

**SOCIAL STUDIES FOR TTC SCHOOLS**

OPTION: EALY CHILD HOOD AND LOWER PRIMARY  
EDUCATION (ECLPE) YEAR ONE

STUDENT BOOK

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## **FOREWORD**

The Rwanda Education Board is honoured to avail the Social Studies Student's Book, Year One for Teacher Training Colleges (TTCs) in ECLPE Option and it serves as official guide to teaching and learning of Social Studies.

The Rwandan education philosophy is to ensure that young people at every level of education achieve their full potential in terms of relevant knowledge, skills and appropriate attitudes that prepare them to be well integrated in society and exploit employment opportunities.

The ambition to develop a knowledge-based society and the growth of regional and global competition in the job market has necessitated the shift to a competence-based curriculum. After a successful shift from knowledge to a competence-based curriculum in general education, TTC curriculum also was revised to align it to the CBC in general education to prepare teachers who are competent and confident to implement CBC in pre-primary and primary education. The rationale of the changes is to ensure that TTC leavers are qualified for job opportunities and further studies in higher education in different programs under education career advancement.

I wish to sincerely express my appreciation to the people who contributed towards the development of this document, particularly, REB staff, lecturers, TTC Tutors, Teachers from general education and experts from Local and International Organizations for their technical support.

I take this opportunity to call upon all educational stakeholders to bring in their contribution for successful implementation of this textbook.

**Dr. NDAYAMBAJE Irénée**

**Director General REB.**

## **ACKNOWLEDGEMENT**

I wish to sincerely express my special appreciation to the people who played a major role in development of Social Studies Student's book for ECLPE Option, Year one. It would not have been successful without the support from different education stakeholders.

I wish also to thank Rwanda Education Board (REB) leadership who supervised the textbook writing process. I wish to extend my appreciation to REB staff, Lecturers, Tutors, Teachers from General Education, Experts from Local and International Organizations for their effort during the writing of this textbook.

**MURUNGI Joan,**

**Head of Curriculum Teaching and Learning Resources Department/REB**

## **General Introduction to Student Book**

This text book is part of the reform of the school curriculum in Rwanda: that is changes in what is taught in schools and how it is taught. It is hoped this will make what you learn in school useful to you when you leave school, whatever you do then.

In the past, the main thing in schooling has been to learn knowledge – that is facts and ideas about each subject. Now the main idea is that you should be able to use the knowledge you learn by developing competencies. These competencies include the ability to think for yourself, to be able to communicate with others and explain what you have learnt, and to be creative that is developing your own ideas, not just following those of the tutor and the text book. You should also be able to find out information and ideas for yourself, rather than just relying on what the tutor or text book tells you.

### **Activity-based learning**

This means that this book has a variety of activities for you to do, as well as information for you to read. These activities present you with material or things to do which will help you to learn things and find out things for yourself. You already have a lot of knowledge and ideas based on the experiences you have had and your life within your own community. Some of the activities, therefore, ask you to think about the knowledge and ideas you already have.

In using this book, therefore, it is essential that you do all the activities. You will not learn properly unless you do these activities. They are the most important part of the book.

In some ways this makes learning more of a challenge. It is more difficult to think for yourself than to copy what the tutor tells you. But if you take up this challenge you will become a better person and become more successful in your life.

### **Group work**

You can also learn a lot from other people in your class. If you have a problem, it can often be solved by discussing it with others. Many of the activities in this book, therefore, involve discussion. Your tutor will help to organize these groups and may arrange the classroom so you are always sitting in groups facing each other.

### **Research**

One of the objectives of the new curriculum is to help you find things out for yourself. Some activities, therefore, ask you to do research using books in the library, the internet if your school has it. This, or other sources such

as newspapers and magazines. This means you will develop the skills of learning for yourself when you leave school.

### **Skills lab**

Social Studies subject in the option of ECLPE is practical than being theoretical only. That is why it requires time of skills lab which is a regular time on normal time table when student-teacher are required to complete learning activities working in manageable groups.

During skills lab activity student-teachers are given an opportunity to talk more and get more involved in the lesson than tutors. Student-teachers receive constructive feedback on work done (Tutor gives quality feedback on student presentations).

The Skills Lab prepares student-teacher to complete portfolio assignments on their own after classes. So the classroom activity should connect directly to the portfolio assignment and the tutor during the skills lab makes sure that he/she links the unit with the students.

### **Icons**

To guide you, each activity in the book is marked by a symbol or icon to show you what kind of activity it is. The icons are as follows:



#### **Thinking icon/Introductory activity**

This indicates thinking for yourself or groups discussion. You are expected to use your own knowledge or experience, or think about what you read in the book, and answer questions individually or as a group activity.



#### **Thinking icon/Learning activity**

This icon reminds you link your previous knowledge with the topic you are going to learn. As a student feel free to express what you already know about the topic. What is most important is not giving the right answer but the contribution you are making towards what you are going to learn.



#### **Application activity**

Some activities require you to complete them in your exercise book or any other book. It is time for you to show if you have understood the lesson by answering the questions provided.



### **Skills lab**

This icon indicates a practical activity, such as a role play to resolve a conflict, participating in a debate and following instructions provided by the teacher. These activities will help you to obtain practical skills which you can use even after school.



### **End unit Assessment icon**

This icon invites you to write down the results from activities including experiments, case studies and other activities which assess the attainment of the competences. Tutors are expected to observe the changes in you as student teacher.

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## UNIT 1:

### GENERAL INTRODUCTION TO Social Studies

**Key unit competence:** The student-teacher should be able to explain the components of Social Studies and evaluate its importance.



#### Introductory Activity

Mugabo was born in the village of Masaka to business parents. His father was a shop keeper and his mother a smallscale milk seller. One day, when he was coming from school, he saw a young girl called Keza who was crying..... When Mugabo asked her why she was crying, Keza replied that she was hungry. Mugabo decided to take her to the mother so that she could get what to eat since he was a Social Studies student. When the two arrived, his mother served them with milk and Keza was very happy. From that day, they became great friends.

From this social behaviour, discuss the importance of Social Studies to both students and the entire community.

#### 1.1. Meaning and importance of Social Studies



##### Learning activity 1.1.

1. Using internet and other reference books, carry out research and write the meaning of Social Studies
2. What is the importance of teaching and learning Social Studies in schools?

The inclusion of Social Studies in the curriculum of TTC classes signifies the importance of the subject and the role it plays in a student's life. Social Studies is incorporated in the TTC school curriculum through a combination of subjects like – History, Geography, Economics, Sociology, Foundation of Education.

According to Collins English dictionary, Social Studies is the studies of how people live and organize themselves in society, embracing Geography, History, Economics and other subjects.

Social Studies is also a study of people in relation to each other and to their world. It is an interdisciplinary subject which borrows from many disciplines for example History, Geography, and Economics. It focuses on peoples' relationship in different environments and help learners to become active and responsible citizens.

Social Studies is very important not only to the student teachers but also to the whole society of Rwanda. Some of its importance is explained below:

1. The study of Social studies provides students with the basic knowledge, skills, attitudes and values to continue to learn, make informed decisions, positively participate in society, and achieve personal goals of interest.
2. Social Studies has the capability to guide students' skills progress, stimulate students' interest and awareness, and enhance their thought processes and decision making.
3. Some of the major skills from Social Studies will help students to master include critical thinking, writing, reading, analysis, interpretation, independent thinking, and more. If these skills are practiced consistently throughout a school year, students can begin to master them. It is these skills that will build a foundation for the knowledge, ideas, abilities and stimulated interest that Social Studies can provide for students.
4. Social Studies is also designed to increase historical understanding; turning points, cause and effects, progress and decline, empathy, connecting past and present, and historical agency.
5. Social Studies have the ability to expose students to common biases and multiple perspectives from an early age preparing them for the reality that waits for them after high school, including diversity and dishonesty.
6. Social Studies have the ability to prepare students and adolescents to be productive, successful, and active citizens in a democratic society. All of the skills, ideas, and exposure all funnel into the overall idea of guiding the development of independent, individual, intelligent and informed citizens who can actively participate in society to make necessary changes and improvements.



### Application activity 1.1

From the content learned above, explain other importance of learning and teaching Social Studies in secondary schools.

## 1.2. Components of Social Studies



### Learning activity 1.2

Read a range of textbooks or use internet and explain the main components of Social Studies.

Social Studies is an interdisciplinary integration of Social Sciences and humanities concepts for the purpose of practicing problem solving and decision making for developing citizenship skills on critical social issues.

Social Studies involves the following component: History, Geography, Economics, Moral issues/Ethics, Philosophy, Political science.

**Geography** is the study of earth's landscapes, peoples, places, and environment. It is quite simply about the world which we live. Geography is unique in bridging the Social Sciences with natural sciences.

Geography informs us:

- The places and communities in which we live and work.
- Our natural environment and the pressures they face.
- The interconnectedness of the world and our communities within it.
- How and why the world is changing globally and locally.
- The importance of location in business and decision-making.

**History** is the analysis and interpretation of the human past that enables us to study continuity and change overtime. It is an act of both investigations that seeks to explain how people have changed overtime.

History is a mean to understand the past and the present through the study of History we can investigate and interpret why society develops as it has and determine what influence has infected the past and the present and shape the future. History helps to learn to understand the immense complexity of our world and provide insight to help cope with problem and possibility of the present and future. History is also a bridge to other disciplines. In order to understand the other humanities and the sciences one needs an historical overview of those ones. Historical knowledge is prerequisite fundamental for understanding the world in which we live. History is "magister vitae" teacher of life.

History prepares us to live more humanly in the present and to meet the challenge of the future because it provides us with understanding human condition. History fulfils our desire, to know, understand ourselves and our assistant. It also trains its students to read intelligently, think critically, and writing effectively.

**Economics:** Is a social science that analyze the production of goods and services, it focuses on how economic agents behave or interact and how economic works. Economics is a social science that predicts and studies the human behavior before given economic; situation.

**Moral issues or Ethics:** Moral issues or Ethics refers to an issue concerning how one ought to behave, how other ought to behave or whether a situation proper or improper, Moral issues are defined by society often called norm however if you claim to be a Christian moral issues can or should be defined by biblical principles the question might what is your moral stand that you use?

Below are several moral issues to which a person should examine in and themselves and compare their response biblical teaching

Gambling,	Slanders,
Tattoos	Blasphemy
Lying (comes in several forms)	Fornication
Being drunk or disorderly	The lottery
Adultery	Covetousness
Violence toward to another human being	Homosexuality
Fighting in a war	Pornography
Abortion	Cheating
Envy	Maligning
Illegal drug	False testimony
Stealing,	

**Philosophy:** is a way of thinking about a world the universal and can help to us to learn how to think more creatively. It offers us path to improve our critical thinking skills far beyond anything else. It can also help us to live better in two ways.

Good life can be in past philosophical became better life. It can help us decide how our life can be improved, it provides the meaning of being human being and its benefit and how it can be treated in the best way. It also enables us to make a good choice, to accomplish our goal, live better life, and become better people.

**Political Education:** refers to the knowledge regarding politics. Political Education provides the science of leadership, national integration, creation of good citizen and preparing adult life

**Sociology:** it is the study of group living, cooperation and their responsibilities

**Psychology:** it is the study of the mind, emotions and behavioral process

**Anthropology:** it is the study of the way people live.



### Application activity 1. 2

Explain the components of Social Studies.

## 1.3. Relationship among the components of Social Studies



### Learning activity 1. 3

Read a range of textbooks and found out the relationship among the components of Social Studies

Although the term “**Social Studies**” includes primarily History, Geography, civics, Economics, and sociology, it also deals with materials from other subjects. Thus some elements of Ethics, psychology, philosophy, anthropology, art, literature, and other subjects are included in various courses in the Social Studies.

**Relationship between History and Geography:** History and Geography are specially closed because they represent fundamental dimension of the same phenomena. History view human experience from the perspective of **time** and Geography view human experience from the perspective of **space**. These dimensions of time and space are constantly affecting the other. Key concept of Geography such as location, space, and region are tied inseparably to major idea of History such as time, period and events. Geography and History enable learner to understand how the events and places have affected each other across time.

### **Relationship between Economics and Geography:**

Location and climate have large effects income levels and income growth,

through the effect of transport cost, disease burdens and agricultural productive, among other channels. Furthermore, Geography seems to be a factor in choice of economic policy itself. When we identify geographical regions that are now conducive to modern economic growth, we find that many of these regions have high population density and rapid population increase. This is especially true in populations that are located far from the coast, and thus that face large transport cost for internal trade, as well as population in tropical Regions of high diseases burden.

### **Relationship between Political Science and History:**

The Political Science and History are very close, History without Political science has no fruits, and Political science without History has no roots. History is essential in Political science because it is a record of past events. It provides the raw materials to Political Science. The study of state as it has been can be done only with the help of History. Historical study is essential for understanding Political thoughts, movements and institutions. In general, History is a vast store house of facts and information as from which Political Science obtains data for all its generation. History has also much to borrow from Political Science. Our knowledge of History is a meaningless if the Political bearings of events and movements are not adequately appreciated. E g: History of 19<sup>th</sup> Century Europe can't be fully understood without bring out significance of Movements like Nationalism, Imperialism, Individualism and Socialism.

### **Relationship between Politics/Political Science and Ethics/Morals:**

Ethics/Morals and Political are intimately related, both are normative science.

Ethics aim at supreme good individual well as Political aim at public good. Public good can be obtained through individual good and also individual goods can be attained through public good. Both Ethics and Political are concerned with the idea of justice, liberty, right, and duties etc...

Thus, we can conclude that incorporating Social Studies in the TTC curriculum ensures well-rounded Education of the students.



### **Application activity 1. 2**

What are the relationship between the components of Social Studies



### **End unit assessment**

As a prospective teacher, how you will apply the Social Studies skills to live in harmony with other people?

## UNIT 2:

# UNIVERSE AND THE SOLAR SYSTEM

**Key unit competency:** The student-teacher should be able to distinguish between the components of the universe and the solar system.



### Introductory Activity

One day, students from a certain school moved outside in the evening and all of sudden saw a running star that disappeared. The moon was fading, being covered by dark clouds. They wondered whether there are moons elsewhere and went back to bed. In the morning, the sunrise with golden rays replaced the dark and starry night.

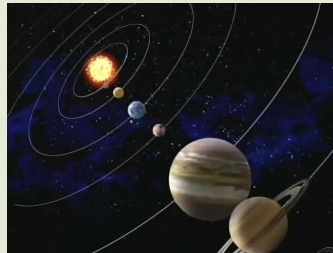
- Identify the heavenly bodies mentioned in the passage.
- Using your experience and the passage above, identify other components of the universe not mentioned in (a) above.

## 2.1. The universe and solar system



### Learning activity 2.1

Study the photograph provided below and use it to answer the questions that follow:



- Explain what the above photograph represents.
- Using the above photograph, explain the meaning of universe.
- Describe the solar system.

### 2.1.1. Definition of the universe and Components of the universe

#### i) Definition of the universe

**The universe** refers to all the space and everything in it. It contains everything that exists, from the smallest particles to the largest structures known. The exact size of the universe is not known. Astronomers estimate that it contains about 100 billion galaxies. Astronomers are experts who study bodies in the sky or outer space. A galaxy is a system of stars, together with gas and dust. These are held together by forces of gravity. Each of the galaxies has an average of 100 billion stars. The origin of the universe is explained through the Big Bang Theory, which happened about 13 billion years ago.

#### ii) The components of the universe

The Universe contains many components, which vary considerably in size, distance from each other and shape.

A **galaxy** is a large scale aggregate of stars, plus some gas, dust, and possibly solar systems, which are held together by gravity.

#### Types of Galaxies

Astronomers classify galaxies into three major categories. **Spiral galaxies** look like flat disks with bulges in their centres and beautiful spiral arms. **The Milky Way** is a spiral galaxy in which our solar system is located. The second type is called **Elliptical galaxies** which are redder, more rounded, and often longer in one direction than in the other, like a football. Finally, Galaxies that appear neither disk-like nor rounded are classified as **irregular galaxies**.

A **globular cluster** is a roughly spherical group of hundreds of thousands to about a million stars, also held together by gravity. Globular clusters seem to be made of very old stars.

A **star** is a ball of hot gas held together by its own gravity. Gravity also causes stars to undergo nuclear fusion within their interior. The energy release causes the star to shine.

A **solar system** is an arrangement of planets and other small bodies around a central star or stars. The planets are kept in place by gravity.

A **planet** is a spherical body which circles a star in a regular orbit.

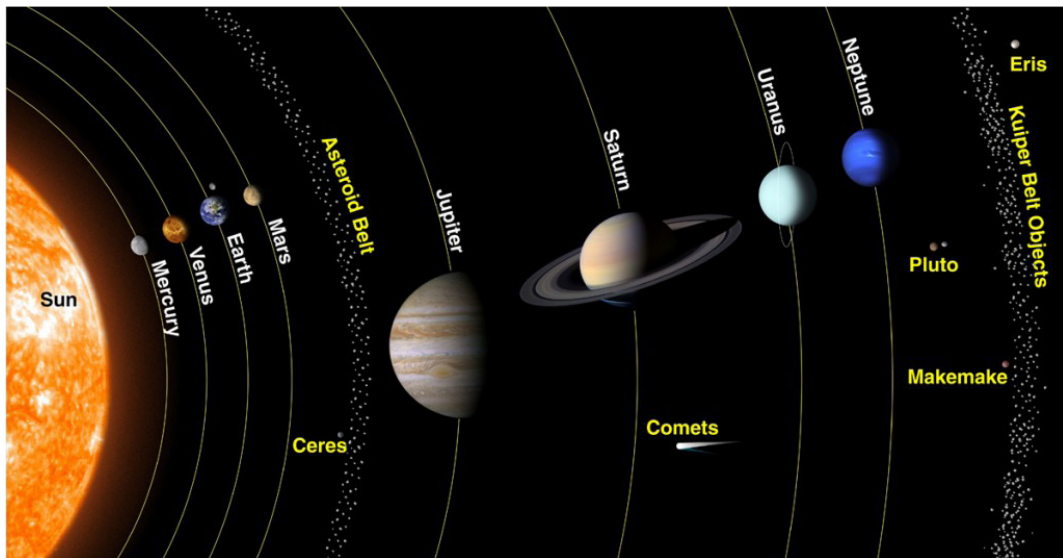
A **comet** is a kilometre-scale mass of frozen gas and rock which orbits the Sun. Comets are leftovers from the formation of the Solar System.

An **asteroid** is a mass of rock and minor amounts of frozen gas. Like comets, asteroids are leftovers from forming the planets. Most asteroids are in orbits

between Mars and Jupiter. They range in size from dust specks to over 300 kilometres in length.

### 2.1.2. Solar system

The term **solar system** is defined as the arrangement of the sun and planets that revolve around it (Sun). The solar system is therefore made up of the following: the sun, planets including the earth, the moon and other heavenly bodies such as asteroids, comets, meteorites, meteors, etc.



*Solar system*

#### i) The sun

The sun as earlier studied, is one of the billions of stars that make up the Milky Way galaxy. It is one of the smallest stars in our universe. However, it is 109 times bigger than Planet earth. It forms the center of the solar system. Its gravitational force keeps planets in their orbital position. All the 8 planets revolve around it.

#### 1) Characteristics of the Sun

The sun as any other heavenly body, has characteristics that distinguish it from the rest of other components of the solar system. These are explained here under:

- It makes or emits its own light/heat.
- It has the diameter of 139,200 km.
- Its temperature ranges from 4000-9000 degrees Celsius.
- Its mass stands at  $1.98892 \times 10^{30}$  kilograms.
- It has a density of 1.4 grams per cubic centimetres.

- The sun is made up of hydrogen and helium.
- Its radius is estimated to be at 695,500 kilometres.
- It takes 25 days to turn once on its axis

## 2) The influence of the sun on the Earth

- It holds the earth in its orbital position.
- It contributes greatly in the balancing of the tidal bulge caused by the moon's gravitational pull and the inertia.
- The sun is the source of the energy that is used by the earth and all that is therein.
- It engines the hydrological cycle.
- It supports life on earth through many ways such as creation of suitable and favourable temperatures.
- The sun influences the general climate at hand due to solar radiation received.
- It contributes to the formation of tides that support in one way or the other to ecosystem and man's activities.

### ii) Characteristics of different planets and their positions

The term **planet** means a large, round object in space that moves around a sun. Planets are grouped into categories as shown below:

Group of planets of the solar system

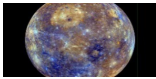
Groups	Planets
Inner planets / Terrestrial planets	Mercury
They are located near the Sun	Venus
They are solide	Earth
they are hot	Mars
they are small in size	
The four inner planets have slower orbits, slower spin, and no rings.	



Outer planets / Jovian planets)	Jupiter
They are located far of the Sun	Saturn
They are gas	Uranus
They are cold	Neptune
They are huge	
The four outer planets have faster orbits and spins, a composition of numerous moons, and rings.	




**Pluto** is known as a dwarf planet. It never developed fully. It is very important to know that Pluto was removed from the list of planets in 2006, because of the following reasons:

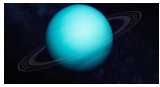
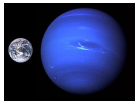
- Its size is too small to be classified as a planet.
- It has no uniform revolution around the sun.
- Its revolution is not circular but spherical in nature.
- Its movement is too slow when compared with the rest of the planets of our solar system.

#### List of planets and their major characteristics

No	Planets	Position in relation to the sun	Characteristics of planets
1	Mercury 	58 million km	<p>It is the smallest and nearest planet from the sun.</p> <p>It completes its revolution in only 88 days.</p> <p>Its diameter is 4,880km.</p> <p>Its total mass is estimated to be <math>330 \times 10^{23}</math> kg</p> <p>It is characterized by great escarpments.</p> <p>Its surface has craters.</p> <p>Its magnetic field is small of about 1% in comparison to that of our earth.</p> <p>It has no natural satellites.</p>

2	<p>Venus</p> 	<p>Between 107 - 108 million km</p>	<p>It is the second planet from the sun.</p> <p>It shares some characteristics with the earth especially in terms of chemical composition and gravity. This explains why it is referred to as the twin planet of our planet.</p> <p>It experiences hot temperatures. It reaches 462°C</p> <p>It orbits an average distance of 108 million km from the sun.</p> <p>To complete its revolution around the sun it takes 225 days.</p> <p>Its atmosphere is poisonous.</p> <p>It has the radius of 6,052 km.</p> <p>Its gravity is 90 % of the earth's.</p> <p>Its mass is <math>4.87 \times 10^{24}</math>kg.</p>
3	<p>Earth</p> 	<p>150 million km</p>	<p>It orbits an average distance of 108,208,000 km.</p> <p>It is the third planet from the sun.</p> <p>It is the only planet known to support life (flora and fauna).</p> <p>It is 93 million miles from the sun.</p> <p>It has one natural satellite called moon.</p> <p>It has the diameter of 7926 miles.</p> <p>It is the fifth largest planet in the solar system.</p> <p>Its greatest part is covered by water.</p> <p>It completes its revolution within 365 days.</p> <p>It completes its rotation on its axis within 24 hours.</p>

4	<p>Mars</p> 	228 million km	<p>It is slightly cooler.</p> <p>It is the 7<sup>th</sup> largest planet in the solar system.</p> <p>It has the diameter of 4222 miles.</p> <p>It takes 686.98 earth days to complete its revolution around the sun.</p> <p>Its rotation on its axis takes 24.6 earth hours.</p> <p>It has hard rock and completely dry surface.</p> <p>It has two satellites.</p>
5	<p>Jupiter</p> 	778 million km	<p>It is the largest planet in the solar system.</p> <p>It has 63 satellites.</p> <p>It is composed of hydrogen and helium.</p> <p>It has the diameter of 88,729 miles.</p> <p>It takes 9.84 earth hours to complete its rotation on its axis.</p> <p>Its revolution around the sun takes 11.862 earth years.</p>
6	<p>Saturn</p> 	1,427 million km	<p>It is composed of liquid and gas.</p> <p>It has rings composed of billions of ice particles.</p> <p>It is 550.9 million miles from planet earth.</p> <p>It takes 10.2 earth hours to complete its rotation.</p> <p>It is the second largest planet in our solar system.</p> <p>Its diameter is 74,600 miles.</p> <p>It takes 29.456 earth years to complete its revolution around the sun.</p>

7	<p>Uranus</p> 	2,870 million km	<p>It is the 3<sup>rd</sup> largest planet in our solar system.</p> <p>Its surface is not solid.</p> <p>It has a diameter of 58,901 km.</p> <p>It is composed of hydrogen, helium and methane.</p> <p>To complete its revolution around the sun it takes 84.02 earth years.</p> <p>Its rotational period on its axis is 17.9 earth hours.</p>
8	<p>Neptune</p> 	4 , 4 9 7 million km	<p>It is 1.14 times the surface of the earth.</p> <p>It completes its revolution within 164.8 earth years.</p> <p>It is the farthest planet in our solar system.</p> <p>It takes the eighth position.</p> <p>It has a mass of <math>1.023 \times 10^{26}</math>kg.</p>



### Application activity 2.1

1. Imagine you represent your school in Geography competition; explain what you would tell others about the difference between inner and outer planets.
2. “The earth is the only planet that supports life” Explain.

## 2.2. Earth



### Learning activity 2.2

Read the following passage and answer the questions provided.

Every day the sun rises in the east and sets in the west. This process led many people in the past to think that the sun is moving, and the earth is fixed. The sun moves around the earth. But with the advancement of science, this has been proved that the sun itself is moving and the earth has also been moving. Later it has been revealed that the sun does not move around the earth, rather the earth moves around the sun.

With the help of your knowledge and skills acquired in previous studies answer the following questions?

1. How many movements does the earth make?
2. Describe effects caused by the rotation and revolution movements.

#### i) Peculiar elements of the earth

The peculiar elements of the earth are the features or characteristics that belong to the only earth planet making it unique.

The **peculiar elements** of the earth are outer parts of the earth. They include the following:

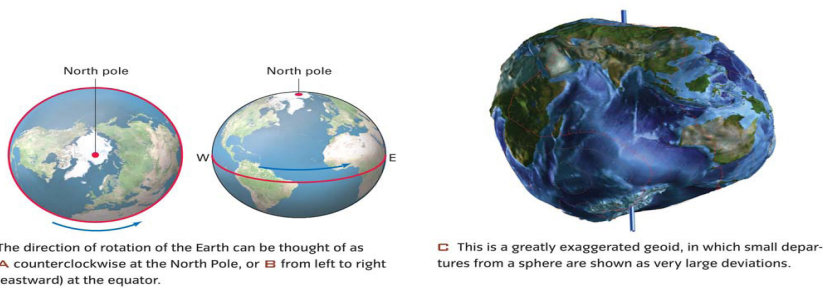
1. Hydrosphere or water bodies
  2. Lithosphere or Land and rocks
  3. Atmosphere or Gases
  4. Biosphere or flora and fauna
- **Hydrosphere:** This stands for all the waters found on the earth surface. It covers a big part of the earth's surface. It includes: Lakes, Seas, Oceans, Wetlands, Rivers, Wells, Streams, Clouds.
  - **Biosphere:** This is known as **ecosphere**. It is a part of the earth that includes the totality of life on the earth (Animals, Plants and Man).
  - **Lithosphere:** This is the solid part of the external area of the earth. It is made up of the crust and a small percentage of the upper mantle (Land, Rocks, Soils and Minerals).
  - **Atmosphere:** It describes the zone occupied by air or gases that surround the earth. This zone is composed of gases such as:

Nitrogen, Oxygen, Argon, Water vapour, Carbon dioxide, Helium, Methane.

