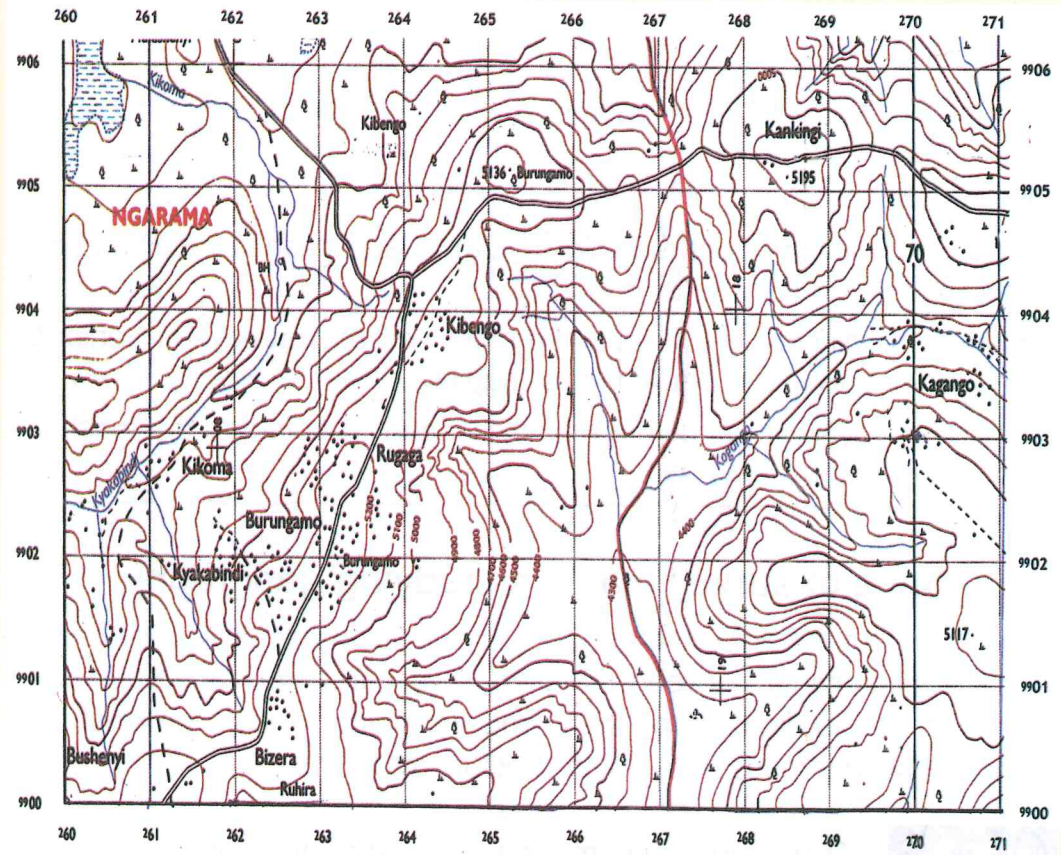


Figure 19.9 : Sample cross section

After doing tasks in activity 19.7, you will learn more about drawing a cross section.

Activity 19.7 Understanding how to draw a cross section

In groups, study the map of lake Nakivale in figure 19.10, and do the tasks that follow.



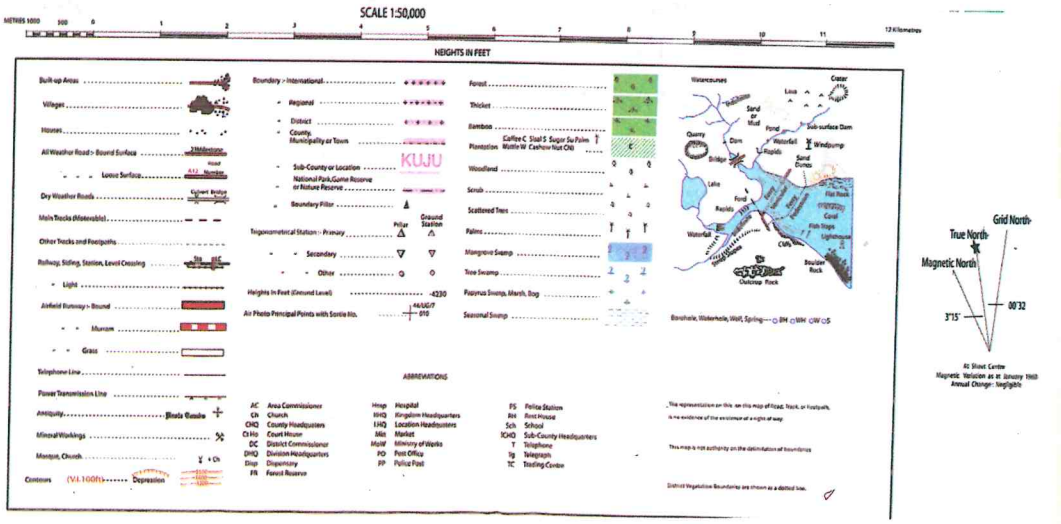


Figure 19.10 : East Africa (UGANDA) LAKE NAKIVALE)

1 Draw a cross section between grid reference 620070 and 700070 and on it mark and name
   (a) Dry weather road
   (b) Rivers
   (c) Kibengo settlements
   (d) Foot paths
   (e) Boundary
2 What is the difference between digitally drawn landscape and the hand drawn landscape profiles?
3 Identify the differences between the cross section you have in Senior One and the one you have drawn in this chapter.
4 Compare your work with your neighbour, and present it to the teacher for further guidance.

Importance of survey maps in studying geography

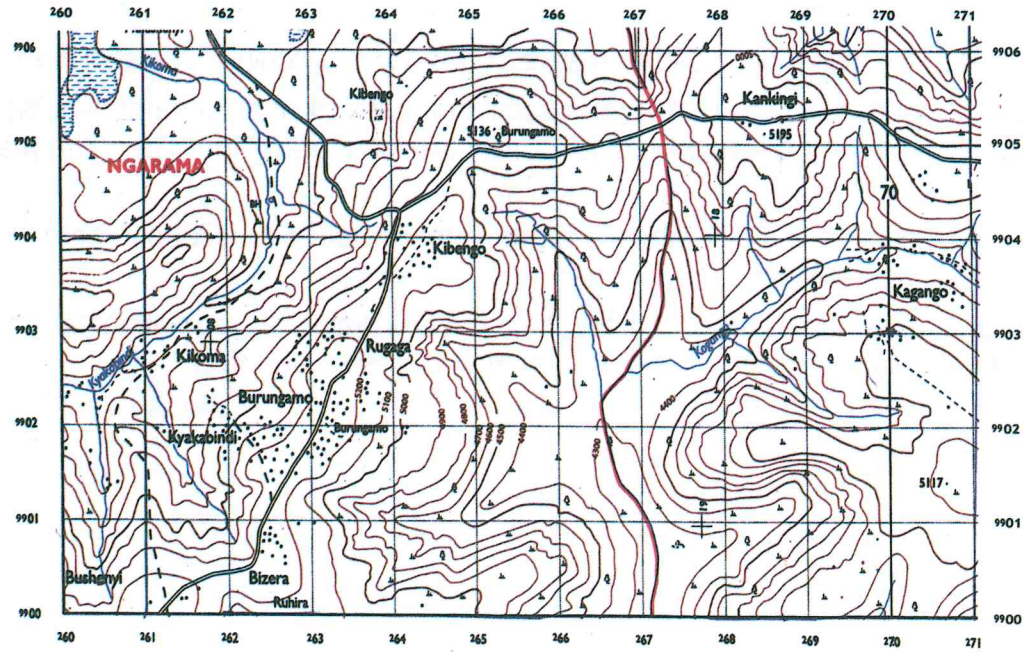
You have found out that survey maps are very useful in people`s lives. They help to show the relationship between features. They can also help you to identify the economic development of an area. You are going to learn more about the importance of survey maps after doing tasks in activity 19.8.

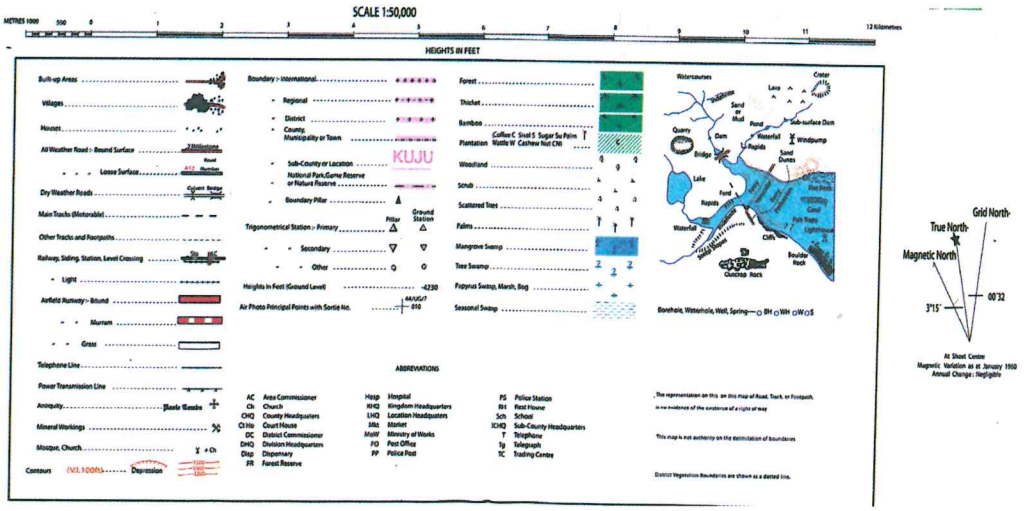
Activity 19.8 Discovering the importance of survey maps

1 Carry out a text book or internet research and find out other uses of survey maps in studying geography.
2 Write a report about your findings.
3 Present your findings to the rest of the class through a discussion.

Sample Activity of Integration

The government of Uganda through the Ministry of Water and Natural Resources is organising to supply water to your area. The chairman in your local council cannot explain how the pipeline from the major water grid can be laid because of the varied relief. He can not also tell the length of the pipe lengths.





Task:

You have been consulted as a surveyor. Make a write up of about 300 words which can help the local Council I chairman sort out this challenge.

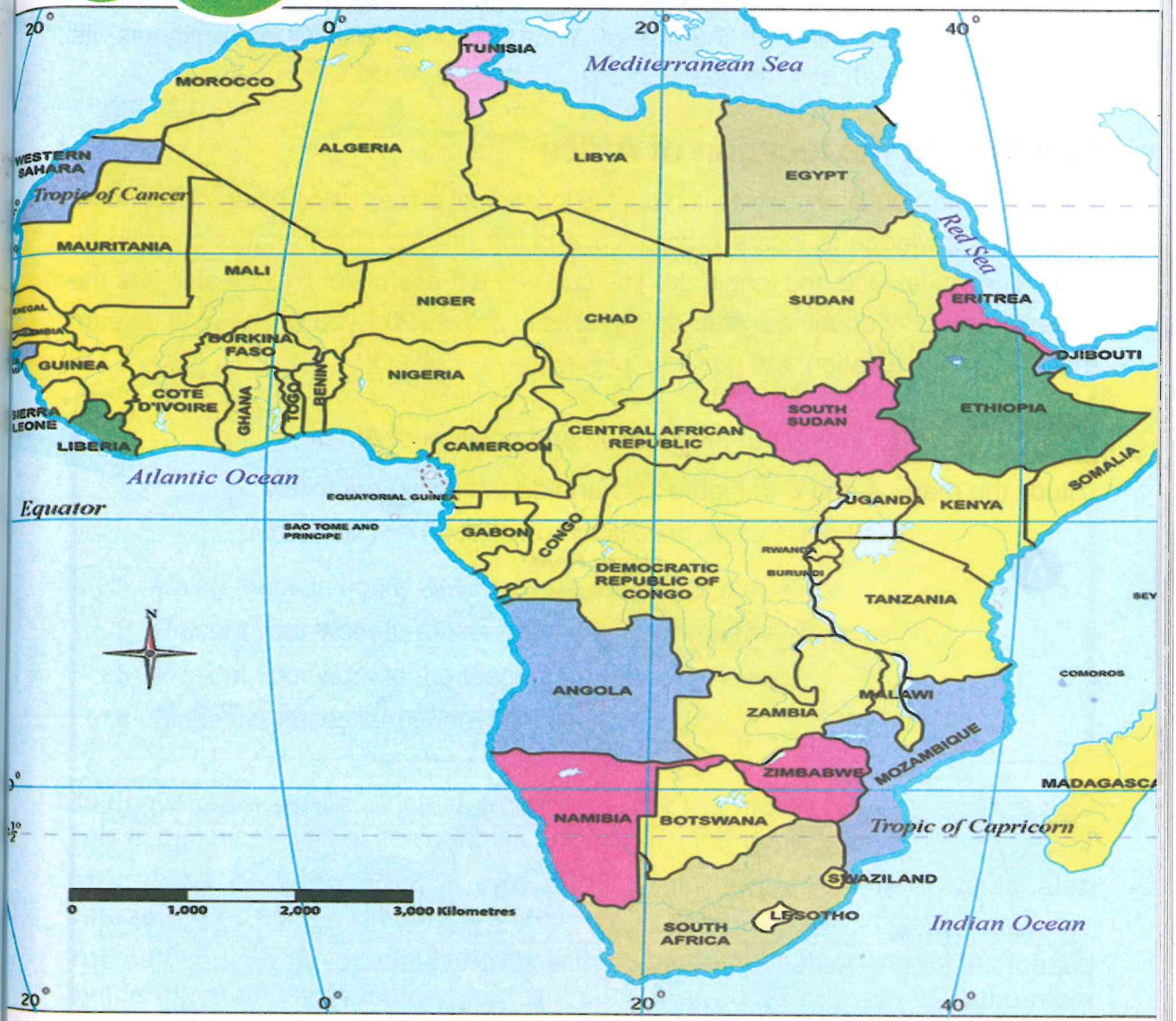
Chapter Summary

In this chapter you have learnt that;

- Contours are imaginary lines drawn on a map joining places of the same height above sea level.
- The use of contours is one of the methods used to show physical features and altitude on a map.
- Relief on the map is described by interpreting the nature of contours and spot heights.
- It is important to note that when describing features of an area shown on a survey map, you are supposed to identify the feature and the part of the map where it is located.
- A cross-section is a diagram that represents the nature of relief of a particular area as viewed along a given line.
- You can use survey maps to describe the relief, drainage, vegetation, farming, settlements, transport and other human activities in an area.

Chapter 20

Location and size of Africa



Key words

- Continent
- Equator
- Oceania
- Tropic of cancer
- Tropic of Capricorn

After studying this chapter, you should be able to;

- know the position of Africa in the world
- know the size of Africa compared to other continents
- know the position and the size of East Africa within Africa
- understand that Africa occupies a unique position as the most tropical of Continents.

Introduction

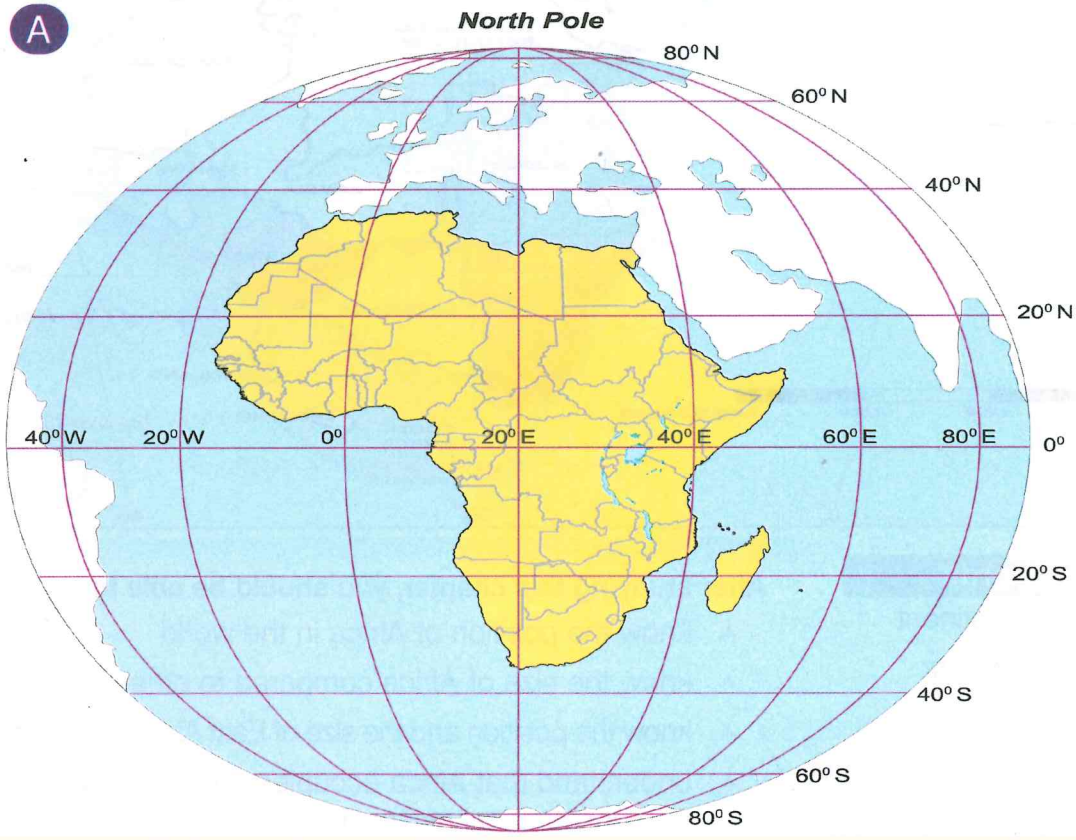
Africa is the second largest continent on planet earth. It covers an area of 30,065,000. Did you know that it has 55 countries, surrounded by two oceans and two seas? Did you know that the third largest fresh water lake is found in Africa? What is the name of this lake? In this chapter, you will learn the size of Africa compared with other continents, its position in the world and the size and position of East Africa within Africa.

Finding out the location of Africa

In Senior One, you learnt how to find out the location of places using different methods. Use that knowledge to locate Africa. Africa is the only continent that is crossed by major lines of latitude and longitude. You can name these major lines. It also has the largest number of countries. After doing tasks in activity 20.1 you will be able to learn more about the location and position of Africa.

Activity 20.1 Finding out the location and position of Africa

Study the maps A and B in Figure 20.1 and do the tasks that follow.



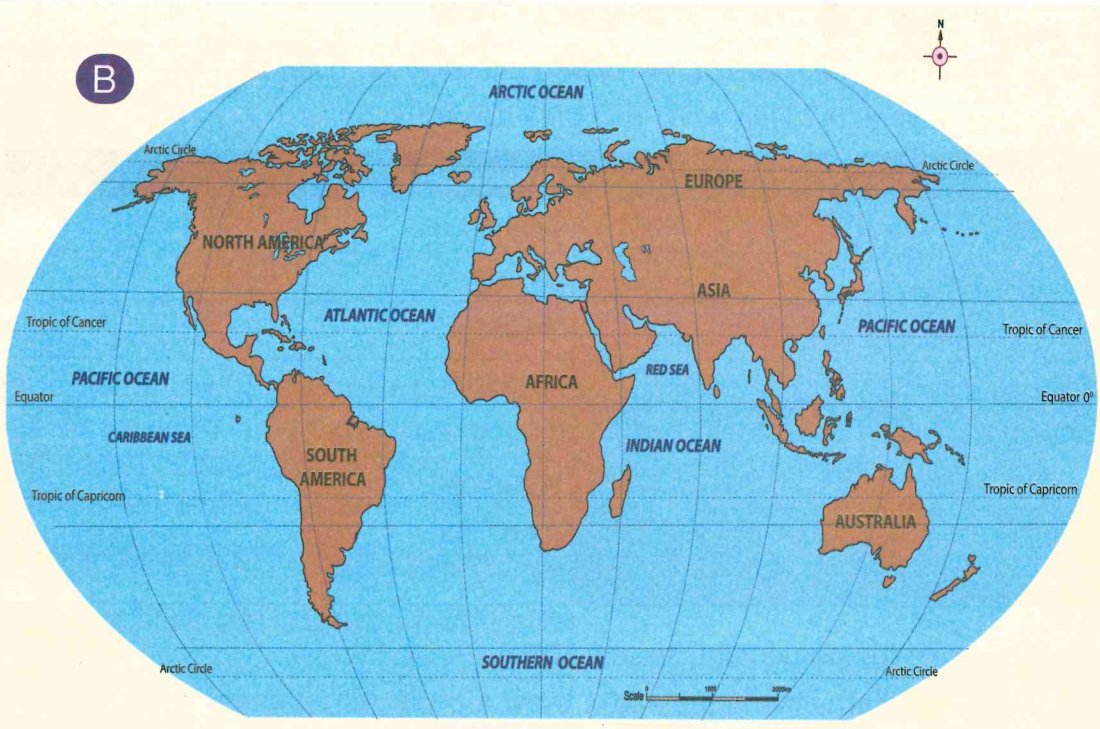


Figure 20.1: Position and location of Africa in the World

1 Using maps in figure 20.1, describe the location of Africa
2 Present your work to the rest of the class through a discussion.
3 Present your work to the teacher for further guidance.
4 Make the necessary corrections in your notebook.

