

SOCIAL STUDIES

FOR TTC

YEAR ONE

STUDENT BOOK

OPTIONS: SSE

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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 SSE 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.

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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 SSE Option, year one. It would not have been successful without the support from different education stakeholders.

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Introduction

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 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 books or any other book. It is time for you 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.

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 small scale 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. 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. Explain 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 study of how people live and organize themselves in society, embracing Geography, History, Economics and other subjects.

Social Studies are 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 are very important not only to the student teachers but also to the Rwandan society. 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 have 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 are also designed to increase historical understanding; turning points, causes 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 involve the following components: 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 fulfills our desire, to know, understand ourselves and our assistant. It also trains its students to read intelligently, think critically, and writing effectively.

Economic: Is a social science that analyze the production of goods and services, it focuses on how economic agent 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	Tattoos
Lying (comes in several forms)	Being drunk or disorderly
Adultery	Violence toward to another human being
Fighting in a war	Abortion
Envy	Illegal drug
Stealing	Slanders
Blasphemy	Fornication
The lottery	Covetousness
Homosexuality	Pornography
Cheating	Maligning
False testimony	

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.

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.

Relationship among the components of Social Studies



Learning Activity 1.3

Do research in library or use internet 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 19th Century Europe cannot 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 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 1.3

Describe the relationship between the components of Social Studies



End unit assessment 1.1

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

UNIT 2:

FORMATION OF RELIEF FEATURES OF RWANDA

Key Unit competence: The student-teacher should be able to explain the formation 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 four provinces of Rwanda.
2. Describe the origin of mountains in Rwanda.
3. Identify the main physiographic regions of Rwanda.

2.1. General presentation of Rwanda and the relief regions of Rwanda.



Activity 2.1

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

2.1.1. General presentation of Rwanda

i) Location of Rwanda

Rwanda is a small landlocked east-central African country. It shares its land boundaries with Tanzania in the East, Burundi in the south, Democratic Republic of Congo in the west and Uganda in the north. It is also located between latitudes 1°04 'S and 2°51' south of the Equator and longitudes 30°53' and 28°53' east of the Greenwich meridian. Considered to be among the smallest countries of the continent, Rwanda's total area is estimated to be 26,338 square kilometres.

Rwanda being among the land locked countries of Africa means that it has no accessibility to the sea or ocean. The nearest ocean to the east is Indian Ocean, where we find Mombasa at 1200 km and Dar-es-salaam ports at 1700km far away from Rwanda. Other oceans and seas are far away to Rwanda. For example, Atlantic Ocean is at 2200 km from Rwanda where we find Matadi port (DRC). Mediterranean Sea is at 3600km from Rwanda, where we reach Alexandria port (Egypt).

Great Lakes Region



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, 2148 Cells and 14837 Villages

Below is a table that summarizes the administrative division in Rwanda.

Table of Administrative divisions 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 96	Karongi district in Bwishyura sector
Southern province	Muhanga, Kamonyi, Ruhango, Nyanza, Huye, Nyamagabe, Nyaruguru, Gisagara	101 101	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.

2.1.2. The relief regions of Rwanda

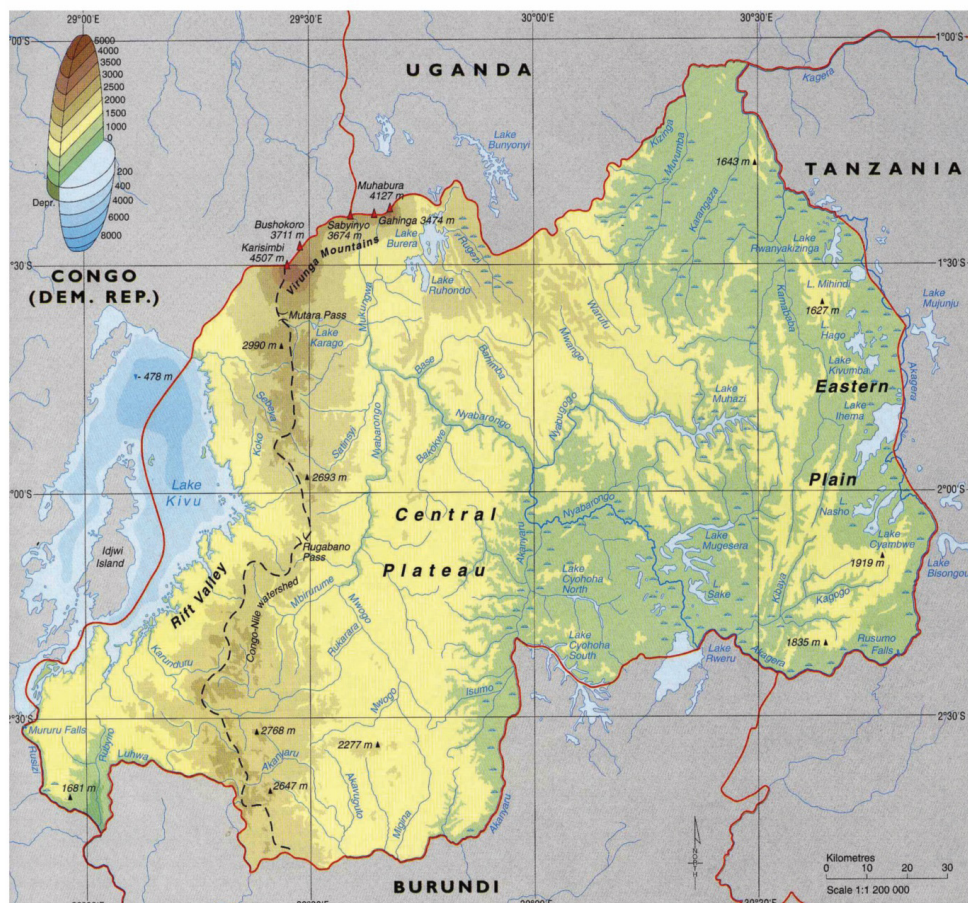
In Geography, the term relief may be defined as “the variations in elevation and slope of an area of the Earth’s surface”. Example, when someone is talking of an area as being flat, gently sloping or mountainous, specifically he/she is speaking of the relief of that area.