## i) Earth's movements

### 1. Rotation of the Earth

Rotation of the Earth is defined as the movement of the Earth spinning on its own axis. This movement of the Earth on its own axis is in an anticlockwise direction during 24 hours. The earth takes 24 hours to complete  $360^\circ$ . At the equator the earth rotates at a speed of 1676 km and zero km at the poles per hour.



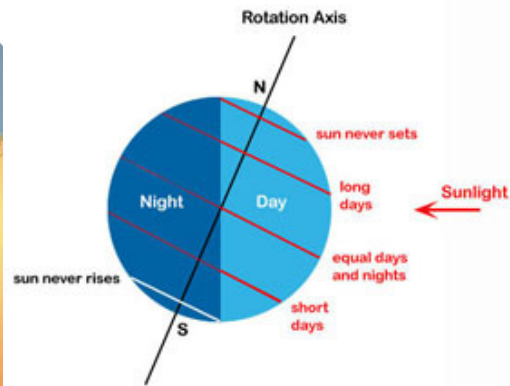
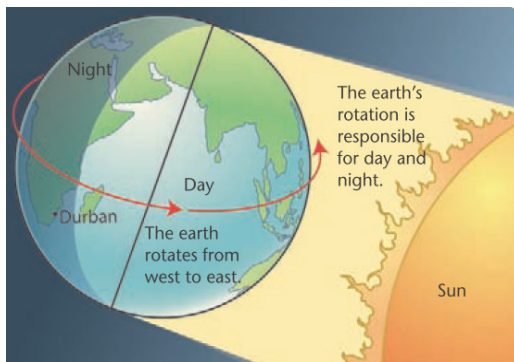
*Rotation of the earth in anti-clockwise*

### The effects of rotation of the earth

As the Earth turns around its axis, it affects some processes on the earth's surface and other associated celestial phenomenon. Some effects of the earth's rotation are:

- **Rotation causes day and night**

Earth's rotation on its axis causes day and night. The one half of the Earth that faces the sun has **day time**, while the opposite half facing away from the Sun has **night time**.



Day and Night

- **Rising and falling of ocean water (tides):** Rotation of the earth with the gravitation force pull of the sun and the moon, act on the ocean water to produce tides which may be high or low tides.
- **Deflection of wind and ocean current (Coriolis Effect):** Rotation causes winds to be deflected to the right in the Northern hemisphere or to the left in southern hemisphere whenever they cross the Equator. This deflection is called the **Coriolis Effect**.
- **Time difference between longitudes:** One round of the Earth is completed after turning  $360^\circ$ . Thus, for 1 hour, the Earth takes:  $360^\circ : 24 = 15^\circ$ .

For every  $1^\circ$ , this gives: 1 hour: 1 = 60 minutes over  $15^\circ = 4$  minutes (time taken for the Earth to rotate through  $1^\circ$ ).

For example, supposing that the local time at Greenwich Meridian is 12:00. What is the local time at Kigali which is on longitude  $30^\circ$  East?

### Solution

One should first find the difference in degrees between the two longitudes:  $(30^\circ - 0^\circ) = 30^\circ$

Secondly change this into the difference multiplying by 4 minutes (this is the time taken for Earth to rotate through  $1^\circ$ ). It is  $\frac{30 \text{ degrees} \times 4 \text{ minutes}}{1 \text{ degree}} = 120 \text{ min}$

Thirdly change this to hours by dividing by 60 minutes:  $\frac{120 \text{ min}}{60 \text{ min}/\text{hour}} = 2 \text{ hours}$

Finally add 2 hours to the original time:  $12:00 + 2 \text{ hours} = 14 \text{ hrs}$ . The time at Kigali is: **14:00 PM**

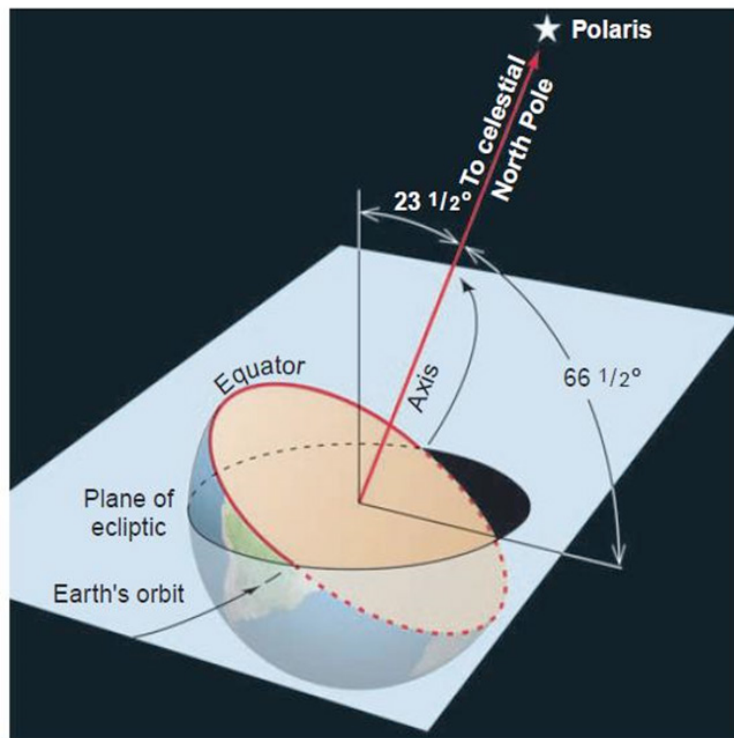
- **Temperature difference:** Due to the spherical shape, the parts of the

Earth located in the tropical areas between  $23.5^\circ$  North and south of the equator get direct sunlight all the year while regions located north and south of the mentioned altitude get less rays during the year.

## 2. Revolution of the Earth

The revolution of the earth is the movement of the earth around the sun.

Earth revolves around the Sun along an oval-shaped path called an orbit. The area of the oval-shaped path is called Plane of the ecliptic, in which the axis of the Earth is tilted at an angle of  $23^\circ 27'$ . Earth takes 365 days and 6 hours or one year to complete one revolution, at a speed of 106,260 km/h around the Sun (30 kilometres per second).



*Earth's ecliptic plane*

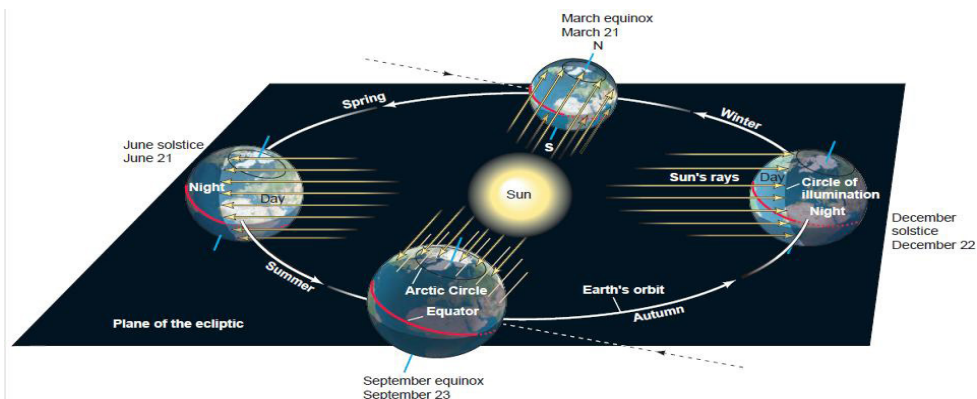
**The Leap year** is the year with 366 days which came after four years where February has 29 days instead of 28 days due to adding of the 6 hours of rotation of each year to make one year after 4 ordinary years.

### The consequences of the revolution

- **Determination of seasonal variation:** The whole year has been divided into four divisions. Each of such division is known as a season. There are four seasons namely: summer, autumn, winter, and spring.

Before explaining the four seasons, it is important to explain first the two concepts of solstice and equinox:

- **Solstice** is either of two times of the year at which the sun reaches its highest or lowest point in the sky at midday, marked by the longest and shortest days over the tropics. Solstice occurs on 21<sup>st</sup> June and 22<sup>nd</sup> December.
- **Equinox** occurs two times in the year (around 21<sup>st</sup> March and 23<sup>rd</sup> September) when the sun is above the Equator, day and night have equal length. There are **spring** and **autumn** equinoxes.



#### 1.21 The four seasons

The Earth revolves once around the Sun in a year, passing through each of its four seasons. The four seasons occur because the Earth's tilted axis is always pointed toward the same point in space, very close to the North Star. That is, a line through the Earth's axis of rotation at each season is parallel to a line through the axis at any of the other seasons. Because of this fixed direction of rotation, the northern hemisphere is tipped toward the Sun for the June solstice and away from the Sun for the December solstice. Both hemispheres are illuminated equally at the equinoxes.

#### *The four seasons*

- **The four seasons**

**Summer** is the hottest of the four temperate seasons, falling after spring and before autumn. At the summer solstice, the days are longer, and the nights are shorter, with day-length decreasing as the season progresses after solstice. When it is summer in the northern hemisphere, it is winter in the southern hemisphere, and vice-versa.

**Winter** is the coldest season of the year in polar and temperate zones. It occurs after autumn and before spring in each year. Winter is caused by the axis of the Earth in that hemisphere being oriented away from the Sun. when it is winter in the Northern Hemisphere, it is summer in the Southern Hemisphere, and vice versa. In many regions, winter is associated with snow and freezing temperatures. The days on which this occurs have the shortest day and the longest night with a day length increasing as the season processes after the solstice.

**Spring** is one of the four conventional temperate seasons, following winter and preceding summer. Days become longer, and weather gets warmer in

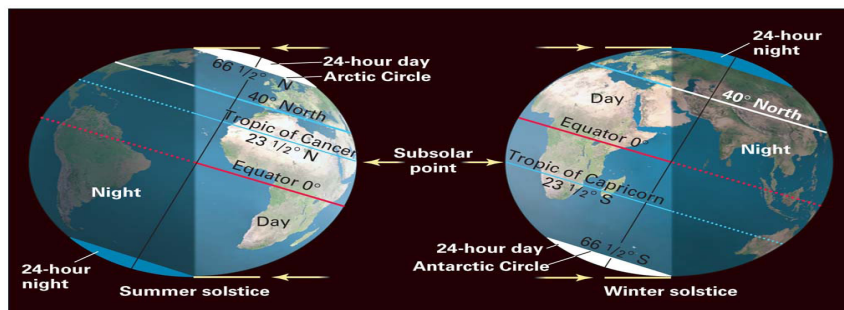
the temperate zone because the Earth tilts towards the Sun. In many part of the World plants grows and flowers bloom.

**Autumn** is one of these seasons of the year between summer and winter during which temperatures gradually decrease and most vegetative growth decrease. It's the season when the days get shorter and colder, and everything turns brown and drop.

- **Varying length of day and night at different times of the year:** The revolution causes variations in the length of the day and night over different latitudes. When the sun is in the southern hemisphere i.e. overhead the tropic of Capricorn, the latitudes in the northern hemisphere receive less hours of sunlight (daytime) but more hours of night time; while the southern hemisphere receives more hours of heating hence more hours of daytime.

During the summer solstice, day time is longer than night time at latitude beyond equator the hours of daytime increase from tropic towards poles (from 12hrs to 24hrs at the Arctic Circle and beyond). During the winter solstice, night time is longer than day time at latitude beyond equator.

Norway is known as the **land of the midnight sun** because the sun does not go below the horizon or comes above it on 21<sup>st</sup> June



*Variation of lengths of hours in different time based on hemisphere and seasons*

- **Climatic zone:** Climate zones are divisions of the Earth's climates into general climate zones according to average temperatures and rainfall. The three major climate zones on the Earth are the Polar, Temperate, and Tropical zones. Temperatures in these three climate zones are determined mainly by the location, or latitude. The reason why the equatorial zone is hotter than the poles is that sun's rays fall vertically at the equator and obliquely at the poles.

**Example**, the stations around the equator such as Kisangani, Masaka, Libreville, and Manaus experience hot temperatures while areas such as Alaska, Greenland and Siberia near the poles experience cold temperature.



### Application activity 2.2

1. Explain why it is very important to conserve the peculiar elements of planet earth.
2. Rusizi is 28 E and the time is 6:00 am. What is the time in a place which is located at 60°W?
3. Explain why some parts of the earth's surface are getting hotter while others get cool and cold.



### Skills lab

With reference to the relief features where you live, prepare an appropriate economic activity you can do.



## End unit assessment

1. Study the photograph shown below.



- a) Identify the heavenly bodies shown in the photograph.
  - b) Mention and describe the heavenly bodies found in the universe that are not shown in the photograph.
3. Examine the importance of the atmosphere.
  4. Explain the impact of rotation movement on human activities.

## UNIT 3:

### FORMATION OF RELIEF FEATURES OF RWANDA

**Key Unit competence:** The student-teacher should be able to explain the formation of major relief regions of Rwanda and evaluate their effects on human activities.



#### Introductory Activity

With reference to the experience and skills acquired in the previous lesson, answer the following questions:

1. Name the four provinces of Rwanda.
2. Describe the major relief regions of Rwanda.
3. Identify the importance of relief features in Rwanda.

#### 3. 1. General presentation of Rwanda and the relief regions of Rwanda.



#### Learning activity 3.1

1. Use a map of Africa to locate Rwanda and write down the neighbouring countries.
2. State the latitudinal and longitudinal locations of Rwanda.
3. What is the size of Rwanda compared to the neighbouring countries?



## ii) Administrative division

Rwanda is an independent country since 1962. The country is divided into 5 administrative divisions known as provinces. There are 4 provinces named after their geographical positioning, that is Eastern Province, Western Province, Southern Province, Northern Province. Kigali city is the fifth administrative division and serves as the capital city of Rwanda. These provinces are further subdivided into 30 districts and 416 sectors, 2 148 Cells and 14 837 Villages.

**Below is a table that summarize the administrative division in Rwanda:**

Province	Districts	Sectors	Provincial H/Q
Kigali city	Nyarugenge Kicukiro Gasabo	35	Nyarugenge district in Nyarugenge Sector
Eastern province	Nyagatare Gatsibo Kayonza Kirehe Ngoma Rwamagana Bugesera	95	Rwamagana District in Kigabiro Sector
Western province	Karongi Rubavu Rutsiro Nyamasheke Nyabihu Ngororero Rusizi	96	Karongi District in Bwishyura Sector

Southern province	Muhanga Kamonyi Ruhango Nyanza Huye Nyamagabe Nyaruguru Gisagara	101	Nyanza District in Busasamana Sector
Northern province	Musanze Gakenke Rulindo Gicumbi Burera	89	Musanze District in Muhoza Sector

Each of the provinces is headed by a governor. The districts are headed by mayors and the sectors are headed by the executive secretaries.

### 3.1.2. The relief regions of Rwanda

In Geography, the term relief may be defined as “the variations in elevation and slope of an area of the Earth’s surface”. Example, when someone is talking of an area as being flat, gently sloping or mountainous, specifically he/she is speaking of the relief of that area.

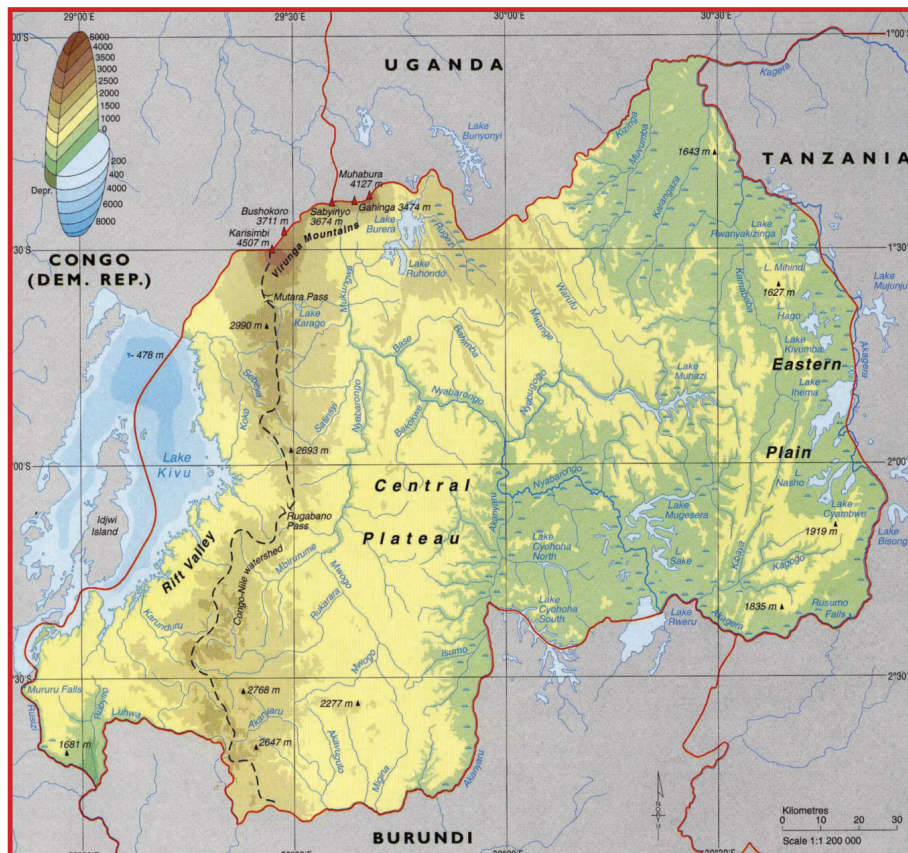
As you know, the surface of the Rwanda is not flat. Some places are high and some places are low. That’s why Rwanda is known as a “*country of thousand hills*”. it is largely mountainous with altitude varying between 900 m (Bugarama plain, the lowest place) and 4507m (the top of Karisimbi volcano, the highest point). The Rwandan relief is characterized by high altitude, which decreases towards the western and eastern extremities.

Rwanda is divided into 6 physiographic regions namely:

- The Congo-Nile Crest
- The central plateau
- The Eastern plateau
- The volcanic region (Birunga)
- The rift valley

- The Bugarama plain

## Major relief regions of Rwanda



Source: Macmillan (2006), *Geography Atlas, Malaysia*

The relief regions of Rwanda are described as follows:

### 1. The Congo-Nile crest

The term “crest” is defined as a long, narrow, elevated section of the earth’s surface, such as a chain of hills or mountains or the divide between adjacent valleys.

The Congo-Nile crest is a highland that divide between the waters of river Congo to the west and waters of river Nile to the East. It is an extensive area of about 160 km in length (from north to south) and 20 to 50 km wide.

It is found in one part of Nyamagabe, Karongi, Rutsiro and Nyabihu districts and all the Ngororero and Nyaruguru districts.

It lies between altitude of 1200 m (pass or col of Rugabano) in Karongi, the lowest point and 3000 m found at mount Muhungwe in Nyabihu District which is the highest point non-volcanic above the sea level.

## 2. The central plateau

The central plateau is also known as high plateau and it is higher in Northern Province where it is called the highland of Buberuka with altitude between 2000 and 2500m (e.g. in Gicumbi and Burera). This region moves from the Eastern slope of the Congo Nile Crest up to the border of Kigali. This means that it covers areas such as Kamonyi, Muhanga, Nyanza, Ruhango, Huye, Gisagara, Rulindo, and Gicumbi. In this region, the landscape is characterized by flat topped hills that are separated from each other by a wide range of river valleys.

It lies between altitudes 1500 to 2500m above the sea level and it covers more than half of the country (over 80 km wide).

## 3. The eastern plateau

This relief region neighbours the central plateau extending in all the eastern province of Rwanda up to Uganda and Tanzania frontiers. The eastern plateau is also called low plateau.

The lowland areas found in this part are largely dominated by marshes, rivers and lakes. Several small hills with flat and elongated tops with gentle slopes are also the main distinct features in this region. The region has an altitude varying between 1000 and 1500 m above the sea level.

## 4. The volcanic region or the Birunga region

The volcanic region as suggested by its name, it is associated with the presence of volcanic ranges, hence the name volcanic region. This region covers about 90 kilometres from north to west including the highland areas in the north in Gicumbi district. This region is found in the North West of Rwanda and lies between 3000 to 4507 m above the sea level.

This region extends in Eastern part of DRC and South West of Uganda. This creates a beautiful scenery chain of volcanoes. Some volcanoes are still active; others are dormant while others are in extinct state. Below are the major volcanoes in Rwanda:

- a) **Karisimbi (4507m)** is classified as a complex volcano and the highest of all volcanoes in Rwanda. It has a crater lake of about 120 m in diameter. It usually has crystals that resemble shells hence the name Karisimbi which means white shell.
- b) **Bushokoro/Bisoke (3711m)** is a complex volcanic cone. Due to its past volcanic activity, it is classified as dormant volcano and it has the biggest Crater Lake among volcanoes in Rwanda. Bisoke and Karisimbi are volcanoes which are found in the boundary between Rwanda and DRC.

**c) Sabyinyo (3634m)** Sabyinyo presents at the top necks of resistant rocks that resemble teeth hence the name Sabyinyo due to its slopes and crater have been badly eroded by surface run off and streams. Sabyinyo is the oldest and most extinct of all the volcanoes in Rwanda. It lies on the border between Uganda, DRC and Rwanda. It doesn't have any crater lake. The slopes of Mount Sabyinyo are habitat to the endangered mountain gorillas.

**d) Gahinga (3474 m)** this volcano lies between Muhabura and Sabyinyo. It is one of the smallest and the dormant volcano in Rwanda and estimated to be the smallest in the Virunga chain. This volcanic mountain is situated on the border of Rwanda and Uganda. It is known that at the peak there is a swampy caldera measuring about 180 meters wide. It has got a small crater lake.

**e) Muhabura**, standing at 4,127 m above sea level makes it the second highest mountain in all five mountains of Birunga mountain ranges behind Karisimbi Mountain. The Muhabura is the most visible volcano throughout the whole of Rwanda especially when the sky is clear. This volcano is the youngest of all the volcanoes in Rwanda. It is a dormant and has a crater lake of about 100 m in diameter. It is found on the border between Rwanda and Uganda.

## 5. The rift valley region

**A rift valley** is a linear shaped lowland between several highlands or mountain ranges created by the action of a geological fault. Rift valley is found in the west and south western part of Rwanda. It contains Lake Kivu, the biggest Lake of Rwanda. The depression /rift valley or graben is practically surrounded by the highland with the steep slopes.

The rift valley lies between 1460m and 3000m of altitude.

## 6. The plain of Bugarama

It is the lowest and hottest area of the country lying on altitude of 900 m above sea level. This plain is made up of sedimentary rocks located in the extreme south west of Rwanda. This means that this plain exists on the old alluvial deposits of sedimentary rocks laid down by sediments from river Rusizi and its tributaries like river Rubyiro.



### Application activity 3.1

1. Explain how landlockedness of Rwanda affect its economic development.
2. Using your skills and knowledge, draw a sketch map of Rwanda and locate the following districts: Muhanga, Rwamagana, Nyagatare, Rusizi and Kirehe.

## 3.2. Problems related to the relief features of Rwanda and their importance



### Learning activity 3. 2

1. Identify problems associated with relief features in Rwanda.
2. Explain the importance of relief features in Rwanda.

#### 3.2.1. Problems related to the relief features of Rwanda

Despite their importance, the relief features of Rwanda also pose the following problems.

- Faulted landscapes may hinder transport and communication due to steep nature of the landscape.
- Where high mountains are found, it is difficult to practice agriculture
- Faulting causes volcanic eruptions which are destructive.
- Vulcanicity may cause violent earthquakes.
- Vulcanicity encourages soil erosion due to high and steep slopes that are formed.
- The leeward sides of the mountains formed receive very little rainfall.
- Building roads, electricity lines, data cable and coming up with different forms of infrastructure on sloping land is expensive.

#### 3.2.2. Importance of the relief features to the development of Rwanda

- The plateaus and basins formed by folding have facilitated growth of crops; human settlements and the construction of transport and communication networks.

- Landforms features such as the belt of Congo-Nile crest and other highlands modify the climate of the surrounding areas especially through orographic rainfall.
- Formation of lakes and swamps in synclinal valleys has facilitated fishing and sand harvesting.
- Folding leads to the formation of hills which are tourist attraction site. Tourists contribute to the economy by bringing in foreign exchange that supports other sectors of the economy.
- Folded highlands and plateaus have led to a multiplication of space of various socio-economic activities in Rwanda.
- Landforms due to faulting such as rift valleys and others are important sceneries which attract tourists.
- Features such as Lake Kivu act as sources of water for river Rusizi. Rift Valley Lakes provide water for domestic as well as industrial uses.
- Escarpments and fault scarps along rivers such as River Rusizi are important features for the generation of hydroelectric power.
- The rift valley shoulders can help in the formation of relief rainfall.
- Volcanic landscapes like the volcanoes in the Northern Province provide beautiful sceneries that attract tourists who bring in foreign exchange to the country.
- Volcanic landforms like the lava plateaus break down giving rise to fertile volcanic soils that are suitable for plant growth.
- Volcanic mountains modify the climate of the surrounding areas through formation of rainfall.
- Lava from volcanic eruptions blocked the flow of rivers leading to the formation of lava dammed lakes such as Lake Burera and Ruhondo.
- Volcanic landscapes are associated with minerals such as Wolfram, Tungsten and Tin.



### Application activity 3.2

1. Explain how Rwandans can benefit from volcanic features.
2. Describe the relationship between human activities and relief features.



## Skills lab

With reference to the relief features where you live, prepare an appropriate economic activity you can do.



## End unit assessment

1. Explain how highland areas influence climate modification in Rwanda.
2. Rwanda occupies a strategic location in East- central Africa, but it is a landlocked country. Suggest what Rwanda can do to overcome the situation.
3. Examine the ways by which farmers could control soil erosion on sloppy areas.

**Key Unit competence:** The student-teacher should be able to compare major types of rocks in Rwanda and evaluate their importance.



### Introductory Activity

Observe the rocks provided below and answer the following questions:



1. Identify the types of rocks given above.
2. In which category can they be classified?
3. Give the characteristics of rocks.
4. Explain the economic importance of rocks in Rwanda.

## 4.1. Types of rocks in Rwanda and their characteristics



### Learning activity 4. 1

Use observation of rock samples provided to you and make research to identify the types of rocks found in Rwanda and their characteristics.

The largest parts of Rwanda are made up of rocks that changed their mineralogical and chemical compositions due to the metamorphism. The examples include **schist and quartzite** that were exposed forming granites which occupy the greatest part of Rwanda.

The rock types of Rwanda are grouped into three distinct categories:

#### 1. Igneous rocks

They are formed by volcanic activities in the north western and the south western regions of Rwanda. Igneous rocks are rocks formed by cooling of molten material from a volcano or from deep inside the earth. This molten material from inside the earth is known as magma. Igneous rocks are also called magmatic rocks or volcanic rocks.

They are in two types:

##### i. Extrusive rocks

They are formed when lava solidified on the surface. These extrusive rocks are basalt, obsidian, ashes and cinders, etc. They are abundant in Northern Province (Musanze and Burera) and in Western Province (Nyabihu, Rubavu, Rutsiro, Rusizi and Nyamasheke districts). They are dark because they come from basic and fluid lava.