You have realised that Africa is a continent that lies mostly in the tropical region. This is because most of its countries are found in the tropics.

Africa lies between $23^1/_2{}^0$N and $23^1/_2{}^0$ S of the Equator. Africa is also characterised by a continental shelf.

You can find out the coasts of Africa with continental shelves. Africa is crossed by the major lines of latitude, you can name them. This makes Africa the most tropical of all world continents.

The Size of Africa

You might have read about the different continents of the world. Africa is the second largest continent on planet earth second to Asia.

The world consists of seven continents, you can name them. After doing tasks in activity 20.2, you will explore the size of Africa.

Activity 20.2 Exploring the size of Africa

In pairs, study table 20.1 and do the tasks that follow.

Table 20.1: Continents of the world and their sizes.

Continent	Area (km^2)
Asia	44,579,000
Africa	30,065,000
North America	24,256,000
South America	17,819,000
Antarctica	13,209,000
Europe	9,938,000
Australia	7,687.000
Total	

1. Calculate the percentage size of Africa.
2. Use the information in table 20.1 draw a graph to represent the information in the table.
3. Exchange your work with another pair and make comments.
4. Present your work to the rest of the class through a discussion.

You have realised that the shape of Africa is not uniform. It is bulky in the north and thin in the south. Africa's farthest point in the North is Cape Ras Ben in Tunisia at 37^0 N. The farthest point in the South is Cape Agulhas in South Africa at 35^0 S.

The farthest point in the West is Almadi, Cape Verde Islands at 25^0 W. The farthest point in the East is in Mauritius, Rodrigues Islands at 58^0 E.

Continents are usually large landmasses separated from each other by large water bodies usually **seas** and **oceans**.

The position of East Africa within Africa

You should be appreciate being called an African and more specifically an East African. This is because you come from Africa and East Africa.

Africa is divided into the different regions and these include Eastern Africa, Western Africa, Northern Africa, Central Africa, Southern Africa and the Horn of Africa.

After doing tasks in activity 20.3, you will understand the location and position of East Africa in Africa.

Activity 20.3 Locating East Africa within Africa

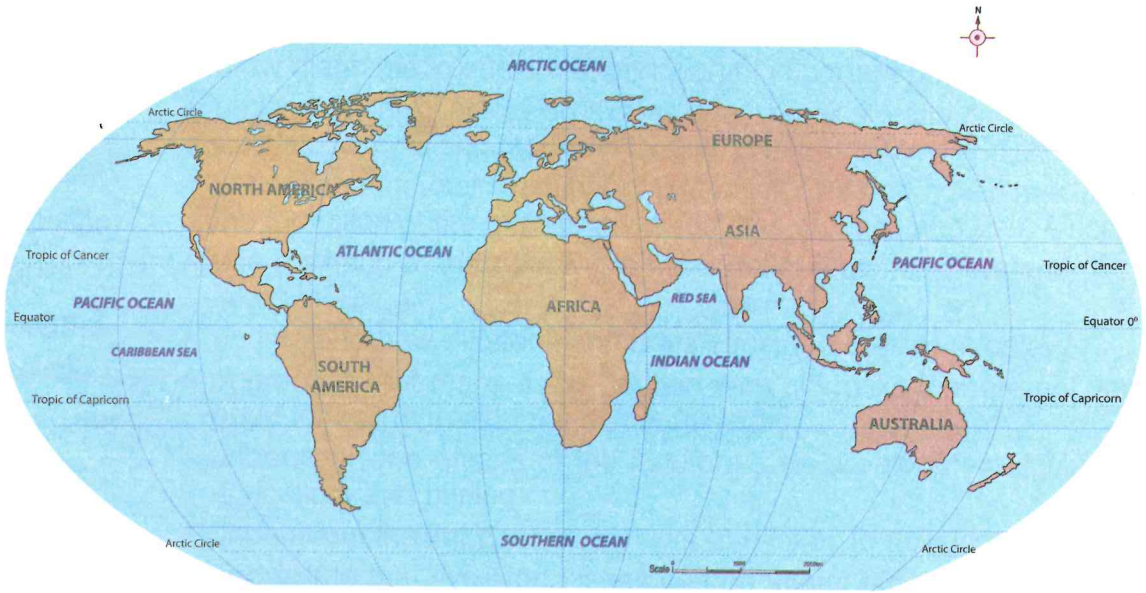
In pairs, carry out a textbook or internet research and do the tasks that follow.

1. Find out the size of East Africa.
2. Draw a map of Africa and on it include East Africa and make your comparisons in class.
3. Describe the position of East Africa within Africa.
4. Present your work to the rest of the class through a discussion.

You have found out that East Africa comprises countries like Uganda, Kenya and Tanzania. It is bordered by Sudan and Ethiopia in the North, DRC, Rwanda, Burundi and Zambia in the West, Mozambique in the South, Somalia in the North east and the Indian ocean in the East.

Sample Activity of Integration

You have been invited for an international conference by the Geographical society in Geneva, Switzerland to represent Africa. The theme of the conference is "The usefulness of global resources". At the opening participant is required to briefly talk about the continent he or she is representing.



Task:

Write a speech of about 500 words to help participants from other continents appreciate the African continent

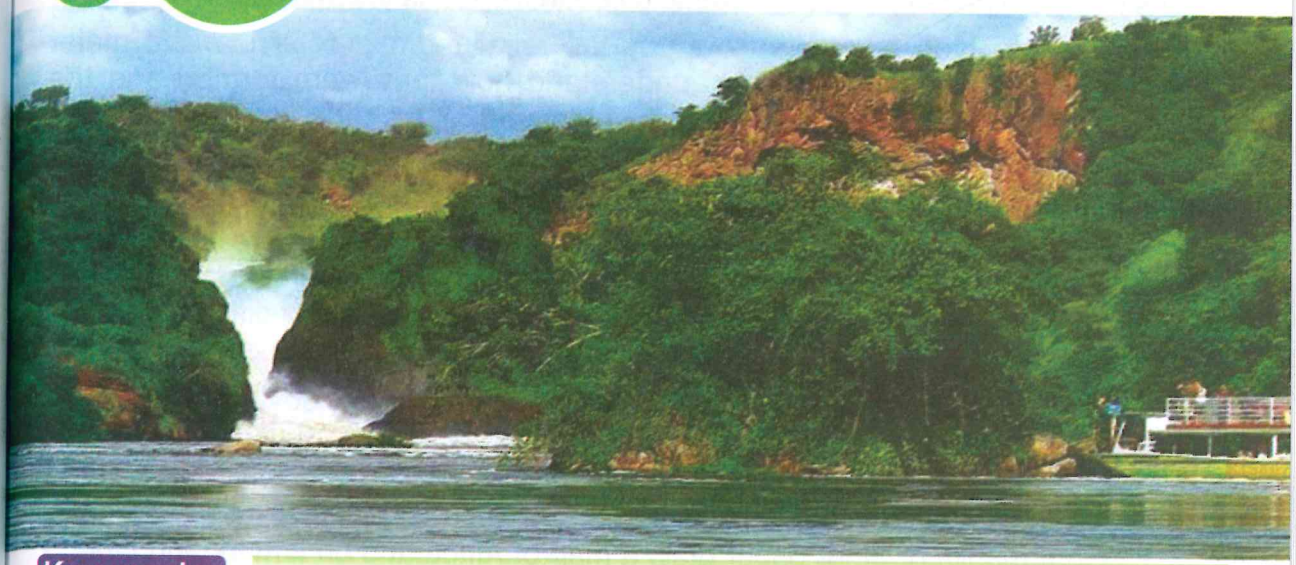
Chapter Summary

In this chapter you have learnt that;

- Africa is the only continent that is crossed by major lines of latitudes and longitudes: Equator, Tropic of cancer, Tropic of Capricorn and the Prime meridian.
- Approximately Africa covers 30,065,000 square kilometres.
- Africa occupies a unique position as a tropical continent, that is to say, it is crossed by latitude $23^1/_2{}^0$ N and $23^1/_2{}^0$ S.

Chapter 21

The Relief Regions and Drainage of Africa



Key words

- relief region
- landform
- currents
- graben
- eruption
- faults
- magma
- mantle
- drainage
- landform
- Plateau
- aerial images
- coastal plains
- hazard

After studying this chapter, you should be able to;

- know the names and positions of the major relief regions of Africa.
- recognize physical features from photographs.
- draw diagrams to show the formation of important physical features.
- understand the characteristics of important physical features in Africa and East Africa, including mountain ranges, plateaus, basins and rift valleys.
- understand the main concept of plate tectonics and how it has led to the formation of the main physical features of Africa and East Africa.
- use a sketch map to show the major relief regions, rivers and lakes in Africa.
- understand how different landforms affect the lives of people.
- appreciate that many areas contain very old rocks that are not very good for soil formation but rich in minerals.
- understand the effects of the landforms on development, including agriculture and mining.
- understand the importance of rivers and lakes to development.
- appreciate that rivers and lakes can be useful but can also be spoilt by pollution.
- understand how their own lives and the lives of their communities are affected by physical features including natural hazards.
- understand through case studies how the physical features affect the lives of people in selected areas of east Africa.
- use field work to study any of the physical features in the local area.
- understand how water resources are used and controlled.

Introduction

The African continent has varied relief regions and drainage features that influence the way people carry out activities on a daily basis. The major landforms in Africa are; coastal plains, high plateau, low plateau lands, rift valley, basins and mountains. It also consists of drainage features for example oceans, seas, lakes and rivers.

In this chapter you are going to study the relief regions of Africa, the major landforms and drainage features, understand how they were formed and the effects of the relief and drainage on development.

The Major Relief Regions of Africa

In Senior One, you learnt about the relief regions of East Africa where you probably noted that it has varied relief. You discuss them. When you look around your community or area around your school you will realise that it is also made up of different aspects of relief. Africa is also made up of such regions. After doing tasks in activity 21.1 you will find out more about Africa's relief regions and the size covered by each.

Activity 21.1 Exploring the relief regions of Africa

In groups, carry out a textbook or internet research and do the tasks that follow.

1 On a manila or other paper draw a map of Africa and on it mark and label the major relief regions.

2 Describe the relief region labelled on the map including its position and characteristics.

3 Study table 21.1 showing the approximate sizes of Africa's major relief regions and then do the tasks that follow.

Table 21.1 Approximate sizes of Africa's major relief regions

Relief region	Elevation in meters	Area in KM²
Depressions	Below 0	30,065,000
Coastal plains	0-250	30,000,000
Rift valley lands	250-900	1,214,800
Basins	150-600	637,593
Plateaus	900-2000	
Highlands and mountains	Over 2000	3,000,000
Total land surface of Africa		3,037,000,000

Source-adapted: https://doi.org, http://www.fao.org, https://www.britannica.com.

(a) Calculate the approximate area covered by the plateaus in Africa.

(b) State the largest and smallest relief region of Africa.

(c) Identify where each of the relief region is found.

(d) What is the dominant type of relief in the area where you live or the area where your school is located?

4 Present your work to the teacher for further guidance.

From activity 21.1 you have learnt that Africa has varied relief regions. You have also learnt that these relief regions cover different areas whereby some are larger than others. Some relief regions are dominant in particular parts of Africa than others.

The plateau covers the largest area, it is divided into the low plateau and the high plateau. The low plateau has an average height of 900 metres above sea level but can rise to 1200 metres above sea level in some areas.

It is found in areas of Ahaggar, Tibesti, Fouta Djalon and Ennedi. The high plateau lands are found in the eastern and southern areas of the continent.

Examples include the Ethiopian plateau, East African plateau, Zimbabwen veld and the Drakensburg. It important is to note that these plateau lands are not continuous but some are separated by basins.

Formation of Landforms in Africa

In Senior One, you learnt about landforms where you noted that they are natural features found on the earth's surface. Name some landforms that you remember.

You also learnt about the different processes responsible for the formation of different landforms. You can name them and discuss with your neighbour.

In chapter eight, you also learnt about plate tectonics and how they lead to the formation of landforms in East Africa. You also learnt that the Earth is a combination of various land masses, called **tectonic plates**.

These plates are constantly moving and they tend to collide with each other. The collusion usually causes the land to fold between them, leading it to rise above the surface and form a fold mountain. After doing tasks in activity 21.2 you will be able to find out the effect of plate tectonism on relief in Africa.

Activity 21.2 Movement of tectonic plates and its effect on relief

In groups,

1. Get a suitable material like manila, other foldable paper or thin sponge mattress and do the tasks that follow.
2. Cut the paper about 30 cm by 5 cm dimension.
3. Place the paper on a flat table or ground.
4. Let two volunteers push from either side towards the centre. Note and record what happens to the material.
5. Repeat the process in 1-3, this time one limb of the material pushing below the other. Again, describe what you have observed and draw a diagram to represent it.
6. What were the two illustrations representing?
7. Present your work to the rest of the class through a discussion.

You have learnt that tectonic forces led to the splitting of the current continents. This process still occurs accompanied by earth quakes and volcanic eruptions. The rift valley in Africa was formed through the same process.

The rift valleys demarcate the zones where plate movements continue. Africa thus acquired rings of escarpments, rifts, rivers, lakes as well as interior basins.

Have you ever been to an area with a mountain? A large area of Africa is covered by mountains of different categories. After doing tasks in activity 21.3, you will be able to learn about the categories of mountains and the processes responsible for their formation.

Activity 21.3 Exploring the major mountains of Africa

In pairs, use wall maps, atlas maps and carry out a textbook or internet research and do the tasks that follow.

1. Draw a sketch map to show the distribution of major mountains in Africa.
2. Draw a table in your notebook and classify the mountains according to their modes of formation.
3. Classify the mountains and indicate the country in which each class is found as in table 21.2.

Table 21.2 Categories of mountains in Africa

Category of mountain	Examples	Country
Block mountains	Rwenzori	Uganda

4. Present your work to the rest of the class through a discussion.

You have found out that Africa is made up of different types of mountains such as block mountains, volcanic mountains and folded mountains.

The mountains of Africa are classified according to their mode of formation for example fold mountains result from folding, volcanic mountains from volcanicity and block mountains from faulting. After doing tasks in activity 21.4, you will understand how these mountains were formed.

Activity 21.4 Describing the formation process of African mountains

In groups, study photographs A-C in figure 21.1, and do the tasks that follow.

Figure 21.1: Mountains of Africa

1. Identify which of the photographs A-C in figure 21.2 shows
   (a) Block Mountain (b) Volcanic Mountain (c) A folded mountain
2. With the aid of diagrams, describe the formation process of the following types of mountains.
   (a) Block Mountain (b) Volcanic Mountain (c) Fold mountain
3. Describe the main characteristics of each type of mountain
4. Present your work to the rest of the class through a discussion.

You have learnt that highlands and mountains lie at an altitude above 2000 metres. Major highlands in Africa are; Ethiopian Highlands, East African Highlands and West African Highlands. The mountains of Africa are also distributed across the continent.

Block Mountains and volcanic mountains are formed as a result of tectonic processes which involve compression, tension, uplifting and vulcanicity.

Did you know that the great rift valley runs from the Red sea in the north, through Ethiopia, Kenya, Tanzania and Malawi and extends southwards to Beira in mozambique?

The great rift valley in East Africa is made up of two branches that is the western branch known as Albertine rift along the boarder of Tanzania and Uganda and the main branch which is the Eastern known as the Gregory rift valley.

Photographs A and B in figure 21.2 show part of the Great African Rift Valley. After doing tasks in activity 21.5 you will learn more about the African Great rift valley.

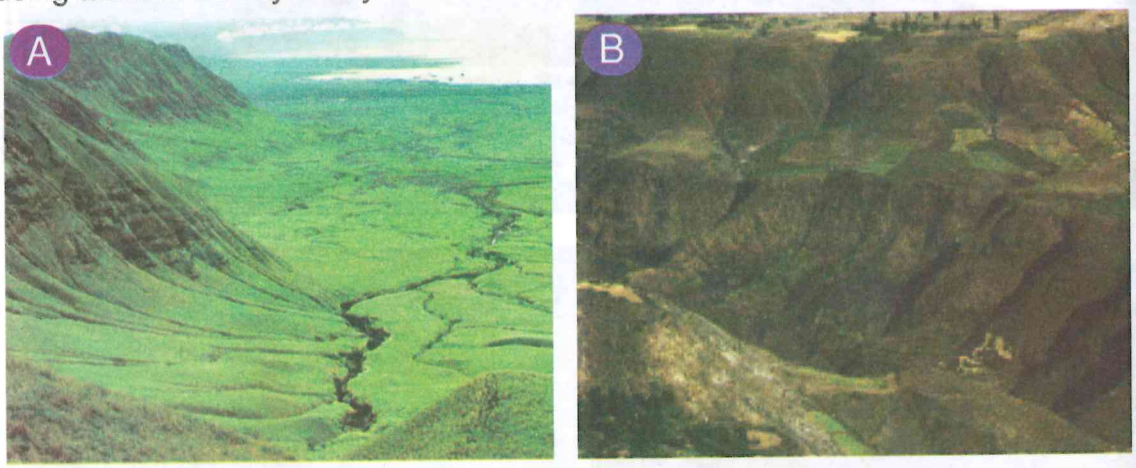


Figure 21.2: Part of the African Rift valley

Activity 21.5 Describing the formation of the Rift Valley

In pairs, carry out a textbook or internet research and do the tasks that follow.

1. With the aid of diagrams, describe the formation of the rift valley.
2. Identify the characteristics of the rift valley.
3. Write your findings in your notebooks.
4. Swap your work with another pair for comments.
5. Present your work to the rest of the class through a discussion.

You have found out that the rift valley was formed due to splitting of rocks in the earth's crust. Forces within the crust pulled or pushed the rocks making them crack. The cracks caused weaknesses on the rocks. These cracks are known as **faults**.

When the rocks are pushed together or pulled apart, they break easily in a process known as **faulting**. The Great Rift Valley was formed through faulting.

The land was pulled apart by forces of tension which pull away from one another, causing the middle part to sink lower than the neighbouring parts. This resulted into a depression in the middle. The depression formed a valley. As the land sunk, it formed steps on the sides of the valley. These steps are known as **fault scarps.**

The sides of the valley are known as **escarpments**.

In your communities or areas around your school, you might have seen a depression or a dip. This is called a **basin**. Basins are shaped like bowls, with sides higher

than the bottom. They can be oval or circular in shape, similar to a sink or tub you might have in your bathroom. Some are filled with water. Figure 21.3 shows a basin.

Figure 21.3: Lake Chad, one of the basins of Africa

After doing tasks in activity 21.6 you will understand more about basins

Activity 21.6 Describing the formation of basins

Carry out a textbook or internet research and do the tasks that follow.

1. With the aid of diagrams, describe the formation of basins.
2. Identify the characteristics of basins.
3. Write your findings in your notebooks.
4. Present your work to the rest of the class through a discussion.
5. Comment on each other's work and make corrections if necessary.

You have learnt that much of Africa consists of very old rocks. The old rocks have become important bases of these basins. Basins in Africa are widespread.

There are several types of basins. Some are above sea level and are bordered by mountains such as the Lake Victoria basin, others are filled with sediments and have external drainage such as the Congo basin.

Others are basins of inland drainage such as the Chad basin. The biggest basin is the Congo basin. Discuss with your neighbour other examples of basins in Africa.

Effects of landforms

You have realised that landforms are found on the surface of the earth. They can be categorized as relief features like mountains, hills, highlands, plateaus, depressions, basins, valleys, escarpments and plains.