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 drainage basins.

The Congo-Nile crest is a highland that divides between the waters of river Congo to the west and waters of river Nile to East. It is an extensive area of about 160 km in length (from north to south) and 20 to 50km 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 1200m (pass or col of Rugabano) in Karongi district 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, is associated with the presence of volcanic ranges, hence the name volcanic region. This region covers about 90 kilometres from West to East including the highland areas in the north of 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 from Eastern part of DRC to South West of Uganda. This creates a beautiful scenery chain of volcanoes. Some volcanoes are still in active, others are dormant while others are in extinct state. Below are the major volcanoes in Rwanda:

- a) **The Karisimbi (4507m)** is classified as a complex volcano and the highest of all volcanoes in Rwanda. It has a crater lake of about 120m in diameter.
- b) **The Bushokoro/ Bisoke (3711m)** is a complex volcanic cone. Due to its past volcanic activity, it is classified as a 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) **The 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) **The Gahinga (3474m)** this volcano lies between Muhabura and Sabyinyo. It is one of smallest and the dormant volcano in Rwanda and estimated to be the smallest of 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) **The Muhabura**, standing at 4,127m 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 100m in diameter. It is found on the border between Rwanda and Uganda.

5. The rift valley

A rift valley is a linear shaped lowland between several highlands or mountain ranges created by the action of a geological rift or fault. The rift valley is found in the west and south-west 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 1460 m and 3000 m 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 and is located in the extreme southwest of Rwanda. This plain exists on the old alluvial deposits of sedimentary rocks laid down by sediments from river Rusizi and its tributaries: rivers Ruhwa and Rubyiro.



Application activity 2.1

1. Explain how landlockedness of Rwanda affects 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.

2.2 Geomorphological processes:



Learning Activity 2.2

The endogenic and exogenic forces played a significant role in giving shape to various surface and subsurface features of the earth.

1. Give any two examples of features resulting from such forces.
2. Differentiate between folding and faulting.
3. Identify any two dormant volcanoes in Rwanda.
4. Distinguish between soil erosion and weathering.

Geomorphology is a part of physical geography that studies landforms or relief found on the earth surface. It focuses on the origin and evolution of various landforms.

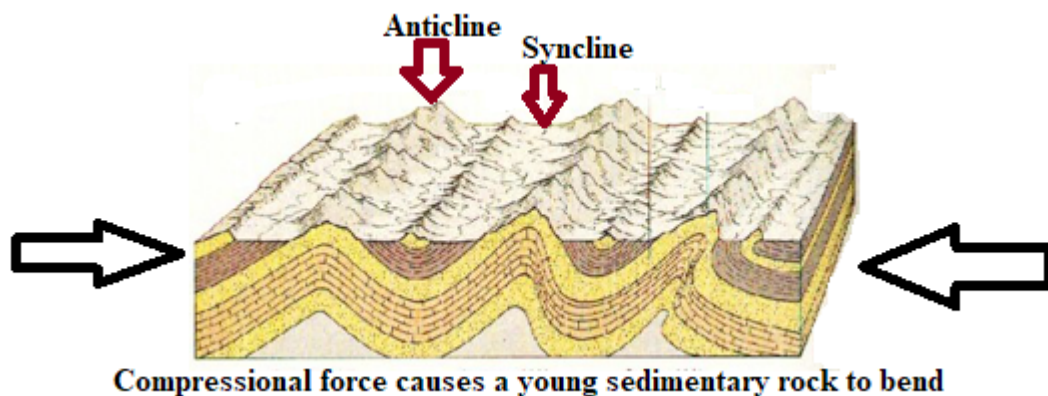
Geomorphologic processes or land-forming processes are all processes required in relief formation. They include endogenic processes and exogenic processes.

2.2.1. Endogenic processes

Endogenic processes are always associated with endogenic forces which derive their strength from the earth's interior and play a crucial role in shaping the earth crust. Examples are faulting, folding, volcanism, earthquakes etc

i) The process of folding in Rwanda and the major fold mountains

Folding refers to the bending of crustal rocks of the earth's crust after being subjected to compressional forces within the interior of the earth. Folding tends to take place on young rocks of sedimentary deposits.