##### ii. Intrusive or plutonic rocks

They are formed when magma solidifies in deep rock layers before reaching the surface land. E.g. granite, diorite, gabbros, etc. They are found under the highlands of Rwanda and they appear on the steep slopes. There are some igneous intrusions in some parts of Rusizi and the shores of Lake Kivu. They are used as quarries to get stones, sand, etc.

#### Characteristics of igneous rocks

Igneous rocks have the following characteristics:

- They have a lot of minerals.
- They do not have strata or layers.

- They do not contain fossils (fossils are remains of plants and animals fixed in rocks).
- The number of joints increases upwards in any igneous rock.
- Igneous rocks are mostly associated with volcanic activities and are mainly found in the volcanic zones. That is why they are also called volcanic rocks.

## **2. Sedimentary rocks**

Sedimentary rocks are the result of the accumulation of small pieces broken off from pre-existing rocks (igneous rocks, metamorphic rocks and sedimentary rocks) or precipitation of dissolved minerals. Sedimentary rocks form when sediments become pressed or cemented together or when sediments precipitate out of solution.

Most of sedimentary rocks found in Rwanda are mechanically formed because they are deposited by running water in the valleys and in depression where they are known as alluvium. E.g. silt, sand, sandstones, mudstones, etc. There are also organically formed sedimentary rocks by decomposition of organic matter.

Examples: Limestone in Bugarama plain and close to Nyabarongo valley near Kigali, peat in many swamps of Rwanda such as Akanyuru, Akagera, and Methane gas in Lake Kivu are extracted from sedimentary rocks.

### **Characteristics of sedimentary rocks**

Sedimentary rocks have the following characteristics:

- Sedimentary rocks are the product of other rocks that were already formed;
- They appear in the form of layers or strata;
- They are formed from materials from the older rocks, plant and animal remains;
- Sedimentary rocks are found over the largest surface area of the earth;
- Sedimentary rocks have various minerals because they are a product of different sources;
- Most of the sedimentary rocks allow liquids and gases to pass through them (permeable and porous);
- Sedimentary rocks are characterized by different sizes of joints;
- Sedimentation units in the sedimentary rocks having a thickness of greater than one centimetre are called beds.

### 3. Metamorphic rocks

They are formed from either igneous or sedimentary rocks under the influence of greater pressure and heat. Most of metamorphic rocks are found under the highlands of Rwanda (Congo-Nile Crest, Central plateau, etc.) because they are caused by pressure and heat from compressional tectonic forces and molten rocks in motion under the crust (Birunga region). E.g. quartzite, slate, gneiss, schist, etc.

In Rwanda, there are several quarries where we exploit metamorphic rocks. Almost 80% rocks of Rwanda are metamorphic and igneous in origin. These rocks found in Rwanda contain minerals necessary for economic development of Rwanda.

#### Characteristics of Metamorphic Rocks

Metamorphic rocks present two distinctive physical characteristics: **Foliated metamorphic rocks** and **Non-foliated metamorphic rocks**. Foliated metamorphic rocks such as gneiss, phyllite, schist and slate have a layered or banded appearance that is produced by exposure to the heat and pressure. Non-foliated metamorphic rocks such as hornfels, marble, quartzite do not have a layered or banded appearance.

Metamorphic Rocks have also the following characteristics:

- They are harder than the original rocks and are not easily eroded;
- They do not split easily;
- They contain minerals;
- Some are made up of just one mineral, for example, marble;
- They have a different texture from the original rock.



#### Application activity 4.1

1. Identify an area in Rwanda where igneous rocks are mostly found.
2. Observe rocks found in your environment and explain their characteristics.

## 4.2. Importance of rocks in Rwanda



### Learning activity 4.2

Use geographical documents and internet to identify the importance of rocks..

Rocks are very important to man in the following ways:

- **Formation of soils.** Rocks are broken down into tiny particles through the process of weathering. This leads to the formation of soil that supports plant growth. For example, the igneous rocks around the volcanic mountains in the Northern and Western provinces of Rwanda have been weathered leading to the formation of fertile volcanic soils. These soils have supported crop production in these areas. These mountains include Mt Muhabura, Karisimbi, Bisoke and Sabyinyo.
- **Construction materials.** Rocks are used in various ways in the building of infrastructure. For example, igneous and Sedimentary rocks are obtained from quarries to provide stones that are needed in building. Some coloured stones are used to decorate houses and to construct fences. Some igneous rocks especially in Musanze area are used in the construction of fences around homesteads to provide security.
- **Tourism development.** There are many rocks in Rwanda that attract tourists from all over the world. For example, there are wonderful cliffs and rocks such as “Ibere rya Bigogwe (Bigogwe Breast), Urutare rwa Ndaba (Ndaba Rock) and Urutare rwa Kamegeri (Kamegeri Rock).
- **Fertilizers:** rocks are very useful in the manufacturing of fertilizers. For example, phosphate bearing rocks are used to make phosphate fertilizers.
- **Minerals.** Rocks provide humans with valuable minerals that are used in various ways. For example, micro- diamonds in Gicumbi and Tin in Muhanga are Igneous rocks. These are exported hence earning foreign exchange.
- **Sources of energy.** Peat coal is used as a source of energy in some homes in Rwanda. Hot rocks found beneath the Earth’s surface are responsible for the generation of geothermal energy. This project is still underway in Rwanda but has already picked up in places like Eburru in Kenya.

### There are some disadvantages of rocks such as:

- Areas with many rocks such as outcrops make it difficult to develop transport and communication infrastructure, especially roads. This is clearly witnessed in some parts of Northern and Western provinces of Rwanda where some areas are inaccessible due to their rocky nature.
- In steep areas, falling rocks lead to serious accidents where houses or homes are destroyed. Sometimes people and animals lose their lives.
- It is difficult and expensive to construct houses in rocky areas. Sometimes people give up on such important developments.
- The formation of sedimentary rocks leads to creation of young soils which barely support agriculture; etc



#### Application activity 4.2

Discuss the disadvantages of rocks.



#### Skills lab

Make a short study on rocks and select the best rock suitable for house construction.



#### End unit assessment

1. "Rocks are good and bad" discuss this statement in relation to the context of Rwanda.
2. With detailed explanation, show how the following rocks were formed in Rwanda:
  - a) Igneous rocks
  - b) Sedimentary rocks
  - c) Metamorphic rocks

## UNIT 5:

## SOILS IN RWANDA

**Key Unit competence:** The student-teacher should be able to compare major types of soil in Rwanda and assess their importance.



### Introductory Activity

Soil is very important and a valuable resource for every human being.

1. How can you define soil?
2. Identify different types of soils in Rwanda.
3. Analyse the causes of soil erosion in Rwanda?

### 5.1. Definition of soil, types of soils and where they are found



#### Learning activity 5.1

The soil types determine how and what we can grow and are the bases for all farming.

1. Identify any two types of soil found in Rwanda.
2. Describe any type of soil identified above.

**Soil** is defined as the thin upper layer of earth in which plants grow, a black or dark brown material typically consisting of a mixture of organic remains, clay, and rock particles.

#### Types of soils and where they are found

Generally, there are four different types of soils: clay soils, silty soils, sandy soils and Loam soils. Clay soils, silty soils, and sandy soils are basic while loam soil is a combination of the three: clay, silty, and sandy soils.

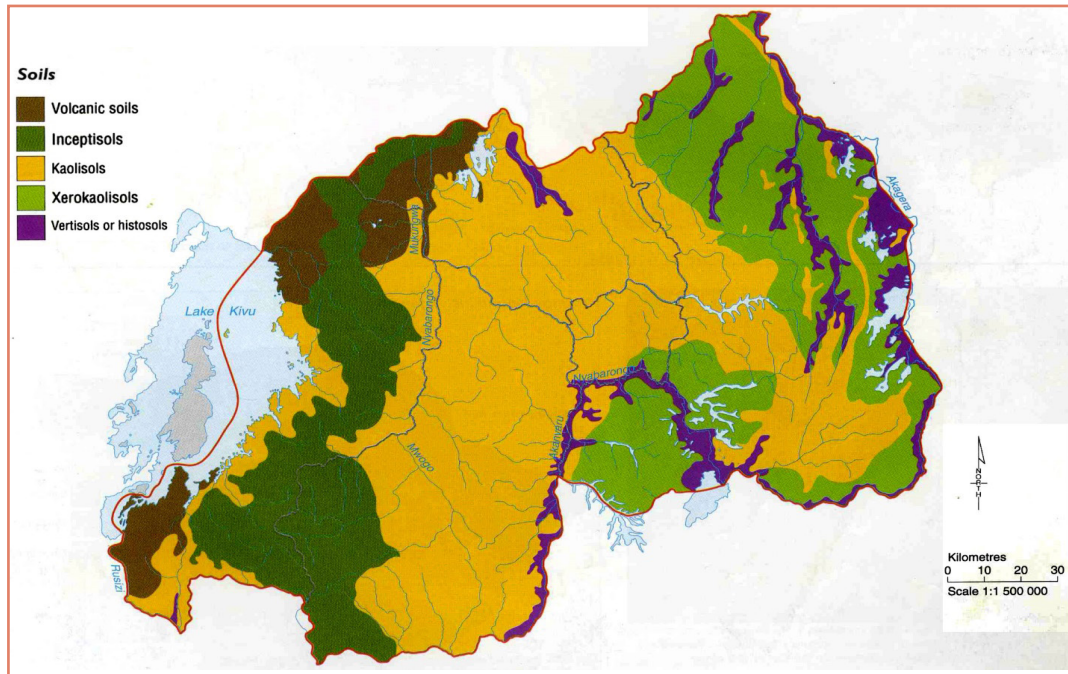
In Rwanda, there are also lateritic soils.

<b>Types</b>	<b>Characteristics</b>
<b>Loam soil</b>	<ul style="list-style-type: none"><li>• These are very fertile soil.</li><li>• They have the ability to support the growth of crops.</li><li>• They have a high content of humus, salt, sand and sometimes clay.</li><li>• They are well drained and rarely become waterlogged.</li><li>• They have high levels of water moisture which is maintained for a long period of time.</li><li>• They are found in the Northern and Western provinces of Rwanda.</li></ul>
<b>Clay soil</b>	<ul style="list-style-type: none"><li>• The amount of humus is relatively low.</li><li>• They have large quantities of nutrients.</li><li>• They have the ability to retain water for a long time.</li><li>• They have high level of acidity. Therefore, they only support specific types of crops such as rice.</li><li>• They are associated with limited decomposition due to the absence of bacteria.</li><li>• They are common along the rivers, valleys and swamps such as Akanyaru swamp in Gisagara district.</li></ul>
<b>Sandy soil</b>	<ul style="list-style-type: none"><li>• They are described by their large particles, which allow the presence of huge pore space.</li><li>• They have a high level of percolation i.e. they are easily infiltrated by surface run-off.</li><li>• They are common in the Eastern province.</li></ul>

<p><b>Silty soils</b></p>	<p><b>Silty soils:</b></p> <ul style="list-style-type: none"> <li>• Silt soils are fertile, fairly well drained and better than sandy soils for crop cultivation.</li> <li>• They contain more nutrients than sandy soils.</li> <li>• Silty soils are heavier than sandy soils.</li> </ul> <p>They are formed when fine sediments (dust, organic matter and debris) are carried by water and deposited.</p>
<p><b>Lateritic soils</b></p>	<ul style="list-style-type: none"> <li>• Normally sandy in structure and saline in nature, arid soils vary from red to brown in colour</li> <li>• They are formed when rock fragments bond together to form a very hard substance known as laterite or marram.</li> <li>• They are formed as a result of leaching.</li> <li>• Laterite soils however are poor in organic matter, nitrogen, phosphate, and calcium, but rich in iron oxide and potash.</li> <li>• Even if they are normally infertile; however, they are widely used to make bricks used in construction.</li> <li>• They are found in the Rusumo region of Eastern province.</li> </ul>

In addition to general soil types, soils in Rwanda are also categorized into different classes according to how they are formed and where they occur.

## Soil distribution in Rwanda



Source : Oxford (2010), 3600 Atlas for Primary, East Africa, Nairobi, Kenya

### 1. Kaolisols

This is the dominant soil type in Rwanda. It is specifically common in central part of Rwanda. It is red in colour, thick and is composed of iron oxide. It becomes water logged during the rainy season. It is subdivided into two:

- i) **Humus-bearing Kaolisols:** This forms from parent granitic rocks and metamorphosed basaltic rocks. Is common in low altitudes of the central region and extends to the west. They are covered with humus resulting from plant decomposition. These soils are rich but fragile when exposed to runoff. That's why it is necessary to protect the humus-bearing layer by planting more plants, use of anti-erosion terracing and maintain its soil fertility by fallow or use of manure and fertilizers. It is commonly found in Gicumbi district.
- ii) **Xerokaolisols:** This is mostly found in the Eastern province especially in Bugesera. It is thin and is covered by aluminium but the top most layer is hard and poor. Therefore, the cultivation on these soils must carefully be carried out in order to avoid the appearance

of this sterile (infertile) lateritic layer on the surface.

## 2. Valley soils

These are soils which form in valley floors of hills and mountains most especially river valleys. It forms from old alluvial deposits. It is also classified into two groups:

- i) **Histosols:** This forms from decomposition of organic materials mostly decaying vegetation in valley floors. The soil remains muddy for a bigger period of the year and is covered by swampy vegetation. Example is Rugezi Swamps.
- ii) **Vertisols:** These are light, black and mineral rich soils. These soils however, may lose fertility very easily more especially under dry conditions. They dry up and harden during the dry season and muddy during the wet season. Example is Nyabarongo valley.

## 3. Altitudinal Soils/ Incept soils

This is formed under the influence of low temperatures and high rainfall. The slopes and plateaus covered by mountain forests of the Congo-Nile peak have fertile soils. However, it is necessary to control erosion and preserve the fertility of these soils by the use manure.

## 4. Volcanic soils

These are formed from vulcanicity. They are found in Musanze in Northern province, in Rubavu, Nyabihu, Rusizi and Nyamasheke in Western province. These soils are more fertile for agriculture, but need many attention because they may easily be affected by erosion.



### Application activity 5.1

1. With reference to the map of Rwanda, locate different types of soils in west and eastern part of Rwanda.
2. Identify soil types that are highly fertile.

## 5.2. Soil erosion in Rwanda



### Activity 5.2

1. Identify any three causes of soil erosion in Rwanda.
2. Explain how soil erosion affect man and environment.

### Soil erosion in Rwanda

**Soil erosion** is a process through which the top soil is removed by running water, wind and animals. In Rwanda, the areas affected by severe soil erosion are the steep slopes of Northern and western Provinces.

#### 5.2.1. Major types of soil erosion in Rwanda.

**There are 4 types of soil erosion. These are:**

- **Splash erosion:** This is the first stage of the erosion process. It consists of the detachment and airborne movement of small soil particles that is caused by the impact of raindrops on soil.
- **Sheet erosion:** This is the detachment of soil particles by raindrop impact and their removal downslope by water flowing overland as a sheet instead of indefinite channels or rills.
- **Rill erosion:** this erosion consists of removal of the soil by concentrated water running through little streamlets, or head cuts. This occurs when several tiny channels, measuring a few centimetres deep are created by water on a piece of land.
- **Gully erosion:** this occurs when there is a removal of the top soil along drainage channels by surface water runoff, it is characterized by an open, incised and unstable channel generally more than 30cm deep.

#### 5.2.2. Causes of soil erosion in Rwanda

- Removing plant cover by burning pasture or felling trees.
- Having too many animals on the land in almost dry areas such as Nyagatare.
- A great increase in population which has led to overuse and misuse of the existing land.
- Mining and quarrying, these activities expose the soils to erosion. They make the soil particles unstable and when agents of erosion come by, much of the soil is carried away.

- Frequent poor cultivation practices on sloppy areas.
- Strong wind can carry loose unprotected soil everywhere.
- Heavy rain and water runoff.
- Unstable soils coupled with unfavourable climate especially on steep slopes and in valleys.

### 5.2.3. Effects of soil erosion

- Area affected by soil erosion suffer much loss of soil fertility
- There is decline in crop yields (productivity), soils subjected to erosion lose all nutrients. This lowers their economic value.
- Famine is always rampant among the local people where there has been severe erosion.
- Over flooding of the river valley may occur as a result of eroded materials blocking the flow of a river.
- Destruction of natural vegetation cover (environmental degradation).
- In some cases, there is loss of lives due to landslides.
- It affects transport systems in different ways. Many roads in Rwanda especially up country and feeder roads are affected by gullies created by continuous surface run-off. This hinders the movement of goods and services.



#### Application activity 5.2

1. Which regions of our country are more exposed to high effects of soil erosion?
2. Suggest measures that should be taken to minimize the strength of soil erosion

### 5.3. Soil conservation and the management measures in Rwanda



#### Learning activity 5.3

1. What is the difference between soil conservation and soil management?
2. Identify any 3 examples of soil conservation measures.

**Soil conservation** refers to the prevention of soils from erosion, degradation or loss of fertility while soil management refers to all the measures put in place to ensure proper use of soils in a sustainable manner.

Soil erosion and depletion are the major threats to soil as a resource. Therefore, sound farming techniques must be employed to prevent soil erosion and impoverishments and to ensure that agriculture is more profitable in Rwanda, the following should be done:

**Mulching:** This method consists of covering the bare ground with a layer of organic matter such as straw. This helps to maintain soil moisture and limit rapid evaporation.

**Contour barriers:** with this technique, farmers are recommended to use stones, grass, and soil to build barriers along contours. Long narrow holes are dug in front of the barriers to stop and collect water.

**Rock dam:** Many stones are collected and piled up to slow down the regular flow of water. This is an efficient technique to prevent gullies and further soil loss.

**Terrace farming:** This method is practically used on the steep slopes to avail enough flat land to grow plants. It is a best way to reduce surface run off and soil erosion.

**Intercropping:** This method consists of growing different crops in alternative rows and sown at different periods to protect the soil from rain wash.

**Contour ploughing:** This method prevents excessive soil loss, as gullies are less likely to develop and also reduce run-off so that plants receive more water. Row crops and small grains are often planted in contour pattern so that the plants can absorb much of the rain, and erosion is minimized.

**Rotational Bush Fallowing:** Sometimes it is very important to allow a farmland to rest or lie fallow, so that the natural forces can act on the soil. Fallowing also increases the sub-soil moisture and improves the general structure of the soil.

**Zero grazing:** (Reducing the number of animals grazed in an area according to the carrying capacity of land.)

**Agro-forestry:** This is a land use management system in which trees are grown around or among crops or pastureland.



### Application activity 5.3

1. Why is terracing necessary?
2. Analyse the importance of zero grazing to farmers.
3. Explain any three negative effects of soil erosion.
4. Describe how terraces are used to prevent and control soil erosion in Rwanda.



### Skills lab

Soil degradation is a threat to the society. Discuss the appropriate measures to prevent soil erosion which can be more effective in your area.



### End unit assessment

1. Explain the process of soil formation.
2. Using specific examples, explain the causes of soil erosion in Rwanda.
3. Soil erosion is one form of soil degradation. Discuss this statement.
4. Assess the effects of soil erosion on the socio-economic development of Rwanda.

**Key Unit competence:** The student-teacher should be able to analyze the climate of Rwanda and its impact on human activities.



### Introductory Activity

Carefully study the photographs below and answer the questions that follow:



1. Explain what the above photographs represent.
2. Give the difference between weather and climate.
3. Identify the main effects of climate change.
4. Describe the main seasons of Rwanda.

### 6.1. Climatic zones and factors influencing climate in Rwanda.



#### Learning activity 6.1

1. What is the key factor in distinction of climatic zones in Rwanda?
2. Explain why Rwanda experience tropical and temperate climate and not equatorial despite its proximity to the equator.
3. Describe how altitude greatly influences the climate of Rwanda.

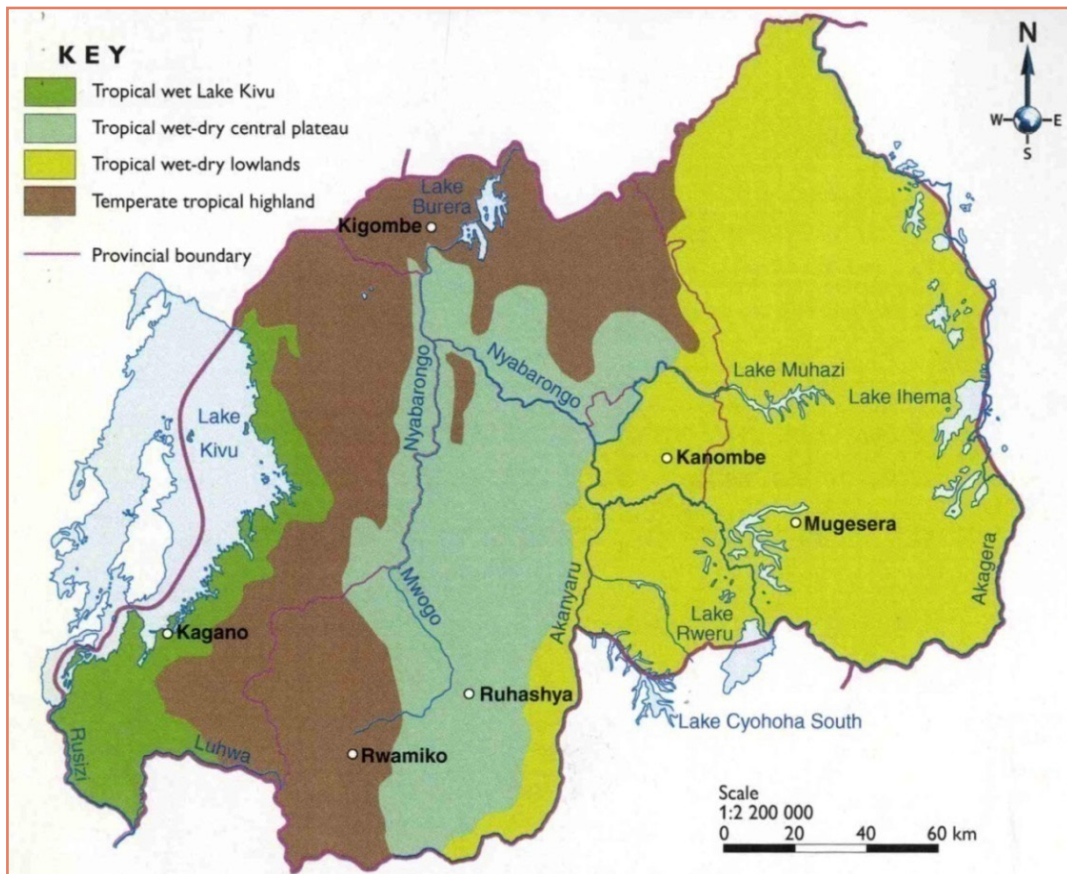
### 6.1.1. Climatic zones of Rwanda

**Climate** refers to the average weather condition of a place, measured and recorded over a very long period of time usually 30-45 years while **weather** is the state of the atmosphere of a specific area for a short period of time.

Although located near to the equator, Rwanda does not experience a hot equatorial climate. It usually has a tropical climate, tempered by altitude. It is a tropical climate with a hot dry season.

The variation of temperature and rainfall in various regions of the country is governed by differences in altitude.

#### Climatic zones of Rwanda



Source : Oxford (2010), 360° Atlas for primary, East Africa, Nairobi, Kenya.

According to the landforms and the distribution of rainfall, Rwanda is divided into the following climatic regions:

### **1. The Eastern plains (1000-1500 m)**

This region is very hot and fairly dry. It presents the average annual temperature ranging from 20° C to 22° C with an annual rainfall between 700 mm and 1100 mm.

### **2. The central plateau region (1500 - 2000 m)**

This zone is moderately humid and fairly temperate, characterized by an average temperature between 19° C and 20° C.

The central plateau has moderate rain. Rainfall is between 1000 and 1200 mm.

### **3. The Western and Northern highland region (the Congo-Nile peak and Birunga region) between 1800 m and 4507 m**

Rainfall is abundant and always above 1200 mm.

### **4. The Lake Kivu side region (1500-2000 m)**

This region is warm and moderately dry but temperatures are moderate on the lakeside. Rainfall significantly decreases with altitude. Briefly, as the altitude increases, temperature decreases and rainfall increases.

## **6.1.2. Factors that influence the climate of Rwanda**

The principal factors that control the climate of Rwanda are explained below:

**Altitude:** The distribution of temperature and rainfall in Rwanda is influenced by the altitude. It provokes the orographic or relief rainfall. As the altitude of Rwanda increases from east to west, the amount of rainfall also increases from east to west. It stops increasing at the Congo-Nile crest where it begins to decrease as the air descends to the sides towards Lake Kivu.

**Latitudinal position:** The latitude of Rwanda (1° 04'-2°51' South Latitude) allows the vertical position of sun's rays to strike directly to the ground and heat it. The intense heat on the ground causes the humid warm and unstable air mass to rise, cool and condense into clouds that later give convective rainfall.

**Vegetation:** The presence of vegetation has had a great impact on the climate of Rwanda. It has contributed a lot to the climatic variations presently witnessed. In areas where there are dense forests such as Nyungwe, Gishwati and mukura, more rainfall is experienced than in the savannah grassland areas of the Eastern plateau.

**Presence of water bodies:** The absence of large water bodies in Rwanda

has contributed a lot to the occurrence of the type of climate experienced in the country.

Water bodies play a great role in the modification of climate where convectional rainfall is created through the hydrological cycle.

**Influence of winds:** Local winds that blow in Rwanda are Breezes. There are land and lake breezes, mountain or hill and valley breezes. They modify temperature and increase rainfall in Rwanda.

**Human activities:** Human activities like mining, urbanization, rural settlement, industries, transport, agriculture, etc. have great impact on the climate of Rwanda because they lead to deforestation, pollution, draining of wetland, degradation of the soil, etc.



### Application activity 6.1

1. Explain how landlockedness of Rwanda affects its climate.
2. Explain how Lake Kivu side region influence the climate of the surrounding areas.
3. With reference to the human activities, explain how they influence the climate positively in Rwanda.

## 6.2. Climate change and global warming



### Learning activity 6.2

1. Distinguish between climate and climate change.
2. Explain the term global warming.
3. Describe any three effects of global warming.

### 6.2.1. Climate change

#### i) Definition of climate change

**Climate change:** It is a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

#### ii) Causes of climate change

Human activities have been mostly responsible for atmospheric alterations.

Human activities contribute highly in atmospheric pollution leading to the change in the state of the atmosphere.