Have you ever gone to a place that has been affected by a natural disaster or seen one in a photograph or television? Such a disaster is called a **hazard**. What hazard was it? Where did it take place?

Hazards affect lives of people whenever and wherever they occur and are related to landforms. After doing tasks in activities 21.7 and 21.8 you will find out how landforms affect people where they are found.

Activity 21.7 Finding out the influence of landforms on humans

In groups, move around your school or community and do the tasks that follow;

1. Identify the major landforms and types of land use in the area.
2. Draw a map of the area covered and on it mark and label the landforms you have identified.
3. Explain the influence of landforms on land use in the area.
4. Explain the impact of human activities on landforms in the area.
5. Write a report about your findings.
6. Present your report to the rest of the class through discussion.

Activity 21.8 Finding out the effects of landforms

In groups, study photographs A-F in figure 21.4 and do the tasks that follow.

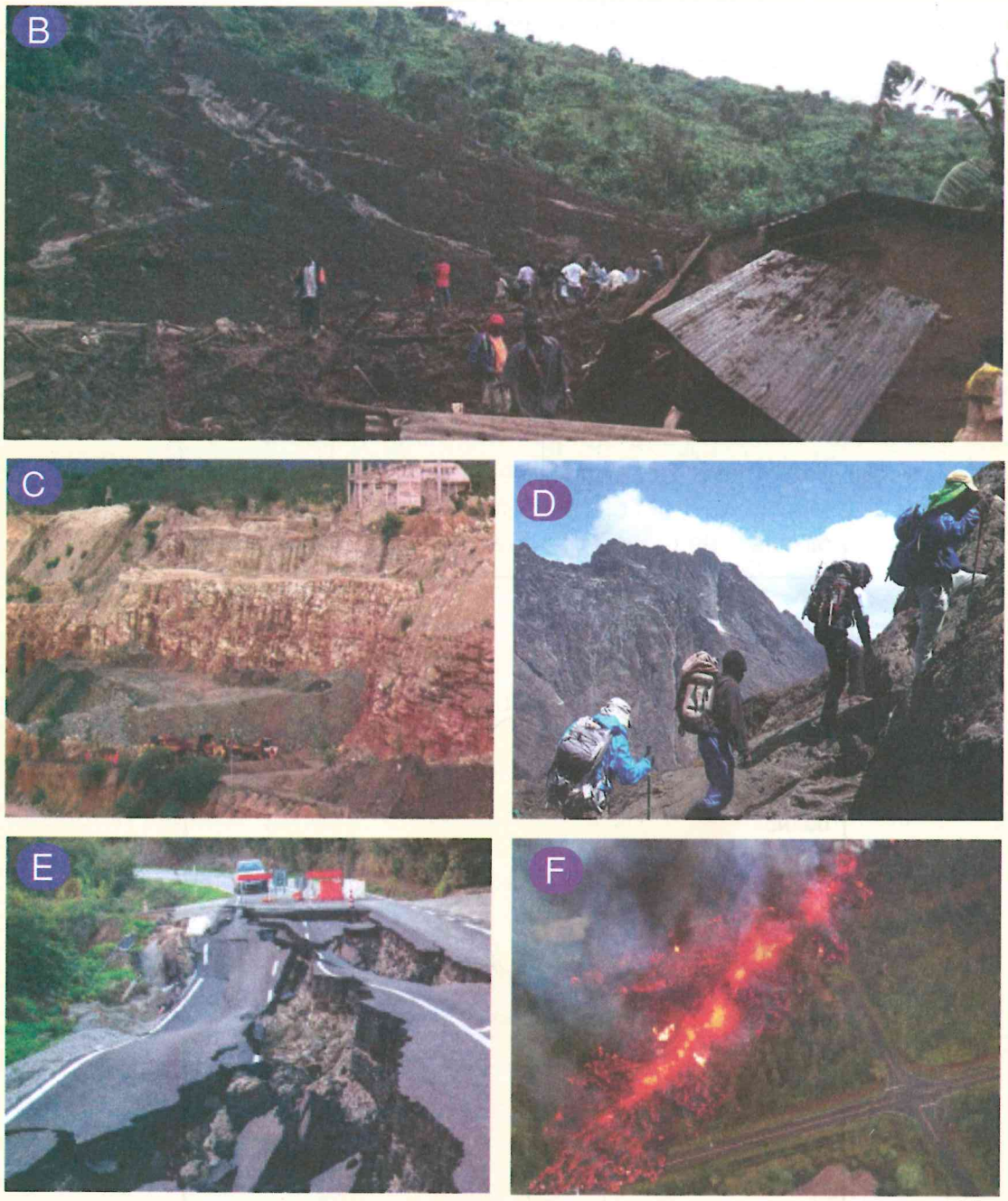


Figure 21.4: Effects of Landforms

1 Describe what is taking place in the photographs in figure 21.4.
2 How do landforms influence what you have described 1 above?
3 Discuss other effects of physical features to the people in the area in which they are located.
4 Present your work to the rest of class through a discussion.
5 Make corrections in your work where necessary.

You have learnt that landforms have a great impact on development as well as the environment. Landforms have an influence on the environment and human activities such as agriculture and transport systems. They also influence tourism and mining activities.

You have also learnt that even though landforms are beneficial to the people, they have a number of negative impacts which lead to destruction of property, displacement and death. Landforms are barriers to construction of transport routes. Some landforms lead to soil erosion and others are obstacles to settlement.

Case Study

You could have noted that Kenya experiences a number of natural hazards, the most common being weather and climate related, including floods, droughts, landslides, lightening/ thunderstorms, wild fires, and strong winds. These in most cases do occur due to the landscape of the areas where they happen.

In the recent past these hazards have increased in number, frequency and complexity. The level of destruction has also become more severe with more deaths of people and animals, destruction of infrastructure among other effects.

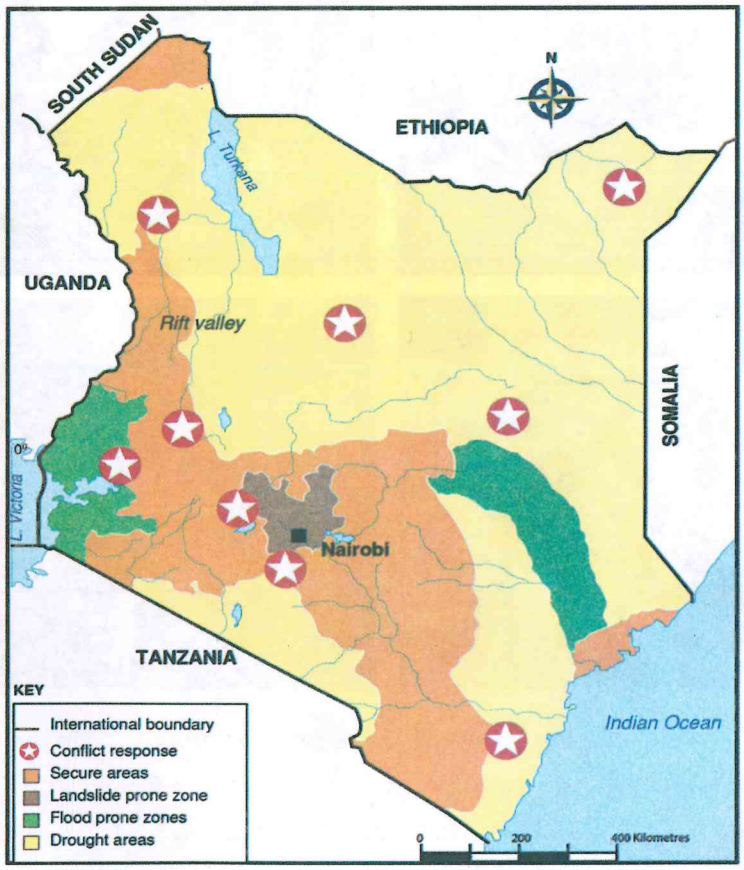


Figure 21.5: Map showing areas affected by hazards in Kenya

Study table 21.3 showing natural hazards, physical features which lead to such hazards, areas mostly affected by those hazards and their effects on people's lives.

Table 21.3: Natural hazards, physical features which lead to such hazards, areas mostly affected by those hazards and their effects on people's lives

Natural hazards	Physical feature	Areas mostly affected	Effects on people's lives
▲ Flooding ▲ Landslides	▲ River valleys ▲ Gentle slopes ▲ Low lands ▲ Rift valley	▲ Counties of Tana River, Busia, Kisumu, Garissa and Marsabit ▲ Central and coastal regions	▲ Displacement of people that is to say around 4,493 households ▲ Damaging settlements ▲ Destruction of properties ▲ Death of people ▲ Destruction of infrastructure like roads, rails and telecommunication lines. ▲ Contamination of water sources causing diseases

Other countries in East Africa have similar and more natural hazards, physical features which lead to such hazards, areas mostly affected by those hazards and their effects on people's lives. You will understand more about hazards after doing tasks in activity 21.9.

Activity 21.9 Exploring natural hazards in East Africa through case studies

Basing on the case study provided, carry out a text book or internet research on the following countries.

(a) Uganda (b) Tanzania

Find out;

1 Natural hazards that occur.
2 Physical features where they occur
3 Areas mostly affected
4 Effects of the natural hazards on people's lives

You have learnt that natural hazards are extreme natural events that can cause loss of life, extreme damage to property and disrupt human activities. They include earthquakes, volcanic explosions, flooding, drought, tropical storms

The drainage of Africa

In senior one, you learnt about drainage of East Africa. Africa has major drainage features distributed all over the continent.

Drainage features like rivers and lakes are very important to people of Africa. Figure 21.6 shows some of the drainage features in Africa. After doing tasks in activity 21.10, you will learn about the location of the major rivers and lakes of Africa.

Activity 21.10 Map showing the distribution of major rivers and lakes in Africa

Study the map of Africa in Figure 21.7 and do the tasks that follow.

Figure 21.6: Africa

1. Copy the map in figure 21.7 in your notebook and on it mark and label the;
   (a) rivers (b) lakes (c) seas and oceans.
2. Using knowledge gained in Senior One explain how lakes were formed
3. Exchange your work with your neighbour and comment on each other's work.
4. Make corrections in your work where necessary.

Importance of rivers and lakes to development of Africa

Do you live or have you ever lived near a river or lake? Or do you have relatives or friends who live near or by the river or lake side? Rivers and lakes play a great role towards the economic development of places. After doing tasks in activity 21.11, you will be able to find out more about benefits of rivers and lakes.

Activity 21.11 Discovering the importance of lakes and rivers to development

In groups, study photographs A-D in figure 21.8 and do the tasks that follow.

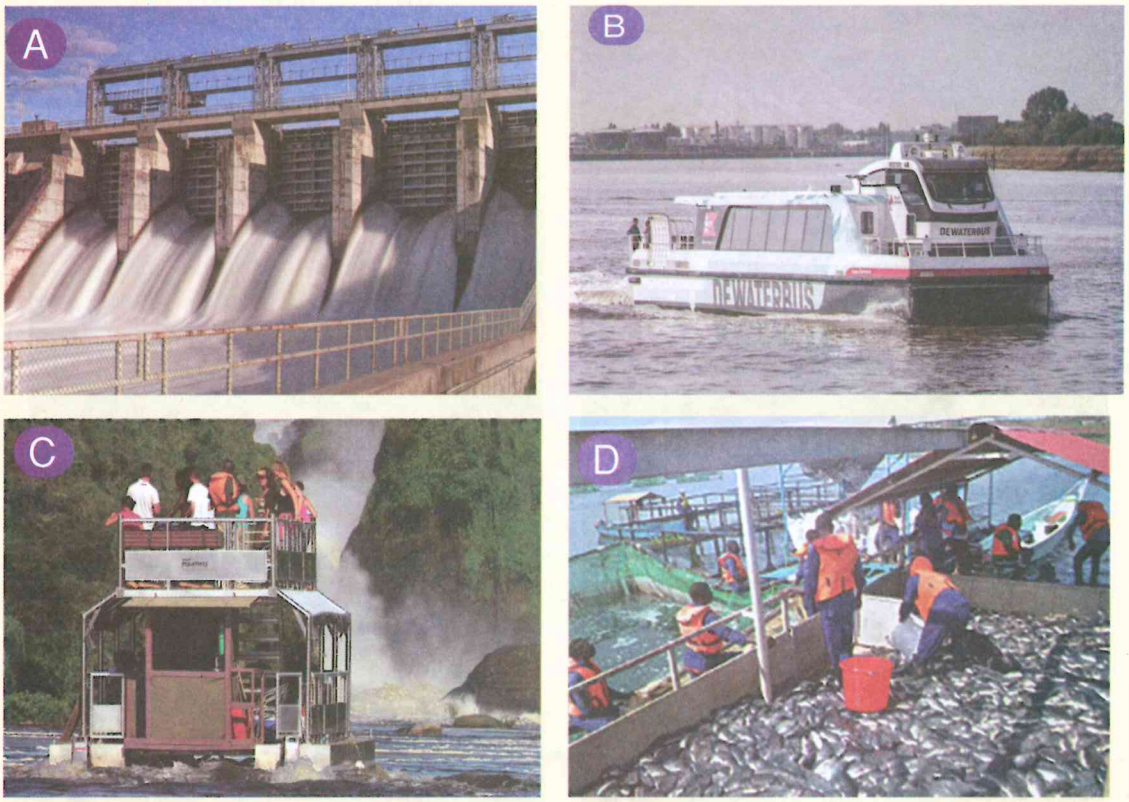


Figure 21.7: Benefits of lakes and Rivers

1. Identify the human activities taking place in photographs A-D in figure 21.8
2. Other than the activities in photographs in figure 21.8, describe how else rivers and lakes benefit the people of Africa.
3. Present your work in class for discussion.
4. Make corrections in your work where necessary.

You have learnt that lakes and rivers are important to Africa because they; help in development of hydroelectric power, provide water supply for the purpose of irrigation, provide fresh water for drinking, industries and factories use river and lake water for their functioning, they act as tourist attraction sites, they are used in navigation and help to develop the fisheries.

Problems the people of Africa face when using lakes and rivers

In activity 21.11 you learnt that lakes and rivers are of great importance to the people of Africa. However, it is important to note that people face a number of problems while using lakes and rivers as you will discover after doing tasks in activity 21.12

Activity 21.12 Understanding the problems the people of Africa face in using lakes and rivers

In groups, study photographs A-D in figure 21.9 and do the tasks that follow.

Figure 21.8: Problems faced while using lakes and rivers

1 Identify the problems faced while using lakes and rivers in Africa as shown in figure 21.9.
2 Suggest other problems that the people of Africa face in using rivers and lakes.
3 Present your work to the rest of the class through a discussion

How water resources are used and controlled

Water resources are important but irresponsible use of water resources can lead to their destruction in many ways. Find out in which ways this happens in your community and in Africa. In activity 21.13 you will find out how water resources are controlled.

Activity 21.13 Understanding how water resources are used and controlled in Africa

In pairs, carry out a textbook or internet research and do the following tasks

1. Make a list of the major water resources in Africa.
2. Describe how each resource you have listed is used.
3. How is each water resource controlled?
4. Exchange your work with other pairs and comment on each other's work.
5. Make corrections in your work where necessary.

You have realised that Africa has a number of water resources ranging from water itself, fish, vegetation and sand. People have used these resources for different purposes. Water resources are important for fishing, providing water for irrigation, industrial and domestic use.

Sample Activity of Integration

Africa is a continent of varied resources. These impact on people's ways of lives. An international environment organisation wishes to invest heavily in tourism and water resources. This organisation has advertised a job as "Regional Landforms and Water expert"

Task Prepare a presentation of about 500 words that will help you get this job.

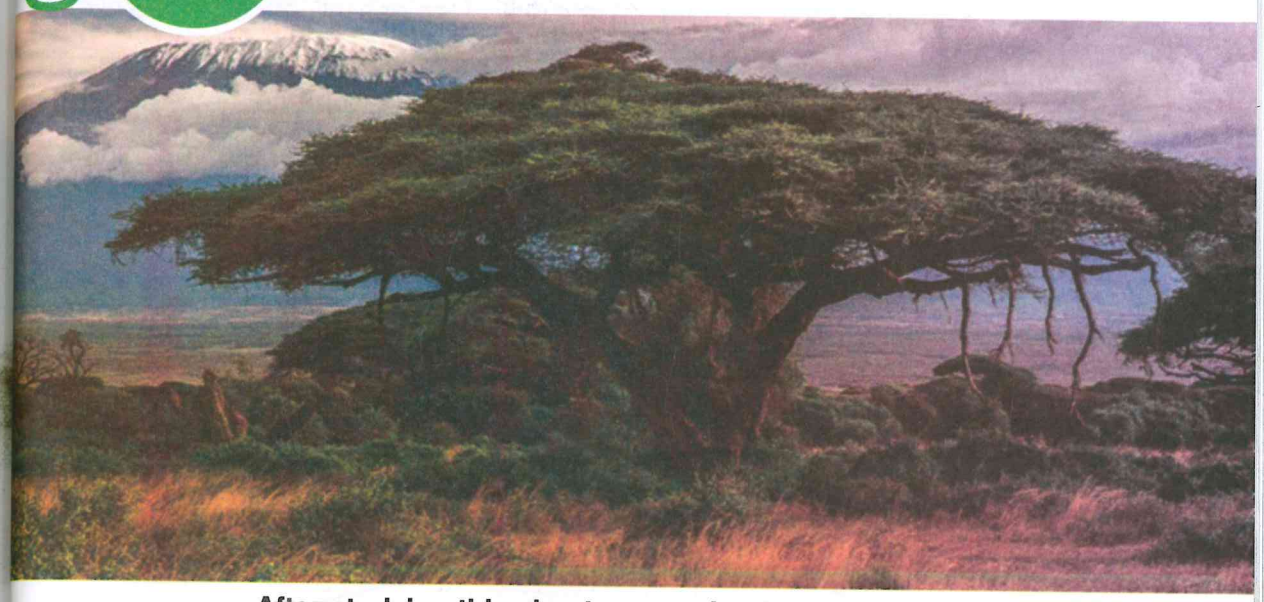
Chapter Summary

In this chapter you have learnt that;

- there are different types of landforms which include; mountains, plateaux, rift valleys and hills, drainage features like lakes, rivers and basins.
- the mountains of Africa are distributed across the continent. There are three major categories; Fold Mountains, Block Mountains and Volcanic Mountains.
- there are different processes responsible for the formation of different landforms which include faulting, folding, vulcanicity and volcanicity.
- many areas in Africa contain very old rocks that are not very good for soil formation but rich in minerals.
- the landforms affect development, including agriculture and mining.
- rivers and lakes help in the formation of rainfall, tourism, water transportation, generating hydro electric power, fishing and habitants for water animals.
- a number of negative impacts which lead to destruction of property, displacement and death of people.
- the physical features affect the lives of people in different areas of East Africa.
- you can use field work to study any of the physical features in the local area.

Chapter 22

The Climate and Vegetation of Africa



Key words

- the sun
- the earth
- climatic changes
- temperature variations
- tropical
- temperate
- polar
- inter-Tropical Convergence zone
- equatorial
- savannah
- vegetation
- mediterranean
- desert

After studying this chapter, you should be able to;

- understand the relationship between the earth and the sun and how this affects temperatures and seasons.
- draw diagrams to show the relationship between the earth and sun's rays and the causes of temperature variations and use these to show why the earth can be divided into tropical, temperate and Polar Regions.
- understand the characteristics of the climates of Africa and factors influencing them.
- appreciate that people's lifestyles are influenced by the type of weather and climate.
- understand through case studies how selected climates and types of vegetation affect the way of life of the people in those areas.
- draw a map showing the climates and vegetation of East Africa.
- draw climate graphs of local and other areas and describe climates using these graphs.
- appreciate that the traditional way of life and farming of all people of Africa is strongly influenced by the climates.
- appreciate that modern technologies and urbanization have made people less dependent on the climate.
- understand through fieldwork the characteristics of vegetation and how the vegetation is affected by the climate.

- appreciate the dangers of the overuse of the natural vegetation.
- appreciate the need to love and care for their local area, community and country by replanting the vegetation in areas where it has been cleared.
- understand the main characteristics of climates and how each affects the vegetation of the area.
- understand how the traditional farming and way of life was influenced by the climate.