Folding may take place slowly over several years resulting into the formation of **monoclines**, **synclines** and **anticlines**. Synclines are plains or basins while anticlines are hills or mountains

The folded places found in Rwanda are characterised by the following features:

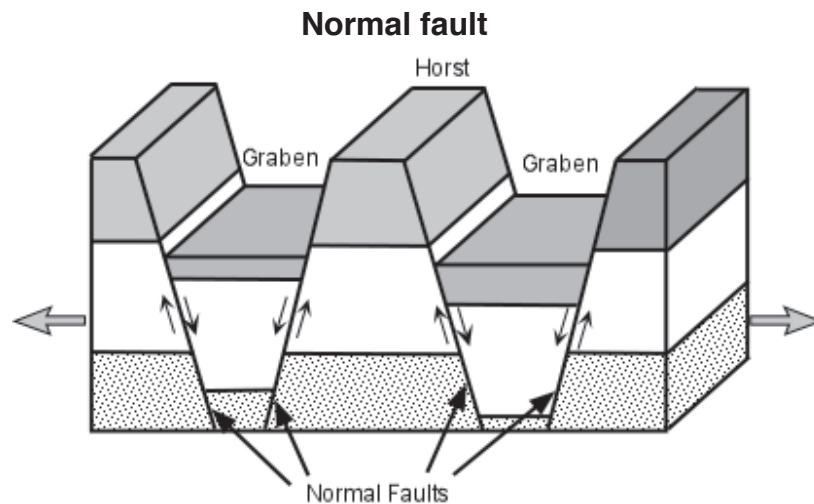
- Inter-montane (or intermont) plateaus
- Valley and ridge landscape
- Rolling plains
- Fold mountains and Inter-montane (or intermont) basins.

ii) The process of faulting in Rwanda and the associated landforms.

Faulting is the process that causes the fragile rocks of the earth's crust to fracture and form cracks. This may result into vertical or horizontal displacement of the crustal rock.

A fault on the other hand is a fracture or a crack on the crustal rocks caused by tensional or compression forces. Compressional will lead to bending and breaking of the rocks.

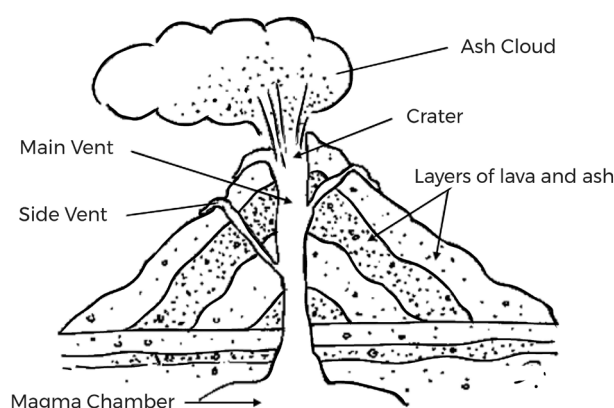
Faulting affected the western part of Rwanda leading to the evolution of the Congo-Nile crest, rift valley and its associated features such as the graben Lake Kivu, the fault guided valley along rivers Rusizi, Rukarara, Mwogo and Nyabarongo, fault scarps and escarpments.



iii) The process of vulcanicity, earthquakes and the associated landforms.

Vulcanicity refers to the ways by which magma is intruded into or extruded at the earth's crust. A volcano is a specific place where gases, ashes and/or molten rock materials such as lava escape to the ground and form a mountain.

The presence of fault scarps in the north western part of the country gave rise to the ejection of molten materials that resulted into the formation of volcanic mountains. As mentioned early in this unit, there are 5 volcanoes in Rwanda (Karisimbi, Muhabura, Sabyinyo, Bushokoro and Gahinga). Vulcanicity resulted into the formation of other features such as Lava plateaus, volcanic depressions which were later filled with water to form lava dammed lakes (Burera and Ruhondo), volcanic hot springs along fault lines (Mashyuza, Ruganji, Gishyita and others), lava domes and plateaus and others. Volcanic intrusions also affected the south western part of Rwanda (Rusizi).



Parts of a volcano

Volcanoes can be classified into three types according to their activity:

Active volcanoes are those volcanoes which can enter into eruption at any time. Example, Nyiragongo and Nyamuragira in DRC.

Dormant volcanoes are those ones that have not erupted recently but are expected to do so again. They are quiet, but might possibly erupt again in the future. Examples are Karisimbi, Bisoke, Muhabura, and Gahinga.

Extinct volcanoes are those volcanoes that did not had eruption since several times compared to their life. Are considered dead and are not expected to erupt again. E.g Sabyinyo.

Features resulted from volcanic activity in Rwanda

Feature	Where it is found
Composite volcano	Karisimbi at the border between Rwanda and DRC. In Rwanda, it is found in Rubavu district
Ash and cinder cone	In the northern part of Musanze district
Lava plateau	In Rubavu and Musanze districts
Hot springs	"Amashyuza" of Rusizi and Rubavu districts
Lava dammed lakes	Lakes Burera and Ruhondo in Burera district.
Crater lakes	On Kalisimbi, Bisoke, Muhabura volcanoes

Earthquakes

An earthquake is the shaking of the surface of the earth, resulting from the sudden release of energy in the earth's lithosphere that cause seismic waves. The western region of the country experiences frequent seismic waves due to the fact that this part of the country belongs to a volcanic region. And it is well known that earthquakes are always associated with vulcanicity.