The atmosphere is polluted by human activities in the following ways:

- Increased emission of greenhouse gases ( $\text{CO}_2$ ,  $\text{CH}_4$ ,  $\text{N}_2\text{O}$ , HFCs). Greenhouse gases include carbon dioxide, methane, nitrous oxide, ozone and some artificial chemicals such as chlorofluorocarbons (CFCs). Greenhouse gas concentrations have increased in the atmosphere and human activities are the primary cause.. Other sources of emissions of greenhouses gases are industries, energy, waste, agriculture activities and volcanic eruptions.
- **Forest and grassland fire:** it increases the concentration of carbon dioxide in atmosphere resulting from the burning of trees and grassland which are cut and put under fire for different purposes.
- **Deforestation and land use changes:**When people clear large areas of forests and grasslands for cooking or construction, they reduce the main sinkof carbon dioxide from atmosphere by photosynthesis. Deforestation leads to the increase of carbon dioxide, and eventually to the increase of temperature on the earth surface.
- **Industrial developments:**Industries which are involved in cement production, fertilizers, coal mining activities, oil extraction produce harmful greenhouse gases.The  $\text{CO}_2$  emissions are generated by mineral industries, metal industries, and non-energy products from fuels and solvent use.
- **Waste and landfills:** Landfills filled with garbage produce carbon dioxide and methane gas contributing significantly to greenhouse effect. GHG emissions from waste are the emission from solid waste disposal site; biological treatment of solid waste and waste incineration.
- **Urbanization:** The urban activities contribute in increasing the concentrations of greenhouse gases in atmosphere leading to the rise in temperature.
- **Energy:** the energy in buildings encompasses the energy consumption for cooking, heating (room heating, water heating), cooling (air-conditioning), lighting and operating electrical appliances.  $\text{CO}_2$  emissions were mainly generated from combustion activities of liquid fuels in transportation and electricity generation, while emissions of  $\text{CH}_4$  and  $\text{N}_2\text{O}$  were mainly generated from combustion activities of biomass in households and institutions/commercial activities.

- **Increase in Population:** It is obvious that this last two decades the people have been huge increase in the population. Now, this has resulted in increased demand for food, cloth and shelter.
- New manufacturing hubs have come up with cities and towns that release some harmful gases into the atmosphere which increases the greenhouse effect. Population growth is also one of the drivers of the growth in greenhouse gases that contribute to climate change.
- **Agriculture activities:** the main gases emitted by agricultural activities are: Carbon dioxide (CO<sub>2</sub>) which is released by burning agricultural wastes; Methane (CH<sub>4</sub>) which is associated with cattle and livestock manure and Nitrous oxide (N<sub>2</sub>O) which comes from using fertilizer and manure.

### iii) Effects of climate change

Rwanda experiences some rainfall events that cause unexpected flooding and catastrophic events such as landslides etc. These extreme events are attributed to climate change. The figure below represents some effects of extreme rainfall events of climate change in Rwanda.



*Floods and landslides*

The following are effects of climate change in Rwanda:

- Significant increase in precipitation in highland.
- Presence of strong wind which cause the displacement of people and the destruction of crops and other infrastructures including houses, classrooms.
- The landslides and floods caused by heavy rainfall.

- The significant increase in mean annual temperatures.
- Prolonged droughts episodes have been registered in Rwanda notably in eastern and south-eastern regions.
- More occurrences of lightning combined with the thunderstorms causing loss of lives.
- Extensive damage to water supply and sanitation infrastructure, including pipelines and pumping stations.
- Roads and houses damaged from flooding.
- Losses of crops and stock from heavy rains and floods.
- Food shortages from crop losses affected children's health.
- Increased incidence of water-borne diseases following flooding.
- Schooling of children disrupted by destroyed roads, as well as demands for children to trek for clean water.
- Reduced hydropower production from low water levels.
- Increased time spent searching for water in rural areas.

### 6.2.2. Global warming

**Global warming** is a phenomenon of climate change characterized by a general increase in average temperatures of the Earth, which modifies the weather balances and ecosystems for a long time. It is directly linked to the increase of greenhouse gases in our atmosphere, worsening the greenhouse effect.

In short, Global warming refers only to the Earth's rising surface temperature, while **climate change** includes warming and the "side effects" of warming like melting glaciers, heavier rainstorms, or more frequent drought.

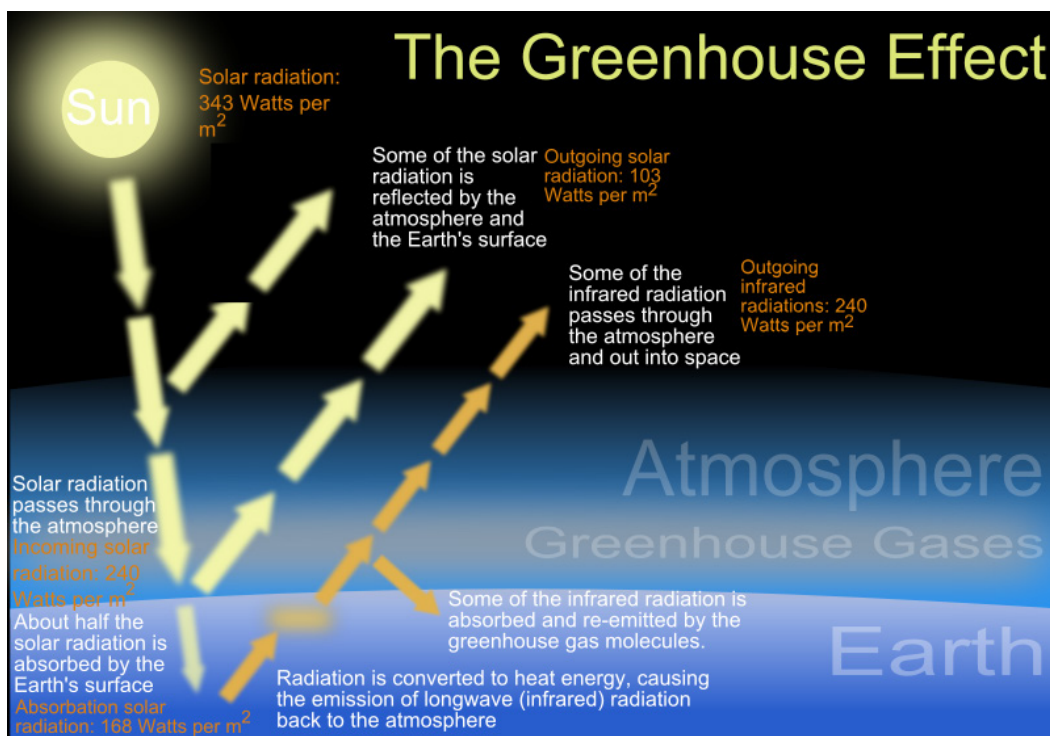
#### i) Causes of global warming

- Global warming occurs when greenhouse gases together with other air pollutants are increased in the atmosphere and keep or absorb sunlight and solar radiation that have reflected from the earth's surface.
- The massive use of fossil fuels is obviously the first source of global warming, as burning coal, oil and gas produces carbon dioxide the most important greenhouse gas in the atmosphere as well as nitrous oxide
- Deforestation has a major role in climate change. Trees help to reduce the concentration of CO<sub>2</sub> from the atmosphere.
- Another cause of global warming is **intensive farming**, including the

use of fertilizers and livestock. For example Cattle and sheep produce large amount of methane when digesting their food, while fertilizers produce nitrous oxide emissions.

- **Waste management methods** like landfills and incineration emit greenhouse and toxic gases including methane that are released into the atmosphere.
- **Mining and industry activities:** contribute to the increase of greenhouse gas emissions in atmosphere.

## ii) Greenhouse gases effects



- The sunlight reaches the Earth coming from the Sun. About half of the light reaching Earth's atmosphere passes through the air and clouds.
- Some energy is absorbed and then reflected back in the atmosphere in form of infrared heat.
- Most of the heat is absorbed by the greenhouse gases and reflected in all direction for warming the earth.

## iii) Effects of global warming

Below are some consequences of Global Warming:

### 1. On biodiversity

The increase of temperatures and the climate is one of the major changes responsible to disturb the ecosystems, modify the conditions and cycles of plant reproduction and lead to the loss of some species.

The scarcity of resources and climate change contribute to habitats destruction and influence migration of animals.

## **2. On oceans**

Because of global warming, ice are melting massively at the poles and increasing the sea level.

## **3. On the weather**

Until now, meteorologists and climatologists around the world have been observing the effects of global warming on the weather phenomena. The effects are huge like more droughts and heat waves, more precipitations, more natural disasters like floods, hurricanes, storms and wildfires.

## **4. On humans**

Global warming leads to climate change which has impacts on human health and activities. The scarcities of natural resources give rise to new conflicts. Rising of sea levels, floods and increased temperature cause population migration.

### **6.2.3. Adaptation and mitigation measures for climate change**

**Mitigation measures:** Mitigation is an action to reduce the sources or to increase the sinks of greenhouse gases such as:

- Use of improved cooking stoves
- Use of energy saving material in household (Lamps, Warming water with solar heaters);
- Verification of control technique automobile;
- Public transport;
- Afforestation, reforestation and agroforestry;
- Reduce uncontrolled forest and grassland burning.

**Adaptation measures:** refer to measures to reduce potential harm, or vulnerability, resulting from actual and expected changes in climate and extreme weather events. The following are the adaptation measures:

- Planting drought-resistant crops to better in drier climate;

- Use of organic manure;
- Radical terraces and Anti-erosive measures;
- Irrigation;
- Use of weather and seasonal forecasting, meteorological advisories and guidance;
- Rainwater harvesting (Installation of water tanks);
- Housing (imidugudu etc.) planning with consideration of Climate Change impacts (floods, landslides, strong winds, lightening etc.);
- Roads protection;
- Information systems to support early warning systems and proactive planning;
- Buy crop insurance.

Mitigation is attempting to slow the degree of warming and adaptation is reducing vulnerability to hazards.



### Application activity 6.2

1. Describe the effects of climate change in Eastern and Western provinces of Rwanda.
2. Describe how the following activities have an impact on weather and climate:
  - a) Urbanisation
  - b) Deforestation
3. Suggest measures that should be taken to minimize the effects of global warming.



### Skills lab

After completing this unit about climate, climate change and global warming, give advice to the people who mostly depend on weather patterns.



## End unit assessment

1. Explain how climate is different from climate change.
2. With examples, explain the importance of weather forecasting
3. Explain the impact of relief on the climate of Rwanda.
4. Describe factors that cause the typical weather we experience in each season.
5. Discuss the source of greenhouse gases and how can we reduce the increase of them in the atmosphere.

**Key Unit competence:** The student-teacher should be able to explain the importance of vegetation in Rwanda and evaluate conservation measures.



### Introductory Activity

Read this short passage and answer the questions that follow

The natural vegetation of Rwanda is very narrowed and the plant landscape is very humanized. The high population of Rwanda has indeed led plant growing on the most of the country's space.

1. What do you understand by the term vegetation?
2. Identify types of vegetation found in Rwanda.
3. With examples show the importance of vegetation?
4. What are the measures to protect the vegetation?

## 7.1. Types of vegetation and importance vegetation in Rwanda



### Learning activity 7. 1

1. Describe major types of vegetation.
2. Explain how vegetation contributes to the development of the country.

#### 7.1.1. Types of vegetation in Rwanda

The term **vegetation** refers to plant cover, plant community or ground full of different plants. There are two major types of vegetation which include both man-made vegetation and natural vegetation.

### i) Natural vegetation

This type of vegetation grows naturally without human intervention or without agricultural practices. It involves all virgin vegetation and those regenerated by natural means and is controlled by the climatic conditions of the region in which it is found. Example, Nyungwe forest, Gishwati forest, Mukura forest.



*Natural forest in Nyungwe National Parc*

ii) **Man-made vegetation** it is also referred to as **Artificial vegetation/ cultural vegetation**. The growth and development of this type of vegetation is under influence of man. They range from smallest garden at home to large forest such as Arboretum forest in Huye, Mount Kigali forest in Kigali and other crops.

### 7.1.2. Importance of vegetation

Vegetation plays a vital role in our natural ecosystem and also supports the biosphere in various ways:

- Forests help to make healthy environment by providing oxygen needed by many living organisms including man.
- Forests help to prevent soil erosion especially on steep slopes like highlands and mountainous areas of Musanze and Gicumbi districts. Roots bind the soil and hold it up.
- Forests facilitate climate modification through evaporation-transpiration that leads to the formation of rain.
- It contributes to the development of handicrafts.
- Forests act as wind breaks, protecting buildings and crops from being destroyed by strong winds.

- Forests help in conserving soil fertility i.e. decomposed materials (e.g. leaves and branches) and add fertility to soils
- Forests act as habitats for wild animals e.g. monkeys, elephants, zebras, etc.
- Forests act as source of fuel e.g. firewood, charcoal, etc.
- Forests act as source of timber which is used for building and furniture making, etc.
- Forests act as a basis for industrial development e.g. paper manufacturing industry, wood processing industry, saw mills, pulp mills, etc.
- Forests are tourist attraction sites as long as they are a home of wild, animals and birds that attract many tourists.
- They act as the source of medicine especially herbs.
- Forests act as a source of employment to many people e.g. those working in the departments of forests in the ministry.
- Forests act as the source of government revenue through people taxing engaged in exploitation of forestry resources.
- Forests are good grounds for educational scientific researches.



### Application activity 7.1

1. Explain how people depend on vegetation.
2. Describe how vegetation is related to the climate.

## 7.2. Causes of the destruction and conservation measures of vegetation



### Learning activity 7.2

1. How can you describe deforestation?
2. Identify any three causes of vegetation destruction in Rwanda.
3. What is the solution to the above problem?

### 7.2.1. Causes of vegetation destruction

Apart from the above mentioned role of vegetation, forests around the world are under threat, fear and risk of no longer enjoying its benefits. The threats manifest themselves in the form of deforestation and forest degradation.

There are a number of factors that account for the destruction of vegetation in Rwanda. They include the following:

**The harsh climatic conditions:** Example is noticeable in eastern province where unreliable rainfall and prolonged drought has left little or no vegetation cover on the ground.

**High population:** The ever increase of population has created pressure on the existing vegetation.

**Lumbering:** Lumbering goes with felling of trees for timber sales.

**Urbanization:** The development of urban centres has affected much vegetation

**Improper farming methods:** In most rural areas of Rwanda, population still use traditional methods which have left the soil bare exposing it to the soil erosion.

**Natural causes:** Rwanda is a mountainous country. There is landslide and mass wasting especially in north and western parts of the country.

**Biotic factors:** Presence of many diseases and insects that destroy the vegetation.

**Overgrazing and search for animal feeds:** In some parts of Rwanda where farmers keep large number of cattle, vegetation is scarce due to overgrazing.

**Infrastructural development:** The presence of new roads as a sign of transport development sometimes leads to the destruction of vegetation during their construction. Poorly planned infrastructure is emerging as a big threat too.

**Fuel needs:** Many people in Rwanda live in rural areas. And most of them depend on wood and charcoal as a source of fuel at home.

**Fire outbreaks:** This is a common tendency in some areas of the country where in the dry season, grasslands are intentionally or accidentally burnt.

### 7.2.2. The conservation measures of vegetation

**Forest conservation** is the protection of forests from damaging effects of human activities. Or is the practice of planning and maintaining forested areas for the benefit and sustainability of future generations.

- Control human and animal population in order to stop encroachment of forests and overgrazing.
- Educating the masses on the advantages of forest conservation (need to conserve forest).
- Employing forest rangers and wardens to protect the forests from poachers and fire outbreaks
- Enforcing rules and regulation governing forests in order to punish those who misuse the forests.
- Training people on forest management.
- Introducing alternative sources of fuel such as biogas and solar energy other than using firewood and charcoal.
- Establishing forest reserves and setting some forests as game parks.
- Control of pests and insects by use of insecticides as well as cutting and burning of affected trees.
- Control bush fire through seminars by use of persuasive posters and employing fire brigades
- Reforestation (planting of trees where others have been cut) and Afforestation (planting of trees where others have not been in existence).
- Improved cutting practices.



#### Application activity 7.2

1. Explain how people depend on vegetation.
2. Describe how vegetation is related to the climate.



#### Skills lab

Vegetation plays a great importance in daily life. Think about a garden you can do at home or school that is both friendly to the nature and productive to the people.



## End unit assessment

1. Find out why deforestation is a problem.
2. Give reasons why it is important to conserve the vegetation.
3. Draw a sketch map of Rwanda and on it, locate the major natural vegetation.
4. Suggest possible ways to protect vegetation.

## UNIT 8:

# DRAINAGE SYSTEM IN RWANDA

**Key Unit competence:** The student-teacher should be able to describe the drainage system of Rwanda and explain its relationship with the human activities.



### Introductory Activity

1. Use the map below on drainage of Rwanda and identify the major rivers and lakes of Rwanda.
2. Discuss the major uses of water bodies in Rwanda.

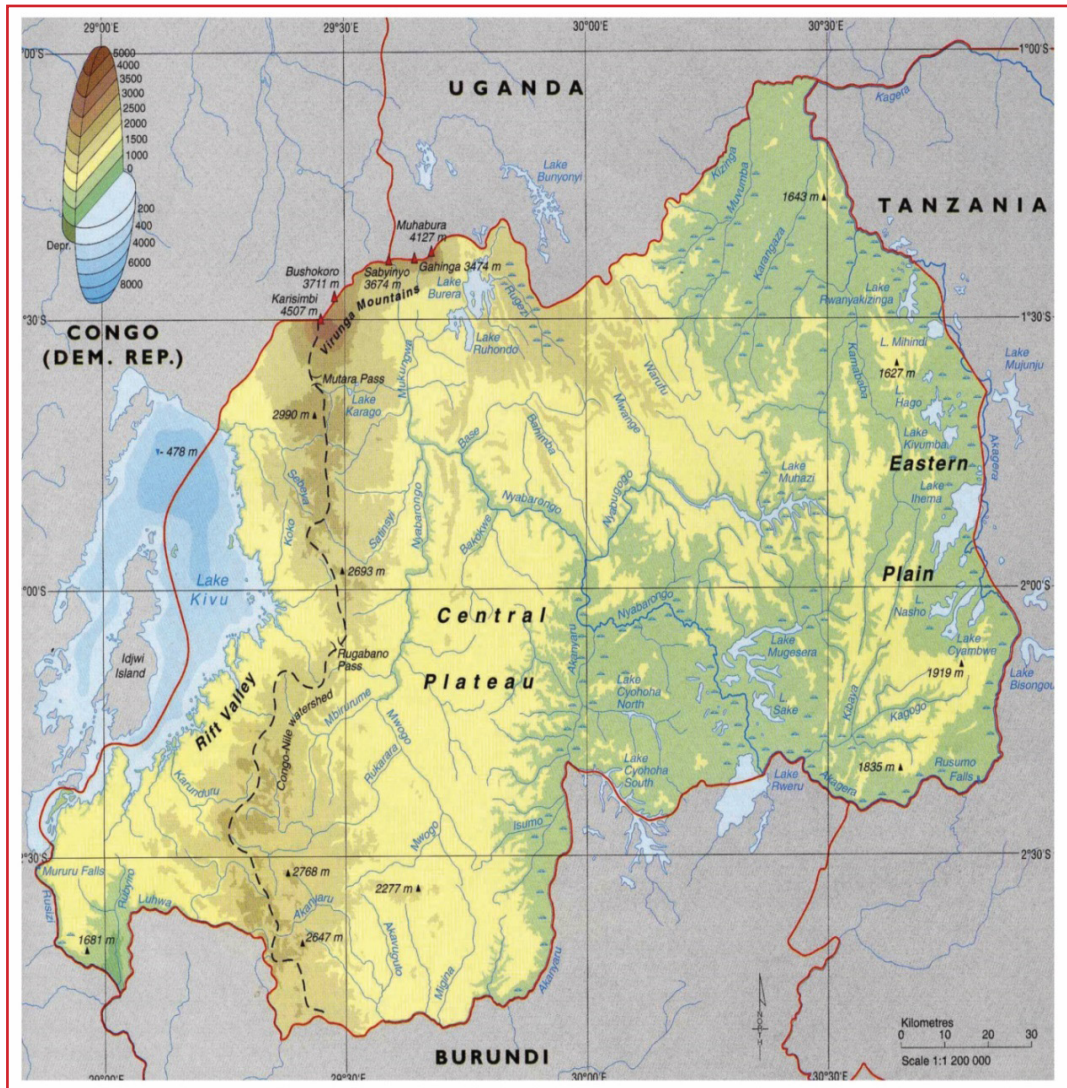
### 8.1. Major rivers and the drainage basins



#### Learning activity 8.1

1. Use the map below and identify the major river basin in Rwanda.
2. With examples, classify rivers according to their geographical basins.

## Drainage map of Rwanda



Source : Macmillan (2006), *Geography Atlas, Malaysia*.

**Drainage** refers to as the general distribution of surface water. A **drainage system** is a lay out or actual plan made by a river and its tributaries on the landscape.

The country is drained by numerous rivers and lakes. The drainage system of Rwanda is categorized in two classes according to the direction of flow: The **Congo Basin** to the West and the **Nile Basin** to the East. The **watershed** is a chain of mountain separating two basins. The Congo-Nile peak is the watershed between Congo and Nile water basins.

## Water basins and major rivers

The distribution of rivers in Rwanda generally depends on rainfall. Rivers are mainly found in the region of the Congo-Nile peak and the central plateau.

### 1.1. The Congo Basin

It consists of all rivers in the west mountain region. The western slope of the Congo-Nile peak is drained by a series of rivers flowing into Lake Kivu (inlet of Kivu) namely Sebeya, Koko, Pfunda, Karundura, Kamiranzovu, Kirimbi and Nyabahanga. Rusizi originates from Lake Kivu (Outlet) and pours in Lake Tanganyika. Lukuga River gets its waters from Lake Tanganyika and pours in River Congo.

### 1.2. The Nile Basin

It is vast and covers  $\frac{3}{4}$  of the Rwandan country. The major rivers which drain it are:

Nyabarongo, Akanyaru and Akagera. Akanyaru waters join Nyabarongo in the North-West of Bugesera to form Akagera. The Akagera river first constitutes the border of Rwanda with Burundi and then with Tanzania. At the south-eastern end of Rwanda, Akagera receives water from Ruvubu and flows towards the northern direction forming the border between Rwanda and Tanzania. It then pours into Lake Victoria where the Nile River originates from.

Note that the Birunga volcanic area in the North-West is poor in rivers despite heavy rains. This is due to its lithology which allows deep penetration of water which leads to lack of surface flow.



### Application activity 8.1

1. Explain why volcanic region of Rwanda doesn't have many river sources.
2. Identify the consequence of the uplifting of the Congo-Nile peak on the hydrography of Rwanda.

## 8.2. Major lakes and their mode of formation



### Learning activity 8.2

1. Identify any 5 lakes located in eastern province of Rwanda.
2. What is the largest lake in Rwanda?

### 8.2.1. Major Lakes of Rwanda

Rwanda is located in the area of the great lakes region.

#### Lake Kivu

It is the largest water area in Rwanda. It forms the border of Rwanda with D.R.C. Lake Kivu is lodged in a graben. The bottom of Kivu contains methane gas stocks which are evaluated to 5 billion m<sup>3</sup>.

#### The Eastern lakes

They are many and are lodged in land depressions. They are not so deep and are surrounded by marshes. These lakes are: Cyohoha south, Muhazi, Ihema, Sake, Mugesera, Rwanyakizinga, Mihindi, Nasho, Rweru, Hago, Cyambwe, etc.

#### The crater lakes

They are formed by a water mass on top of volcano, in a crater depressed by solidified lava in the vent. Example: Bisoke.

### 8.2.2. Mode of formation of lakes

Rwanda has got different lakes according to their origin and process of formation as explained below:

**Lakes due to Lava damming:** These lakes include Burera and Ruhondo. These are lakes formed due to lava damming of some rivers from Rugezi swamp. Water piled behind the barrier forming lakes.

**Crater lakes:** These are lakes which formed when water accumulated in craters at the tops of volcanoes. Examples of crater lakes are found on volcanoes of Bushokoro, Karisimbi and Muhabura.

**Lake due to faulting:** This is a lake formed when water accumulated in graben within the rift valley (Lake Kivu).

**Lakes due to alluvial deposit:** These are lakes which were formed as

a result of valley flooding and a result of river reversal (back ponding). Examples include Ihema, Nasho, Rweru, Rwanyakizinga, Hago and others in Eastern province. In the flood plains of river Akagera, numerous small lakes have also formed as a result of river erosion and deposition. Most of such lakes are found in Bugesera and Akagera national park.

**Lakes due to subsidence (Warping lakes):** These are lakes which formed when water accumulated in down warped depressions especially of Eastern province. Examples include; Lakes Muhazi, Mugesera, Sake, and others.

**Ox-bow lakes:** These include; lake Bilira, Hago, Mihindi and others

In general, an oxbow lake is formed when a river creates a meander as a result of the river's eroding the bank. After a long period of time, a meander river become strongly curved, and finally the neck of the meander become narrow and the river cuts through the neck during a flood, cutting off the meander and forming an oxbow lake.

**Man-made lakes:** Examples are found in Eastern province such as Cyabayaga and Rwagitima, Rugeramigozi near Kabgayi in Muhanga district and Mukunguri in Nyanza district.

### **8.2.3. Relationships between the drainage system and the human activities**

There is a very close relationship between human activities and water. Sufficient and reliable water supply greatly improve the quality life of people. Humans greatly depend on water in different ways. However, some of the human activities gradually pollute water bodies.

- The availability of water bodies means that family members are easily able to cook, clean themselves and do other domestic work.
- Also the nature of activity and size of family determines how much water is needed at a given time and how frequently available it should be.
- Farming activities depend on water supply especially irrigation farming to ensure high production.
- Excessive use of water on arable farms may lead to scarcity of water in future.
- Afforestation and reforestation practices play a very crucial role in ensuring a continuous rain water supply.

- Presence of places with dense forests and other forms of vegetation act as water catchments.
- Weakness in vegetation conservation may lead to desertification and consequently very little or no water availability.
- It is also important to note that vegetation can not exist if there is lack of water.



### Application activity 8.2

1. With examples, explain how people depend on water.
2. Describe human behaviours that cause water pollution.



### Skills lab

Despite many water bodies and rainfall in different parts of the country, in Rwanda there is scarcity of water. Suggest what should be done to overcome this situation.



### End unit assessment

1. Explain how the major lakes in Rwanda were formed.
2. Explain why most rivers of Rwanda flow eastwards.
3. Water in many places of the world is getting scarce:
  - a) Discuss the major causes of water shortage in Rwanda.
  - b) Suggest ways in which people should conserve water as a resource.

**Key unit competence:** The student-teacher should be able to examine demographic problems in Rwanda and suggest their solutions.



### Introductory Activity

The study of population is necessary for proper national planning in relation to the provision of social services to the people. Rwanda is one of the most populated countries in Africa and there is fear that the rate at which population growth is increasing and presents great challenges to the development of the country. The proper strategies to solve the problems related to the rapid population growth should be taken.

1. Explain the terms related to population concepts.
2. Discuss the factors influencing population growth in Rwanda.
3. Explain the population problems related to the rapid population growth in Rwanda.
4. Describe the population policies that should be taken by Rwanda to control rapid population growth.

## 9.1. Population concepts



### Learning activity 9. 1

Use the Internet and other Geographical sources of information and explain the following terms with reference to the population of Rwanda:

Population, population density, birth rate, death rate, growth rate, fertility rate, life expectancy.

#### 9.1.1. Population concepts

**Population** is defined as the total number of the people living in an area or a region or country in a given period of time.

### a) Birth rate

**Birth rate** refers to the number of new born babies per every 1000 people of the total population of a given place.

The birth rate is determined by the following formula.

$$\text{Birth rate} = \frac{\text{number of births}}{\text{total population}} \times 1000$$

### Example

Suppose a given location has a total population of 21,346 inhabitants and the new born babies are 3240. The birth rate will be calculated as shown below.

$\text{Birth rate} = \frac{3240}{21,346} \times 1000$  roughly 151 new born babies. This means that for every 1000 people, 151 are new born babies.