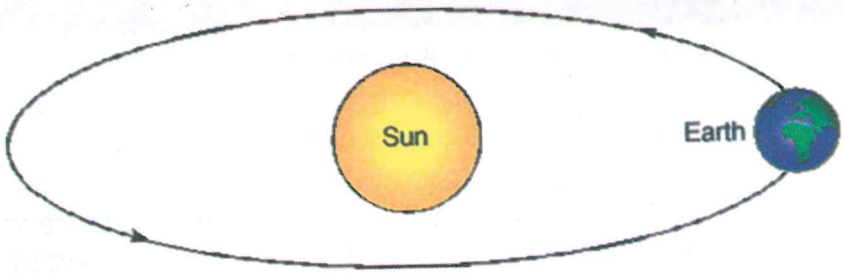
Introduction

You learnt about climate and vegetation in East Africa in Senior 1. Have you ever imagined what the climate and vegetation of other African countries are like? Do you think they have more types of climate and vegetation than what you studied in East Africa?

The climate of Africa is determined in the same way that of East Africa is determined. *Can you remember how this is so?*

Well, Africa is blessed with a variety of climates and vegetations which you are going to find out. In this chapter you will understand the distribution of climates and vegetation in Africa, the reasons for their distribution and the effects of these climates and vegetation on human development.

The Earth-Sun Relationship



Sunlight is Earth's primary source of energy which is made up of heat and light. Before you study the climates of Africa, you have to look at the earth as a whole and its relation with the sun. After doing tasks in activity 22.1, you will find out more about the relationship between the earth and sun.

Activity 22.1 Understanding the relationship between Earth and Sun

In groups, use knowledge gained from Senior One in chapter five **The earth and its movements** and do the following tasks.

1 Brainstorm on the relationship between the Earth and the sun .
2 Draw diagrams to show the relationship between the Earth and the sun's rays.
3 Describe how the Earth-Sun relationship affects;
   (a) changes in temperatures. (b) changes in seasons.
2 What happens when the northern and southern hemispheres are tilted towards the sun?
3 Present your work to the rest of the class through a discussion.

You have learnt that the sun's movement is apparently caused entirely by the movement of the earth. Our planet earth both spins on its axis and orbits around the sun. This brings about changes in seasons, causes day and night and changes in temperature. All these affect the climate of the African continent.

Tropical, Temperate and Polar regions of the Earth

The sun heats the earth's surface at different angles. This brings about differences in temperatures leading to the division of the earth into the tropical, temperate and polar regions. After doing tasks in activity 22.2, you will find out the differences between tropical, temperate and polar regions of the Earth.

Activity 22.2 Understanding the Tropical, Temperate and Polar regions of the earth

In groups, study figure 22.1 and do the tasks that follow.

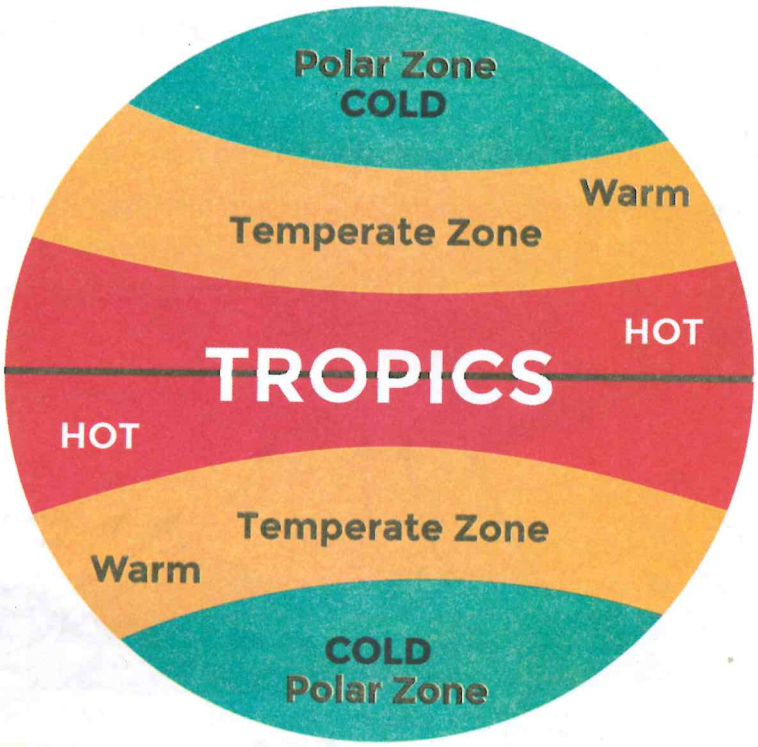


Figure 22.1: Regions of the earth

1. Why is the earth divided into the tropical, temperate and polar regions?
2. Find out whether Africa is also divided into the tropical, temperate and polar regions.
3. Describe the causes of variations in temperatures.
4. Present your findings to the teacher for further guidance.

You have found out that the African continent extends from 35°N to 37°S latitude and it mostly lies within the tropics. In the tropical zone, the average temperature in the coldest month is 18°C.

In this climate zone, the warmest months average less than 10°C. This is another region of Africa. This is called the **temperate climate.** It is located between the tropic of cancer north west and capricon south west. You can name African countries in this climate region.

The average temperature of the coldest months in the temperate zone is lower than that of the tropical zones, while the average temperature of the warmest months in the temperate zone is higher than that of the polar zone.

The overhead sun and rising air

As earlier learnt in Senior one the apparent movement of the sun influences rising air, the rainfall pattern and the temperature. Rainfall received in an area also varies with the position of the overhead sun.

After doing tasks in activity 22.3 and revising Senior One activities, you will understand more about the overhead sun and rising air.

Activity 22.3 Understanding the overhead sun and rising air

In groups, study the photograph in figure 22.2 and do the tasks that follow.

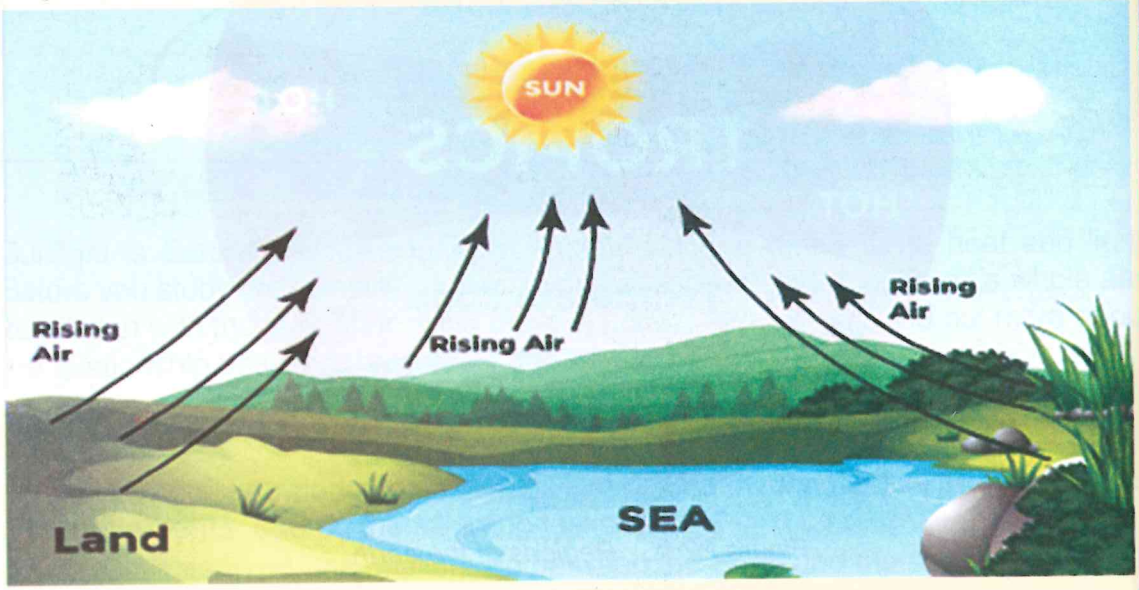


Figure 22.2: Overhead sun and rising air

1 Describe what you see in figure 22.2.
2 Describe what happens to air when the sun is overhead.
3 Discuss the effects of what you have described in (2)
4 Present your findings to the rest of the class through a discussion.

You have found out that the sun is overhead at the Equator twice a year that is to say 21st March and 23rd September. During this period areas around the equator such as; Gabon, Democratic Republic of Congo, Kenya, Uganda, Somalia and Principe and Sao Tome receive heavy rainfall. When the sun is in the Northern hemisphere, the areas receive heavy rainfall while the southern hemisphere remains dry and vice versa.

The Inter-tropical Convergence zones (ITCZ)

Have you ever heard that the Inter-Tropical Convergence Zone (ITCZ) is characterised by convective activity which generates thunderstorms over large areas? After doing tasks in activity 22.4, you are going to explore more about the Inter-Tropical Convergence Zone.

Activity 22.4 Exploring Inter-Tropical Convergence Zone

In groups, study photograph in figure 22.3, Carry out a text book or internet research and do the tasks that follow.

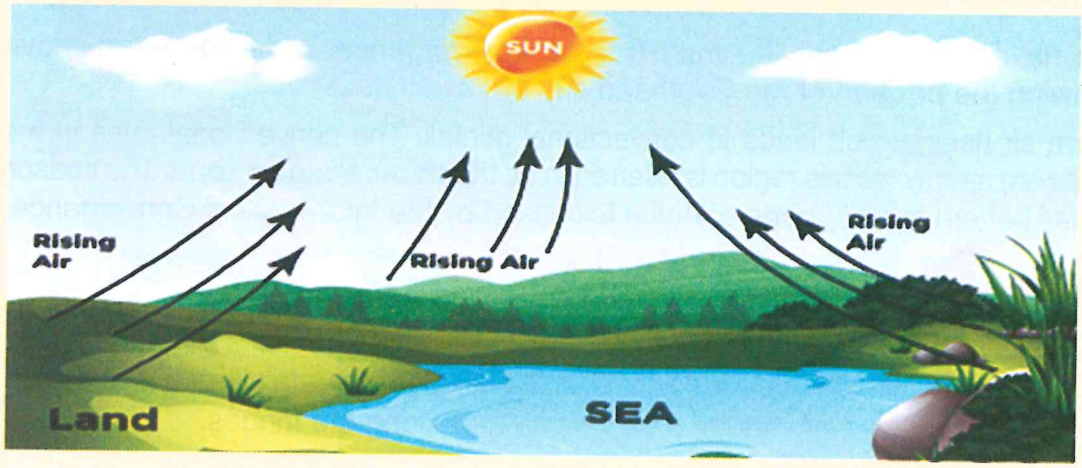


Figure 22.3: Inter-tropical convergence zone

1 What do you understand by the term inter-tropical convergence zone?
2 Describe how the rising air causes winds to blow from north to south.
3 Find out;
   (a) the position of inter-tropical convergence zone.
   (b) the seasonal movements of the inter-tropical convergence zone.
   (c) the relationship between the overhead sun, ITCZ , wind movement and rainfall pattern in Africa.
4 Present your findings to the rest of the class through a discussion.

You have realised that the Inter-Tropical Convergence Zone shifts position throughout the year in relation to apparent movement of the sun. In Africa, it is dominant in sub-saharan African countries excluding the East African Coast. The Inter-Tropical Convergence Zone migrates northwards and is positioned over the tropic of cancer.

How the Inter-Tropical Convergence zone affects different climates in Africa

What do you think causes the rainfall to be much at the equator as compared to the higher latitudes? To answer that question, you need to look at the movement of air around the Earth. On a large scale, there are few air masses which shape the rainfall characteristics of tropical Africa. After doing tasks in activity 22.5, you will understand the effects of the Inter-Tropical Convergence Zone on climate.

Activity 22.5 Understanding the effects of the Inter-Tropical Convergence Zone on climate

In groups, carry out a text book or internet research and do the tasks that follow.

1. Discuss the effects of the Inter- Tropical Convergence Zone on climate.
2. Find out why places outside the tropics have different kinds of climate not affected by the Inter-Tropical Convergence Zone.
3. Present your findings with the rest of the class through a discussion.

You have realised that the Inter-Tropical Convergence Zone keeps on moving following the position of the Overhead sun.

Warm air rises, which leads to convectional rainfall. The convectional rains in most cases are stormy, so this region is referred to as the **thunderstorm zone**. The seasonal rainfall pattern in most parts of Africa is caused by the Inter-Tropical Convergence.

Climate of Africa

The climate of Africa has a range of climates such as the equatorial climate, savannah climate, desert climate and Mediterranean climate. Temperate climate is rare across the continent except at very high elevations and along the fringes.

Factors influencing climate in Africa

In Senior One you learnt about factors affecting climate in East Africa. You can discuss them with your neighbour. Similarly, the distribution of climate in Africa, is determined by the same factors. After doing tasks in activity 22.6, you will understand the factors influencing the types of climate in Africa.

Activity 22.6 Understanding the factors influencing climate in Africa

In pairs, carry out a text book or internet research and do the tasks that follow.

1. Discuss the factors influencing climate in Africa.
2. Exchange your work with your neighbour and comment on each other's work.
3. Present your findings to the rest of the class through a discussion

You have found out that, the climate of Africa is influenced by a number of factors. These include the distance from the sea, ocean currents, direction of prevailing winds and shape of the land.

Major Climate Regions of Africa

Climatic regions in Africa have been classified in categories each with sub-climatic types. This is done depending on the distance of the region from the equator. After doing tasks in activity 22.7, you will explore more about the climatic regions of Africa.

Activity 22.7 Exploring the climatic regions of Africa

In groups; use an atlas and the map provided in figure 22.5 and do the tasks that follow.

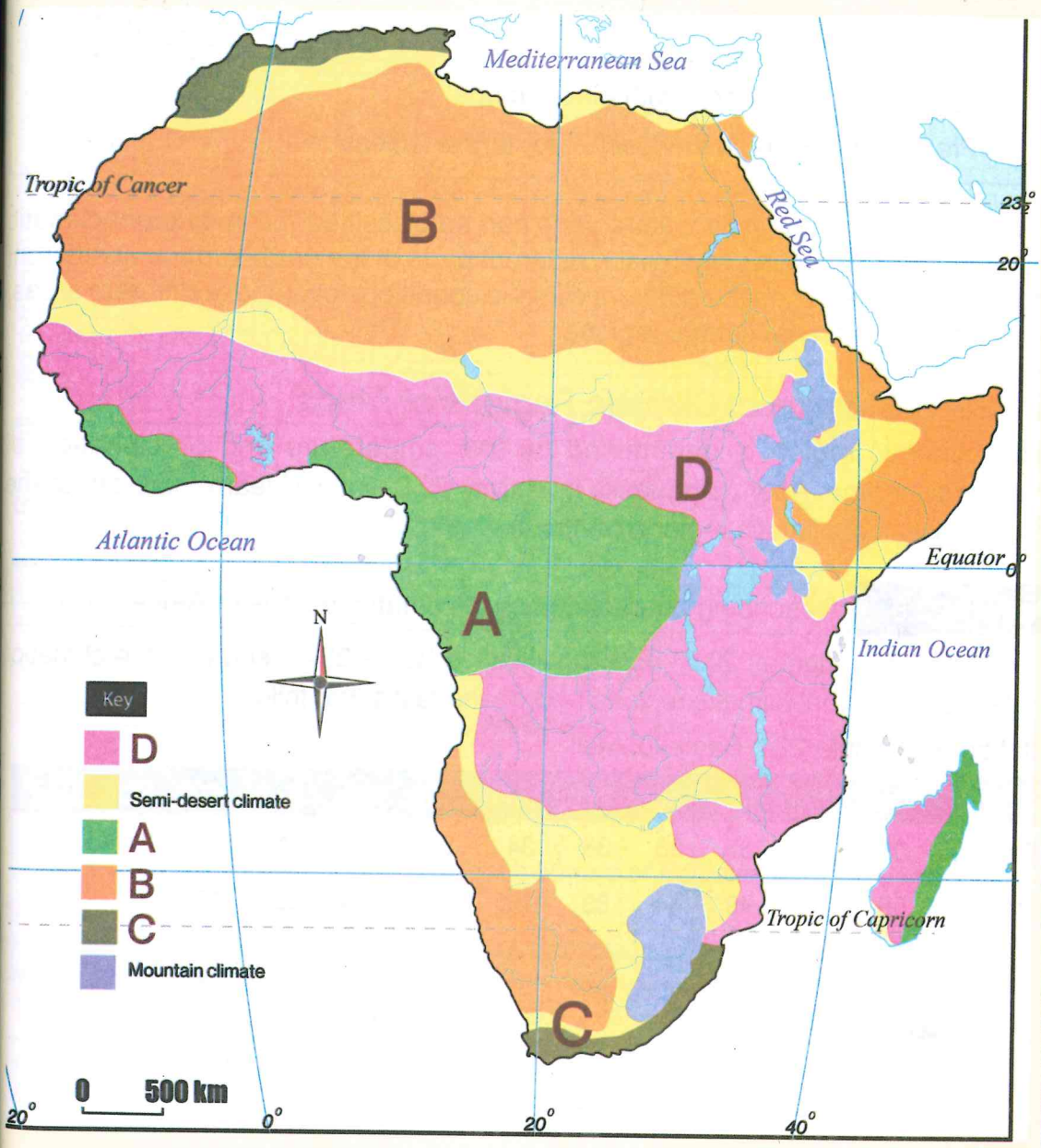


Figure 22.4: Climatic regions of Africa

1 Copy the map in figure 22.4 into your notebooks and name climatic regions marked A to D

Table 22.1: climatic types and region of location

Climatic regions	Location
A	
B	
C	
D	

2 Compare your answers with other groups.

3 Present your work to the teacher for further guidance.

You have found out that climatic regions can be classified using different climatic characteristics. The sun`s rays reach different parts of the earth surface at different angles. This determines the different climatic conditions over those different areas, resulting into different climatic regions.

Characteristics of Climatic Regions of Africa

Every climatic region is determined by the temperature and precipitation of a region over time. After doing tasks in activity 22.8, you will learn more about the characteristics of climatic regions of Africa.

Activity 22.8 Describing characteristics of climatic regions of Africa

In groups, study figures 22.5 - 22.6 and tables 22.2 - 22.3, showing the climatic statistics of different climatic regions and do the tasks that follow.

Station A: Table 22.1: Bamako, Mali

Month	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Temp °C	33	35	37	38	36	34	31	30	31	33	34	33
Rainfall (mm)	55	50	49	44	88	151	217	264	235	154	89	68

Bar and line graph showing the climate of Bamako Mali

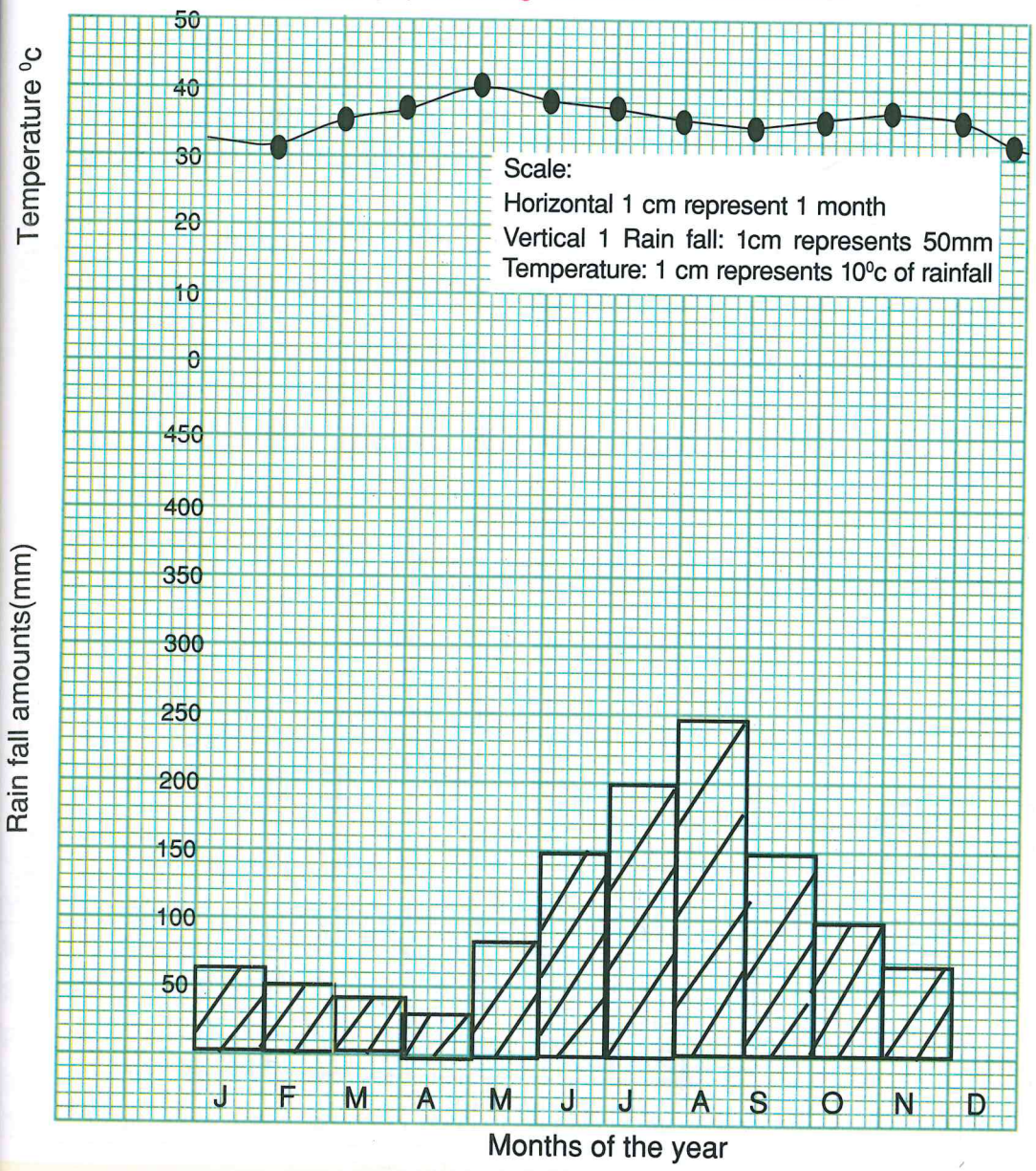


Figure 22.5: Savannah climate of Bamako, Mali

Station B: Table 22.2: Kassala, Sudan.