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 formed, 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 lee-ward 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.

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 sites. Tourists contribute to the economy by bringing in foreign exchange that supports other sectors of the economy.
- 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 Rivers and 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

2.2.2. Exogenic processes

Exogenic processes are processes that take place on or near the surface of the Earth. The forces that are responsible for the exogenic processes are commonly referred to as denudation forces. Weathering, erosion and deposition are good examples of external processes.

One of the natural processes that cause changes in the environment is weathering. This is because weathering is the process in which rocks break down or decompose near the earth's surface. The process of weathering may be caused by the exposure of rocks to elements such as temperature changes, rain or human activities

Erosion, on the other hand is the removal of soil, sediment, regolith, and rock fragments from the landscape. Erosion requires certain medium to move materials such as wind and water which are the mediums primarily responsible for erosion. This erosion is responsible for the creation of hills and valleys.

Heavy rains on sloppy and mountainous areas cause erosion. The soils on the slopes of the hills are washed away by surface runoff causing thinning of soils. This makes the land agriculturally unproductive. As we know, rivers usually flow from upland to lowland areas. Along their course, they carry soil and other materials that they deposit at the end of their course. River erosion and deposition are responsible for the formation of fertile areas especially where alluvial soils are deposited.



Application activity 2.1

1. Using evidence gained about the relief of Rwanda and the processes of faulting and folding, evaluate how this has made an impact on the population distribution in Rwanda.
2. Explain how soil erosion impact agricultural productivity.



Skills lab

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



End unit assessment

1. Evaluate how vulcanicity in Rwanda has a direct impact on human activities.
2. Explain how highland areas influence the climate modification in Rwanda.
3. Rwanda occupies a strategic location in East- Central Africa, but it is a landlocked country. Suggest what Rwanda can do to overcome the situation.
4. Examine the ways by which farmers can control soil erosion.

UNIT 3:

ROCKS IN RWANDA

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.

3.1 Types of rocks in Rwanda and their characteristics



Learning Activity 3.1

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 into two types:

i) Extrusive rocks

They are formed when lava solidified at 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 the magma solidifies in deep rock layers before reaching the surface land. Eg: 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.

iii) 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**. Eg: 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 and 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). Eg: 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 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 also have the following characteristics:

- They are harder than the original rocks. Therefore, they 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 3.1

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

3.2. Importance of rocks in Rwanda



Learning Activity 3.2

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

Rocks are very important for different human activities:

- **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.



Application activity 11.1

Discuss the disadvantages of rock.



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 4: 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. Develop the causes of soil erosion in Rwanda.

4.1 Definition of soil, types of soils and where they are found



Activity 4.1

The soil types determine how and what we can grow and are the basis 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.

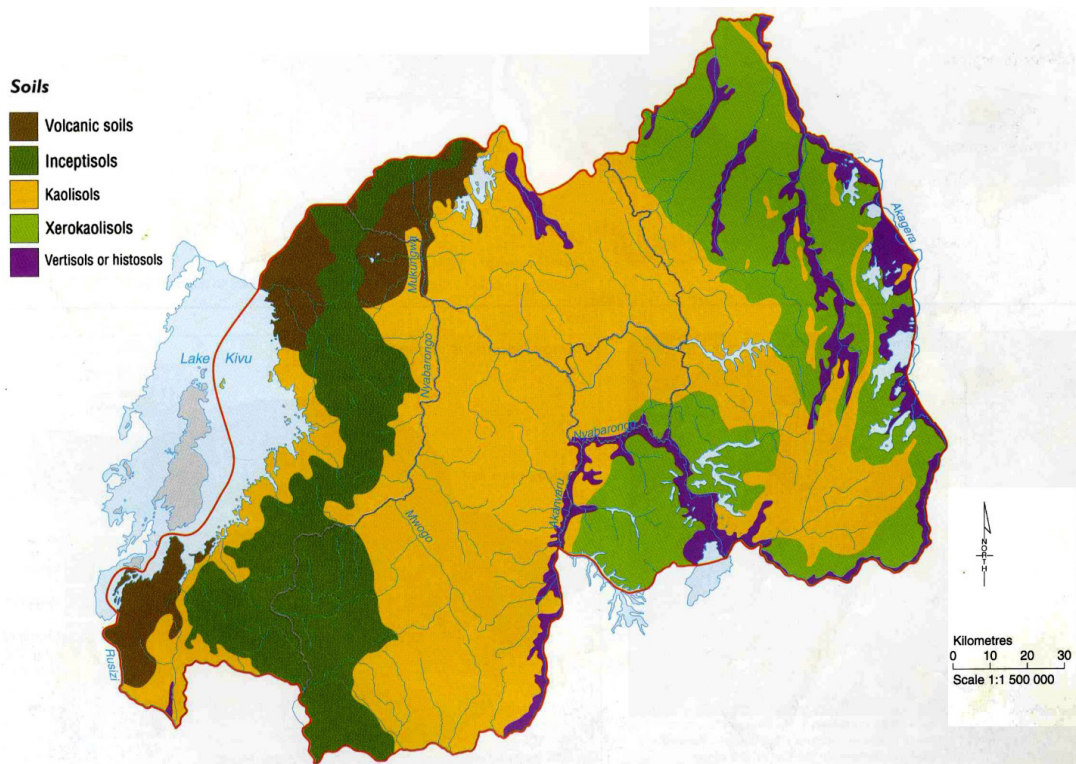
Types	Characteristics
Loam soil	– These are very fertile soil. – They have the ability to support the growth of crops. – They have a high content of humus, salt, sand and sometimes clay. – They are well drained and rarely become waterlogged. – They have high levels of water moisture which is maintained for a long period of time. – They are found in the Northern and Western provinces of Rwanda.
Clay soil	– The amount of humus is relatively low. – They have large quantities of nutrients. – They have the ability to retain water for a long time. – They have high level of acidity. Therefore, they only support specific types of crops such as rice. – They are associated with limited decomposition due to the absence of bacteria. – They are common along the rivers, valleys and swamps such as Akanyaru swamp in Gisagara district.
Sandy soil	– They are described by their large particles, such as allow the presence of huge pore space. – They have a high level of percolation i.e. they are easily infiltrated by surface run-off. – They are common in the Eastern Province.
Silty soils	Silty soils: – Silt soils are fertile, fairly well drained and better than sandy soils for crop cultivation. – They contain more nutrients than sandy soils. – Silty soils are heavier than sandy soils. – They are formed when fine sediments (dust, organic matter and debris) are carried by water and deposited.