### b) Death rate

**Death rate** refers to the number of people who lose lives per every 1000 people of the total population. It is determined using the following formula:

$$\text{DR} = \frac{\text{Nbr of deaths}}{\text{Total population}} \times 1000$$

### c) Growth rate

**Population growth rate** refers to the natural change in the number of population.

A population will either increase or decrease. Population growth rate is expressed as a percentage. It is the ratio of death rate and birth rate per 1000 people. The number of people living in an area can increase, decrease or remain stagnant for some time. The population growth rate of Rwanda is on the increase. Population growth rate is calculated using this formula:

$$\text{Growth Rate} = \frac{\text{Birth Rate} - \text{death Rate}}{1000} \times 100$$

### d) Fertility rate

**Fertility rate** refers to the average number of children born to a woman in her life time. It is calculated per every 100 women in a population. The fertility rate of Rwanda is 5.2. This is calculated using the formula given below.

$$\text{Fertility rate} = \frac{\text{Total number of children born} \times 100}{\text{Total number of women (15 - 49 yrs)}}$$

### e) Life expectancy

**Life expectancy** refers to the average period or number of years that a person expects to live. In Rwanda, life expectancy has increased due to improvement in standards of living and healthcare. In the year 2013, the life expectancy of Rwanda was at 63.99 years. Life expectancy is affected by factors such as socio-economic status, including employment, income, education and economic wellbeing, the quality of the health system and the ability of people to access it; health behaviors such as tobacco and excessive alcohol consumption, poor nutrition and lack of exercise.

### f) Population density

**Population density** is simply the number of people living in an area per square kilometer (sq km). If the population of Rwanda is 9,300,000 million people and the size (area) of Rwanda is 26,338 sqkm then, its population density is:

$$\text{Population density} = \frac{\text{Total population}}{\text{Area / Size}}$$

$$\text{Population density} = \frac{9,300,000}{26,338 \text{ km}^2} = 353 \text{ person per sq.km}$$

This means that for every one km<sup>2</sup> there is 353 people occupying it.

Because of this, Rwanda is said to be one of the most densely populated countries of Africa.



### Application activity 9.1

Explain the relationship between population growth and population density

## 9.2. Population growth in Rwanda



### Learning activity 9.2

**Read the following case study and answer the questions that follow:**

In recent years there is a large inflow of refugees from neighboring countries entering Rwanda. Besides, this is happening when the infant mortality rate in Rwanda has declined tremendously. The life expectancy level in Rwanda has also risen.

1. Discuss the factors that influence the population growth in Rwanda.
2. Find out the consequences of rapid population growth to the local area and to the country.

**Population growth** is the increase in the number of individuals in a population while population Growth rate is the rate at which the number of individuals in a population increases in a given period of time. Rwanda has a high population growth which keeps increasing every year. As at 2014, the population growth rate of Rwanda was estimated to be at 2.63%.

### 9.2.1. Factors influencing population growth in Rwanda

The following are the factors that influence population growth in Rwanda:

- **Religion:** Some religious faiths teach their followers to procreate and have many children in the quest to fill the world. Other faiths favour polygamy. All these teachings lead to an increase in the population. On the other hand, other religious faiths teach against polygamy and allow family planning. These practices lead to a low population.
- **Early marriages:** In most developing countries like Rwanda, girls get married when they are still very young. The longer they stay in their marriages; the more number of children they are likely to have. This leads to an increase in population.
- **High birth and fertility rates:** This has contributed to an increase in population. In Rwanda, the fertility rate averagely stands at about 5 children per every female. This means that families are big translating to an increase in population.
- **Polygamous marriages:** Polygamous marriages lead to population growth. The more women that are in a marriage, the more number of children they are likely to get collectively.
- **Improved health care:** In Rwanda, improved health facilities, immunisation programs and the use of modern drugs have led to reduction in the diseases such as malaria and other epidemics which claimed many lives. As a result, there is an increase in birth and fertility rates and a decrease in infant mortality rate.
- **Illiteracy:** High levels of illiteracy have made many people unable to utilise family planning methods. Lack of this information encourages people to get many children leading to an increase in population.
- **Migrations and refugees:** Migration refers to the movement of people from one place to another.

- This movement leads to an increase in population in the area where the people move to and a decrease where they come from.
- **Traditions and cultural beliefs:** Most rural citizens uphold traditional values that encourage big families for labour and wealth. Most families therefore have many children in order to uphold the cultural values of their communities. This leads to an increase in population.

### 9.2.2. Consequences of rapid population growth in Rwanda

There are both positive and negative consequences of rapid population growth. Some of the consequences are discussed below.

#### Positive effects

- **Source of labour:** A high population offers cheap source of labour.
- **Source of revenue:** A high population means a high source of revenue to the government through tax levies.
- **Creation of markets:** The rapid population growth in an area or country leads to a high demand for goods and services.
- **Exploitation of resources:** An increase in population enables the use and full utilisation of resources.
- **Urbanisation and industrialization:** The movement of people from areas of high population to areas with low population contributes a lot to the development of towns, cities and industries.

#### Negative effects

- **Food shortages:** In areas with high populations, there is always a shortage of food supply due to the high demands.
- **Shortage of land:** Rapid population growth has resulted in scarcity of land due to pressure on land.
- **Unemployment:** A rapid population growth means there is a high number of job seekers with few employment opportunities.
- **Migration:** The rapid population growth has influenced many to move from one place to another in search of better survival opportunities and living conditions.
- **Environmental degradation:** Rapid population growth is a cause of environmental degradation. People encroach on the reserved areas, degrading the environment.
- **Shortage of social facilities due to congestion:** Rapid population growth has increased population pressure on the existing social facilities, like schools and hospitals.

- **Insecurity and increased crime rate:** Crime is increasingly becoming common in the highly populated areas of Rwanda. This is because of congestion and joblessness. The crime rate is higher in urban areas.
- **High cost of living:** Rapid population growth has led to an increase in the cost of living. Due to the increase in demand for various resources such as housing, food and transport, the cost of obtaining the resources is very high.
- **Increased government expenditure:** The government spends a lot of funds in addressing the effects of rapid population growth. For example, huge sums of money are used to establish more social facilities, resettle people and to improve on security.
- **Development of slums:** Rapid population growth has come along with the emergence of shanty towns also known as slums. Such areas harbor criminals, have poor hygiene and drainage systems and have substandard houses. Other social ills such as organized crime, prostitution and drug trafficking are rife in slum areas.



*A slum in Kigali city*

### 9.2.3. Solutions to rapid population growth

There are several ways that can be used to address the challenges resulting from rapid population growth. They include the following:

- **Encouraging migration:** The government should encourage people to migrate from high to low populated areas.
- **Education on the importance of family planning:** The population should be educated on the importance of family planning methods in order to have small families.

- **Emphasis on education especially of the girl child:** Educating the girl child to higher levels tends to delay the age at which the girls get married. This discourages early marriages which lead to high birth rates and big families.
- **Economic empowerment:** Economic empowerment of the masses especially of the women gives them the power to make wise decisions among them, the number of children they should have and have comfortable support.
- **Government intervention:** The government can intervene by providing incentives to the families that have few children. The incentives could be through things like sponsored education and health care. This will discourage people from having big families hence reducing the population growth.



### Application activity 9.2

Observe the local environment near your home or school;

1. Identify the factors that contribute to the growth of population in the observed area.
2. As prospective teacher, suggest different ways to address the challenges of rapid population growth in your village.



### Skills lab

Discuss the disadvantages of population growth to a country like Rwanda



### End unit assessment

1. Assess the impact of life expectancy to the economy of Rwanda.
2. Explain any six factors that influence population distribution in Rwanda.
3. Discuss five factors that influence population growth in Rwanda.
4. Analyse five consequences of population increase in Rwanda.

**Key Unit competence:** The student-teacher should be able to evaluate the impact of the rural and urban settlements on the sustainable development in Rwanda.



### Introductory Activity

Discuss and answer the following questions:

1. Why is it necessary to have a home?
2. Identify the factors that influence the establishment of a home.
3. Draw a village where people live and display your picture in the class.
4. Discuss the advantages and disadvantages of rural and urban settlement.

## 10.1. Rural settlement



### Learning activity 10.1

After making an observation of your local environment

1. Describe the characteristics of the area where you live.
2. Using the description that you have given, classify the area as urban or rural.
3. Give the type of settlement found in the area you have described.

**A settlement** refers to a place where people live. They build homes and form a community. In some areas a rural settlement is considered to be any settlement in the areas defined by the government as rural. This may include even rural towns. In some other areas, rural settlements do not include towns. Common types of rural settlements are villages, hamlets and farms.

Traditionally, rural settlements were associated with agriculture. In modern times, other types of rural communities have been developed.

### 10.1.1. Types of rural settlement

#### Clustered or nucleated rural settlement

This is a form of rural settlement where people live in houses that are grouped together in close proximity. These settlements are common in areas where extended families still hold a strong influence. In Rwanda, this type of settlement can be seen in parts of Rubavu, Muhanga, Musanze, Burera and Nyabihu districts.



#### *Nucleated rural settlement*

##### **i. Dispersed, sparsed or scattered rural settlement**

This is where people stay in houses that are far from each other. Most of the land is used for cultivation and grazing. This occurs in areas that have low populations. In Rwanda, this type of settlement is found in the Eastern Province where cattle rearing is a major activity. This settlement can also be found in areas near the National Park and other reserved areas like the Akagera and Birunga National Parks.



#### *Scattered rural settlement*

##### **ii. Linear rural settlement**

This is a type of settlement where people establish their homesteads in a linear form, usually along a road, a river, lake shores or a dyke.

This type of settlement is evident in most parts of Rwanda, for example along the Kigali-Huye road.



*Linear rural settlement*

### iii. Planned rural settlement

This is a settlement that is established according to the standards put in place by the government. Such settlements are well-facilitated in terms of social facilities such as roads and health centres. It is a preferred type of settlement in areas faced with overpopulation. This is the common type of rural settlement in Rwanda. It was begun during the land reform program that came along with the introduction of the umudugudu.



*Planned rural settlement*



### Application activity 10.1

Using a sketch diagram differentiate a linear to a dispersed settlement.

## 10.2. Problems and solutions associated with rural settlement in Rwanda



### Learning activity 10.2

With reference to your own observation of any village:

1. Identify some of the problems associated with rural settlement in Rwanda and their solutions.
2. Find out Rwanda's government policy towards rural settlement schemes in the country.
3. Discuss the importance of having rural settlement schemes in the country.

#### i. Some of the problems associated with rural settlements are discussed below:

- **Poor transport and communication facilities:** Rural areas in Rwanda are not well served with roads and communication systems. This has led to slow economic development and difficulties in the movement of people and goods.
- **Low levels of education:** The concentration of schools especially higher institutions of learning is very low in rural areas. Due to this, the quality of education remains very low.
- **Poor medical care:** The numbers of hospitals and other health facilities are very low. The few that are there have insufficient medical personnel. This translates to poor medical care and a high death rate.
- **Easy spread of diseases:** If there is disease outbreak or attack, many rural settlers tend to be affected. This may be due to poor hygiene and ignorance caused by illiteracy.
- **Lack of social services:** Some rural areas in Rwanda completely lack facilities such as piped water and electricity. This makes some of the areas to remain remote.
- **Unemployment:** There are fewer job opportunities in the rural areas.
- **Limited markets:** Due to low population in some areas, agricultural production exceeds the consumption levels. Since there is no market for the surplus, this leads to wastage of food and eventually poverty.
- **Land and social conflicts:** In the rural areas of Rwanda, there is

always a perennial problem of insufficient land. Conflicts between neighbours and relatives over land and other resources like rivers, pasture land and boundaries are a common occurrence.

- **Underutilization of resources:** In most cases, rural settlements are under populated. The population available fails to properly utilise the available resources.
- **Poverty and poor standards of living:** The high levels of poverty have made the rural population to live under very poor living conditions. The houses in which they live in are small and are poorly constructed. The people cannot afford decent clothing, meals, healthcare and other essentials of life.

## ii. Solutions to the problems of rural settlements

Some of the solutions to the problems of rural settlements include the following:

- **Government housing and construction scheme:** The government should construct better houses in the rural areas and make them affordable to all people. This will assist in solving the housing problem.
- **Establishment of investments:** Both local and foreign investors should be encouraged to venture into the untapped opportunities available in the rural areas of Rwanda. This will help to boost the economies of the rural areas and to improve the living standards of the population through employment opportunities.
- **Development of the rural areas:** Rural areas should be developed and provided with facilities to attract people to settle there. The facilities to be provided include electricity, piped water and social halls.
- **Transport and communication facilities:** Transport and communication networks should be established and developed in the rural areas. This will help to improve the economy of the rural areas and also to attract settlements.
- **Social services:** There should be improvements in the provision of social services to the rural population. Health centres should be constructed and more schools should be established in order to reduce the pressure being exerted onto the few existing ones.
- **Implementation of regional balance by the government:** The government should develop well balanced policies that will ensure equal development of all regions in the country.

- **Mass education:** The rural population needs to be educated on the disadvantages of migration to towns and on how to solve the social challenges that they face.
- **Credit facilities:** Financial and credit institutions should endeavour to economically empower the rural masses by giving them loans and credit facilities. This will help them to eradicate poverty.
- **Diversification of the rural economy:** The rural economy should be diversified through the establishment of other economic activities that will enable the farmers and the rural population in general to earn extra income.

### iii. Government policy towards rural settlement

The Rwandan government has dealt with rural populations through the establishment of rural settlement schemes known as the imidugudu. This scheme was created as part of the land reform program in the country to promote equal sharing of land and to help the poor to build homes with the government's assistance.

#### Reasons for establishment of Imidugudu settlement schemes in Rwanda

- **To improve the living standards of the people:** The Imidugudu settlements in Rwanda were created to improve the living standards of people especially the poor landless.
- **To promote peace and unity among the Rwandese people:** The establishment of the Imidugudu was part of the concerted effort by the government of Rwanda to restore peace and unity among the people of Rwanda.
- **To utilise the natural resources in the country:** The government of Rwanda decided to put people in the imidugudu schemes in order to find more land that could be used for other economic activities.
- **To provide better social services to its citizens:** The government of Rwanda decided to put its citizens in the imidugudu scheme in order to provide them with better social services.
- **To provide general education and other social services:** When people were put in the imidugudu, it became easy for the government to provide education to the poor thus increasing the literacy levels in the country.

- **To implement the government's policies and programs:** The government of Rwanda put its citizens in the imidugudu so that it could be easy for it to implement its policies and programs on a population that is easy to reach out to.

- **To settle thousands of refugees** who returned after the genocide against the Tutsi.

The government of Rwanda put people in the Imidugudu to settle the returned refugees from other countries.

- **To find land for landless people in the country:** The government wanted to provide land to the people who were homeless and landless.



### Application activity 10.1.2

Describe the advantages and disadvantages of Imidugudu settlement.

## 10.3. Urban settlement in Rwanda



### Learning activity 10.3

Mr. Bahati is a resident of Kabuga. Every day he takes a taxi to go to workplace in Kigali city. In the morning he gets at work late because of traffic jam in the roads of Kigali city. He cannot afford class house in the city. He preferred living inkabuga because there are cheap houses compared to the city. But also less pollution even if there is frequent shortage of water.

1. Identify the problems faced by people who stay in the urban areas.
2. Suggest the solutions to the problems mentioned in the passage above.

### 10.3.1. Definition

**An urban area** is a built-up area such as a town or city. **Urbanisation** means an increase in the proportion of people living in urban areas compared to those living in the rural areas. As a country industrialises, the number of people living in urban areas tends to increase.

Rwanda has a high growth in population as well as development of urban centres. Many people are now found in cities and towns. The once small trading centres are now developing into municipal towns. The urban centres of Rwanda include the following:

Huye, Gicumbi, Rusizi, Rubavu, Muhanga, Ngoma, Ruhango, Kigali, Nyanza, Musanze, Rwamagana, Nyamagabe, Kayonza, Karongi, Nyamata, Nyagatare.

### 10.3.2. Factors favoring the growth of urban centres in Rwanda

There are several factors that have contributed to the development and growth of urban centres in Rwanda. Some of the factors are discussed below.

- **Transport and communication:** Transport and communication have facilitated the growth and development of towns. They facilitate trade and the development of other social facilities. Some of the examples of towns that have grown as a result of transport and communication include: Kigali, Musanze and Kayonza.
- **Industrialization:** Areas that have many industries usually turn out to be industrial towns. The employment opportunities available attract many people.
- **Supportive government policies:** The government through policy makers identifies areas that have to be developed into towns. The master plan for Kigali includes all areas around the city which are rural in nature but are now being developed into urban centres.
- **Historical factors:** This is a major factor that contributed a lot to the development and growth of Nyanza town. Historically, the town used to host the king's palace. As a result, many people were attracted to the town where they settled and invested in.
- **Strategic position:** The location or position of a place in relation to major facilities contributes a lot to the growth of an urban area. Kigali City for example developed because of its location at the centre of the country.
- **Social facilities:** The presence of facilities such as schools and hospitals influence the development of urban centres since they attract many people.
- **Trade and commerce:** Areas which are associated with trading activities easily develop into urban centres. Such areas include Musanze, Kigali, Rubavu and Gicumbi. They all developed due to the convenience they offered to the business community.
- **Power:** This has contributed to the development and growth of some towns in Rwanda. The presence of electric power stations and other sources of energy such as methane gas play a great role in attracting various activities to areas. An example is the Bralirwa industry in Rubavu -Western Province.

### **10.3.3. Problems of the urban centres and their solutions**

#### **i. Problems of the urban centres of Rwanda**

Urban centres are mainly associated with the following problems:

- Unemployment caused by a high rural- urban migration of people.
- Environmental pollution due to poor waste disposal and industries.
- Deforestation that occurs due to the need for space for expansion and timber for building
- Decline in agriculture due to rural-urban migration.
- Congestion of people posing a risk of infections and the spread of other diseases.
- High rates of crime and other social ills that arise due to the large number of idle youths.
- Loss of culture that occurs because of mixing of people from different cultural backgrounds.
- Development of unplanned settlement because of low income earners of city dwellers but also massive incoming of rural people in city disturb the implementation of city housing plan.

#### **ii. Solutions to the problems of urban centres**

- Construction of sky scrapers in order to use less land and gain space for other activities.
- Recycling, treatment and proper disposal of industrial waste to avoid pollution of the environment.
- Strengthening the police force in order to fight the increase of crime.
- Developing transport systems in order to avoid traffic congestion.
- Construction of more industries to create more employment opportunities.
- Mass education on the danger of rural- urban migration in order to have fewer people in the urban areas and other people practicing agriculture in the rural areas.
- Extension of credit facilities by the government through banks and other financial institutions to enable people create jobs for themselves.
- Devolving essential services and institutions to the rural areas to contain rural-urban migration.

- Provision of decent and affordable housing to the people to contain the emergence of slums.



### Application activity 10.3

1. Evaluate the advantages and disadvantages of urbanization.
2. Suggest what should be done to solve the problem of slums in major urban areas.



### Skills lab

Give advice to the people thinking that better life is found in urban areas



### End unit assessment

1. Giving examples, discuss four types of rural settlements that are found in Rwanda.
2. a) Explain five factors that influence rural settlements in Rwanda.  
b) Discuss three problems of rural settlements in Rwanda and give their solutions.
3. Explain five factors that have favoured urbanization in Rwanda..
4. Evaluate three positive and three negative effects of urban settlements in Rwanda.

## UNIT 11:

### ECONOMIC ACTIVITIES IN RWANDA

#### 11.1. AGRICULTURE

**Key Unit competence:** The student-teacher should be able to investigate the impact of various agricultural activities on the sustainable development in Rwanda.



#### Introductory Activity

Observe the photograph below and answer the following questions:



1. Describe the economic activity identified on the photograph by giving evidence.
2. Identify the contribution of agriculture on the sustainable development of Rwanda.
3. Describe different factors influencing small animal farming in Rwanda.

#### 11.1.1. Crop cultivation in Rwanda



#### Learning activity 11.1.1

Based on your past knowledge and other sources of geographical information;

1. Explain subsistence farming.
2. Mention the subsistence crops that are grown in your region.
3. Outline the characteristics of subsistence farming.

**Agriculture** is defined as the growing of crops and the rearing of animals either for subsistence or for commercial purposes.

**The subsistence crop cultivation** refers to the growing of crops on a small scale for domestic purposes and the surplus for sale.

Therefore, subsistence crop cultivation is the growing of crops such as maize, beans, Irish potatoes, sweet potatoes, Sorghum, banana, cassava, etc.

#### 11.1.1.1. Characteristics of subsistence farming

- Crops grown are on small scale and are mainly food crops for home consumption
- Simple tools such as hand hoes are used
- Use of poor methods of farming such as over cultivation, cultivating upper hills, etc.
- Different crops are grown together
- Low yield per square unit of land cultivated
- Farms are owned by individuals
- It employs people who are mainly members of the family and at times few hired workers.

#### 11.1.1.2. Types of crop cultivation in Rwanda

##### a) Types of Subsistence crop cultivation

##### i) Shifting cultivation / Non sedentary farming

**Shifting cultivation**, is an agricultural system in which plots of land are cultivated temporarily, then abandoned and allowed to revert to their natural vegetation while the cultivator moves on to another plot. It is also known as slash and burn because under shifting cultivation, farmers clear the natural vegetation, cut it into pieces and then burn the cuttings or cleared vegetation.

##### ii) Rotational bush fallowing

**Rotational bush fallowing** is a system of farming whereby the farmer cultivates one piece of land for some years and leave it thereafter with the aim of restoring naturally its fertility. Meanwhile, the farmer will be cultivating another piece of land.

Rotational bush fallowing method differs from shifting cultivation in that farmers are settled and hence are rotating rather than shifting to a new home. This system of cultivation is the simplest form of sedentary farming. It replaces shifting cultivation after this has failed to perform well due to rapid increase in population.

### iii) Small holder

**Small holder**, this is a type of farming that is practiced in densely populated areas. It is a more advanced form of subsistence farming where the lands have been fragmented into very small pieces that are owned by individuals. Crop rotation, mixing, inter cropping, application of fertilizers etc. are applied.

#### **Advantages of subsistence farming**

- It is easy to manage mainly because it involves the members of the family to grow crops.
- People are assured of enough food supply because crops grown are for consumption.
- It is cheap because it requires very little investment.
- The farmer is free from government taxation.
- A farmer has a chance of saving some money.
- Soil fertility is maintained because of growing different crops.

### **b) Types of modern crop cultivation in Rwanda**

#### **i) Plantation crop cultivation in Rwanda**

**Plantation refers** to large scale growing of a single crop using scientific methods of farming and purposely for sale.

In Rwanda, the major plantation crops grown are tea, sugar canes, coffee and pyrethrum.

The major areas of plantations include the following:

- Coffee

The most important types of coffee grown in Rwanda are Arabica and Robusta. Arabica which is mostly grown is believed to have been introduced in Rwanda by German Missionaries. Arabica is mostly grown in high altitude while Robusta is usually grown in humid areas at low altitude.

- **Tea plantations** are especially found at Gisakura, Shagasha, Gisovu, Pfunda, Nyabihu, Rubaya, Mata, Kitabi, Nshiri-Kivu, Mulindi and Mukamira.

## Tea Plantation



*Tea Plantation in Rusizi district*

- **Pyrethrum plantations** are mostly found alongside the Birunga chain of mountains like Gahinga, Kinigi and Karisimbi. The main districts for this plantation are Burera, Rubavu and Nyabihu.

## PYRETHRUM GROWING



*Pyrethrum growing in Musanze district*

- **Sugarcane plantations** are largely found at Kabuye-Nyacyonga, Nyabugogo valley and alongside Nyabarongo river valley.



*Sugarcane Plantation*

### **Characteristics of plantation farming**

- It requires great capital for investment.
- Large size of land (big scale) which leads to specialization of labour on plantations.
- Plantations are usually mechanized and scientific techniques of farming are used. E.g.: use of selected and improved seeds, application of fertilizers, etc.
- Plantation are mainly owned by foreigners, large companies, the government or cooperatives
- The crop is processed where it is grown before exportation.
- There is less wastage of crop. E.g.: From sugarcane, we get sugar, sweets, animal feeds, fertilizers, etc.
- Crops grown are for commercial purposes and mainly for export.
- There is monoculture which means that there is specialization in the production of a single crop.
- Very many people are employed in different activities.
- Plantation farmers offer social services such as schools, hospitals, etc to the workers.
- They are normally established in sparsely populated areas.
- They cover large areas which reach to over 10 ha.

### **Advantages of plantation farming**

- Plantations offer employment opportunities to many people both skilled and unskilled due to different activities.
- They stimulate the development of industries mainly processing industries.
- Plantation farming leads to the development of infrastructures such as roads, schools, Markets, etc.
- The country raises foreign exchange when the crops are exported.
- It is a source of income to the government and people.
- It improves the standards of living of the people because it provides market to rural people.
- People living nearby the plantation get the technical knowledge of how to grow the crops scientifically.

### **Disadvantages or problems of plantation farming**

- There is price fluctuation when there is no demand for that particular crop on the world market.
- There is soil exhaustion due to monoculture.
- It is expensive because many people can't manage it.
- It can lead to famine because food crops are neglected.
- It may lead to the displacement of people because large areas are required.
- They are costly because they require long gestation period to be harvested.
- The crops may be destroyed in case of disease and pest or in case of natural hazards.

#### **ii) A market garden**

This is a form of farming that is relatively small-scale specializing in cultivation of fruits, vegetables and flowers as cash crops, frequently sold directly to nearby consumers and restaurants.

#### **iii) Horticulture**

This means culture or cultivation of garden crops by growing of crops that are highly perishable like fruits, vegetables, flowers and crops like spices, condiments. The horticultural activity involves planting and tending to planted ornamental and food plants. They therefore need to be as near the market as possible for quick consumption.

### 11.1.1.3. Problems and solutions to crop cultivation in Rwanda

N	Problems	Solutions
1	Land fragmentation	Land use Consolidation
2	Competition on the world market	Increase the quantity and quality
3	Limited capital	Provide loans for agriculture Attract foreign investors
4	Climatic/ weather change	Irrigation, canalization, water conservation Development of metrological services
5	Relief which is mountainous	Terracing and afforestation
6	Limited skilled and trained labour	Development of schools and universities for agriculture
7	Monoculture which leads to soil exhaustion	Use of fertilizers and rotation of crops
8	Long time to be harvested	Selected seeds
9	Insects, pests and diseases	Use of insecticides, pesticides and herbicides.
10	Use of local material	Mechanization
11	Poor transportation facilities	Improve the transportation facilities
12	Flooding in plain areas	Good management of swamps and marshes



#### Application activity 11.1.1

1. Suggest the measures that should be taken to address the challenges facing crop growing in swamps of Rwanda.
2. Analyze ways in which plantation agriculture can be improved in Rwanda.

## 11.1.2. LIVESTOCK FARMING IN RWANDA



### Learning activity 11.1.2

Visit a nearest farm:

1. Find out the factors that hinder the development of dairy farming in the farm that you have visited.
2. How does small subsistence farming differ from large scale farming?
3. Explain the contribution of that farm to the nearby people.

**Livestock** refers to the rearing of domesticated animals either for subsistence or for commercial purposes.

In Rwanda, there is both traditional livestock farming and modern livestock farming.