Month	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Temp °C	33	35	38	41	41	39	36	35	36	38	37	34
Rainfall (mm)	0	0	0	2	9	27	77	83	47	12	2	0

Bar and line graph showing the climate of Kassala Sudan

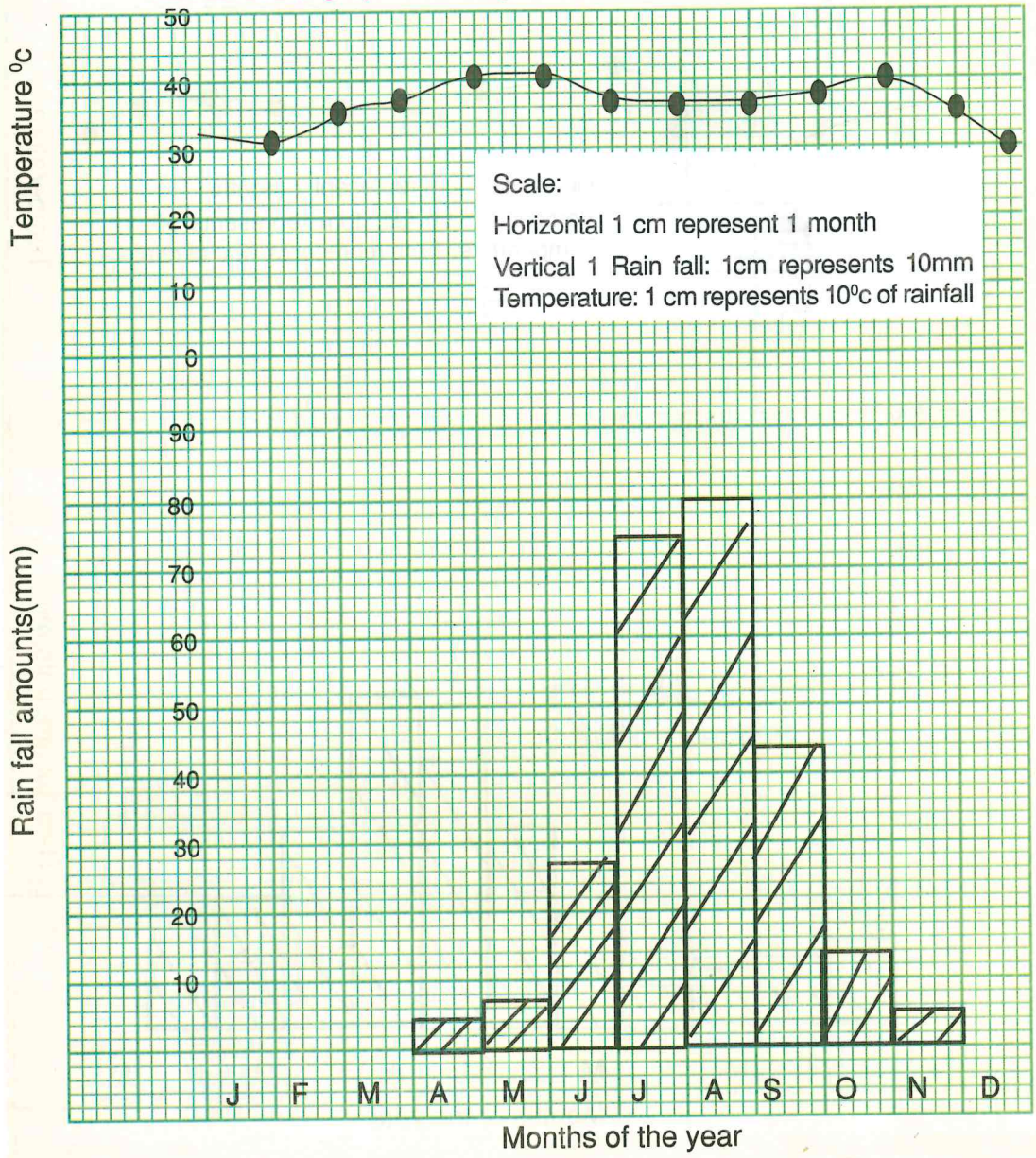


Figure 22.6: Desert climate of Sudan

Station C: Table 22.2: Equatorial Climate of Kisangani, Democratic Republic of Congo

Month	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Temp °C	25.5	25	25.5	25.5	25.5	24.5	24	24	24.5	25	25	25
Rainfall (mm)	90	115	165	180	160	115	115	115	185	230	215	165

Station D

Table 22.3: Mediterranean Climate of Cape Town, South Africa

Month	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Temp °C	21	21.5	19.5	17.5	14.5	13	12.5	13	14	16	18.5	20
Rainfall (mm)	12	8	17	45	85	80	85	70	45	30	17	11

1 Draw a suitable graph to represent the climatic conditions for stations C and D.

2 Identify;

(a) the warmest month in each climatic region.

(b) the coldest month in each climatic region.

3 For each station, calculate the:

(a) mean annual temperature. (b) mean annual rainfall.

4 Describe the characteristics of each climatic region.

5 Describe the factors that lead to such a climatic condition in each climatic region.

6 Giving reasons for your answers, suggest at least two economic activities that can take place in each climatic region.

7 Present your work to the rest of the class through a discussion.

You have found out that savannah climate is usually warm and temperatures range from 20° C to 30° C. Savannas exist in areas where there is a 6 - 8 month wet summer season, and a 4 -6 month dry winter season.

Parts of North Africa and Southern Africa as well as the whole Horn of Africa mainly have a hot desert climate, or a hot semi-arid climate for the wetter locations. The biggest part of equatorial Africa is dominated by tropical rainforest.

This region receives from 100 to 500 mm of rainfall annually. The Mediterranean climate of North Africa is characterized by hot dry summers and seasonally restricted rainfall. The western region experiences sub-humid conditions.

Influence of Climate on people's way of life

Climate affects people's way of living in different ways. These can be social or economic. First ask yourself, what you do when it rains?

Which type of clothes do you put on? Do you drink or eat cold things? Such questions help you understand that climate influences our daily life. After doing tasks in activity 22.9, you will get to know how climate influences peoples' way of life.

Activity 22.9 Understanding how climate influences people's way of life

Study photographs A-D in figure 22.7 and do the tasks that follow.

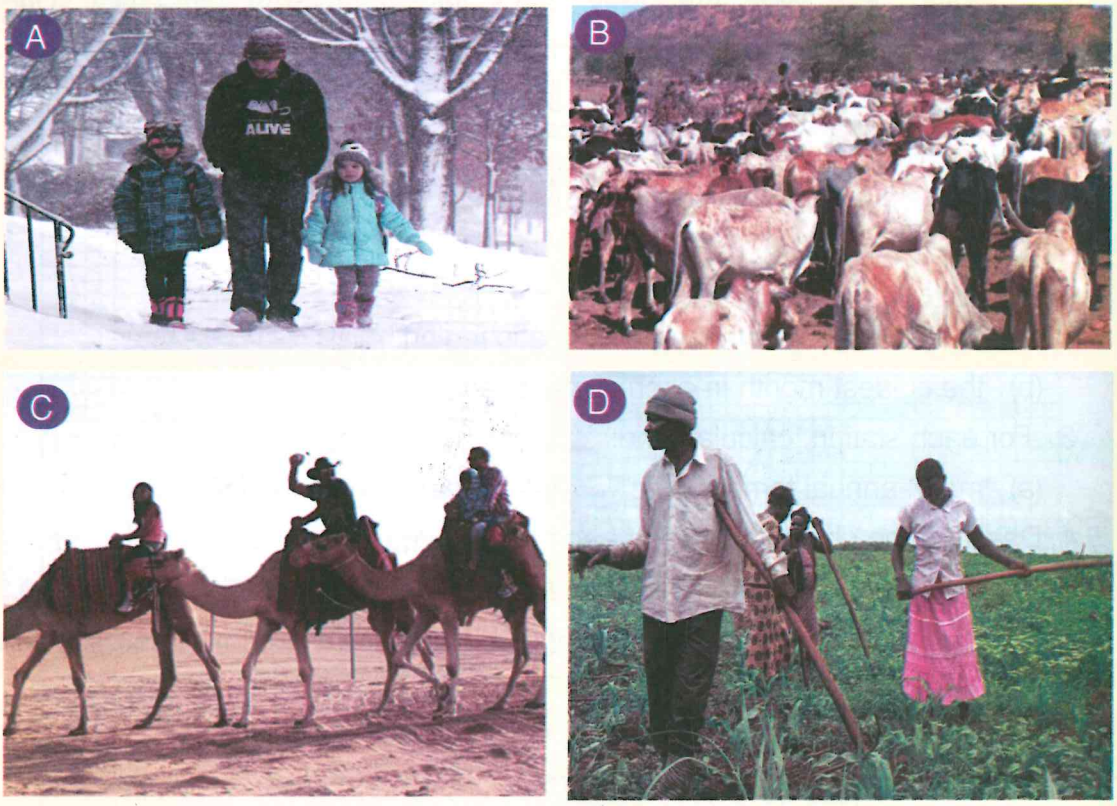


Figure 22.7: Influence of climate on people`s lives

1 In which climatic zones do you think each of these photographs was taken.
2 Explain how climate has influenced people`s ways of life as shown in the photographs.
3 Suggest the likely problems caused by climate to the people living in different climate regions.
4 Share your findings with the rest of the class for further discussion.

Human health has always been influenced by climate. Climate influences the choice of economic activities we engage in, when and where we do them from. Climate influences our settlement patterns and the social life styles including the way we eat and dress.

Modern technology versus changes in climate

Humans for the past decades have managed to adapt to the changing climatic conditions. In Africa there is technological development which undermines the effects of climate so that humans can survive in any condition. After doing tasks in activity 22.10, you will find out how man has adapted to the changing climatic conditions.

Activity 22.10 Finding out how people have adapted to the changing climatic conditions

Study photographs A and B in figure 22.8 and do the tasks that follow.

Figure 22.8: Modern technology versus changes in climate

1 Describe what you observe from the photographs in figure 22.8
2 How have people adopted to the harsh climates in figure 22.8?
3 In which other ways have people controlled climate change using modern technology and advancement?
4 Present your findings to the rest of the class through a discussion.

You have learnt that a fresh wave of technological innovation is deepening our understanding of tough environmental challenges and also giving us new ways to solve them. Even in the absence of rain, people can still cultivate using irrigation farming.

Vegetation of Africa

Did you know that all the trees, bushes and grasses you see around your school or community is vegetation? Vegetation can grow naturally on the earth`s surface or can be planted by people. Natural vegetation develops over years according to the climate and soils in which it grows. After doing tasks in activity 22.11, you will understand the different types of vegetation in Africa.

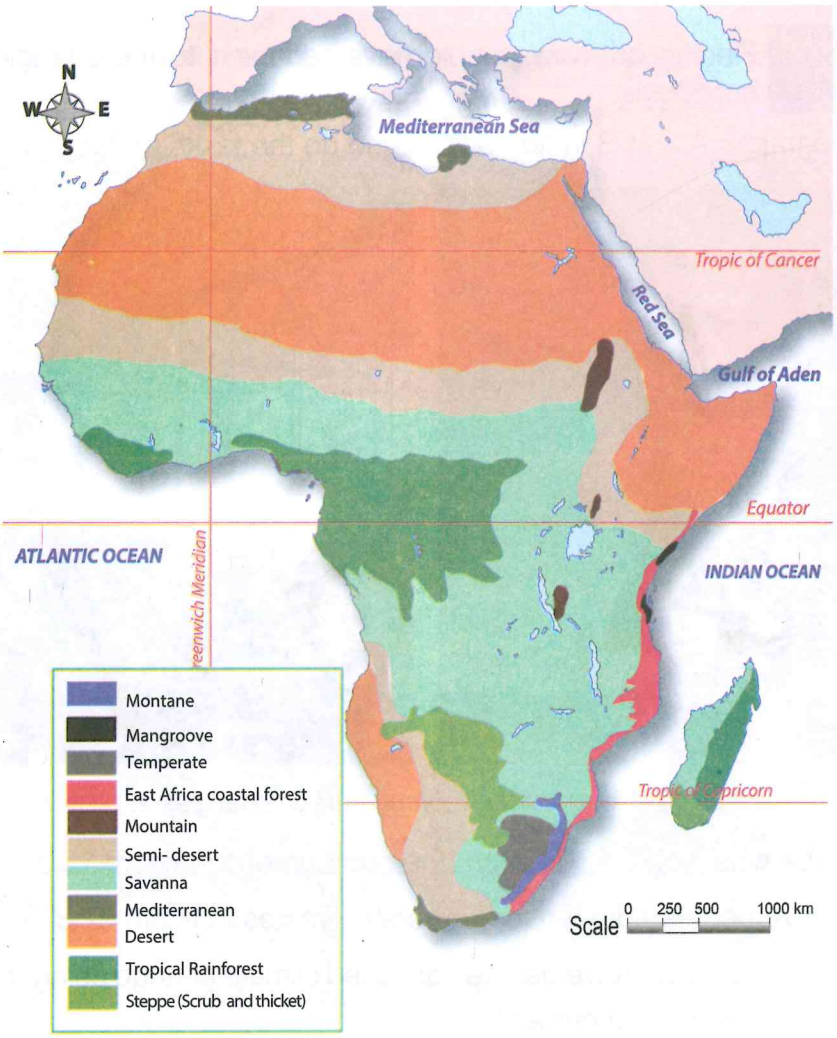


Figure 22.9: Vegetation of Africa map

Activity 22.11 Describing the different types of vegetation in Africa

In groups, Study map in figure 22.9 and photographs A-D, in figure 22.10 and do the tasks that follow.

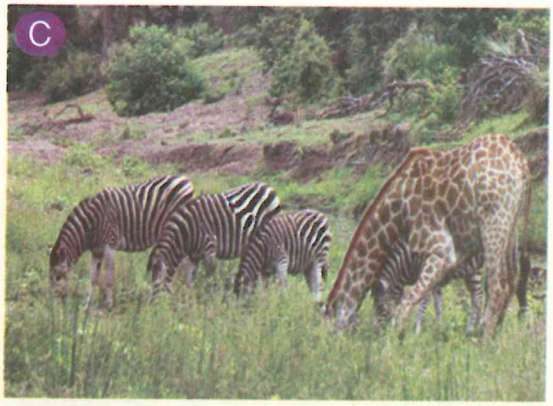


Figure 22.10: Vegetation types in Africa

1 (a) Copy the map in figure 22.9 in your note book.

(b) Discuss the factors responsible for the distribution of the types of vegetation shown on the map.

2 Identify the types of vegetation shown in each photograph.

3 Describe the characteristics of each type of vegetation in figure 22.10.

4 Explain how climate has contributed to the existence of each of the vegetation types in figure 22.10.

5 Suggest at least four economic activities that can take place in each of the vegetation types.

6 Using the knowledge obtained in chapter nine, draw a map of East Africa showing its climate and vegetation.

7 Present your work to the teacher for further guidance.

You have learnt that Africa has many types of natural vegetation. For the purpose of this study, they have been reduced to a few and these are related to major climates of Africa and they include; **equatorial, tropical, Mediterranean** and **desert vegetation**.

Influence of Vegetation on People's Lives

The vegetation type found in a place can affect people negatively or positively.

Many of the economic activities in a place are influenced by the vegetation type found there. Some other places may not be suitable for any economic activity because of the vegetation in that area.

For example, thick forests and swamp vegetation may not be favourable for certain activities. After doing tasks in activity 22.12, you will understand more about how vegetation influences people`s way of life.

Activity 22.12 How vegetation influences people`s way of life

In groups; study photographs A-C in figure 22.11 and do the tasks that follow

Figure 22.11: Influence of vegetation on people`s way of life

1 Describe what is taking place in the photographs in figure 22.11.
2 In what other ways does vegetation affect the people`s way of life.
3 Present your work to the rest of the class through a discussion.

People's influence on natural vegetation

Human activities are contributing to climate change. Changes in climate are causing changes in vegetation patterns around the world. Although people's activities are influenced by the vegetation cover of an area, they are also responsible for the drastic changes in vegetation for example people cut down trees for wood. This in the long run leads to desertification. After doing tasks in activity 22.13, you will find out how humans have influenced climate change and how they have tried to control these activities.

Activity 22.13 Exploring the influence of people on natural vegetation

In groups, study photographs A-D in figure 22.12 and do the tasks that follow.

Figure 22.12: Influence of people on natural vegetation

1. Describe what is taking place in the photographs in figure 22.12.
2. Identify the photographs showing the negative effects and positive effects of people on vegetation.
3. In which other ways do people destroy vegetation not shown in figure 22.12?
4. Which activities do people do to conserve the natural environment?
5. Discuss why it is important to conserve the natural environment?
6. Present your work to the rest of the class through a discussion

You could have found out that the human impact on the environment starts with vegetation, for humankind has possibly had a greater influence on plant life than on any of the other components of the environment. The changes humans have brought about on vegetation cover include deforestation, bush burning and afforestation.

Sample Activity of Integration

Uganda is to host tourists from various countries to attend the Pearl of Africa Tourism Expo. A number of tourists from Europe have never been to Africa before and had many questions about the climatic conditions of the region. Most of them are eager to tour different parts of Africa to get the feel of the different climatic conditions and vegetation types.

Task Write a presentation of about 400 words highlighting the uniqueness of Africa.

End of Chapter Summary

In this chapter, you have learnt that;

- The relationship between the earth and the sun brings about changes in seasons and causes temperature variations.
- The sun heats the earth`s surface in different angles, which causes the difference in temperatures leading to the division of the earth into the tropical, temperate and polar regions.
- The sun is overhead at the Equator twice a year that is to say 21st March and 23rd September. During this period areas around the equator receive heavy rainfall when the sun is overhead.
- The Inter-Tropical Convergence Zone (ITCZ) is the zone in the tropics where the north-east and south-east trade winds converge.
- The climate of Africa has a range of climates such as the equatorial climate, savannah climate, desert climate and Mediterranean climate.
- Africa has many types of natural vegetation and they include; equatorial, tropical, Mediterranean and desert vegetation.
- Many of the economic activities in a place are influenced by its climate and the vegetation type.