Lateritic soils

- Normally sandy in structure and saline in nature, arid soils vary from red to brown in color.
- They are formed when rock fragments bond together to form a very hard substance known as laterite or murram.
- They are formed as a result of leaching.
- Laterite soils however are poor in organic matter, nitrogen, phosphate, and calcium, but rich in iron oxide and potash.
- Even if they are normally infertile; however, they are widely used to make bricks used in building construction.
- They are found in the Rusumo region of Eastern province.

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 color, 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
- i. **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:

- ii. **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, Rugezi Swamps.
- iii. **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, 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, Rubavu, Nyabihu, Rusizi and Nyamasheke in Western province. These soils are more fertile for agriculture, but need much attention because they may easily be affected by erosion.



Application activity 4.1

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.

4.2 Soil erosion in Rwanda



Activity 4.2

1. Identify any three causes of soil erosion in Rwanda.
2. Explain how soil erosion affects 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 region (the mountainous regions).

4.2.1. 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 consist 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 centimeters 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.

ii. 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 are 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 unfavorable climate especially on steep slopes and in valleys.

iii. 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.
- Destruction of human settlement, water contamination by the pollutants transported by the heavy rain.



Application activity 4.2

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

4.3. Soil conservation and management measures in Rwanda



Activity 4.3

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. A 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 the 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 grazing in an area according to the carrying capacity of land.).

Agroforestry: this is a land use management system in which trees are grown around or among crops or pastureland.



Application activity 4.3

1. Explain why terracing is necessary.
2. Analyze the importance of zero grazing to farmers.
3. Discuss the impact of agro-forestry to agroculture.

4.4. Importance of soil in Rwanda



Activity 4.4

Discuss the importance of soil

In Rwanda land and by extension soil is a valuable resource that must be protected and well managed.

- **It is a source of food:** the increasing population of Rwanda depends directly on the agricultural produce from the farms. Available land and fertile soils can enable farmers to plant a variety of crops.
- **Modification of climate:** fertile soils support the growth of dense forests which in turn play a great role in influencing weather conditions.
- **Soil support growth of plants:** Fertile soil supports growth of plants. In-turn these plants produce vital needs to humans like food, clothing, furniture, medicine etc. Even other animals, insects receive food by grazing on plants.

- **Soil is used in construction:** soil contents like gravel, clay, sand, etc. are widely used for construction of buildings such homes and classrooms, roads, etc.
- **Raw material for some industries:** soil is used for making tiles and utensils like cups and plates which are made from clay.
- **Environmental balance:** soil provides support for survival of many micro-organisms like bacteria, algae, fungi etc. These micro-organisms present in soil help in environmental balance like retaining of moisture, decay of dead bodies of animals, plants etc.
- **Soil acts as a source of essential minerals and elements:** Soil organic matter contains essential minerals and elements like phosphates, sulphates, calcium, zinc, magnesium and many more. These elements are provided to plant during growth and from there to all the living forms. Hence they act as source of essential minerals and elements needed for various enzyme and cell reactions.
- **Soil is a source of minerals:** minerals and mines present in soil are the source of many metals like iron, bauxite, zinc etc. Many metal elements are mixed up with soil and hence extracted from soil by technical processes.
- **Soil keeps atmosphere cool:** soil absorbs water when there is rain and so, when it sunny with heavy sun heat, water from soil evaporates making the atmosphere cool.
- **Soil constitute the biodiversity habitats:**
Soil is the natural dwelling place for many living organisms. Animals like rats, mice, guinea pigs, mongoose, squirrel live in the burrows made in the soil. Reptiles like snakes, lizard live in the soils. Even insects live and nest in the soil. Some birds also nest in the soil. Thus soil provides a safe shelter to many living organisms and accommodate the biodiversity.
- **Soil supports germination:** without soil, the earth would have lacked plants, trees and forests. When seeds from trees fall down on the soil, they receive nutrients for growth and safe protection from the soil.