#### 11.1.2.1. Traditional livestock farming or pastoralism

It refers to the keeping of local breeds of animals for subsistence purposes. It is carried out in sparsely populated areas.

**E.g.:** Cattle, sheep, pigs, goats, rabbits, hens etc.



*Traditional Livestock Farming in Nyagatare District*

Traditional livestock farming in Rwanda based on sedentary pastoralism. This term “sedentary” simply means where animals are kept for subsistence on the same piece of land where herds can go out and come back even when conditions are unfavourable.

#### 11.1.2.2 Modern Livestock Farming in Rwanda

This is aimed at rearing animals for commercial purposes using modern or scientific methods. It is therefore a tendency to shift from nomadism to controlled grazing.

## **Types of modern livestock farming in Rwanda**

### **1. Dairy farming**

**Dairy farming** refers to the rearing or keeping of animals for milk and its products such as cheese, butter, etc.

In Rwanda, it is mostly practiced in low lying plains and on mountain slopes with enough moisture and moderate temperatures. The main areas include Nyabisindu, Gishwati, Rubirizi, Songa, Cyeru, Rugende, and Eastern province .



*Modern Livestock Farming in Nyanza District*

### **Characteristics of dairy farms in Rwanda**

Dairy farms in Rwanda is Characterized by:

- Improved breeds of animals are reared specifically for milk and its products.
- Animals are reared in the paddocks with necessary facilities such as veterinary services.
- There are improved crop pastures such as Alfalfa, elephant grass, scetaria and others.
- There is cross breeding between improved races of cattle.
- Most animals are fed indoors (zero grazing) to maintain proper management and care.

The modern breeds of animals reared for dairy farming include: Freesian cattle, the Boran cattle, Hairshire and others.

## 2. Ranching

**Ranching** is the rearing of animals for production of meat.

### Characteristics of ranching farming

- Improved breeds of sheep, goats and cattle are kept.
- Animals are reared on land individually owned or under cooperative units.
- The movement of animals is confined to the paddock within the ranch.
- There is grazing on both natural and artificial pastures, for example Alfalfa.
- Exotic breeds, cross breeds and local breeds are all kept together.
- Ranches are scientifically managed and there is use of artificial insemination, food mixers, de-worming, de-horning, and dipping among other modern practices.
- There is neither overgrazing nor overstocking in ranches.
- A huge capital investment is required to purchase machinery, pay workers, fence off the ranches and to maintain them.
- There is constant record keeping of all inputs and outputs.

## 3. Zero grazing

**Zero grazing:** Is a kind of intensive livestock rearing without pasture land. Animals are kept in the shed where they are fed with fodder and supplementary food.

### Characteristic of zero grazing

The following are some characteristics of Zero grazing in Rwanda:

- Practice of improved breeds
- Improved food made of fodder and industrial products.
- Modern techniques of crossing breeds (artificial insemination).
- Is a farming method that involves keeping cows inside enclosed shelters.
- Zero-grazing is a good system of keeping dairy cattle in densely populated areas, where land is small.
- Huge capital is involved to keep cattle.
- Output is good and high for all level (milk, meat, butter, etc).

#### **11.1.2.2. General problems affecting livestock in Rwanda**

- a) Climatic changes mainly in the eastern province due to rapid increase of temperatures which may result into poor pastures and springs disappear.
- b) Lack of sufficient markets for the products from livestock.
- c) Pests and diseases in some seasons of the year which may affect the production.
- d) Poor breeds of animals which lead to death and poor productions.
- e) Uncontrolled grazing which leads to soil erosion.
- f) Lack of veterinary services and facilities in some areas of the country.
- g) Population growth which causes pressure on pasture.
- h) Poor transport and storage facilities from farms to milk collecting centres and to markets.

#### **11.1.2.3. Ways of improving the livestock farming in Rwanda**

- Replacing the local breeds of animals with the exotic to increase the output. Where possible, crossbreeding should be introduced.
- The farmers should be organized into cooperative societies so that they pool resources together and be done in order to isolate the diseased animals in time to avoid the spread of diseases.
- Provision of market in ranching areas.
- Construction of water valley-dams so as to ensure constant water supply of water.
- Use of scientific methods to improve on pasture in addition to planting drought resistant grasses.
- Extending veterinary services to all the areas where the livestock keeping is practiced.
- Establishing ranch management schools where people can learn modern methods of ranch management.
- Fencing of land, this results in controlled grazing and ensuring of constant supply of pasture.in addition to minimizing the dangers of pests and diseases.

- Encouraging tree planting on pasture land. This minimizes the dangers of environmental deterioration in addition to provision of shelter to animals.
- Several milk collecting centres should be established near the farmers to avoid wastage.



### Application activity 11.1.2

1. Identify the key factors influencing dairy farming in Rwanda.
2. Explain major challenges of traditional livestock farming in Rwanda.
3. Suggest different ways of improving livestock farming in your region.



### Skills lab

After studying different types of agricultural systems in Rwanda, make a business plan you intend to start at home.



### End unit assessment

1. Explain the impact of population pressure on the agriculture of Rwanda.
2. What can people do to improve agricultural productivity?
3. Examine the role played by agriculture products in industrial development of Rwanda.
4. Describe the relationship between livestock and crop cultivation.

## 11.2. MINING IN RWANDA

**Key Unit Competence:** The student-teacher should be able to investigate the impact of mining on the sustainable development in Rwanda.



### Introductory Activity

Study this photograph below and answer questions that follow.



1. Identify the activity that is taking place in the photograph shown above.
2. Mention areas in Rwanda where the activity identified takes place.
3. Assess the impact of the activity on the environment.

### 11.2. Types of major minerals, their importance, problems and solutions to mining in Rwanda



#### Learning activity 11.2

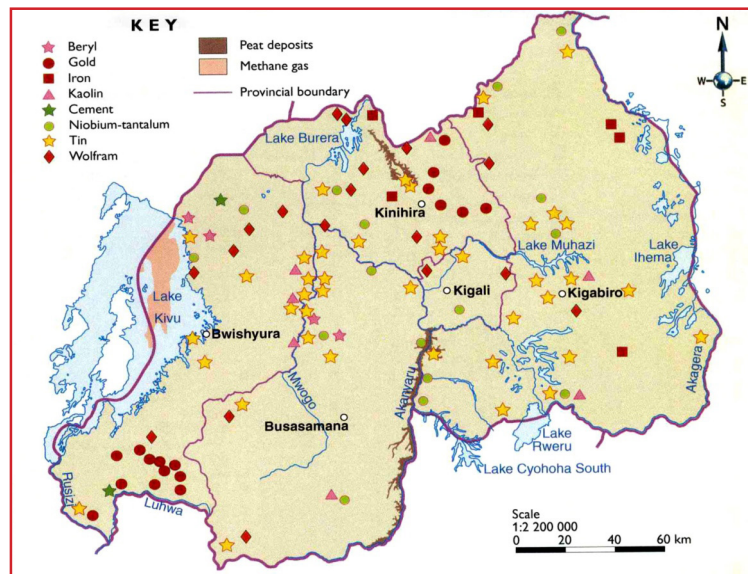
Draw a sketch map of Rwanda and on it, indicate the various mining areas and the types of minerals found in the areas.

1. Identify the importance of mining in Rwanda.
2. Describe the problems facing mining industry in Rwanda.

### a) Types and distribution of the major minerals in Rwanda

Types of mineral	Place where it is found
Cassiterite (Tin ore)	<ul style="list-style-type: none"> <li>• Rwinkwavu • Musha • Bugarama</li> <li>• Rutongo • Gatumba • Mwaka • Rutsiro</li> <li>• Bisesero</li> </ul>
Coltan	<ul style="list-style-type: none"> <li>• Kabaya • Rutsiro • Ngoma • Nyagatare</li> <li>• Gatsibo • Rubavu • Rusizi</li> </ul>
Natural and methane gas	Lake Kivu
Gold	<ul style="list-style-type: none"> <li>• Nyungwe • Miyove in Gicumbi district</li> <li>• Nyamasheke</li> </ul>
Limestone	• Bugarama in Rusizi district
Peat coal	It is found in marshy areas along Rivers Akagera, Akanyaru, Nyabarongo and around Lakes Burera and Ruhondo; it is also found in Rusizi district, etc.
Wolfram (Tungsten)	<ul style="list-style-type: none"> <li>• Rwinkwavu • Gatumba • Rutongo</li> <li>• Nyakabingo • Bugarama • Gifurwe</li> </ul>

### Major mining areas in Rwanda



Source: Oxford (2010), 360° Atlas for Primary Schools, East Africa, Nairobi, Kenya.

## **b) Importance of mining to the economy of Rwanda**

The mining sector in Rwanda plays a significant role in the economic development of the country

- Mining has led to the development of other industries which use the minerals as a raw material.
- Mining has led to the development of social facilities such as schools and hospitals that are located near the mining centres.
- The sector provides employment to the people who work in the mines thus providing them with a source of income that improves their standards of living.
- The mining sector earns the country foreign exchange through the export of minerals.
- The sector provides revenue to the government through taxation.
- Mining has led to economic diversification. It has reduced the country's overdependence on agriculture.

## **C) Problems affecting the mining and their solutions.**

### **i) Problems affecting the development of mining industry in Rwanda**

The major problems affecting the mining industry of Rwanda include the following:

- The absence of high-grade ores deposit in Rwanda, existence of small quantities makes it uneconomical to exploit them.
- Lack of enough capital to invest in the development of mining which causes Rwanda to still use poor methods of mining.
- Shortage of internal market for mineral ores which therefore lead to their exportation and thus price fluctuation on the world market.
- Competition of mining sector of Rwanda and that of other countries.
- Shortage of power to use in form of hydroelectric power.
- Loss of lives in the mining areas. Some mining sites collapse with the workers inside the mines. This leads to loss of lives and discourages people from working in the mines.
- Most mining activities are controlled by foreign companies. As a result, a big part of the revenue from the sector is repatriated.
- Poor transport due to lack of good roads and railways that makes some areas especially those in the mountainous areas inaccessible.

- Shortage of skilled manpower for exploitation of minerals.
- ii) Possible solutions to the problems of mining in Rwanda
- Introduction of improved and modern methods of mining. This will increase the mining output and the quality of products.
- Hiring of skilled labour force and training the local workers in order to empower them.
- The government should give local companies financial assistance.
- In areas where large mineral deposits have been identified, the government should construct roads, railways and airports.
- Safety standards and the working conditions of the employees should be improved so as to guard against accidents that lead to loss of lives.
- More industries that use minerals as raw materials should be established in order to increase the local demand for mining output.



### Application activity 11. 2

1. Evaluate the negative effects of mining on the physical environment of Rwanda.
2. Suggest ways of protecting the environment from the damage caused by mineral exploration and exploitation.
3. Account for the low levels of mineral exploitation in Rwanda.



### Skills lab

There are many minerals in the environment. Create a business plan of mineral production you will do after finishing secondary school level.



### End unit assessment

1. To what extent is mining a significant sector in the development of the economy of Rwanda?
2. Assess the impact of mining methods used in Rwanda to the environment.
3. Suggest environmentally friendly methods of mining that should be used by mining companies in Rwanda.

## 11.3. POWER AND ENERGY IN RWANDA

**Key Unit competence:** The student-teacher should be able to investigate the impact of Power and Energy production on the sustainable development in Rwanda.



### Introductory Activity

Study the following image of energy and answer questions that follow:



1. Identify the major sources of energy used in Rwanda.
2. Classify the sources as either renewable or non-renewable.
3. Analyze the effects of energy exploitation to the economic development of Rwanda

### 11.3.1. Major sources, forms of energy and importance of energy in Rwanda



#### Learning activity 11.3.1

In her home, Mahirwe watches the television, she cooks by using gas cooker, because firewood is not friendly to the environment.

1. Identify other sources of energy not mentioned in the passage above.
2. What is the importance of power and energy in Mahirwe's family?

## i) Major sources and forms of energy used in Rwanda

**Power** is the capacity to change or do things whereas **energy** refers to any source of usable power. The sources of energy used in Rwanda include; wind, hydroelectric power, solar, natural gas, biogas and petrol. With respect to renewability, sources of energy may be divided into: renewable and non-renewable energy.

### a) Renewable sources of energy

These are sources of energy that cannot be exhausted. They have the capacity of refilling themselves after being used. The production of such energy is endless because the energy is regenerated naturally.

Renewable energy is also called '**Clean Energy** or '**Green Power**' because it does not harm the environment by causing pollution. Many forms do not emit any greenhouse gases or toxic waste in their process of producing electricity. It makes the less impact on the environment than our current convectional energy source.

In Rwanda, the renewable sources of energy that are in use include the ones listed below.

- **Water (Hydroelectric power):** It can be generated where there is water flowing such as in the permanent rivers of Rwanda. It is generated by water of river at the falls were dams are installed.
- **Solar energy:** It is generated by sun's rays that reach the solar boards which convert them in electricity. It is the renewable, cheap and clean power without pollution. It is relatively simple to operate and maintain.
- **Wind energy:** It is generated using wind or moving air. It comes from wind turbines that run with the force of wind speed. Some of them are installed on mount Jali.
- **Biogas:** It is a gas generated from human and livestock wastes as well as biodegradable household wastes. Biogas in Rwanda is used in prisons, schools, hospitals and some homesteads for cooking and lightning.
- **Biomass:** This is got from woods.
- **Geothermal:** This will be generated using the hot springs and geysers found in the volcanic areas.

### b) Non –renewable sources of energy

They are exhaustible sources; they cannot be replaced when exhausted. Examples: coal, natural gas, oil, firewood.

- **Peat coal:** Peat is an organic black deposit composed of the remaining parts of plants that are partially decomposed due to poor drainage. It is formed in many swamps of Rwanda: Akagera, Akanyaru, Nyabarongo, Mugesera, and Gishoma swamps.
- **Firewood and charcoal:** They are mostly used in Rwanda by people over 90% for cooking. Firewood is also used by different tea factories and Kabuye sugar factory.
- **Petroleum:** Rwanda does not produce it but it is imported from Middle East in Asia through Mombasa and Dar-essalaam ports. Rwanda uses refined petroleum (diesel, petrol, kerosene) for transport, lighting at home and for generation of electricity.

#### ii) Importance of power in the development of Rwanda.

- Power is important for domestic uses hence raising the standards of living of the people.
- Power is important in the development of industry. Most industries use electricity and petroleum to run engines in the industries.
- Petroleum is used to run vehicles hence facilitating transport systems in the country.
- Petroleum and electricity are often used to run water pumps and other agricultural machinery.
- Electricity contributes a lot in running activities in schools, hospitals and printing industries.
- Power contributes to the growth and development of urban centres.
- Power contributes to the development of trade and commerce by facilitating the operations of the various businesses.
- The availability of power helps in making an area a potential tourist attraction centre.



#### Application activity 11.3.1

In Rwanda there are many sources of energy like solar, oil fuel, biogas, hydro-electric energy that are used in our daily activities:

1. Explain why hydroelectric power is mostly used than other source of energy.
2. Analyse the advantages of oil fuel over solar energy.

### 11.3.2. Problems hindering the development of energy and their possible solutions



#### Learning activity 11.3.2

Make a research: Outline the problems encountered in power production and suggest ways to improve energy production in Rwanda.

#### i) Problems hindering the development of energy

**Poor economy of people:** This has limited the market for power and energy since a large proportion of the population is not economically empowered to pay energy.

**Illiteracy:** Due to illiteracy, part of the rural population in the country is hesitant to use electricity.

**Climatic changes:** Much of Rwanda still uses hydroelectric power which depends on the availability of water in the rivers. When there is drought the production of electricity is affected.

**The break-down of facilities:** Due to poor technology, sometimes breakdown of machines disrupts power generation and distribution.

**Unskilled labour:** Sometimes, the country has to depend on expatriate expertise. This causes delays and is also expensive raising the cost of power production.

**Lack of adequate capital:** Setting up of power stations is a very capital intensive venture. The capital needed is usually not readily available because of other competing needs.

**Limited alternative sources of power:** Due to the use and dependence on hydro-electricity, the other alternative sources of energy have not been developed. This creates a power shortage in the country whenever it fails.

**Limited research: Research** is very important in harnessing power. The ability and resources to research further on hydroelectricity power production as well as in other alternative sources of energy is limited.

**Inaccessibility of some areas that are power potential sites:** Due to the hilly and mountainous terrain of the country, it is difficult to construct roads and other infrastructure. This limits access to other areas that are power generation potential sites.

**Silting and flooding:** majority of the rivers in Rwanda carry a lot of eroded materials from the mountainous areas. They end up depositing a lot of silt and mud on their river beds. The silt may interfere with the generation of power.

**ii) Possible solutions to the problems affecting power and energy production in Rwanda**

- **Use of diversified sources of energy:** In many areas of Rwanda, homesteads have been connected to renewable power such as solar energy. This mostly works in rural areas and in urban areas as an alternative to hydroelectric power.
- **Efficient transmission and distribution of power:** This has been one of the government's top agenda. It has been implemented through the rural electrification programme that has assisted many homes to have power.
- **Emphasise on the use of renewable energy:** Both the government and private sector in Rwanda emphasise on the need to use renewable energy sources such as wind and solar energy.
- **Construction of more power plants:** The construction and establishment of more power stations especially hydroelectric power stations will help in boosting power production in the country.
- **Training human resource:** The government should commit itself in training more people in power and energy specific courses. These people will help in providing the much needed expertise in the energy sector.
- **Creation of buffer areas around power stations:** The creation of protected areas and buffer zones of 50 metres around water bodies and power stations will assist in reducing the silting of dams and power stations in the country.
- **Affordable prices:** The government together with other parties involved in the production of power and energy should device a fair power pricing system. This will make power affordable and available to all.
- **Environmental assessment reports:** There should be serious environmental assessment studies carried out before and during the power production periods. This will help to prevent environmental hazards beforehand.



### Application activity 11.3.1

To what extent is the presence of waterfalls responsible for the development of power and energy production in Rwanda?



### Skills lab

In Rwanda there are many sources of energy. Introduce any source of energy that is friendly to the environment.



### End unit assessment

1. Imagine, if the oil supply gets exhausted one day, how would this affect our life style?
2. Explain why the government of Rwanda advocates for transmission and distribution of power and energy to rural areas.
3. Describe the effects of power generating stations and operation on the environment
4. Suggest ways in which the government will cope with the increasing demand for power with the increasing population
5. There is much energy which is not well exploited, highlight the factors affecting oil fuel production in Rwanda.

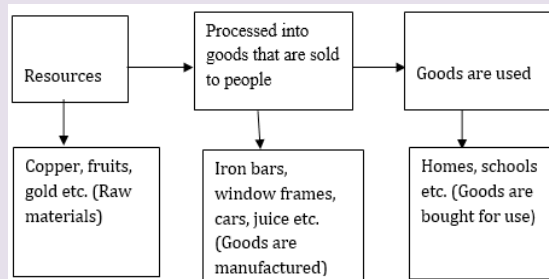
## 11.4. INDUSTRIALISATION IN RWANDA

**Key Unit competence:** The student-teacher should be able to explain the impact of industrialization on the sustainable development in Rwanda



### Introductory Activity

Work in pairs, study the flow chart below and use it to answer the questions that follow.



X

1. Name the process that the flow chart represents.
2. Describe the process represented by the flow chart.
3. What is represented by X and why is it important?
4. Name at least two areas in Rwanda where the processes shown in the flow chart are carried out.

### 11.4.1. Industry and factors affecting the location of industries in Rwanda



#### Learning activity 11.4.1

With reference to the statement “Inyange industry ltd is located in Masaka sector, Kicukiro district” answer the following questions:

1. To which category of industry does Inyange industry belong to?
2. Find out the factors that influenced its location.
3. Identify and explain the factors that affect the development of the industry.

## i) Definitions

**Industry** is defined as an establishment set up to process and transform complex, simple and ordinary raw materials to either semi-finished or finished materials.

**Industrialization** refers to the concentration of industries in an area; it also refers to the process concerned with the mechanical or chemical transformation of inorganic and organic substances into new products. It is the process that transforms raw materials into new products.

Industrialisation in Rwanda takes place in a very low scale when compared to other countries such as Kenya and Uganda. The government of Rwanda is working hard to turn the economy from being predominantly agrarian to a more industrialised one.

However, the challenges of limited natural resources such as minerals and the fact that the country is landlocked slow down the industrialisation process. Most of the industries in Rwanda are agro-based with a few manufacturing industries found in urban centres especially Kigali.

## ii) Factors affecting the location of industries in Rwanda

Industries in Rwanda are located in different places. There are factors that affect their locations. They include the following.

- **Availability of raw materials:** In determining the location of an industry, closeness to sources of raw materials is of vital importance. This reduces the cost of production and increases the profit margins of the company.
- **Transport and communication facilities:** Industries are usually located near transport and communication facilities in order to easily transport raw materials and finished goods to and from the industries.
- **Availability of power and other energy sources:** Most industries in Rwanda are located near sources of energy and power, such as areas in Kigali city.
- **Proximity to markets:** Most industries in Rwanda are located in areas where there is already market for their products.
- **Government policies:** The Rwandan government has demarcated areas for industries through the Rwanda Development Board.
- **Availability of labour:** Industries that are labour intensive in Rwanda are located in areas where there is assurance of a steady supply of labour. This is possible in areas that are densely populated such as Kigali, Musanze and Masaka areas.

- **Availability of land:** This has a great influence in the location of industries in Rwanda. Industries that require large pieces of land have to be established in areas where there is available land.
- **Availability of water:** Industries that need to use a lot of water are usually located near water sources. Water is a raw material for some industries, acts as a cooling agent in some industries and is sometimes used to transport raw materials and finished products to the market centres.
- **Investors' preferences:** Industries may be located in specific areas due to the investor's personal preferences.
- **Proximity to aids to trade:** Industries in Rwanda are located near areas where aids of trade such as banking and insurance services are available.
- **Industrial inertia:** Investors would want to establish new industries in areas where other industries were located This is due to the advantages of already established infrastructure and other public utilities that can be of help to the industry.
- **Climate:** There are some industries in Rwanda that are located in given areas due to favourable climatic conditions. Examples of these industries are agro-based industries such as tea processing factories that are located in areas where climate is favourable for the growth of tea.
- **Relief:** Most of the industries in Rwanda are located in lowland areas where the landscape favours easy construction of industrial infrastructure.



### Application activity 11.3.1

1. Differentiate industry from industrialization.
2. Visit any industry near your home or school and examine the factors that led to its location.

## 11.4.2. The importance, Problems affecting industrial development and their solutions in Rwanda



### Learning activity 11.4.2

Read the extract below and answer the questions that follow.

Nyirangarama, Rwanda (CNN) — A maverick entrepreneur and self-made millionaire, Sina Gerard is probably Rwanda's most famous businessman. Having established a business empire from the bottom up, he's now training local farmers to help make Rwanda an agricultural exporter.

“My aim is to make sure that the Rwandan people build themselves and get out of poverty,” he says. “My aim is to make sure Rwandan farmers, because they are rated at 90%, feel proud to be farmers. I'm sure I'll achieve it because so far I have achieved a lot.”

There are no doubts to Gerard's achievements. Twenty-five years ago he had just one employee, who helped him sell the bread he baked at his parents' farm. Now, Gerard says he employs hundreds of workers and buys produce from thousands of farmers. **Source: CNN's Marketplace Africa.**

1. Identify and explain the importance of industries that are mentioned in the extract.
2. Describe the likely problems facing NyirangaramaEntreprise
3. Suggest possible solutions to the industries in Rwanda

#### i) Importance of industries

Industrialisation is among the most significant sectors that faster modernisation. This is due to the following reasons.

- **Employment opportunities:** Industries create varied employment opportunities to the people thereby reducing the problem of unemployment and underemployment in the country.
- **Provision of products needed by the society:** The agro-based industries in Rwanda such as the Inyange and Urwibutso agro industries provide products that satisfy the needs and wants of the people.
- **Source of foreign exchange:** The government of Rwanda is able to earn foreign exchange from the export of products from the industrial sector. This assists the government to stabilise its balance of trade.

- **Improved standards of living:** The industries enable the population of Rwanda to improve their standards of living. They provide processed food stuffs and other materials for use in the day to day life of the Rwandan people.
- **Diversification of the Rwandan economy:** Industrial development in Rwanda has provided an alternative source of revenue to the economy of the country. This has helped to reduce overdependence on primary products whose prices fluctuate from time to time.
- **Growth of infrastructure:** Rapid industrial growth has resulted in the expansion of infrastructural facilities. The development of modern industries in Rwanda has stimulated the growth of the banking, insurance, commerce, air and road transport services to industrialise the economy.
- **Research and development:** Creativity and innovation define Rwanda's industrial sector. Constant research ensures that the sector is up to speed with advances in technology that are needed for further growth and development. This is aimed at producing quality goods and services.

#### ii) Problems affecting industrial development

Some of the problems affecting industrial development in Rwanda include the following:

- There is a shortage of skilled labour. This results in reduced production and poor utilisation of resources.
- There is limited market for products from industries because of the low income of most Rwandans.
- The technical development in Rwanda is still low. This affects the quality of industrial products.
- There is inadequate supply of raw materials especially those needed in metal work industries. These raw materials have to be imported making them expensive beyond the reach of many Rwandan citizens.
- Rwanda is a landlocked country. This poses a great challenge to industrialisation since it has to depend on the delivery of raw materials from other countries.
- Rwanda faces stiff competition in the international market from other industrial countries like Kenya and Uganda in the region.
- There is limited investment in the industrial sector as a result of insufficient capital required to put up and operate industries.

- The education system of Rwanda has been theoretical only equipping learners with knowledge without the skills required in the job market. This has resulted in a shortage of technical industrial skills.
- There are limited raw materials to be used in the manufacturing of different products.

### iii) Solutions to problems faced by industries in Rwanda

There are several solutions to address the problems affecting industries in Rwanda. They include the following.

- Improving the transport and communication network in the country through construction of new roads and rehabilitation of the existing ones.
- Encouraging more investors, both foreign and local to invest more capital, and use managerial skills in the sector. This will ensure smooth running of industrial activities.
- Training of more human resources in different industrial jobs such as communication and marketing. This will help to deal with the problem of shortage of labour.
- Cooperating with major development partners such as the World Bank and the African Development Bank to provide credit facilities so as to address the problem of inadequate capital.
- Widening both the local and international markets through joining economic blocs such as the East African Community (EAC) and Common Market for Eastern and Southern Africa (COMESA).
- Improving technology in order to produce high quality goods which can attract high demand in both the local and foreign markets. (g) Importation of raw materials which are not found in Rwanda in order to sustain production.
- The government should design policies that encourage the establishment of local industries and protect them from external competition.
- The **Made in Rwanda Policy** is a holistic roadmap aimed at increasing economic competitiveness by enhancing Rwanda's domestic market through value chain development. It does so through two channels: firstly, it brings together existing government interventions under a clear policy framework; secondly, it addresses supply-side bottlenecks via targeted interventions aimed at deepening specific high potential value chains, improving quality, and boosting cost competitiveness. The Policy has five main pillars:

1. Sector Specific Strategies
2. Reducing the Cost of Production
3. Improving Quality
4. Promoting Backward Linkages
5. Mind-Set Change



### Application activity 11.4.2

Explain with supporting evidences how Made in Rwanda policy is one of the solutions to the problems that affect industrial development of Rwanda.