Chapter 23

Forests, Forest resources and Forestry in Africa

Key words

- forests
- forest resources
- ecosystem
- equatorial rainforest
- wood
- forest preservation
- logging
- deforestation
- sustainable

After studying this chapter, you should be able to;

- know where the main forest resources in Africa are and their main uses
- draw maps to show the areas of the case studies on forestry and graphs to illustrate their climates
- understand the location and reason for location of the forest resources in Africa
- know the characteristics of the forest in Africa
- understand the importance of forests in terms of environment.
- understand factors that favour the development of hardwood industry.
- understand the methods of harvesting trees from forests
- understand the development of hardwood trade in Gabon
- recognise from photographs the characteristics of forests and activities related to logging in Gabon
- use simple graphs charts and diagrams to present and analyse statistics on timber industry in Gabon
- draw a map showing the major forested areas and timber processing areas in Gabon
- appreciate the dangers of unsustainable forestry in Africa and dangers of destroying forests
- appreciate the dangers of overuse of the natural vegetation
- understand the effects of human activities on the environment
- draw diagrams and flow diagrams to show stages in logging
- appreciate the need to preserve the natural environment
- appreciate the dangers of overuse of natural resources deforestation and overfishing

Introduction

What is a forest? Are you surrounded by a collection of trees in your school or home area? In Senior One, you learnt about climate and vegetation in East Africa.

You described the vegetation types found in East Africa and you realised that East Africa has different vegetation types which are greatly affected and influenced by the nature of climate experienced in an area.

In this chapter, you will learn the importance and uses of forest resources in Africa and get to know the reasons why they should be preserved.

Forests of Africa

Forests mainly are of two types: the natural and planted. Natural forests are those that grow in a particular environment because of its natural climatic conditions while artificial forests are those which have been planted by people.

In Senior One you learnt about the categories into which forests are subdivided. You can discuss them with your neighbour and note them down. After doing tasks in activity 23.1, you will discover the main types of forests in Africa and their characteristics.

Activity 23.1 Understanding the main types of forests in Africa and their characteristics

In groups, study photographs A-C in figure 23.1, carry out a textbook or library research on the forests of Africa and do the tasks that follow.

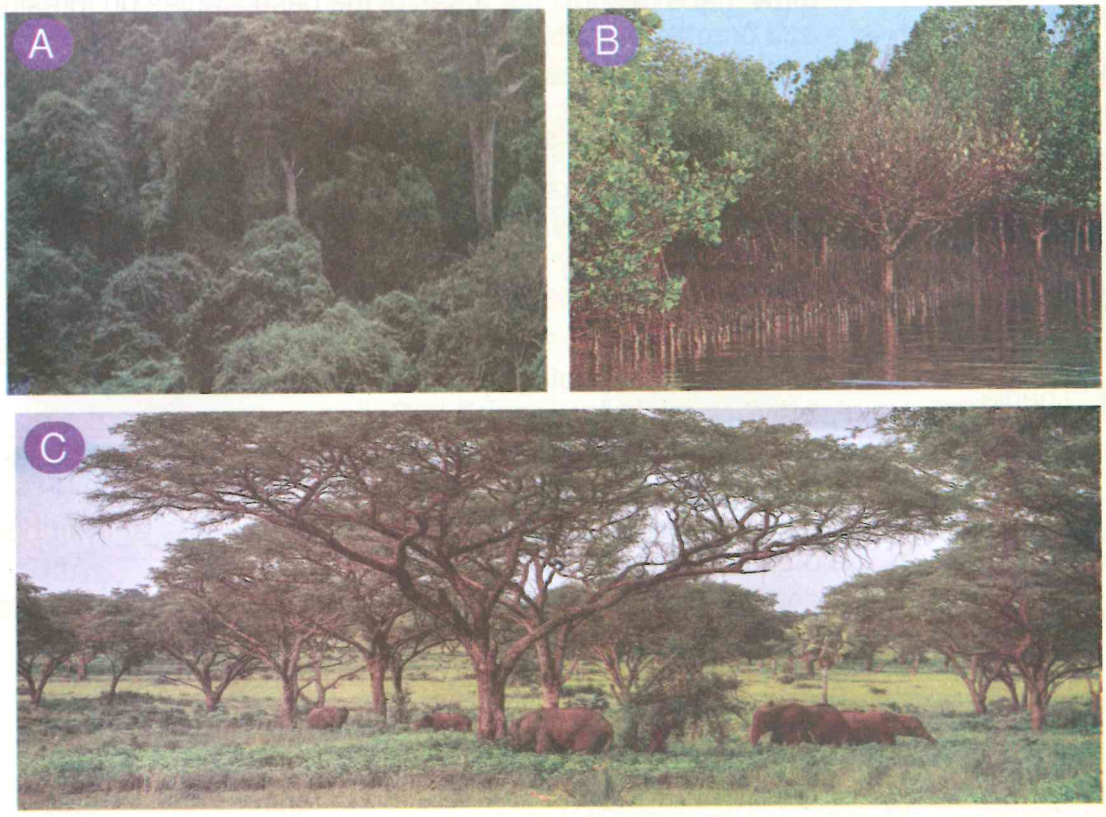


Figure 23.1: Forests in Africa

1 Identify the type of forests in photographs A-C shown in Figure 23.1.
2 What are the other types of forests in Africa but not shown in the photographs in Figure 23.1?
3 Describe the characteristics of forests identified in (1) and (2).
4 Use an atlas and draw the map showing forest distribution in Africa.
5 Share your work with the rest of the class through a discussion.
6 Present your work to the teacher for further guidance.

You have learnt that Africa has different types of forests such as tropical rainforests, Mediterranean, mangrove and temperate forests. These forests have different characteristics in relation to their tree sizes, heights, the undergrowth, vegetation and climatic zones where they are located.

Mediterranean forests have dense vegetation, composed of broad leaves and small trees. Mangrove forests have tree spices which can tolerate highly concentrated salt water and stilt roots that help them adapt to harsh conditions. Temperate forests are mainly characterised by a variety of deciduous trees. Tropical rain forests receive very high annual rainfall, therefore they are ever green forest.

Factors responsible for the growth and distribution of forests in Africa

You might realise that forest growth and distribution is influenced by various factors. These factors are both physical and human. After doing tasks in activity 23.2, you will understand the factors responsible for the growth and distribution of forests in Africa.

You will also find out the importance of forests to African countries.

Activity 23.2 Discussing the factors responsible for the growth and distribution of forests in Africa

In groups,

1 Discuss the factors that influence the growth and distribution of forests in Africa?
2 Study the photographs A-D in Figure 23.2 and do the tasks that follow.

Figure 23.2: Some benefits of forests

(a) Identify the benefits of forests shown in the photographs A-D in Figure 23.2

(b) Discuss other benefits of forests to the;

(i) Environment (ii) People (iii) Economy

3 Present your work to the rest of the class through a discussion

4 Present your work to the teacher for further guidance

You have realised that forests are essential to the health of our environment. For example, trees absorb and store much of the carbon dioxide that would be contributing to climate change. Forests also regulate water cycles, maintain soil quality, and reduce the risks of natural disasters such as floods.

Forestry in Africa

Forestry involves the management, exploitation and utilisation of forests for human and economic development. This involves a number of methods. After doing tasks in activity 23.3 you will find out the methods used in forest exploitation in Africa.

Activity 23.3 Discovering the methods of forest exploitation in Africa

In groups,

1 Carry out a textbook or internet research and explain the methods involved in the exploitation of forests in Africa.

2 Share and present your findings to the rest of the class through a discussion

3 Make corrections where necessary.

Forestry in Gabon

Gabon is one of Africa's countries whose economy partly depends on forest products. In chapter 3 you learnt about locating places using different methods, use that knowledge and locate Gabon. The map in Figure 23.3 shows the forested areas of Gabon.

About 77% of the country is estimated to be covered by dense equatorial vegetation containing 3000 species. It is important to note that African forests are mainly made up of hardwood trees. Examples of species are Mahogany, Maobi, Azobe, Keva Azigo Ebony and Okoume, a softwood tree that forms the backbone of Gabon's forest industry. Gabon is the chief timber exporter. You probably learnt that the forests of an area are influenced by the type of climate experienced in that area.

Figure 23.3: Forestry in Gabon

After doing tasks in activity 23.4, you will be able to describe the climate of Gabon.

Activity 23.4 Describing the Climate of Gabon

In groups, study the table 23.1 and do the tasks that follow.

Table 23.1 Climate data of Libreville - Gabon coast

	J	F	M	A	M	J	J	A	S	O	N	D
Temp ^{0}C	30	31	31	31	30	29	28	28	29	29	29	30
Rainfall (mm)	250	250	325	300	213	25	25	25	100	275	380	200

Draw a graph showing the climate of Libreville

1 Identify the months with:

(a) Highest temperature
(b) Lowest temperature
(c) Highest rainfall
(d) Lowest rainfall

2 Calculate the

(a) Mean annual rainfall
(b) Mean annual temperature

2 Describe the characteristics of the climate in the table 23.1

3 Which type of forests do you think can be found in the climatic region whose data is shown in table 23.1

4 Present your work to the rest of the class through a discussion.

You have found out that Gabon has rainforests mainly because it receives reliable rainfall throughout the year. Gabon is largely made up of tropical rainforests which normally grow astride the equator but within the tropics of Cancer and Capricorn.

These types of forests have a number of characteristics which differentiate them from other forests. After doing tasks in activity 23.5, you will be able to understand the characteristics of forests in Gabon.

Activity 23.5 Understanding the characteristics of forests in Gabon

In groups, study photographs A and B in Figure 23.4 and do the tasks that follow;

Figure 23.4: Tropical forests

1 Identify the characteristics of forests in Gabon shown in figure 23.4
2 What are the other characteristics of forests in Gabon not shown in figure 23.4?
3 Present your findings to the rest of the class through a discussion
4 Present your work to the teacher for further guidance.

The development of the hard wood industry in Gabon has been favoured by a number of factors which are both physical and human. After doing tasks in activity 23.6 you will be able to find out the factors that have favoured the development of the hard wood industry in Gabon.

Activity 23.6 Finding out the factors that have favoured the development of hard wood industry in Gabon

In groups, carry out a textbook or internet research and do the following tasks.

1. What are the factors that have led to the development of the hard wood industry in Gabon?
2. Present your work to the rest of the class through a discussion.
3. Make corrections in your work where necessary.
4. Present your work to the teacher for more guidance

You have learnt the factors that lead to the development of the hard wood industry which are both physical and human. It is important to note that the physical factors mainly favour the growth of forests while the human factors favour the exploitation of forests.

Timber processing is that part of the forest industry involved in transforming logs into new products. Timber processing involves a number of steps before it is turned into finished products. After doing tasks in activity 23.7 you will be able to find out the stages of timber processing.

Activity 23.7 Exploring the stages of timber processing

In groups, carefully study the photographs A-E in Figure 23.5 and do the tasks that follow.

E

Figure 23.5: Stages of timber processing

1 (a) Describe what is taking place in each of the photographs shown in figure 23.5

(b) Draw a flow chat to show the steps of wood processing from the photographs shown in Figure 23.5

2 (a) Why is it better to process the timber and make things in Africa, than selling it directly overseas?

(b) What are the difficulties faced in processing timber?

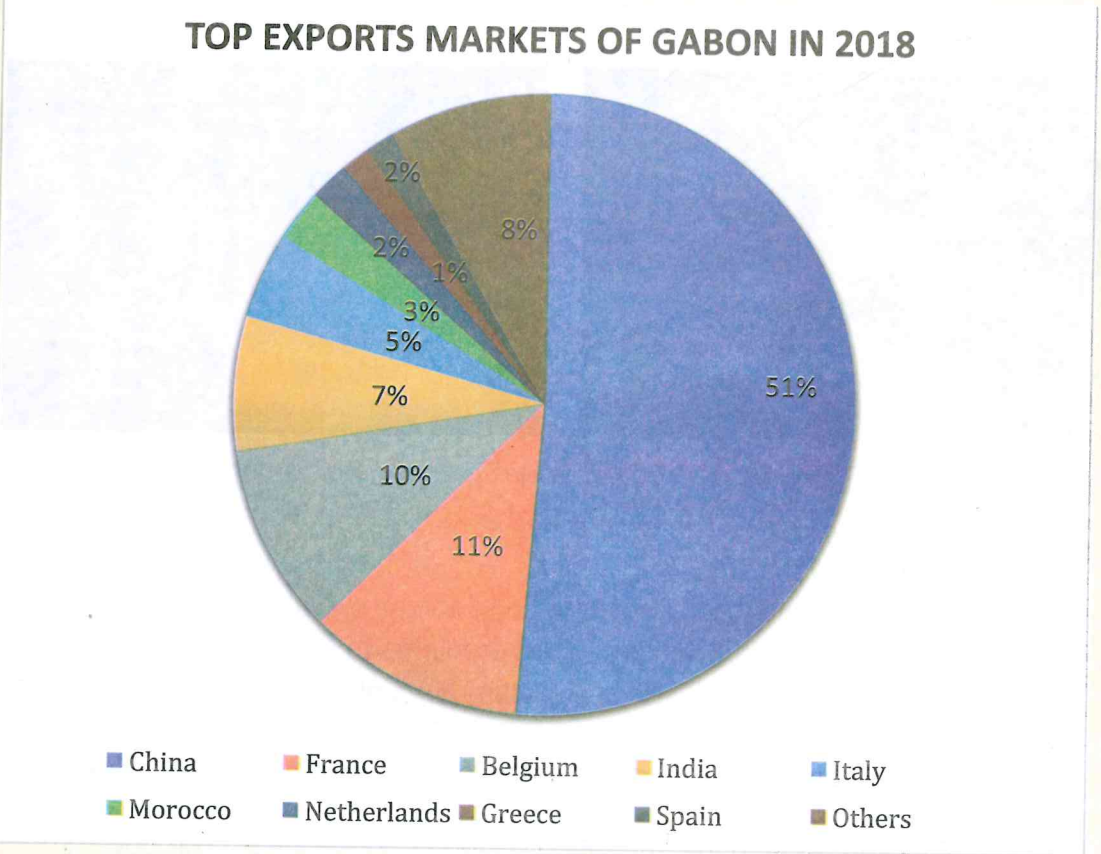
3 Present your work to the rest of the class through a discussion

Industrial production in Gabon is very clearly dominated by sawn timber accounting for over 70% of production but Gabon stands out from the other countries of the Sub-Region. The timber industry had to move further inland to the untouched forestland. Today up to 750,000 tons of wood are exported annually.

Production of timber is mainly carried out by large companies and run by Europeans and Gabonese government enterprises and 15% of the total production is carried out by family members. After doing tasks in activity 23.9 you will understand more about the timber exports of Gabon.

Activity 23.8 Exploring timber exports of Gabon

Study the pie chart in Figure 23.6 and do the tasks that follow.



Source ITC (2020) main markets in terms of exports value for the product of wood, wood charcoal exported by Gabon

Figure 23.6: Gabon exports

1 Identify the country where Gabon exports;
   (a) the highest percentage of wood.
   (b) the lowest percentage of timber of wood.
2 Comment on the volume of wood exports in 2018.
3 Present your work to the rest of the class through a discussion

Even though Gabon is greatly depending on the forestry sector for her economic development, it faces a number of problems which affect the exploitation of forests. These problems are both physical and human.

After doing tasks in activity 23.9, you will be able to understand the problems facing the exploitation of Gabon's forest resources.

Activity 23.9 Understanding the problems facing the exploitation of Gabon's forest resources

In groups, study photographs A and B in Figure 23.7, and do the tasks that follow.

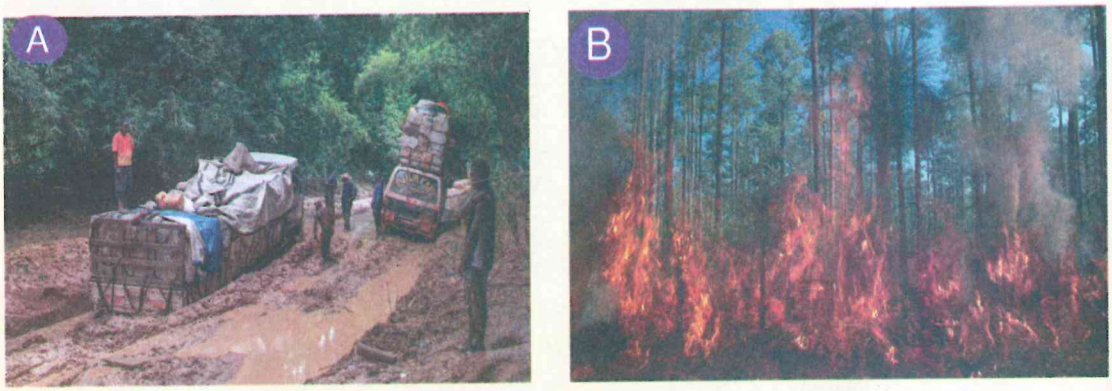


Figure 23.7: Problems facing forest exploitation

1. Identify the problems facing the forest sector shown in the photographs in Figure 23.7.
2. Discuss other problems facing the forest sector in Gabon
3. Suggest the possible solutions to the problems in 1 and 2
4. Present your work to the rest of the class through a discussion

You have realised that the development of forestry in Gabon has had challenges for example over exploitation which leads to depletion of forests. The dense forest cover in Gabon has limited good roads and railway network construction. The government of Gabon is working tirelessly to solve the problems faced by the forest sector.

Destruction of forests in Africa

Forest destruction involves the removal of trees at a greater rate than the growing rate. You have probably seen trees being cut down in your area, why were they being cut down? Were the cut trees replaced?

Figure 23.8: Forest destruction

The forests of Africa are disappearing at a high rate. According to the United Nations and Food and Agriculture Organization, forests in Africa are being cut down at a rate of more than 4 million hectares per year. After doing tasks in activity 23.10, you will be able to understand more about destruction of forests in Uganda.

Activity 23.10 Understanding the ways through which forests are destroyed

In groups, study the word puzzle in Figure 23.9 and do the tasks that follow.

S	E	T	T	L	E	M	E	N	T	J	P	M	T	D	T	C
W	C	T	S	V	N	B	F	E	R	B	J	L	B	C	K	O
B	D	R	P	S	T	A	G	N	K	E	P	K	J	F	H	N
X	U	K	U	Q	A	U	S	T	R	A	L	I	A	D	J	S
Z	E	Q	O	H	R	W	H	Q	C	G	A	N	I	N	L	T
I	N	D	U	S	T	R	I	A	L	I	S	A	T	I	O	N
T	E	S	B	K	T	E	U	M	S	L	I	P	E	J	P	U
A	U	P	A	S	I	A	X	N	T	K	R	Q	R	X	N	C
C	R	Y	R	T	C	S	Y	P	W	Z	F	F	T	W	I	T
F	U	E	L	W	O	O	D	R	T	S	X	O	N	G	D	I
B	P	X	N	S	M	C	T	O	G	T	R	U	N	H	G	O
A	G	R	I	C	U	L	T	U	R	E	T	X	S	Q	D	N

Figure 23.9: A puzzle

1 (a) From the word puzzle identify the different factors that have led to the destruction of forests in Africa

(b) Discuss other ways through which forests are destroyed in your area.

2 Suggest ways through which forests can be conserved.

3 Present your work to the rest of the class through a discussion.

Destruction of forests in Uganda

Uganda has a wide range of forests and these include the tropical rain forests which cover 49% and the planted forests 1%. Major forests include Mabira, Kalinzu and Maramagambo. What are the others?

However, human activities have reduced this forest cover. After doing tasks in activity 23.11, you will learn more about forest destruction in Uganda.

Activity 23.11 Exploring forest destruction in Uganda

In groups do the following tasks

1. Have you heard of illegal destruction or cutting down of forests in Uganda, why is it happening?
2. What are the trees cut down used for?
3. Discuss the dangers of cutting down trees in your area.
4. Present your work to the rest of the class through a discussion.

Deforestation and forest degradation have continued over the last decades despite all the attention and efforts to implement sustainable forest management and conservation. You should note that all African countries are experiencing high rates of forest destruction. Controlling forest destruction has been emphasised in most of the African countries. After doing tasks in activity 23.12 you will find out the ways of controlling forest destruction

Activity 23.12 Understanding ways of controlling forest destruction

In groups, study the photograph in Figure 23.10 and do the tasks that follow.

Figure 23.10: Students doing country service

1. Identify the activity being carried out by the students in the photograph in Figure 23.10
2. Explain the importance of the activity to the community.
3. Why is re-planting of forests not embraced in Africa?
4. In what other ways can forests be sustainable?
5. Share and present your findings to the rest of the class for further discussions

You have learnt that the best solution to deforestation is to curb the felling of trees by enforcing a series of rules and laws to govern it. Ban Clear-Cutting of forests, carry out re-afforestation and afforestation. All these can solve the problem of forests in Uganda and the rest of Africa.