Application activity 4.4

Explain any 3 contributions of soil to the country's development.



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. Explain the causes of soil erosion in Rwanda and support your answers with specific example for each cause.
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.

UNIT 5:

CLIMATE IN 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 observe 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.

5.1. Climatic zones, Seasons and factors influencing climate in Rwanda



Activity 5.1

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. Identify the seasons in Rwanda.
4. Describe the relationship between human activities and climate.

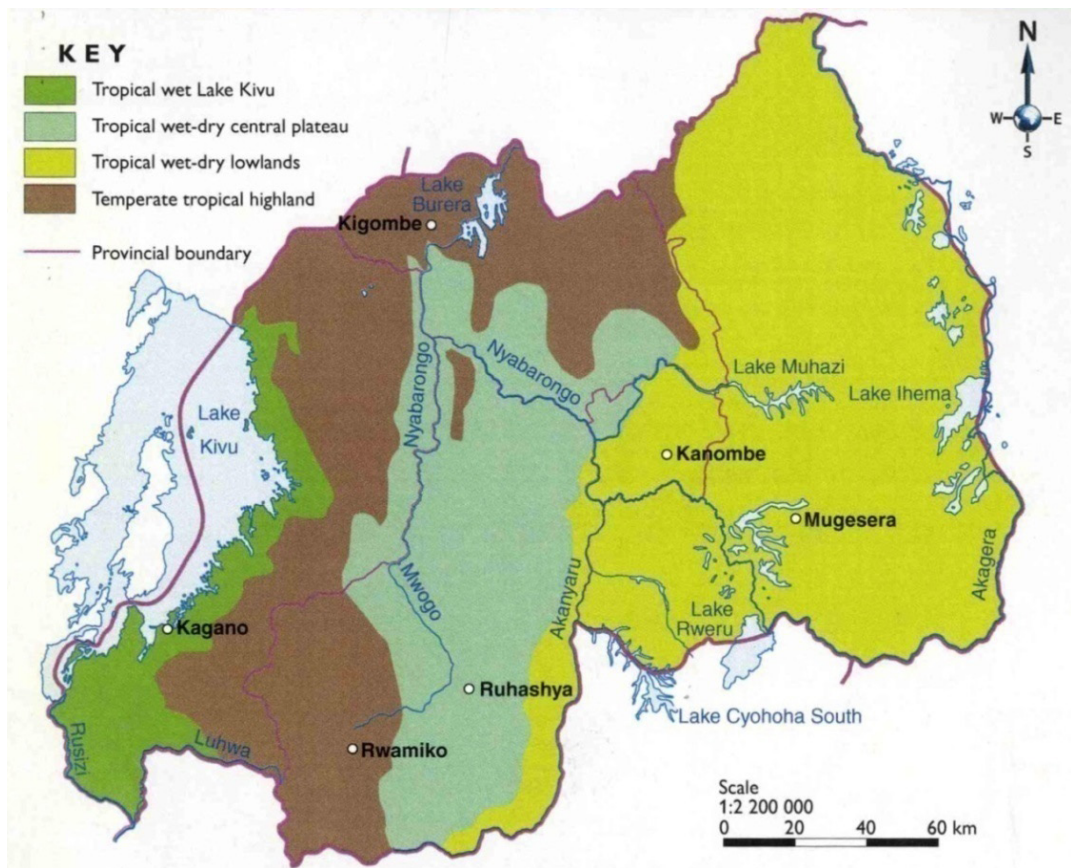
5.1.1. Climatic zones of Rwanda

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 at a given 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), 360th Atlas for Primary, East Africa, Nairobi, Kenya.

According to the landforms and the distribution of rainfall, Rwanda is divided into four main climatic regions, namely: eastern plains, central plateau, highlands, and regions around Lake Kivu.

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 rain fall of between 700mm and 1100mm.

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.

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

This region is very humid and moderated by altitude. The annual temperatures are cooler as the altitude increases, ranging between 15°C and 17°C.

Rain fall is abundant and always above 1200 mm

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.

5.1.2 Factors that influence the climate of Rwanda

The principal factors that influence 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 the sides towards the 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 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 convectional 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 Birunga, 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 contribute to modify temperature and increase rainfall in Rwanda.

Human activities: Human activities like mining, urbanization, rural settlement, industries, transport, agriculture have a great impact on the climate of Rwanda because they lead to deforestation, global warming, pollution, draining of wetlands and degradation of the soil.