### 11.4.3. Environmental and health issues associated with industrialization and ways to mitigate them



### Learning activity 11.4.3

Using the Internet and other geographical documents

1. Find out the impact of industrialization on the environment and on human life.
2. Suggest ways in which the effects of industrialization can be addressed and their negative impacts reduced.

#### i) Impacts of industrialization in Rwanda

Industrialization has had several impacts on the environment and on human health. Some of the impacts are discussed below.

- Industries emit poisonous gases and smoke that pollute the atmosphere. This affects the environment, creating micro climates and endangering the lives of people and animals.
- The establishment of industrial infrastructure requires vast amounts of land. This means that the preparation of sites requires the removal of vegetation in readiness for construction.
- Industries that deal with forests, mining and processing, destroy the environment because they use up the scarce natural resources available.

- The industrial waste products are sometimes improperly disposed. This makes it hard to find clean water for domestic consumption especially in areas that are near the industries. The effluents also destroy aquatic life.
- The raw materials used in industries are sometimes from the environment in areas such as forests, water bodies and land. The exploitation of these materials has had negative effects on the environment.
- There are diseases that have come up as a result of the establishment of industries.
- Industrialisation in Rwanda has caused rural urban migration. Many people leave the rural areas to go to urban centres to work in industries that are found in the urban areas.
- There are accidents that occur in industries which have caused the loss of many lives.
- Some industries produce goods that are harmful to the lives of people.

#### **ii) The mitigation of the environmental and health issues associated with industrialisation in Rwanda**

There are various mitigation measures that the government has put in place to address the environmental and health issues that are related to industrialisation. They include the following.

- The government has designed various policies that aim at protecting the environment and people against the negative effects of industries.
- The government has put in place the Environmental Impact Assessment (EIA) requirement before the establishment of any industry.
- The government has set up new industrial areas such as the Free Trade Zone at Ndera, the Masaka region and the new huge industrial region in Gashora, Bugesera district.
- There are standards that have been put in place that the industrialists have to follow. These are safety standards to ensure that the working conditions do not endanger the lives of the workers and the communities around.
- There is emphasis put on chemical neutralisation of the industrial wastes that could cause serious problems. This aims at reducing the toxicity of the industrial wastes.
- Rwanda has demarcated areas to be disposal sites. These sites are located far away from homes and are relatively protected as secure hazardous waste disposal sites.



### Application activity 11.4.1

In a field visit to one of the industries in the country, observe and find out the following;

1. The effects of the industry on the environment and on human health.
2. Suggest ways to mitigate the impacts highlighted in the above question.



### Skills lab

Industrialization is one of the pillars of development. Identify your contribution to the new brand of Made in Rwanda.



### End unit assessment

1. Give five reasons why industries are important in Rwanda.
2. a) Discuss five problems that affect industrial development in Rwanda.  
b) Provide the solutions to the problems listed in (a) above.
3. Explain three environmental issues associated with industrialization in Rwanda.

## 11.5. TOURISM IN RWANDA

**Key Unit competence:** The student-teacher should be able to investigate the impact of environmental conservation and tourism on the sustainable development of Rwanda.



### Introductory Activity

Kwita Izina is an annual baby gorilla naming ceremony aimed to raise awareness on the conservation of mountain gorilla, promote Rwanda, and empower local communities of the volcanoes national park. Since 2005 the government of Rwanda through RDB and other conservation partners celebrates the event.

1. Explain the relationship between environmental conservation and tourism.
2. Explain why Rwanda celebrate annually Kwita Izina event.

### 11.5.1. Forms of tourism, major tourist attractions and factors influencing tourism in Rwanda.



#### Learning activity 11.5.1

Now days the government of Rwanda is empowering the tourism sector to boost its economy. The country put forward an advertising campaign of “Tembera u Rwanda” and “visit Rwanda” aiming at encouraging local people and foreigners to explore more the beauty of the country. The campaign is not only about tourism but it shows Rwanda as a good place to do business as well.

1. What do you understand by “tourism”?
2. Outline the major national parks in Rwanda.
3. Identify the major tourist attraction in Rwanda.

#### i) Definition

**Tourism** refers to travel for recreation, leisure, religious, family or business purposes usually for a limited duration. Tourism may be practised outside one’s country or domestically within the confines of one’s country.

**Ecotourism** is a better way of doing tourism without destroying the environment. This means that ecotourism attempts to minimize the impact of tourism upon the environment and is ecologically sound, and prevents the negative impacts of many large-scale tourism developments undertaken in the areas which have not previously been developed.

## ii) Forms of tourism

Forms of tourism refer to the types of tourism. There are two main types or forms of tourism:

### **Domestic tourism and International tourism.**

**Domestic tourism** involves visiting places that are located within the borders of one's country for pleasure, relaxation, study or research. This is known as domestic tourism.

When tourists come from Europe to tour Rwanda, this is known as **international tourism**. Their travel involves crossing of international borders to reach Rwanda. The citizens of Rwanda also get involved in international tourism when they tour other countries.

## iii) Major tourist attractions in Rwanda

Rwanda is blessed with a wide range of tourist attractions. They include the following:

- **Wild animals:** These include mountain gorillas, elephants, hippos, giraffes, monkeys, buffaloes and lions. The animals are protected in the national parks and game reserve such as the Birunga National Park, the Akagera National Park, and Nyungwe Forest Park.
- **Mountains and hills:** Rwanda has various mountains and rolling hills that make it a land of thousand hills at the heart of Africa.
- **Vegetation:** Forests like Nyungwe, Gishwati forest, and the savanna woodlands of the Akagera are parts of the vegetation that are attractions in Rwanda.
- **Water bodies:** Lakes such as Lakes kivu, Burera, Ruhondo, Mugesera, Muhazi and Ihema. These water bodies provide beautiful sceneries that attract tourists.
- **Hot springs:** Rwanda has other tourist attractions that are associated with vulcanicity. Among them are the hot springs in Rusizi and Rubavu districts.
- **Beaches:** There are beaches next to the Rwandan lakes. The beaches offer excellent sites for relaxation. There are common along the shores

of lake kivu in Rubavu, lake Muhazi, and around lake Rumira in Bugesera.

- **Caves:** Musanze and Busasamana caves in Musanze and Rubavu respectively. Busasamana caves of Rubavu are associated with volcanic eruptions that took place longtime ago.
- **Historical sites:** They include the Nyanza king's palace which was the headquarters of the traditional kingdom in Nyanza district, the burial place of the traditional kings in Gicumbi district and Urutare rwa Ndaba in Karongi district.

iv) Factors affecting the development of tourism in Rwanda

There are several factors that affect the development of tourism in Rwanda. They include the following.

- **Political stability:** Rwanda has experienced long peaceful period since 1994. This has enabled foreign tourists to travel to the country without fear of insecurity.
- **Existence of varied tourist attractions:** The many museums with unique information and the beautiful countryside are of the attraction, another example is mountain gorilla which is rare elsewhere.
- **Gorilla naming ceremony:** This ceremony is a special tourist attraction. Every year, Rwanda holds a gorilla naming ceremony which attracts many local and foreign tourists.
- **Publicity and advertisement locally and abroad:** The government carries out campaigns both locally and abroad creating awareness on the tourist attractions in the country.
- **Development of tourist hotels:** The government and private organization have constructed class hotels and lodges in different parts of the country near tourist attractions.
- **Friendly people:** The people of Rwanda are friendly. The hospitality of Rwanda people encourages more people to visit the country.
- Favourable government policies towards tourism.
- Historical and cultural factors that contribute to the development of tourism.



### Application activity 11.5.1

1. Identify major features that attract tourists in Rwanda.
2. Differentiate Eco-tourism from tourism.

## 11.5.2. Impact of tourism, Problems affecting the tourism in Rwanda and the solutions



### Learning activity 11.5.3

1. Identify the importance of tourism in Rwanda.
2. Describe at least 4 problems affecting tourism sector in Rwanda.

#### i) Importance of tourism on sustainable development of Rwanda

- It provides potential market for industrial produce as well as local market produce.
- It facilitates the improvement of infrastructures, more especially roads, schools, hospitals, cultural centres.
- It provides employment opportunities due to high demand for cooks, hotel personnel, administrative staff, drivers, guides and game rangers.
- It contributes to the appreciation of local culture (cultural dances and music) and various historical sites such Kings Palace, Museums, etc.
- It is a source of foreign exchange which can be used for buying imports and developing other sectors of the economy.
- The entrance fees to game parks helps to ensure the conservation of the environment especially wild game (fauna) and natural vegetation (flora).
- Tourism leads to expansion of local handcraft industry because foreign holiday makers buy large amount of baskets (uduseke) and wood carvings.
- Tourism leads to improvement in international relations between Rwanda and other countries.

#### ii) Problems affecting the tourism in Rwanda

There are many problems that affect the development of tourism in Rwanda. They include the following:

- **High population:** Increase in human population has led to human encroachment on the tourist attraction sites destroying the natural habitats for wildlife.
- **Lack of a skilled labour force:** Lack of skilled and trained workers in various tourist centres affects the quality of service offered.
- **Lack of participation in tourism by the locals:** There is lack of interest within the local population that is ignorant on the tourist attractions in the country.
- **Inadequate social facilities:** There are inadequate social facilities such as hospitals, sports and other recreational facilities in areas containing tourist attractions.
- **Poor technology:** The level of technological development of the country is still very low. This affects the development and growth of tourism industry.
- **Poaching:** Illegal poaching has led to the diminishing numbers of wild game.
- **Lack of information on the importance of tourism:** There is lack of awareness on the importance of tourism among the local communities.
- **Poor transport and communication:** Most of the areas of importance to tourism are situated in remote areas where roads are non-existent or impassable during the rainy seasons.

### iii) Future prospects of tourism in the country

- The government plans to develop other products that can attract more tourists to Rwanda.
- The Rwandan government plans to intensify marketing and awareness of the resources found in the country.
- The country intends to increase the number of skilled and professional personnel in the sector through training.
- There are more plans to involve the local communities who live near tourist attractions in the management of the sites.
- There are plans to open up the country more through increased development of transport infrastructure.
- There are plans to review the current framework of regulations so that laws are established to facilitate sustainable growth and development of the tourism sector in the country.

- The investors willing to develop businesses in the sector will receive full support from the government.
- There are plans to put more emphasis on the importance of eco-tourism and environmental sustainability for the future generations.



### Application activity 11.5.1

1. Analyse the major problems hindering tourism industry in Rwanda.
2. Explain what should be done to promote local tourism?
3. Assess the contribution of tourism in the development of the country.



### Skills lab

Carry out a field visit in your local community to discover and explore new tourist attraction.



### End unit assessment

1. Identify the importance of environment conservation in tourism.
2. Explain the role of advertisement in tourism sector.
3. Analyze any 3 measures put forward by the government of Rwanda to improve the tourism industry in Rwanda.
4. Poaching is one of the major challenges in tourism and environment conservation.
  - a) What does poaching mean?
  - b) Why do people poach?
  - c) Suggest possible solutions to poaching.

## UNIT 12:

# CIVILIZATION OF PRE-COLONIAL RWANDA

**Key unit competence:** The student-teacher should be able to analyze the civilization of pre-colonial Rwanda



### Introductory Activity

Do you think that in the Pre-colonial period, Rwandans had managed to develop different elements of their civilization? If you think so, write down a 500 word text justifying your assertion.

The term “civilization” refers to the process through which people settling on a territory improve their ways of living during a given period of time. This concept is also defined as a set of characters, distinct signs, pertaining to intellectual, artistic, moral and material life of a country or a given society. Civilization also refers to the great advance in highly developed culture and way of life when people began to farm, form governments, use metals, develop cities and use writing.

## 12.1. Social organization of the Pre-colonial Rwanda



### Learning activity 12.1

Define the concept of civilization. Thereafter, describe the social organization of the Pre-colonial Rwanda.

#### 12.1.1. Family, lineage and clan

The social organization of Pre-colonial Rwanda was based on three main elements including nuclear family, lineage and clan.



*Nuclear family*

The nuclear family was a key element of this organization. It was composed of the husband, his spouse and children if they had them. For polygamy, a man had many wives and single children. Every wife had her own homestead and their husband used to visit them one after one.

In case of death of a spouse, a woman would remarry with one of the members of the family of the deceased in order to form a Leviticus family. The children resulting from this union were socially considered at the same level like those of other spouses.

### ***Lineage***

The lineage is a set of several families descending from one common and real ancestor and recognizable because of the genealogical tree traces. People who claim the same lineage take on the name of the common ancestors. Besides carrying a proper genealogic remembrance, the members of the same lineage have kept a minimum residential unity. In the traditional Rwanda, there was *minor lineage, inzu* and *major lineage, umuryango*.

### ***Clan***

“The term “clan” means a group of people who claim to be descendants from one common mythical ancestor. The term “clan” corresponds to the term “ubwoko”. Clans also have animal totems.

The clan is a set of several lineages claiming a same mythic common ancestor, but rather far off and fictitious. It is not easy to trace it using a genealogical tree. The members of same clan share the same culture, same taboos and same totem.

### 11.1.2. Alliance and solidarity in traditional society

The alliance between families and individuals was reinforced and maintained through marriage and solidarity.

#### Traditional marriage



#### *Guheka umugeni*

*(Source: Republic of Rwanda, Ministry of Education, National Curriculum Development Centre, (2010), The History of Rwanda Secondary Schools Teacher's Guide, Module I & II, Kigali, Page41)*

In traditional Rwanda, a daughter was considered as a linking factor between families. Marriage was a union between a man and woman, after the former had paid dowry (cow, goats and hoes) and after organizing ceremonies where big quantities of beer were served.

A part from marriage, there was also solidarity blood pact (Kunywana / Guca ku nda) rescuing (Gutabarana) giving a cow (Guhana inka)

### 11.1.3. Division of labor

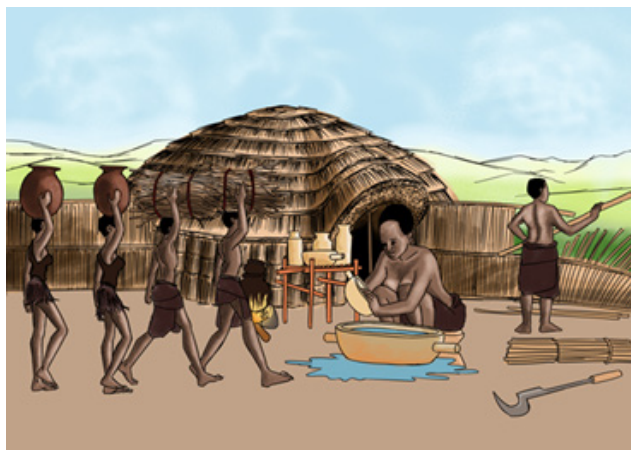
In the Rwandan society, it is worth noting that every able member even young children had to be active. But all members of the society were not equally strong. Therefore, there were activities reserved for certain categories of people: men, women and children.

**For men:** to fish, to hunt, to dig the fields, to build houses, to herd cows or goats and to serve in the army;

**For women:** to look after babies, to maintain the house, to prepare the food, to weave, to fetch water and to collect firewood;

**For children:** to collect firewood, to fetch water, to herd cows or goats, to sweep or clean house.

However, as the children grew up, parents began initiating them in the work of adults according to their sex. Boys educated by their father and girls educated by their mother (*mu rubohero*).



*Division of labor*



### Application activity 12.1

1. Basing on the definitions and features of the lineage and clan, compare and contrast these two concepts.
2. Explain different roles played by clans in the Pre-colonial Rwanda.

## 12.2. Cultural organization



### Learning activity 12.2

During the Pre-colonial period, the kingdom of Rwanda was already endowed in matter of cultural organization. Analyze to which extent this affirmation can be justified.

#### 12.2.1. Traditional religion

##### Conception of Imana (God)

In the Pre-colonial period, Rwandans were monotheists who believed in One Supreme Being. They commonly accepted their God (Imana) as omnipotent, omnipresent and omniscient.

However, there were no rites for Imana, no temple to worship Imana but Imana is present in throughout some aspects of the daily living of Rwandans.

### **Omnipresence of Abazimu**

By “*Abazimu*” we understand spirits of the departed or dead. According to the belief of Banyarwanda, a human being is made up a visible part (body) and an invisible part (soul). Upon dying, the union of body and soul disappears and in a mysterious way the soul is transformed into a spirit called in Kinyarwanda “*Umuzimu*”.

### **Guterekera or culture for ancestors**

This rite concerns to offer some things as food or drinks to Umuzimu. That rite took place in small house called Indaro. The gestures are accompanied by oral requests formulation according to circumstances.

### **Kubandwa**

The rite of Kubandwa is a ritual ceremony accomplished in two steps and consists to offer the offertories to Ryangombe and other Imandwa.



People of Ancient Rwanda performing the rite of kubandwa

[https://www.google.rw/search?q=photo+on+the+rite+of+kubandwa+in+rwanda&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjU8dS4qLfkAhUDShUIHfbfBOYQ\\_AUIEigB&biw=911&bih=438#imgrc=WEhT0IVoOdZmJM:](https://www.google.rw/search?q=photo+on+the+rite+of+kubandwa+in+rwanda&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjU8dS4qLfkAhUDShUIHfbfBOYQ_AUIEigB&biw=911&bih=438#imgrc=WEhT0IVoOdZmJM:)

The first stage of kubandwa is “**Kwatura** and the second step, called “**Gusubizwaho**” or “**Gusubira ku ntebe**”. A similar cult was practiced in the north of the country and it was rendered to Nyabingi. She was a noble woman never married and died very old. After her death, her followers (Abagirwa or Ababyukurutsa) spread her cult.

### 12.2.2. Rites and Taboos

The Rites (*Imigenzo/Imihango*) and taboos (*Imiziro*) can be considered to have been in the framework of religion in traditional Rwanda. They are part of beliefs which influenced behavior of ancient Rwandans. Rites were activities that were performed in a particular way or occasion at ceremony as the naming a child (Kwita Umwana or Gusohora umwana), marriage, funerals... while Taboos were activities that were not allowed to be done because they could bring curses. E.g. Kwica inyamanza, kwicara ku isekuru, etc.



#### Application activity 12.2

1. In the Pre-colonial period, Rwandans had their own way of believing in God. Write a 250 words text explaining the concepts of Imana(God), Nyabingi and Imandwa during that time.
2. Write short notes to explicate the following terms: Taboo, guterekera, kubandwa

### 12.3. Political and military organization



#### Learning activity 12.3

The Pre-colonial Rwanda was politically and militarily well organized. Justify this statement.

The political and administrative structure of pre-colonial Rwanda mainly that of the 19th Century, was built on four pillars, namely a monarchy conceived in terms of a theocracy, a two-headed monarchy (King and Queen Mother), a policy of territorial aggrandizement, conquest and patriotism

#### 12.3.1. Political organization

The Pre-colonial Rwanda had several institutions reinforcing the king and his representatives. These institutions include *Ubwiru* (court secrets), *Ubuhake* (gifts of cows), *Ubusizi* (dynastic poetry was important in legitimizing the ruling king), *Ubucurabwenge* (knowledge on the dynastic genealogy), *Ibitekerezo by'Imiryango* (family historic narratives), etc.

The Ancient kingdom of Rwanda was divided into Ibiti or Districts which were large constituencies covering several hills and villages. Ibiti were divided into Ibikingi which were a collection of different hills where administrative authority was exercised. Igikingi consisted of division (a hill or a sub-hill) rich in pastures which was part of the provincial division.

The Ibikingi were similar to sub-chieftaincy divisions of the colonial era and there were two types of Ibikingi: the 'administrative Igikingi' and 'pastoral Igikingi'.

### ***King (Umwami )***



[https://www.google.rw/search?q=Photo+on+the+rite+of+kubandwa+in+Rwanda&source=l-nms&tbm=isch&sa=X&ved=0ahUKEwjTiJzVoLfkAhVvA2MBHSOYDT8Q\\_AUIEigB&bi-w=911&bih=416&dpr=1.5#imgrc=bmpSP3J4ZXEqX](https://www.google.rw/search?q=Photo+on+the+rite+of+kubandwa+in+Rwanda&source=l-nms&tbm=isch&sa=X&ved=0ahUKEwjTiJzVoLfkAhVvA2MBHSOYDT8Q_AUIEigB&bi-w=911&bih=416&dpr=1.5#imgrc=bmpSP3J4ZXEqX)

The king was very honoured in Ancient Rwanda. He occupied the topmost position in the political, administrative and military hierarchy to the extent that these functions were closely linked. Following his nomination, the king identified himself as a separate entity from the nobility. The kingdom of Rwanda was sacred and the king was therefore supposed to have the divine origin. The king was the sole proprietor of everything and had every right to life and death over his subjects. He was also in charge of the armies, lawmaker and supreme judge. His sentences had no appeal.

### ***Queen-mother (Umugabekazi )***

She was usually the mother of the king or his step mother. She could perform some ceremonies defined by the tradition. She was the confident of and chief advisor to the king. She could orient the king's actions and act as regent in case the king came to the throne when he was still young.

### ***Custodians of the esoteric code (Abiru)***

They were the guardians of the tradition and royal secrets. They were high dignitaries and they came second as advisors of the king. They mastered the rites and symbolic procedures and processes of the country and their

accomplishment. The king confided to them the name of his successor and he passed recommendations to the successor through them.

### ***Chiefs (Abatware b'intebe)***

They were the heads of Ibiti appointed by the king and lived most of their lives in the royal court. They were consulted by the king especially in the time of crises. They had the functions of controlling farmers and cattle keepers; supervising closely and control the functions of land and cattle sub-chiefs; commanding the army; raising taxes for the king, ikoro and other service; distributing land and to withdraw it from others if it was felt necessary

At the level of "Igikingi" the administration was insured by three chiefs. These chiefs were appointed by the king depending on their merit or the merit of their families.

### ***The chief responsible of land (Umutware w' ubutaka)***

He was in charge of agricultural production and responsible for collecting royal tribute, "ikoro" from agricultural production. He had the responsibility to settle disputes arising from land issues like land distribution and settling new inhabitants on his land.

### ***The chief responsible for cattle (Umutware w'umukenke)***

He was responsible for pastures in his Igikingi and collected tax dues from cattle keepers. He had to know and supervise pastures reserved for Inyambo or cows for the royal court.

### ***The army chief (Umutware w'ingabo)***

He had the role of commanding the army and participating in the fighting between Rwanda and its enemies. He was also in charge to settle disputes between other chiefs and conflicts between the pastoralists.

## **12.3.2. Military organization**

In traditional Rwanda, the military institution was very strong and powerful. The army in Ancient Rwanda had the role of expanding country; participating in the different wars; fighting against cattle rustlers and various raids; ensuring territorial security.

At the royal court, there was a military training camp known as "**Itorero**" where the young men **Intore** recruited from among the king's favorite chiefs learnt and practiced such values as generosity, courage, patriotism, the moral responsibility, self discipline, the quality of being a man, "*kuba umugabo*".



### Application activity 12.3

1. In the Pre-colonial Rwanda, the King, Queen-mother, Abiru and Chiefs played a paramount role in the administration and politics of their country. Write a 250 word text to prove this assertion.
2. Describe the role that was played by the institution of army in Rwanda during the pre-colonial period.
3. At every beginning of a new reign, the king had to start training his own army of young Rwandans. Identify different steps that were followed in this process.

## 12. 4. Economical organization



### Learning activity 12.4

The economic domain, in the pre-colonial Rwanda, comprised of different sectors. Analyze the place of each of them in satisfying the needs of Rwandans during this period.

Economic organization in Ancient Rwanda was based on the following economic activities: agriculture, animal rearing, handicrafts and trade.

#### 12.4.1. Agriculture

It was the principle activity and characterized by archaic production method (tools, crop rotation system, conservation methods...) which gave poor yields. Agriculture was subsistence in nature, this means individual or the family consumption. Cultivation was carried out according to climate seasons such as Umuhindo, Urugaryi, Itumba and Icyi or Impeshyi and he main crops cultivated were beans, sorghum, peas, maize, yams, bananas, tobacco, sweet potatoes.

#### 12.4.2. Animal rearing

The animal production in Ancient Rwanda was mainly based on cattle rearing, goats, sheep and the keeping of the dogs and the bees.

### 12.4.3. Handicraft

It was a very important activity in the daily life of Rwandans. It was from handicraft that Rwandans could get most tools to satisfy their daily needs. They made clothes, metal and wooden objects destined for commercial purposes.

The clothes made were the Ishabure for the girls; Inkanda for the women; Uruhu for the men; Impuzu made from skin of umuvumu while ishabure, inkanda and uruhu were made from the skins of animals.

Metal tools made included spears, arrows, knives and hoes. Three regions of Rwanda had celebrity on making and production of hoes such as: Buberuka (Amaberuka) Buramba (Amaramba) Rusengesi (Amasengesi)

### 12.4.3. Trade

Trade system in traditional Rwanda involved exchange of goods for other goods, with was known as a barter system. The trade was mainly based on agricultural products, animal products and handicrafts.

Many markets or commercial centers through the country especially the northwestern regions were the following: Mushwiza, Ryabizige, Mulinzi, Mubuga, Butare, Kazirabageni, Mururu, Rwanza, Itetero, Buramba, Kaziba, Agasakuza, Miyove and Vunga.

The main imported products from the neighboring countries included the salt from Lake Eduard; the bracelet from Masisi and Buhavu; the perfume from Ijwi Island.



### Application activity 12.4

1. Rwandans performed a number of economic activities including agriculture, animal rearing, trade and handicraft. Identify different items Rwandans were able to produce internally and these ones they could import from outside.
2. Metal working was very important during the pre-colonial period. Hoes were the main tools that were made up of metal. Identify different names of hoes manufactured and the place where this activity was carried out.



## Skills lab

By reading different textbooks that have been written on the civilization of the Pre-colonial Rwanda, explain some positive aspects of this ancient civilization that are likely to be preserved today and the negative ones that deserve to be rejected.



## End unit assessment

1. Analyze the role played by the nuclear family in the Pre-colonial Rwanda.
2. Differentiate a lineage from a clan.
3. In the Pre-colonial Rwanda, the King was at the top of the administrative and political hierarchy. He therefore played a vital role at this level of the life of his country. Comment on this statement.

## UNIT 13:

# COLONIAL RWANDA (1897 – 1962)

**Key unit competence:** The student-teacher should be able to assess the performance of the German and Belgian rules, the 1959 crisis and the process of the independence in Rwanda.



### Introductory Activity

The 19th Century was characterized by the colonization of Africa by Europeans. In case of Rwanda, the first colonizers were Germans followed by the Belgians. Using various books written on History of Rwanda and internet, evaluate the causes of the colonization and discuss the major reforms that the Germans and Belgians have introduced in Rwanda.

## 13.1 German administration of Rwanda and its impact



### Learning activity 13.1

By using various books and internet:

1. Discuss the causes of colonization of Africa by European countries.
2. Analyze the effects and achievements of German colonization in Rwanda.

The first German administrator of Rwanda was Captain Ramsay who arrived at Runda on March 20, 1897 under the reign of King Yuhi V Musinga. Captain Ramsay was the regional military chief of Tanganyika – Kivu whose capital at Ujiji (in Tanzania). On this occasion Captain Ramsay managed to give King Musinga a German flag as a symbol of German authority.

From 1898, Rwanda became a German protectorate. The King MUSINGA and Bethe concluded a pact on 5<sup>th</sup> March 1898 and Rwanda became the 20<sup>th</sup> province in East Africa.