Sample Activity of Integration

According to the United Nations food and agricultural oraganisation indigenous forests in Africa have been cutdown at a rate of more than 4 million hectares per year. Yet the experts have pointed out that the forest destruction will lead to loss of biodiversity. The 260 species of trees in the forest will eventually disappear, and increased temperatures will lead to cases of food insecurity plus out break of diseases.

Task:

You have been hired by the United Nations for help. Write a sensitization message of about 600 words to the United Nations on the way forward.

End of Chapter Summary

In this chapter you have learnt that;

- Forests are mainly of two types the natural and artificial. Natural forests are those that grow in a particular environment because of its natural climatic conditions while artificial forests are those which have been planted by people.
- Forests in Africa are further sub divided into Tropical rainforests, Mediterranean forests and Mangrove forests.
- the main forest resources in Africa are located in Gabon, Congo, Eswatini
- Forests have many uses.
- Forests in have different characteristics, for example, the tropical rainforests are ever green, trees grow in impure stands and have long gestation periods.
- Forests help in terms of conserving the environment such as helping in the formation of rainfall, holding soil particles together thus reducing erosion, and the leaves help in soil formation.
- Different factors favour the development of a hardwoods industry for example valuable tree species, availability of capital, market, improved transport and communication networks and labour.
- The sustainable methods of harvesting trees from the forests include clear cutting, shelter wood and the selection system.

Chapter 24

Irrigation farming in Africa

Key words

- climate
- cooperation
- farming
- hydroponics
- irrigation
- monsoon
- precipitation
- summer
- winter
- sub-saharan
- farmers

After studying this chapter, you should be able to;

- understand how problems of the physical landscape can be overcome with traditional or modern technology.
- recognise physical and other features on conventional survey maps and photographs(s)
- draw maps to show the areas of the case studies and graphs to illustrate their climate(s)
- know the parts of Africa where irrigation is most important and some examples of irrigation schemes.
- know one example of a large-scale irrigation scheme in Africa.
- understand why irrigation is becoming increasingly important in Africa.
- understand the factors leading to the development of the Gezira scheme.
- understand how the Gezira scheme works, it's benefits and difficulties.
- use statistics and other information to analyse different aspects of the Gezira scheme.
- appreciate the advantages of government Cooperation with small scale farmers.
- appreciate the dangers of corruption in government schemes.
- know the areas of China where irrigation is important
- know the main crops grown on irrigated farms in china.

- understand reasons for the importance of irrigation in China.
- understand the main methods of irrigation used in China.
- understand the principles and use of hydroponics.
- recognise and describe irrigation farming in China from photographs.
- appreciate the importance of rice growing and irrigation in China.
- appreciate the lessons Uganda can learn from rice growing and the Gezira irrigation scheme.

Introduction

A large number of people in Africa are dependent on agriculture.

In the past years farmers used to wait for seasons to plant their crops and the dry seasons were mainly known for harvest. Currently, due to the improvements in technology, there are many new developments and innovations in the agricultural sector and among the new technologies is irrigation farming.

With irrigation farming, various crops are grown either in dry or wet seasons. In this chapter you are going to learn why irrigation is becoming particularly important in African farming, and the methods of small scale and large-scale irrigation.

Irrigation Farming in Africa

In your community you might have seen people watering crops. Which crops were they watering? How were they doing it? Irrigation is largely carried out in the semi-desert or desert areas of Sub-Saharan Africa where little or no rainfall is received.

It is divided into small-scale and large-scale. After doing tasks in activity 24.1, you will understand irrigation farming in Africa.

Activity 24.1 Understanding irrigation farming in Africa

In groups; carry out textbook or internet research and do the tasks that follow.

1. Identify examples of irrigation schemes in Africa.
2. Classify them into large and small scale irrigation scheme.
3. Identify countries of Africa with large irrigation schemes.
4. Why were the irrigation schemes established in those countries?
5. Present your work to the rest of the class through a discussion.

You have realised that when a region does not have sufficient natural rain water to meet the requirements of plants, water is provided artificially. This is called **irrigation farming**. Irrigation becomes necessary whenever rainfall does not come or is insufficient.

Though most of the African countries are more fortunate in terms of rainfall amount and distribution, it also has a number of semi-arid lands. Therefore improving agriculture in semi-arid areas largely depends on irrigation.

Irrigation has a number of methods and these are classified according to water supplied to plants. There are many types of irrigation systems in which water is supplied to the entire field uniformly. Irrigation water can come from groundwater, through springs or wells, surface water, through rivers, lakes, or reservoirs, or even other sources, such as treated wastewater or desalinated water. As a result, it is critical that farmers protect their agricultural water source to minimize the potential for contamination. After doing tasks in activity 24.2, you will understand the methods of irrigation used in Africa.

Activity 24.2 Understanding irrigation farming in Africa

Figure 24.1: Methods of irrigation in Africa

1. Identify the methods of irrigation shown in each of the photographs shown in figure 24.1.
2. Explain the methods identified in (1).
3. State areas in Africa where photographs in figure 24.1 could have been taken from.
4. Present your findings to the rest of the class through a discussion.

You have learnt that irrigation involves the application of water to the plants uniformly so that each plant has the amount of water it needs neither too much nor too little.

You should have noted that irrigation makes the continuous supply of agricultural products both in the wet and dry seasons. The irrigation farming sector contributes to the socio-economic development of African states in a number of ways. After doing tasks in activity 24.3, you will find out the importance of irrigation farming in Africa.

Activity 24.3 Understanding the importance of irrigation farming

In groups; carry out textbook or internet research and do the tasks that follow.

1. Discuss the Importance of irrigation farming in Africa.
2. How have people managed to control the physical landscape of Africa using modern technology.
3. Present your work to the rest of the class through a discussion.

You have found out that irrigated crop yields are double or more than comparable to rainfed yields, irrigation has become more important in Africa since it boosts the continent's agricultural productivity.

Gezira Irrigation Scheme

Gezira irrigation scheme is found in Sudan. Why do you think Sudan relies a lot on irrigation farming? Did you know that Gezira irrigation scheme is one of the schemes the country relies on for agriculture? It is one of the largest irrigation projects in the world. The Gezira Scheme was begun by the British while the area was governed as part of Anglo-Egyptian Sudan. Water from the Blue Nile is distributed through canals and ditches to tenant farms lying between the Blue and White Nile rivers.

It is particularly suited to irrigation because the land slopes away from the Blue Nile and water therefore naturally runs through the irrigation canals by gravity. After doing tasks in activity 24.4, you will discover the location of Gezira.

Activity 24.4 Discovering the location of the Gezira scheme

In groups, study map in fig 24.2 and do the tasks that follow

Figure 24.2: The location of Gezira irrigation scheme

1 Copy the map in figure 24.2 in your note books.
2 Describe the location of Gezira irrigation scheme.
3 Why do you think the Gezira irrigation scheme was built where it is?
4 What are the methods of irrigation used at Gezira irrigation scheme?
5 Present your findings to the teacher for further guidance.

You have learnt that Sudan is one of the African countries which has benefited from irrigation farming. This means that with modern technology, everything can be possible in terms of food crop production. You should have further noted that irrigation is an expensive venture which requires a lot of capital and government support.

For any irrigation scheme to be set up in an area, there must be something that favours its set up. After doing tasks in activity 24.5, you will find out the factors influencing the development of Gezira irrigation scheme.

Activity 24.5 **Understanding the factors influencing the development of Gezira irrigation scheme**

In pairs; carry out textbook or internet research and do the tasks that follow.

1 Explain the factors that influence the development of Gezira irrigation scheme.
2 Present your work to the rest of the class through a discussion.
3 Present your work to the teacher for further guidance.

You have learnt that, a number of factors such as favourable relief have largely influenced the development of Gezira irrigation scheme.

The scheme is managed by Gezira irrigation board. It provides farmers with seeds, fertilizers, machinery and technical advice. The government provides land and it is responsible for the extension of the irrigation water to the scheme. After doing tasks in activity 24.6, you will explore the organisation of Gezira irrigation scheme.

Activity 24.6 **Exploring the organisation of Gezira irrigation scheme**

Carry out a text book or internet search and do the tasks that follow.

1 How does the Gezira irrigation scheme work?
2 Which technique can Uganda copy from Gezira irrigation scheme and why?
3 Present your findings to the teacher for further guidance.

You have learnt that the management of Gezira scheme used to be undertaken by three institutions: the Sudan Gezira Board (SGB), the Ministry of Irrigation and Water Resource (MOIWR), the Water Users Associations (WUAs).

The SGB was responsible for agriculture management, the MOIWR was responsible for controlling the irrigation system, and the farmers were responsible for managing and irrigating their farms. Currently, the Gezira scheme is operated by over 5,000 staff from the Ministry of Irrigation (MOI) and the Sudan Gezira Board (SGB).

Have you realised that the largest area of Sudan lies in the desert climatic zone? Areas in such climatic zones are hot and dry throughout the year.

Sudan has a short rain season from July to September. The annual average rainfall is only 161 mm. Temperatures are highest during the day.

They range between 40°C to 50°C. After doing tasks in activity 24.7, you will understand the climate of Gezira irrigation scheme.

Activity 24.7 Understanding the climate of Gezira irrigation scheme

In groups; study the information in table 24.1 and do the tasks that follow.

Table 24.1: Climate data of Gezira irrigation scheme

Month	J	F	M	A	M	J	J	A	S	O	N	D
Temp °C	26.2	27.6	29.9	31.4	31.5	31.5	31.2	30.7	30.9	31.4	30.3	27.1
Rainfall (mm)	00	00	00	00	00	21.7	79.1	109.3	34.2	244.9	00	00

1 Identify months with;
   (a) Highest and lowest temperatures (b) Highest and lowest rainfall
2 Draw a bar graph to represent the climate of Gezira irrigation scheme
3 In which months of the year do you think irrigation is mostly needed at Gezira irrigation scheme? Give reasons to support your answer.
4 Explain ways in which climate change can affect irrigation farming.
5 Exchange your work with your neighbour and make comments.
6 Present it to the rest of the class for further discussions.

Benefits of the Gezira Irrigation Scheme to Sudan

Irrigation has been a priority in Sudan due to its water scarcity, contributing around 30 percent of agricultural production. After doing tasks in activity 24.8, you will understand find out the benefits of Gezira irrigation scheme.

Activity 24.8 Finding out the benefits of Gezira irrigation scheme

In groups, study photographs A-D in figure 24.3 and do the tasks that follow.

Figure 24.3: Development brought about by Gezira irrigation scheme

1 Observe and identify what you see in each of the photographs in figure 24.3.
2 Explain how the Gezira irrigation scheme has contributed to what you observed.
3 Present your work to the rest of the class through a discussion.

Difficulties Faced by Gezira Irrigation Scheme

Although irrigation farming in Sudan is developed with a number of schemes, there are a number of difficulties faced. After doing tasks in activity 24.9, you will be able to identify the difficulties faced by Gezira irrigation scheme.

Activity 24.9 Identifying difficulties faced by Gezira irrigation scheme

In groups,

1. Discuss the difficulties faced by the Gezira irrigation scheme.
2. Swap your work with your neighbour and make comments.
3. Present your group work to the rest of the class.

You have learnt that the major problems facing the Gezira irrigation scheme tenants include poor operation and maintenance.

Government Cooperation with Small Scale Farmers

Governments are the primary actors in the physical, social, and economic aspects of a nation's food security, so any attempts to improve agriculture and food security outcomes must also consider the role of governance. It is a two-way relationship.

Stable agriculture and food security systems can help to establish stable and transparent governments, which contribute to more inclusive and effective agriculture and food security systems.

This is why the government of Sudan is laying heavy emphasis on the importance of developing cooperation with small scale farmers. After doing tasks in activity 24.10, you will understand the cooperation between government and local farmers.

Activity 24.10 Understanding cooperation between government and local farmers

In pairs; carry out library research or search the internet to on the Gezira scheme and:

1. Discuss the cooperation between government and local farmers.
2. Explain the advantages of cooperation between government and local farmers.
3. Explain the problems faced by government owned irrigation schemes.
4. Present your work to the teacher for further guidance.

You have learnt that the Gezira faces major government interventions that include mandating cropping patterns, provision of irrigation water, land management practices, fertilizer application, and the setting of input and output prices for wheat and cotton.

The government is heavily involved in production and marketing decisions. The government preference for controls prevents the private sector from competing with or complementing the inefficient state monopolies.

Position of China

In Senior One, you learnt about locating places on a map.

Using that knowledge locate China on the world map. You can use the atlas to identify water bodies and boundaries surrounding China.

Have you ever heard that China is the world's third largest country after Russia and Canada? After doing tasks in activity 24.11, you will be able to learn more about the location of china.

Activity 24.11 Understanding the location of china

Study figure 24.4 and do the tasks that follow.

Figure 24.4: position of china

1. Find out the continent in which China is found.
2. Identify the countries that share boundaries with china.
3. Find out the water bodies found on the Eastern part of China.
4. Exchange work with your neighbour and comment on each other's work

You have noted that China is located in Southeast Asia along the coastline of the Pacific Ocean. It has an area of 9.6 million square kilometres making it the third largest country in the world after Russia and Canada. But with approximately 1,357,380,000 people, China is the world's most populous country.

Due to its massive size, China is bordered by fourteen countries. China has more different political units as immediate neighbors than any other country except Russia. On land, China shares borders with fourteen states. The most important of these are Russia, North Korea, Vietnam, Myanmar (Burma), India, Pakistan, Afghanistan, and four states of Central Asia.

At sea, Chinese territorial claims about or overlap with those of some of the same states plus six others, including South Korea, Japan, the Philippines, Brunei, Malaysia, and Indonesia. China has maritime boundaries with the Republic of Korea, Japan, Philippines, Brunei, Malaysia and Indonesia. Some of the water bodies include yellow sea, Lake Balkhash and Yangtze river.

The climate of China

The climate of China is characterised by the large size of the country. In the north, the climate is temperate with summer temperatures and very cold winters. In the south, it is subtropical with very hot summers and mild winters. After doing tasks in activity 24.17, you will understand more about the climate of china.

Activity 24.12 Understanding the climate of China

In groups; study maps in figure 24.5 and figure 24.6 and do the tasks that follow.

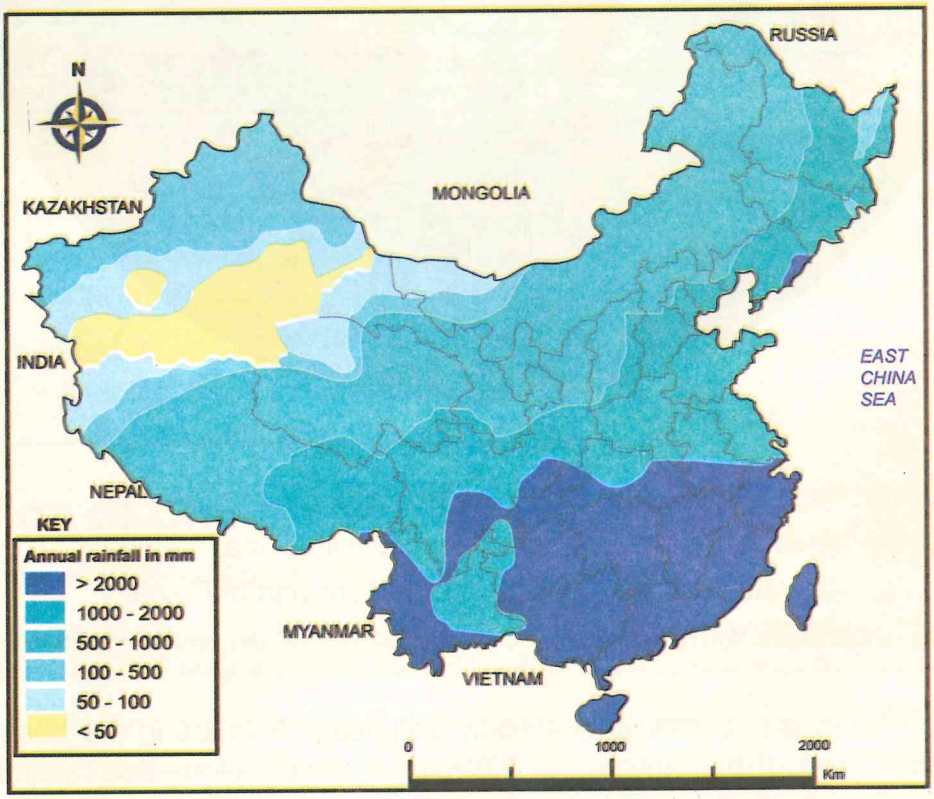


Figure 24.5: Map of china showing annual precipitation

1 Copy map in figure 24.5 in your note books.

2 Identify the; Wet areas. (b) Drier areas. (c) Very dry areas.

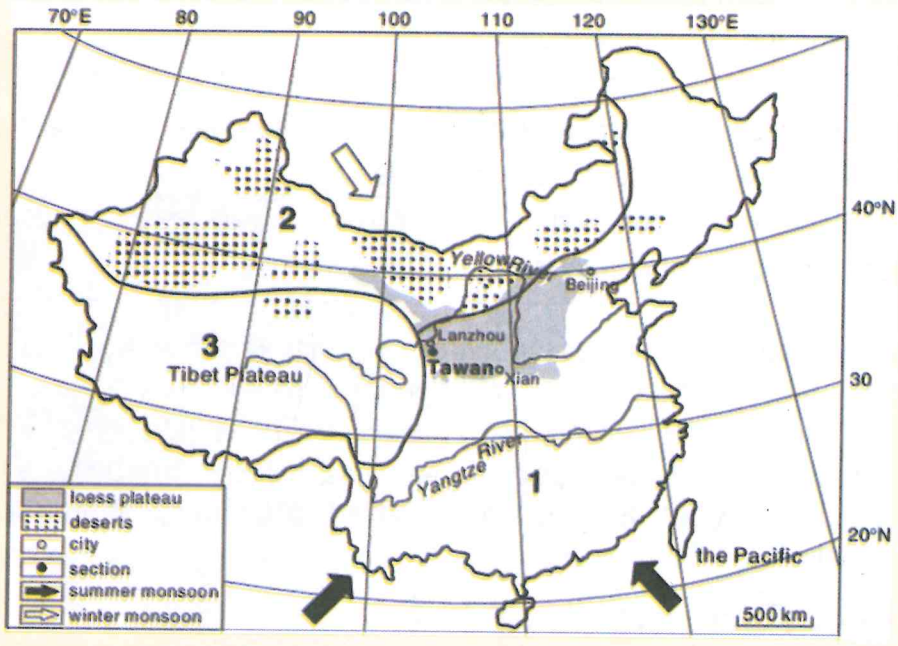


Figure 24.6: Moonson climate map of china

1. Copy map in figure 24.6 in your exercise book.
2. Describe the climate of China.
3. Which climate of East-Africa is similar to the monsoon climate of China?
4. Present your work to the teacher for further guidance.

You have learnt that precipitation in China generally follows the same pattern as temperatures that is to say decreasing from the South East to Northwest. China's southern cities experience monsoon rainfall during summer. In some areas especially in the dry northwest changes in precipitation every year are greater in the coastal area.

Activity 24.13 Weather forecasting

Study the weather forecast in figure 24.7 and do the tasks that follow.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
80mm	75mm	30mm	38mm	10mm	300mm	85mm
89 79°c	90 81°c	95 82°c	97 82°c	95 80°c	94 21°c	88 78°c

Figure 24.7: Weather forecast

1 (a) Which day has the highest temperatures

(b) What season do you think this could be?

(c) What is the low temperature for Tuesday?

(d) Which two days have the same high temperature?

2 Observe the atmosphere around your school and make a weather forecast for 7 days.

3 Describe how weather forecasts are made.

4 Do you think weather forecasts are useful to us? Give a reason for your answer

5 Present the work to the teacher for further guidance.

You might have learnt that the weather forecast predicts what the temperatures and air conditions will be in the near future. Weather forecasting is therefore the application of science and technology to predict the state of the atmosphere for a given location.

Weather forecasts are issued for example to save lives. There are a variety of forecasting techniques but the easiest one is called **persistence,** tomorrow's weather is same as today's weather.

Irrigation Farming in China

Although China's agricultural output is the largest in the world, only 10% of its total land area can be cultivated. China's arable land, which represents 10% of the total arable land in the world, supports over 20% of the world's population.