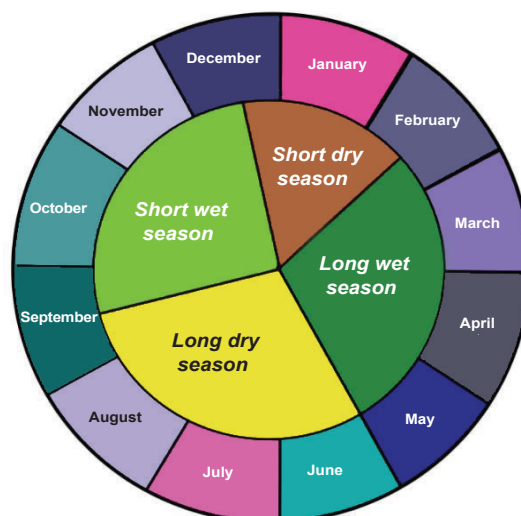
5.1.3 Seasons in Rwanda

i) Seasons in Rwanda

A season is a division of the year characterized by changes in weather conditions, resulting from the earth's changing position with regard to the sun.

Four noticeable seasons in Rwanda

In Rwanda there are four noticeable seasons: Two wet seasons and two dry seasons.



The short rain season (Umuhindu)

It starts in **mid-September** and ends in **mid – December**. It is characterized by heavy and frequent rain representing approximately 27% of annual

rainfall with the short rain season that marks the beginning of the Rwandan agricultural year.

The short dry season (Urugaryi)

It starts from **mid-December** up to **mid-February**. In fact, it is a decrease in rainfall. It is especially pronounced to the East and the Lake Kivu side. During the short dry season, farmers harvest the crops sown in September-October, such as beans, peas, maize.

The long rain season (Itumba)

The long rain season starts from **mid-February** and runs through the end of **May**. This season is locally referred to as ***Itumba***.

The long dry season (Icyi/Impeshyi)

It lasts from **June** to **mid-September**. It has uneven duration depending on regions and years. The air is very dry during the dry season. It is also a season to harvest sorghum, beans and coffee.

The climate of Rwanda is generally characterized by the change in rainfall that depends on the general atmospheric movement and the altitude. Here are factors that cause the typical weather we experience in each season:

- The trade winds of the South-East: Originating from the Mascarenes anticyclone which releases much of their humidity on the East Africa before entering Rwanda in a relatively dry state (long dry season: June, July and August).
- The trade winds from Sahara that cross the Lake Victoria where they pick up humidity and dump rain in the northern part of Rwanda (September, October, November, December).
- The Atlantic monsoon that, after being relieved of its humidity on Mitumba Mountains in DRC, reaches Rwanda in a dry state.
- The rains recorded in Rwanda are mainly due to the intercrossing of the North trade winds with south trade winds or intertropical front and the altitude that favours orographic rainfall.

i) Relationship between climate and human activities

Climate influences our day to day life as it gives us various opportunities for development. However, like relief, it also poses challenges and can be a source of problems that hinder certain human activities.

Positive aspects	Negative aspects
a) High and reliable rainfall favours agriculture. This explains the growth of crops such as coffee and bananas in areas experiencing moderate to heavy rainfall b) Fishing as a human activity is also directly influenced by climate. The continued existence of wetlands and other water bodies is supported by the availability of rainfall. c) Aquatic animals also need moderate temperatures for their existence. d) Favorable climate has led to the occurrence and presence of many features such as forests, grasslands, wetlands and water bodies. These features have become tourist attraction sites. e) A good climate with reliable rainfall supports mining especially of alluvial mineral deposits. These deposits occur in alluvial soils which come into existence due to the presence of rivers and lakes. f) Some industries such as agro-industries and water bottling industries depend on a good climate with reliable rainfall. g) The industries get raw materials from agriculture and water bodies which also directly depend on climate.	1. Excessive rainfall may lead to flooding of low- lying areas, damage of infrastructure, loss of crops, damage of human settlements, loss of wild life and some times, human death. 2. Dry hot climatic conditions discourage agriculture. 3. Innappropriate mining activities contributes to land and waterbodies degradation. 4. Increase of green house gases leads to global warming condition that affects the climate. 5. The reclamation of swamps by humans in search of land for agriculture and fish farming leads to the draining of these areas and this interrupt the hydrological cycle. Eventually these activities affect the climate.



Application activity 5.1

1. Explain how Lake Kivu side region influences the climate of the surrounding areas.
2. With reference to human activities, explain how people influence the climate positively.

5.2 Climate change and global warming



Activity 5.2

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

5.2.1. Climate change

i) Definition of 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 (CO₂, CH₄, N₂O, 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 sink of 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 CO₂ 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. CO₂ emissions were mainly generated from combustion activities of liquid fuels in transportation and electricity generation, while emissions of CH₄ and N₂O 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 (CO₂) which is released by burning agricultural wastes; Methane (CH₄) which is associated with cattle and livestock manure and Nitrous oxide (N₂O) 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.



Flooding 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.