### 13.1.1. Causes of colonization of Rwanda

German and Belgium came to colonize Rwanda because of the following reasons:

- **Need of cheap labour:** Especially Belgians needed a work force to cultivate their plantations in Kongo;
- **Need of areas to invest their surplus capital:** The Germans and Belgians needed the new areas where they could invest their surplus capital and found Rwanda as a virgin country to cater for such desire which made them to be interested in colonizing Rwanda;
- **Need of markets:** Germany and Belgium was among the first industrialized countries in Europe and they needed the markets for their manufactured products elsewhere outside of Europe, may be in Africa including Rwanda. This encouraged them to come and occupy Rwanda;
- **Need to promote Western civilization:** By coming and colonizing Rwanda, the Germans and Belgians socially wanted to promote Western civilization by making people of Rwanda modern and civilized. This developed more obsessive desire in colonizing Rwanda;
- **Need to spread Christianity:** The Germans and Belgians who were Christian missionaries were fascinated by colonizing Rwanda as they could spread out their religion to Rwanda as they looked it as “the best religion” in the World;
- **Need to gain political prestige and glory:** By the time, European countries believed that having more colonies is one way to be respected in the World. Therefore, the Germans had also this desire to acquire political prestige by colonizing more areas including Rwanda and among others;
- **Green light given by the 1884 – 1885 Berlin Conference:** This conference on partition of Africa had officially recognized Germany as the rightful colonial master of Rwanda. This granted and encouraged the Germans to take up Rwanda as their colony.

The German Protectorate was committed to ensure indirect rule for Rwanda, means that by this system of administration, the local traditional leaders and the culture would be maintained. The implementation of the German rule was to be attained through the two steps:

### **Military phase: 1897 - 1907**

The first phase from 1897 to 1907 was characterized by military occupation of Rwanda. During this phase, the German government was to give support to the local leaders to suppress several insurrections. In this way, the military posts created by the German government at Shangi and Gisenyi had only the role of bringing the population in the areas under German rule and therefore under local Rwandan rule headed by King Musinga.

### **Civil administration phase: 1907-1916**

This step started when Rwanda became a Residence and administrative services were transferred to Kigali from Usumbura, followed by the appointment of a civilian Resident called **Richard Kandt**. He was charged with responsibility of establishing a civilian rule in Rwanda, carrying out a census of population, raising taxes and creating a police force. In 1908, he founded **Kigali** as imperial residence which will become the capital of independent Rwanda.

During this phase, the German government also helped the local authorities to suppress several rebellions, markedly the rebellion of Ndungutse and his acolytes Rukara and Basebya. Ndungutse rebellion had started in the north of Rwanda towards the 1910 in the former provinces of Ruhengeri and Byumba (Buberuka, Kibali and Bukonya).

Another major event happened during this phase of civil administrators is the delimitation of Rwanda's borders. It was on February 8th, 1910 during a conference held in Brussels between Belgium, Germany and Britain that Rwanda was limited in the northern and western frontiers. The cutting was simply done using a map.



### **Application activity 13.1**

1. Analyze the reasons why European countries came to colonize Rwanda
2. After coming in Rwanda for the colonization purpose, the German ruled Rwanda in 2 phases. According to you, were these phases necessary? Why?
3. With the coming of Germans, Kingdom of Musinga was facing the insecurity based on power conflicts. Evaluate their role in the process of pacification of Rwanda

## 13.2. Rwanda under Belgian colonization (1916 – 1962)

The Belgian era includes several elements that contributed to the total transformation of Rwanda in the political, social, economic, cultural and religious areas. It is important to distinguish three major periods of the Belgian domination to Rwanda: Military occupation (1916 – 1926), Rwanda under Belgian Mandate (1926 – 1946) and Rwanda under Belgian Trusteeship (1946 – 1962).

### 13.2.1. Belgian military occupation and its reforms (1916 – 1926)



#### Learning activity 13.2.1

Using the books and internet:

Analyse the social, political and economic transformations operated by the Belgian colonization in Rwanda during Belgian military occupation

The Belgians did not wait for the peace conclusions to act on the sovereignty of the conquered territories. They already had colonial experience in neighboring Congo. So, before initiating any reforms they first occupied the country militarily. The High Royal commission was created for that purpose in 1917. The first leader General Malfeyt put his residence at Kigoma. Rwanda once again fell under military regime and was divided into four military sectors namely: Gisenyi, Ruhengeri, Cyangugu and Nyanza. Because they wanted to ensure public law and order in respect for traditional institutions, they opted for indirect rule based on the German model.

#### a) Administrative reform of 1917 and that of 1923

From 1917, Rwanda was governed from Kigoma by a Royal High Commissioner. However, it was retained as residence and the Belgians imitated the German local policy which consisted of exploiting the authority of the local administration by making sure that they were made tools of colonial occupation. Hence the King and traditional chiefs were allowed to exercise their functions under the guidance of the new colonial authority (Belgians colonialists).

From 1923, a law was put in place to prohibit the King from appointing or dismissing a chief without the permission of the Resident Representative of the Belgian Government. In the same way chiefs and Governors of Provinces did not have the right to dismiss their subordinates.

The application of the system of indirect rule in Rwanda by the Belgian authorities was dictated by the fact that they did not have enough Belgian officials in the country.

The traditional authorities in Rwanda were charged with the responsibility of collecting taxes, mobilizing porters and workers on the local roads or tracks.

### **Judiciary reform of 28<sup>th</sup> April 1917**

The king was stripped off the right to condemn his subjects to death and life but he kept the right to hear appeal cases. The chiefs who traditionally had the power to hear and resolve differences in the areas of jurisdiction and had the right to emit punishments saw their powers reduced. The Belgian Resident representative or even the Belgian administrator was given the right to hear appeals from such cases.

### **Politico-religious reform**

The king was forced to sign a decree proclaiming freedom of worship. Therefore, the royal power became secular because the King had just been forced to destroy his politico-religious power. Actually, Rwandans considered the King as their unique religious leader who communicated with God through some sort of magical power and he was, for them, a source of life and prosperity for the whole kingdom.

### **Fiscal reform of 26<sup>th</sup> December 1924**

The Belgians introduced new fiscal reform in 1924. The significant part of this reform was abolition of certain gifts:

*Imponoke* which consisted of cows given as gifts to a chief who had lost cattle in huge numbers.

*Indabukirano* which were cows given to a new chief upon assuming his duties as a new leader in an area. This gift was disguised as a form of congratulatory gift but it often amounted to an inducement to have some favors from the chief.

As for the allocation of work and services, they were fixed at two days out of seven instead of two out of five as was the case in traditional Rwanda. These measures meant that the King was losing more and more of his power to fix allocations of work and services. This naturally weakened his authority as his economic position was also somewhat neutralized. However, as

compensation, the King and the Chiefs became civil servants and started earning salaries. For example, the King received a salary of 130,000 Belgian Francs per month.



### Application activity 13.2.1

1. What were the concerns of the following reforms?
  - Judicial reform of 1917
  - Politico-religious reform
  - Fiscal reform of 1924
2. Explain other reforms done in Rwanda during Belgian military occupation?

### 3.2.2. Rwanda under Belgian Mandate (1926-1946)



### Learning activity 13.2.2

Using books and internet analyse the transformations done by the Belgian colonizers during the mandate period. Discuss how the Belgian policy introduced during this period in Rwanda led to the divisive ideology.

Amandate, in ancient Roman law refers to a contract in which one person agreed to perform a gratuitous service for another in return for indemnification against loss. After World War I, the term was applied in international law to provisions under the covenant of the League of Nations for the administration of territories formerly held by Germany and the Ottoman Empire. Between 1926 and 1931, Belgians did many administrative reforms known as Morteihan reforms. These are the following:

1. Rwanda – Burundi was joined to Belgian Congo in terms of administration. Congolese colonial law was applied to both countries.
2. Rwanda which was originally governed under 20 Ibiti or districts and pastoral fiefs or Ibikingi, was transformed into a system of chiefs and sub chiefs and territories. By 1931, the 52 “chefferies” corresponded more or less to historical traditional regions and the 544 “Sous-chefferies” were equivalent to former pastoral fiefs.
3. The functions of the three chiefs: Chief of land (umutare w’ubutaka), chief of the cattle (umutare w’umukenke) and chief of the army (umutare w’ingabo), were abolished and replaced by Tutsi chiefs and sub chiefs.

4. The chiefs from that time resided in their administrative places and not in the royal court as it was before this administrative reform.

However, the distribution of administrative responsibilities in the new structure was discriminatory because it excluded the Hutu, Twa and Tutsi of modest background in favour of the Tutsi from wellbeing families. The chiefs were in turn replaced by their sons who had graduated from the school reserved for sons of chiefs or Groupe Scolaire d'Astrida. These were considered as able to rule in a modern way. It is during this period also that the King Musinga was deposited (November, 1931) because he was opposed to the missionaries' activities, especially to the Catholic Church. He considered Christianity as one way of undermining the kingship.



King of Rwanda, Yuhi V Musinga (1895 -1931)

Source:<https://www.pinterest.com/pin/463378249132527834/>

Thus, he refused to be baptized. That is why, he was dismissed and replaced by his son Mutara III Rudahigwa.



King Mutara III Rudahigwa ( 1931 -1959)

Source:<https://www.google.com/search?q=Rudahigwa+images&tbm=isch&source=i-u&ictx=1&fir=iqsNc0at8Y4x-M%253A%252CZYKGIBji5dwfKM>

Although Rudahigwa was proclaimed a king of Rwanda, all his power felt down and became a staff of colonial administration. He occupied the 6th position in the administration of Rwanda. The King was under the Resident authority and had to report on him. He had also a contract and a salary.

### **Transformations under the Belgian mandate**

During the Belgian mandate, Rwanda was transformed in many fields. This transformation negatively and positively affected the Rwandans and was carried out by the Belgian government in the following domains:

#### **Economic transformation**

##### **Forced labour policy**

During the Belgian colonial rule, the Belgians used cruel forced labour in Rwanda, called “Akazi”. Forced labour was mainly in plantations of the forests, carrying things, road construction, building of churches, schools and hospitals and the digging of anti-erosive ditches. With the introduction of akazi, people found themselves in a worse situation, because this work was so hard and not paid. Instead of being paid, those who didn’t perform well their tasks were bitten by the chiefs nominated by colonial masters.

The Belgian colonizers introduced also “Shiku”: This was the cultivation obliged food crops such as cassava, sweet potatoes in common plantations. People were also obliged to travel long distances to cultivate the cash crops like coffee. These were cultivated away from their homes, often near the roads where colonial dignitaries liked to pass and get a good impression. The Belgian policy of forced labour had negative effects such as famines: Rumanura (1917 – 1918), Gakwege (1928–1929) and Ruzagayura (1943–1944) and insecurity among people.

Forced labour became so insupportable that people started fleeing it to neighbouring countries like Uganda and Tanzania in search of free and paid work.

##### **Taxation policy**

Capitation or poll tax was introduced in 1917. This was obligatory for all men adult Rwandans of sound mind. From 1931, poll tax was even more concretised. It covered more people and it was paid in form of money, depending on the welfare of each Territory.

## **Agriculture and animal husbandry**

In this field, the Belgians intensified the cultivation of food crops like cassava, Irish potatoes and sweet potatoes in order to fight endemic famines which were ravaging the country.

They also encouraged the plantation of trees and the digging of terraces to control soil erosion.

In 1927 the colonial power put in place 3 agricultural research stations in Rwanda: Rubona (Southern Province), Rwerere (Northern Province), and Karama (Eastern Province).

In the area of animal rearing, the colonial power concentrated on higher animals like cows and goats. Research centres were established at Nyamiyaga – Songa in Southern Region Cyeru in Northern Region and Nyagatare in Eastern Region. Animal health centres were built and veterinary clinics were established in rural areas.

## **Mining activities**

The mining activities started in 1923 while prospection had started five years before. Four mining companies in all shared the mining exploitation. These were MINETAÏN (Société des Mines d' Etain) which had deposits in Gatumba (former Gisenyi) and in Musha (near Rwamagana) and was founded in 1926.

SOMUKI (Société Minière de Muhinga et de Kigali), founded in January 1923 exploited and had deposits in Rutongo and in Nyungwe forest for the mining of gold; COREM (Compagnie de Recherche et d'exploitation Minière) which was a mixed company, jointly managed by the territorial government of Rwanda – Burundi and GEORWANDA (Compagnie Géologique et Minière du Rwanda) that had big concessions in Rwinkwamvu. The main minerals were tin, Colombo tantalite, gold, wolfram and other minerals associated with tin. Some people got jobs in the mining sector employed by these mining companies.

## **Trade, commerce and infrastructure**

In 1930, the monetary economy has been re-enforced in Rwanda due to the emerging class of salaried Rwandans who had started working in the newly created enterprises such as commercial companies, mines, civil servants working for colonial administration in plantations and in the road construction.

As for external trade, the main partners were Belgian Congo, Burundi, some European countries, Asian countries and America. Foreign companies controlled import and export business. The colonial administration only intervened in the trade of coffee which required a lot of care in order to export good quality products.

In domain of transport, three international roads were built:

- **Road:** Bujumbura – Bugarama – Astrida – Kigali – Rwamagana – Gatsibo – Nyagatare – Kagitumba
- **Road:** Bujumbura – Cyangugu – Bukavu;
- **Road** Bukavu – Cyangugu – Astrida.

## **Socio – cultural transformations**

### **Education**

Belgians introduced secular and religious education under the control of the missionaries. However, it should be noted that admission to some sections of these schools was selective for some sections (Groupe scolaire of Astrida), allowing only sons of Tutsi chiefs and other notables.

This type of education introduced was a monopoly of Christian missionaries and the main courses taught at the beginning were religion, arithmetic, reading and writing (Kiswahili, German and later French with the Belgians).

Secondary schools started in 1912 with the creation of the minor seminary of Kansi which in 1913 was transferred at Kabgayi. Secondary education developed in 1929 with the establishment of the “Groupe Scolaire d’Astrida”. Other secondary schools were established such as the teacher Training School in Zaza by Brothers of Charity (transferred from Kabgayi in 1944), Teacher Training School for girls at Save managed by White Sisters (1939).

### **Christianity**

The Catholic Church dominated other churches and had in large numbers different congregations. The number of Rwandan priests increased from 5 in 1922 to 40 in 1939. The number of baptised converts also increased from 13, 400 in 1928 to 320, 000 in 1945.

### **Health**

The medical sector was run by the Christian missions. By 1932, the colonial administration had 2 hospitals: Kigali and Astrida and 29 dispensaries. From 1933, the colonial administration conceived a new policy to replace all dispensaries with mobile “assistance camps”.

This policy was done in order to solve the problem of insufficient medical infrastructure. The private hospitals were put in place in Kigeme and Shyira by the Anglican Church and some others by mining companies like hospital of Rutongo by SOMUKI and Rwinkwavu hospital by GEORWANDA. Other

Christian missionaries set up the hospitals throughout the country such as Kabgayi and Mibilizi by the Catholics; Kilinda by the Presbyterians; Gahini by the Anglicans; Ngoma – Mugonero by the Adventists

In addition, a section of training of medical assistants was opened in Groupe Scolaire of Astrida and Medical auxiliaries also opened at Astrida and 2 schools for assistant nurses at Kabgayi and in Kigali.

### **Introduction of identity card**

In 1935, the Belgian colonial administration introduced a national identity card basing on ethnicity. The Banyarwanda who possessed 10 or more cows were registered as Batutsi, whereas those with less were registered as Bahutu and Batwa were considered not only as those with no cows but as the “pygmies” and as those who survived by pottery active ties. They measured also the height and noises. You could see two people born from same parents given identities mentioning different ethnics group (one Tutsi and another Hutu).



### **Application activity 13.2.2**

Answer the following questions:

1. Analyse the administrative reforms introduced by Belgians in Rwanda between 1926 -1931.
2. Although Rudahigwa replaced his father Musinga as a new king of Rwanda, he was no longer a king as it was in Rwanda before the colonization. Discuss.
3. Analyse the effects of forced labours and obligatory cash crops on Rwandan people during mandate period
4. In 1932, the identity card was introduced in Rwanda and Burundi, mentioning if a person is a Hutu, Tutsi or Twa. Analyse the impact of the introduction of this identity card in great lakes conflicts.

### 13.2.3. Rwanda under Belgian Trusteeship (146-1962)



#### Learning activity 13.2.3

Using books and internet discuss and analyse the following:

1. The role played by United Nation Organizations in helping the colonies to improve the welfare of their population and to achieve the independence.
2. How did the “ Mise au point” and the “ Manifeste des Bahutu or Hutu manifesto” affected Rwandan society
3. Do any analysis and criticism on the ideology of political parties created in 1959
4. Explain the factors that led to the outbreak of the 1959 crisis.
5. The effects of the “Coup d’Etat” of Gitarama and the last stage that led to the achievement of the independence of Rwanda in 1962.

Towards the end of the World War II, the victorious nations created the United Nations Organization with principal mission of maintaining peace and security in the world. At the same time in Rwanda, the mandate regime was replaced by the Trusteeship regime but all under the Belgian authority.

It was on the 13th December 1946 that the UN and Belgium signed a Trusteeship Agreement on Rwanda and on April 29, 1946, the Belgian Parliament approved it. The Belgium was given a mission of preparing Rwanda for internal autonomy and later on independence. Belgian government had the duty to promote economic and social development as well as of the local people who would manage the country after attaining independence.

In order to help the Belgium to fulfil that mission, the UN put up a Trusteeship Council which had to send a mission every 3 years to territories under Trusteeship. The purpose of these missions was to hold consultations and examine together with the state holding Trusteeship any petition arising from the administrated population. Such missions in Rwanda were in 1948, 1951, 1954, 1957 and 1960.

#### **Economic reform**

The Belgian government elaborated a Ten Year Social and economic development Plan for Rwanda – Burundi in 1951 (From 1951 up to 1960).

Several projects were financed under this plan like the construction of schools, hospitals, dispensaries, roads, the development of marshlands and the plantation of forests.

On the side of the local authorities, the socio-economic reform done was of king On the 1st April 1954, the King Mutara III Rudahigwa abolished the socio-economic dependence system based on the cow or Ubugake by the royal decree, with the objectives of liberating the pastoral clients (Abagaragu) who used to spend much of their time working for their patrons (shebuka); and to encourage private initiatives and to force cattle keepers to reduce the number of cows to manageable and profitable size.

### Political reforms

Under the period of Belgian Trusteeship, there were two political reforms introduced by the Belgian administrators:

1. The first reform was introduced on May 4, 1947. It was the creation of a Conseil du Gouvernement du Ruanda-Urundi. The council comprised 22 members, 5 of whom were Belgians including the governor, 2 resident representatives and 2 Belgian state agents. The rest 17 members were said to represent other foreigners living in Rwanda – Burundi.
2. By the decree of 14th July 1952, the Belgian government established the “Conseil de sous-chefferie” (council of sub - chieftaincy), the “Conseil de chefferie (council of chieftaincy)”, the “**Conseil du Territoire** (council of Territory)” and the “Conseil Supérieur du Pays( High council state).”

On February 22, 1957, a memorandum called “Mise au point” was prepared by the “Conseil supérieur du pays” and addressed to the UN Trusteeship mission to Rwanda and to the Belgian administration.

This document was critical of the colonial power. It talked about discrimination based on colour, the monopoly of the missionary led education which was of questionable quality and finally demanded more representation of Rwandans in the political administration of their country.

To the “Mise au point”, the Belgian authorities mobilised an elite group of the Hutu to write another memorandum in counter attack; which they named “Le Manifeste des Bahutu” (“Hutu manifesto) or ‘Note sur l’aspect social du problème racial indigène au Rwanda”. The issued on March 24, 1957. They protested against the monopoly of power by the Tutsi and against all social injustices and through this situation, the colonial power had created a “Hutu – Tutsi” conflict which had never existed before and later would become an obstacle in the unity of Rwandans.

It was in that climate of great confusion and misunderstandings between the King and his former allies (Colonial administration and the Catholic Church officials) that the Belgian government authorised the creation of the political parties in 1959. Some of them are Union Nationale Rwandaise (UNAR). The Rwanda National Union Party officially formed on the 3rd September 1959. Created by President was Francis Rukeba supported by the king Mutara, Rassemblement Démocratique du Rwanda (RADER) (The Rwanda Democratic Assembly) founded by Bwanakweri Prosper to support the colonial administration and the Catholic Church, Parti du Mouvement pour l'Emancipation Hutu (PARMEHUTU) formed on October 1959 and officially launched as a party on the 18th October 1959 with Grégoire Kayibanda, as its President.

We cannot also forget the Association pour la Promotion Sociale de la Masse (APROSOMA) founded on the 1st November 1957 by Joseph Habyalimana alias Gitera and became a Political party on February 15, 1959, AREDETWA founded by Laurent Munyankuge from Gitarama, APADEC founded by Augustin Rugiramasasu. ABAKI (Alliance des Bakiga) and many others.



### Application activity 13.2.3

1. What is the impact of 10 years social- economic plan introduced by Belgians in 1951?
2. The political reforms introduced by Belgian colonizers in Rwanda in 1952 failed. Discuss.

### 13.2.4. The 1959 crisis in Rwanda



### Learning activity 13.2.4

1. Analyze the causes of 1959 crisis a part from the beating of Mbunyumutwa Dominique
2. Evaluate the effects of 1959 crisis in Rwanda in particular and in great region in general.

Many political parties had the divisive ideology, based either on region or ethnic group. On November 1<sup>st</sup>1959, Mbonyumutwa Dominique, a member of PARMEHUTU, (who was a chief of Ndiza), was beaten by a young Tutsi.



Mbonyumutwa Dominique who has been the 1st President of Rwanda

Source: [https://www.google.com/search?rlz=1C1CHBD\\_enRW858RW858&q=mbonyumutwa+images&tbm=isch&source=univ&sa=X&ved=2ahUKEwj6\\_Ls87nkAhUHrxoKHZyt-COkQ7Al6BAglECQ&biw=1038&bih=722&dpr=1.25#imgrc=HwzusufTrQi6ZM](https://www.google.com/search?rlz=1C1CHBD_enRW858RW858&q=mbonyumutwa+images&tbm=isch&source=univ&sa=X&ved=2ahUKEwj6_Ls87nkAhUHrxoKHZyt-COkQ7Al6BAglECQ&biw=1038&bih=722&dpr=1.25#imgrc=HwzusufTrQi6ZM)

This led to the open violence from the 1st to 7th November 1959 in Gitarama against the Tutsi and the members of UNAR. It was sparked off by the members of PARMEHUTU and APROSOMA from Byimana in Marangara and spread to Ndiza, Gisenyi, Ruhengeri, Kibuye and Nyanza.

The violence had mainly the following effects:

1. The houses of Tutsi and Hutu members of UNAR were burned and destroyed systematically. There were arbitrary arrests, imprisonments and assassinations.
2. Many Tutsi were killed (at least 200 people), internally displaced and became refugees in neighbouring countries like in Burundi, Uganda, Tanzania and Belgian Congo (almost between 150.000 and 200.000 people)
3. The 20 chiefs were dismissed and 150 sub-chiefs were replaced by the members of PARMEHUTU assisted by Colonel Guy Logiest.

Since November 25, 1960, the administrative reforms were introduced by Colonel Logiest:

- The general governor changed the title and became general resident. The sectors or sub-chiefdoms were reduced from 544 to 229 and they were known as communes and communal elections were prepared.
- The chiefdoms were abolished and the 10 territories became prefectures headed by the préfets.

- The “Conseil supérieur du pays” (High Council of the state) was dissolved and replaced by a Special Provisional Council comprising 8 members from 4 political Parties: RADER, PARMEHUTU, UNAR and APROSOMA. This Special provisional council was formed on February 4<sup>th</sup>, 1960. King Kigeli V Ndahindurwa could not hide his hostility for that council because it actually substituted his powers.

From 26<sup>th</sup> June to 30<sup>th</sup> July, 1960, communal elections took place with the following results: PARMEHUTU got 70.4% corresponding to 2, 390 communal councillors, APROSOMA got 7.4% corresponding to 233 communal councillors, RADER got 6.6% corresponding to 206 communal councillors and UNAR got 1.8%, as almost all his members were fled the country and others killed.

By these elections, PARMEHUTU had 166 Bourgmestres, 21 were from APROSOMA, 7 were from RADER and 17 were from other different political parties. UNAR had only one Bourgmester.

According to those results, PARMEHUTU was declared winner. UNAR protested these results along with the king Ndahindurwa. In July, 1960, king Kigeli V Ndahindurwa went to the Belgian Congo to meet the UN Secretary General and to attend Congo’s independence celebration. After these ceremonies, the Belgian minister in charge of Rwanda – Burundi issued order prohibiting king Ndahindurwa from returning to Rwanda.

On October 26, 1960, a provisional government was put in place by the resident general. It was composed of 10 Rwanda ministers and 9 Belgian state secretaries. On the 25<sup>th</sup> January, 1961, the resident general conferred upon these institutions the powers of autonomy.



#### Application activity 13.2.4

1. Do you agree that the 1959 crisis happened because Mbonyumutwa was simply beaten? Explain your answer!
2. Analyze the effects of 1959 crisis on Rwandan people

### 13.2.5. The “coup d’Etat” of Gitarama



#### Learning activity 13.2.5

Do you think that Belgians played a role during the preparation of the coup d’Etat of Gitarama? Explain your answer.

On the 28<sup>th</sup> January, 1961, the famous “Coup d’Etat of Gitarama” took place. At that time, a meeting took place in a market in Gitarama in which about 2,900 councillors and bourgmestres took part. These people were elected from PARMEHUTU and APROSOMA political parties. With the complicity of the Belgian government, they proclaimed the following decisions:

1. The abolition of the monarchy and the kingdom emblem, the royal emblem drum Kalinga and Ubwiru institution.
2. The proclamation of a republic and the election of the first president, Mr. Mbonyumutwa Dominique.
3. The formation of a government made up of 11 ministers with Grégoire Kayibanda as prime minister.
4. Creation of a supreme court.

On the February 1961, the Belgian Trusteeship recognised that regime and transferred the power of autonomy to them. A new tricolour flag of Red, Yellow and Green was exhibited. On September 25<sup>th</sup> 1961, legislative elections and a referendum were organised and were won by PARMEHUTU. It was declared that majority of voters had voted “No” against the monarchy and the person of King Kigeli V Ndahindurwa. On the second of October 1961, the legislative assembly was put in place. Grégoire Kayibanda was elected President of the Republic by the Legislative Assembly headed by Joseph Habyalimana Gitera. On the 1<sup>st</sup> July, 1962, independence was recovered to Rwanda; the Belgian flag was replaced by the Rwandan flag.



#### Application activity 13.2.5

Analyze the outcomes of the “Coup d’Etat” of Gitarama.



## Skills lab

Reading different sources of information related to the colonial period of Rwanda, examine the strategies adopted by Rwandans to search how to recover their independence and provide suggestions on what Rwandans can do in present days so as to preserve and improve that independence.



## End unit assessment

Answer the following questions:

1. Why European countries came to colonize Africa?
2. Explain the circumstances under which the Belgian Rule was established in Rwanda.
3. Identify the political, economic, social and socio – cultural performance of the Belgians in Rwanda during mandate.
4. Explain the causes and the effects of 1959 crisis in Rwanda.
5. Describe the different steps that led to achievement of independence in Rwanda.

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