While the production efficiency of farmland has grown over time in China, efforts to expand to the west and the north have met with limited success, as such land is generally colder and drier than traditional farmlands to the east.

China's limited space for farming has been a problem throughout its history, leading to chronic food shortage and famine. This is the main reason as to why they resorted to irrigation farming . At present the country has a total irrigated area of 46 million hectares accounting for 46% of the total cultivated land. Having covered irrigation farming in Africa, the knowledge acquired will help you discover the methods of irrigation used in China after doing tasks in activity 24.13.

Figure 24.8: irrigation farming

Methods of irrigation in China

Activity 24.14 Discovering methods of irrigation in China

In groups; study photographs A-E in figure 24.9 and do the tasks that follow.

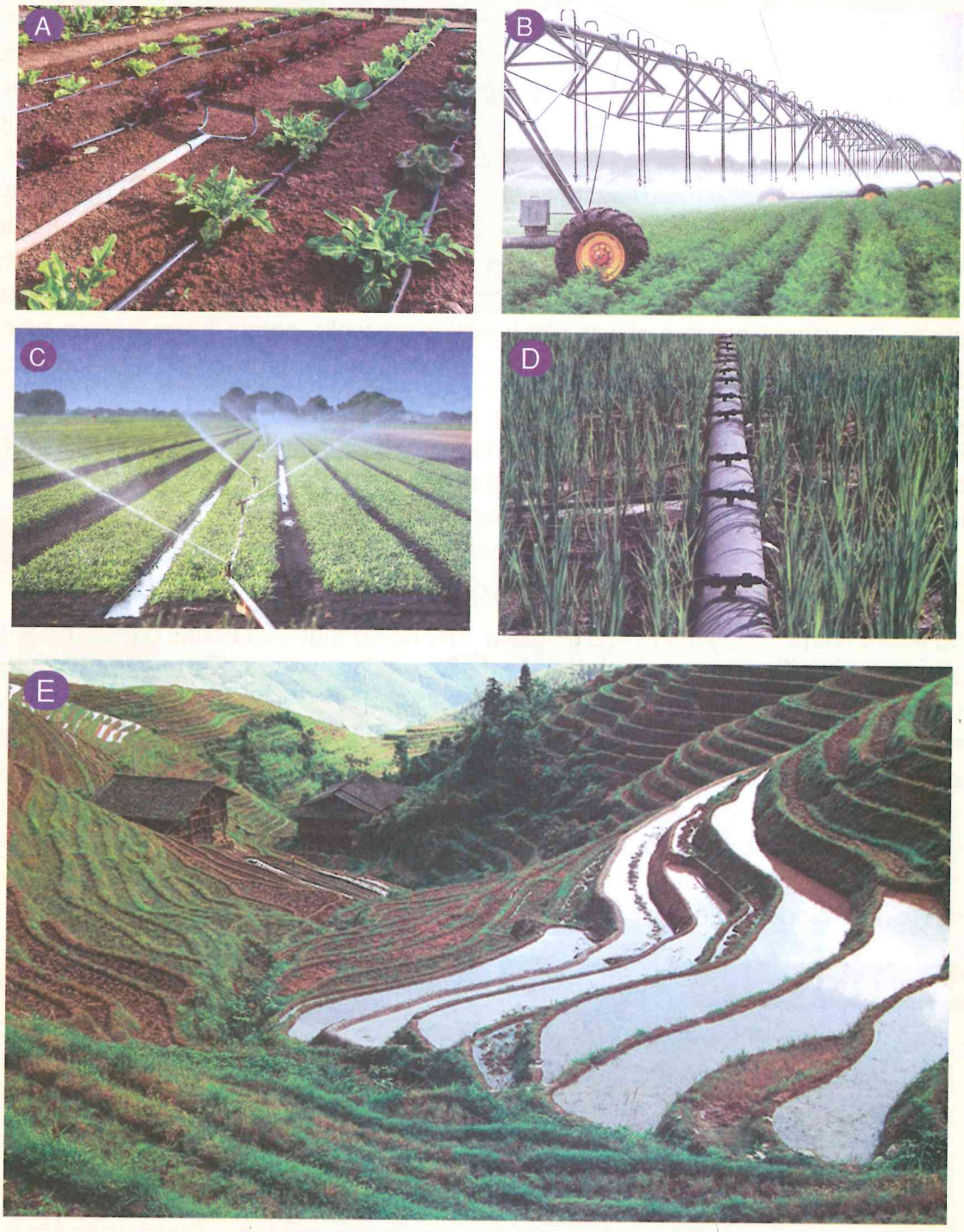


Figure 24.9: Methods of irrigation in china

1 Identify the methods of irrigation shown in each photograph in figure 24.9
2 State areas in China where irrigation is commonly practiced.
3 Exchange your work with your neighbour and make comments.
4 Present your work to the teacher for further guidance.

You have learnt that there are different types of irrigation practised in China for improving crop yield. These types of irrigation are practised based on the different types of soil, climates, crops and resources. They include; Surface Irrigation,Sprinkler Irrigation, Drip Irrigation, Centre Pivot Irrigation and pipe line irrigation. In surface irrigation system, no irrigation pump is involved. Here, water is distributed across the land by gravity. In sprinkler irrigation system, water is distributed from a central location by overhead high-pressure sprinklers or from sprinklers from the moving platform. In centre pivot irrigation system, the water is distributed by a sprinkler system moving in a circular pattern. The various sources of water for irrigation are wells, ponds, lakes, canals, tube-wells and even dams. Irrigation offers moisture required for growth and development, germination and other related functions.

The rate, amount and time of irrigation are different for different crops and also vary according to the types of soil and seasons. For example, summer crops require a higher amount of water as compared to winter crops.

Importance of irrigation farming in china

You learnt about irrigation farming in Africa. You noted that Sudan has benefitted a lot from Gezira irrigation scheme. Similarly, other countries that practice irrigation farming like China have benefited from it. The productivity of irrigated land is more than the un-irrigated land. Crop yields everywhere in the developing world are consistently higher in irrigated areas than in rain fed area. Irrigation contributes to the economic growth and poverty reduction. As income and employment are closely related to output and irrigation increases production, substantial increase in income is achieved in the countryside. After doing tasks in activity 24.14, you will understand the importance of irrigation farming in china.

Activity 24.15 Understanding the importance of irrigation farming in china

In groups; carry out a text bok or internet reseach on the importance of irrigation farming in China and do the following tasks

1 Discuss the importance of irrigation farming in China.
2 Swap your work with your neighbour and make comments.
3 Present your work to the teacher for further guidance.

Rice growing in China

Figure 24.10: Rice field

China is the world's largest producer of rice and accounts for 30 percent of all world rice production. Rice growing conditions in China vary because of topography and weather but the crop is basically irrigated. After doing tasks in activity 24.15, you will understand the stages of growing rice in China.

Activity 24.16 Understanding the stages of rice production in china

Study photographs A-F in figure 24.11 and do the tasks that follow.

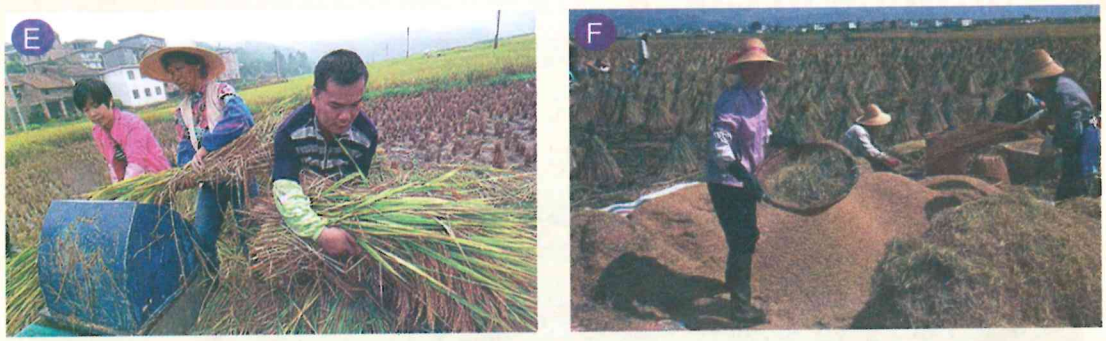


Figure 24.11: Stages of rice production in china

1 Describe the stages of rice production shown in photographs in figure 24.11.
2 Draw a flow diagram to represent the stages described in (1).
3 Suggest reasons why irrigation is important in rice growing.
4 What lessons can Uganda learn from rice growing in china?
5 Present your findings to the rest of the class through a discussion.

You have probably learnt that many steps are involved in the production of rice. All steps are vital and affect the overall quality of the yield hence knowledge in each step is crucial. The stages include; preparing land for planting, seed selection, sowing the rice seeds, transplanting, planting, weeding, harvesting and sun drying or winnowing.

Areas of rice growing in China

In China rice is grown in specific areas in various provinces. Basically, our interest in this section is to understand areas of rice growing in China. After doing tasks in activity 24.14, you will understand areas of rice growing in china.

Activity 24.17 understanding areas of rice growing in china

Carry out a textbook or internet search on the rice growing areas in China and do the following tasks:

1 Draw a sketch map of China and on it mark and label areas of rice growing in China.
2 Display your maps on the wall for your friends to see and make comments.
3 Compare your map with others displayed and make changes to your map if necessary.
4 Besides rice, which other crops are grown on irrigated farms in China?
5 Discuss the importance of growing rice in China.
6 Describe the problems associated with rice growing in China
7 Compile your answers for a class presentation through a discussion.

You might have realised that rice cultivation is highly labour intensive. Rice is grown as a wetland crop in fields flooded to supply water during the growing season.

Rice is the most important food crop of the developing world and the staple food of more than half of the world's population. Rich in nutrients and vitamins and minerals, it's an excellent source of complex carbohydrates.

Nine out of every ten people in the world who eat rice are Asian. The major problems confronting rice production in China are narrow genetic background, overuse of fertilizers and pesticides, breakdown of irrigation infrastructure, oversimplified crop management, and a weak extension system.

Hydroponic farming

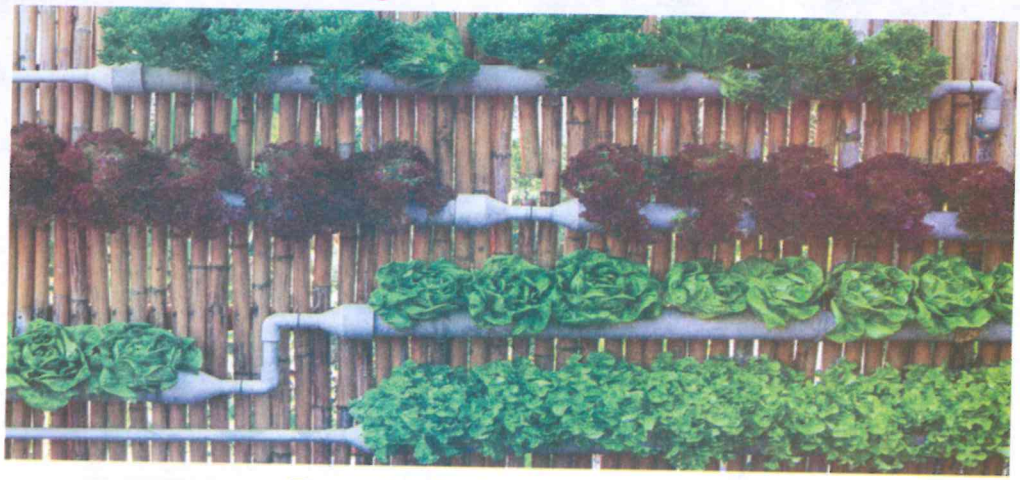


Figure 24.12: Hydroponic farming

Hydroponics is an ideal concept for today's agriculture sector which struggles to find new fertile lands for crop productions and will enable crops to be grown in greenhouses or in multilevel buildings.

You have seen some plants growing on water where there is no soil for example the water hyacinth. People have developed many methods of growing crops especially vegetables in water where plant nutrients have been dissolved. This method of growing crops in water rich in mineral nutrients is called hydroponics.

Crops grown in hydroponic system will require less growing time since they get all the nutrients they need. After doing tasks in activity 24.17, you will be able to understand the principles and use of hydroponics.

Activity 24.18 Principles and use of hydroponics

In groups, study photographs A-D in figure 24.13 and do the tasks that follow.

Figure 24.13: Hydroponic farming

1 Explain how hydroponics farming systems work.
2 Describe the basic principles of hydroponics.
3 Discuss the benefits of hydroponic farming.
4 Present your work to the teacher for further guidance.

You have learnt that the word hydroponics comes from the roots "**hydro**" meaning water and "**ponos**" meaning labour. This method of gardening does not use soil.

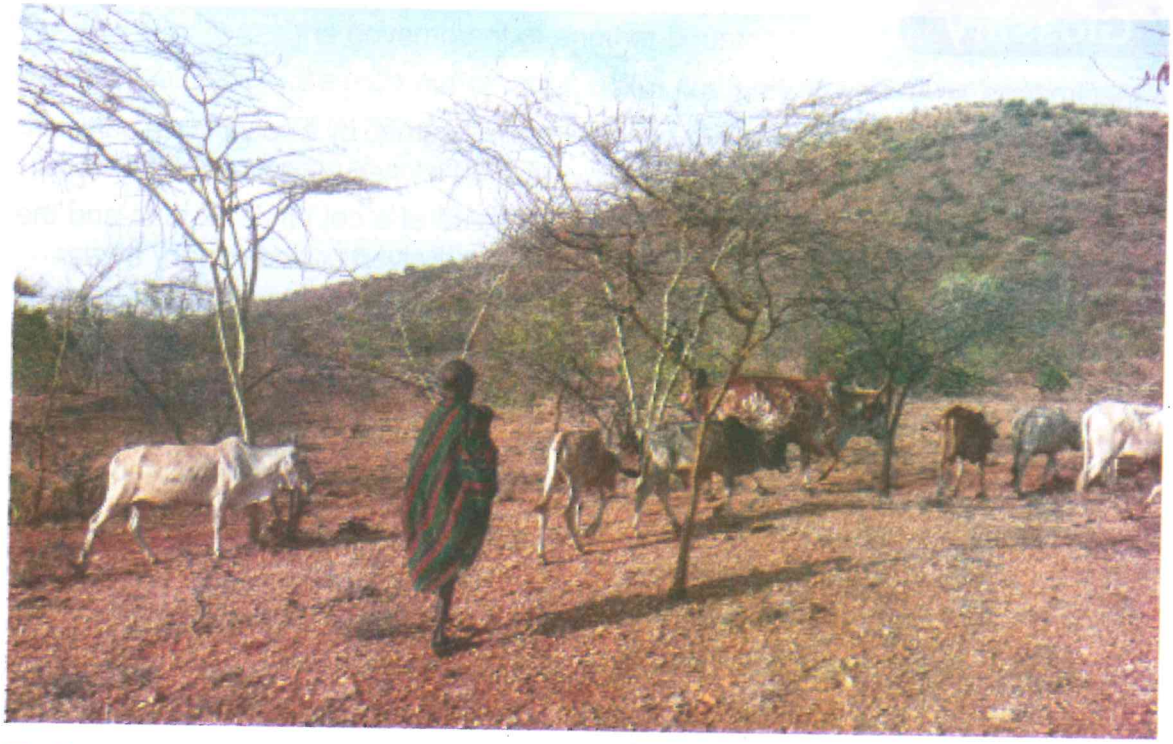
Hydroponics is a good method for growing plants, vegetables and herbs. Compared to the cultivation in soil, the plants also get everything they need to grow through the nutrient's solution delivered directly to the roots.

The various types of hydroponic growing systems include; Aeroponic systems; these require only air and some nutrients. The crops are suspended on a tray which contains water and nutrients at the bottom, with the roots hanging in the air.

Drip system is the most widely used type of hydroponic system. Nutrient-rich water is pumped via small tubes and drips on to the top of the plants, with a timer controlling the submersed pump. In a nutrient film technique system; plants are supported in small plastic baskets in a tray with their roots hanging into a nutrient solution.

Sample Activity of Integration

The ministry of Agriculture, Animal Industry and Fisheries has plans to improve food production in the Karamoja area. The ministry needs to be guided in a special way to make Karamoja self-reliant in food production.



Task:

As a Geography student write an action plan that you will present to the ministry about Karamoja region.

End of Chapter Summary

In this chapter you have learnt that;

- Irrigation is the artificial application of water to the soil through various systems for example tubes, pumps, and sprays.
- Irrigation farming is usually used in areas where rainfall is irregular or where drought is expected. Because irrigated crop yields are double or more than comparable rainfed yields, irrigation is becoming increasingly important in Africa.
- There are three main types of irrigation systems in Africa namely surface, sprinkler and drip irrigation.
- With irrigation farming the problems of the physical landscape can be overcome using the modern technology. In china rice is the main crop grown on irrigated fields.
- Some of the factors that have favoured irrigation farming include; favourable relief, availability of expansive land, availability of water provided by water bodies, availability of enough capital and political stability.

Glossary

Aerial images	any photograph taken from the air
Balance of payment;	the difference between all money earned by a country in a particular period of time and the outflow of money to the rest of the world
Balance of trade;	the difference between the value of a country's exports and the value of a country's imports for a given period usually a year.
Barter trade:	a system of exchange in which people directly exchange goods or services for other goods or services without using money as a medium of exchange
Basin;	a natural depression on the surface of the earth. It may be dry or occupied by water for example a lake or river and its tributaries.
Coastal plain:	generally flat, low-lying piece of land next to the ocean.
Continent;	one of Earth's seven main divisions of land
Contours;	imaginary lines on a map that join places of the same height above sea level.
Cross section	diagram that represents the nature of relief of a particular area as viewed along a given line
Currents;	the continuous, predictable, directional movement of seawater driven by gravity, wind (Coriolis Effect), and water density
Deforestation;	refers to the decrease in forest areas across the world that are lost for other uses such as agricultural croplands, urbanization, or mining activities
Drainage;	the system or process by which water or other liquids are drained from a place
Earth;	the third planet from the Sun and the only astronomical object known to harbor life.
Ecosystem;	a geographic area where plants, animals, and other organisms, as well as weather and landscape, work together to form a bubble of life
Exports;	a good or service produced in one country that is sold into another country
Faults;	a fracture in rock where there has been movement and displacement
Forests;	an area of land dominated by trees
Graben;	a valley with a distinct escarpment on each side caused by the displacement of a block of land downward.
Hydroponics;	a method of growing plants without soil.

Imports; foreign goods and services bought by citizens, businesses, and the government of another country

International trade; the exchange of capital, goods, and services across international borders or territories because there is a need or want of goods or services

Inter-Tropical Convergence zone; is the region that circles the Earth, near the equator, where the trade winds of the Northern and Southern Hemispheres come together (Regions of low pressure belt where North East and South East winds meet.)

Invisible trade; the exchange of physically intangible items between countries for example services.

Irrigation; the artificial process of applying controlled amounts of water to land to assist in production of crops.

Landform; a feature on the Earth's surface that is part of the terrain

Logging; the process of cutting, processing, and moving trees to a location for transport.

Magma; the molten or semi-molten natural material from which all igneous rocks are formed.

Plateau: raised land with a generally flat surface.

Polar region; area around the North Pole or the South Pole.

Preservation: the act or process of keeping something in existence.

Regional integration; regional Integration is a process in which neighboring countries enter into an agreement in order to upgrade cooperation through common institutions and rules, common market and free movement of goods and services.

Relief region: a large area of uniform relief in terms of height and local surroundings.

Ridge; a geographical feature consisting of a chain of mountains or hills that form a continuous elevated crest for some distance

Saddle; the lowest point along a ridge or between two mountain tops and the highest point between adjacent valleys or lowlands.

Spur; a piece of land jutting into a river or stream or a ridge descending from mountains into a valley.

Sun; a star around which Earth and the other components of the solar system revolve`

Trade agreements; any contractual arrangement between states concerning their trade relationships

Trade: the transfer of goods or services from one person or entity to another, often in exchange for money

Tropic of cancer; the most northerly circle of latitude on Earth at which the Sun can be directly overhead at $23^1/_2{}^0$ N of the equator.

Tropic of Capricorn; the circle of latitude that contains the subsolar point at the December solstice. It is $23^1/_2{}^0$ S of the equator

Tropical region; tropics are the regions of the Earth surrounding the Equator

Vertical interval; the vertical distance between two contour lines closest to each other.

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