5.2.2. Global warming

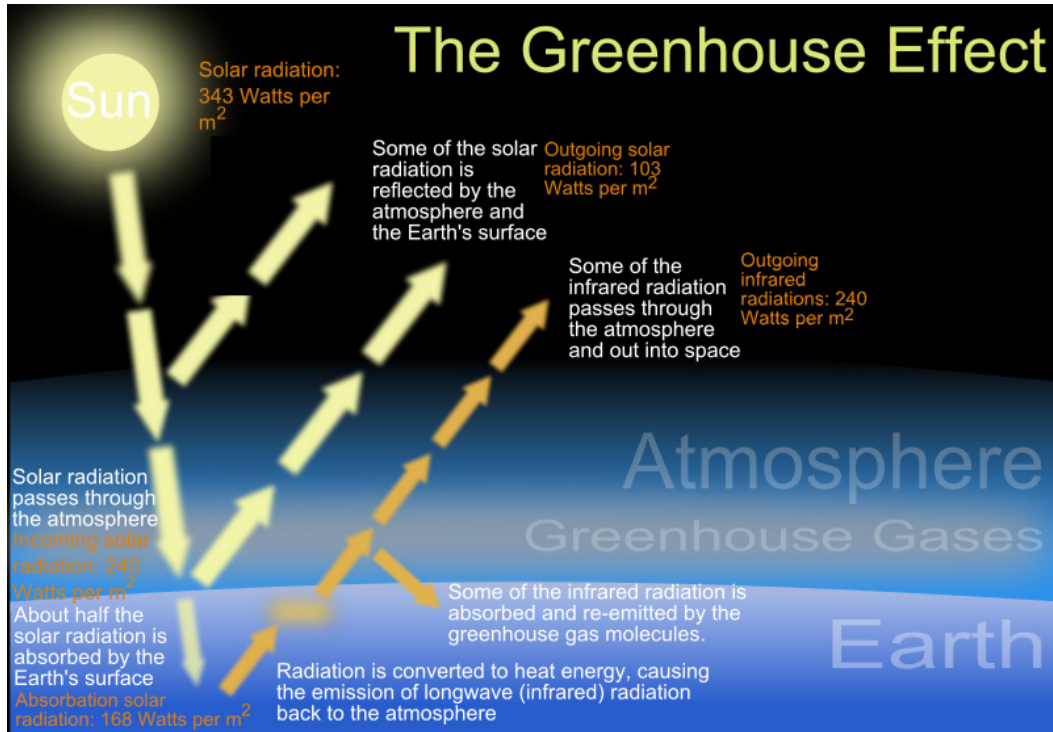
Global warming is a phenomenon of climate change characterized by a general increase in average temperatures of the Earth, which modifies the weather balances and ecosystems for a long time. It is directly linked to the increase of greenhouse gases in our atmosphere, worsening the greenhouse effect.

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 CO₂ 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.

5.2.3. 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;
- Buy crop insurance.

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



Application activity 5.2

1. Describe the effects of climate change in Eastern and Western provinces of Rwanda.
2. Discuss the impact of the following activities on weather and climate.
 - i. Urbanisation
 - ii. 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 advices 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.

UNIT 6:

VEGETATION IN RWANDA

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 to 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?

6.1. Types of vegetation, importance and factors influencing vegetation in Rwanda



Activity 6.1

1. Describe major types of vegetation in Rwanda.
2. Explain how vegetation contributes to the development of the country.
3. What are the factors favouring vegetation growth in Rwanda?

6.1.1. 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.

6.1.2 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 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 taxing people engaged in exploitation of forestry resources.
- Forests are good grounds for educational scientific research.

6.1.3. Factors influencing the types of vegetation

Climate: the most significant climatic aspects that are directly related to the distribution of vegetation are rainfall and temperature. Areas which receive a lot of rainfall that is well distributed throughout the year support dense vegetation forest of equatorial nature.

The nature of the Soil: Areas with fertile soils such as the western and northern parts of the country have dense vegetation. On the other hand, areas with poor soils have stunted or no vegetation.

Altitude /relief: altitude has a great influence in the nature, type and distribution of vegetation. As one ascends a mountain, one notices the varying types of vegetation. This is due to the differences in the type of soils, temperature and rainfall experienced at a given altitude.

Biotic factors (animals, man, birds and other living organisms): influence vegetation distribution in an area. This is true because animals carry seeds of plants and disperse them in different areas hence contributing to their spread. On the other hand, diseases and pests can lead to serious destruction of vegetation. Overgrazing by animals can also lead to destruction of vegetation in a given area.

Man's activities: In Rwanda, the government initiatives have led to the planting of various vegetation ranging from crops to trees under environmental conservation. On the other hand, human activities like deforestation lead to the destruction of vegetation.

Slope aspect: this determines the degree of exposure of vegetation to sunlight which is very helpful for plant growth. Therefore, the parts of the slope that are exposed to too much sunshine have dense vegetation than the opposite slope.

Drainage: the amount of moisture and water contained in the soils has a great influence in the growth of plants. E.g., swampy areas along the river banks, lake shores and marshy areas, vegetation will thrive because they are near the source of water.



Application activity 6.1

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

6.2 Causes of the destruction and conservation measures of vegetation



Activity 6.2

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?

6.2.1. 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 centers has affected much vegetation.

Improper farming methods: in most rural areas of Rwanda, population still use traditional methods which has 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 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.

6.2.3. 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 6.2

1. Describe 4 ways in which vegetation is destroyed in Rwanda.
2. Suggest possible solutions to the above causes.



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. Identify at least 5 uses of vegetation.
2. Find out why deforestation is a problem?
3. Give reasons why it is important to conserve the vegetation.
4. Draw a sketch map of Rwanda and on it, locate the major natural vegetation.

UNIT 7:

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. By using the drainage map of Rwanda, identify major rivers and lakes of Rwanda.
2. Discuss the major uses of water bodies in Rwanda.

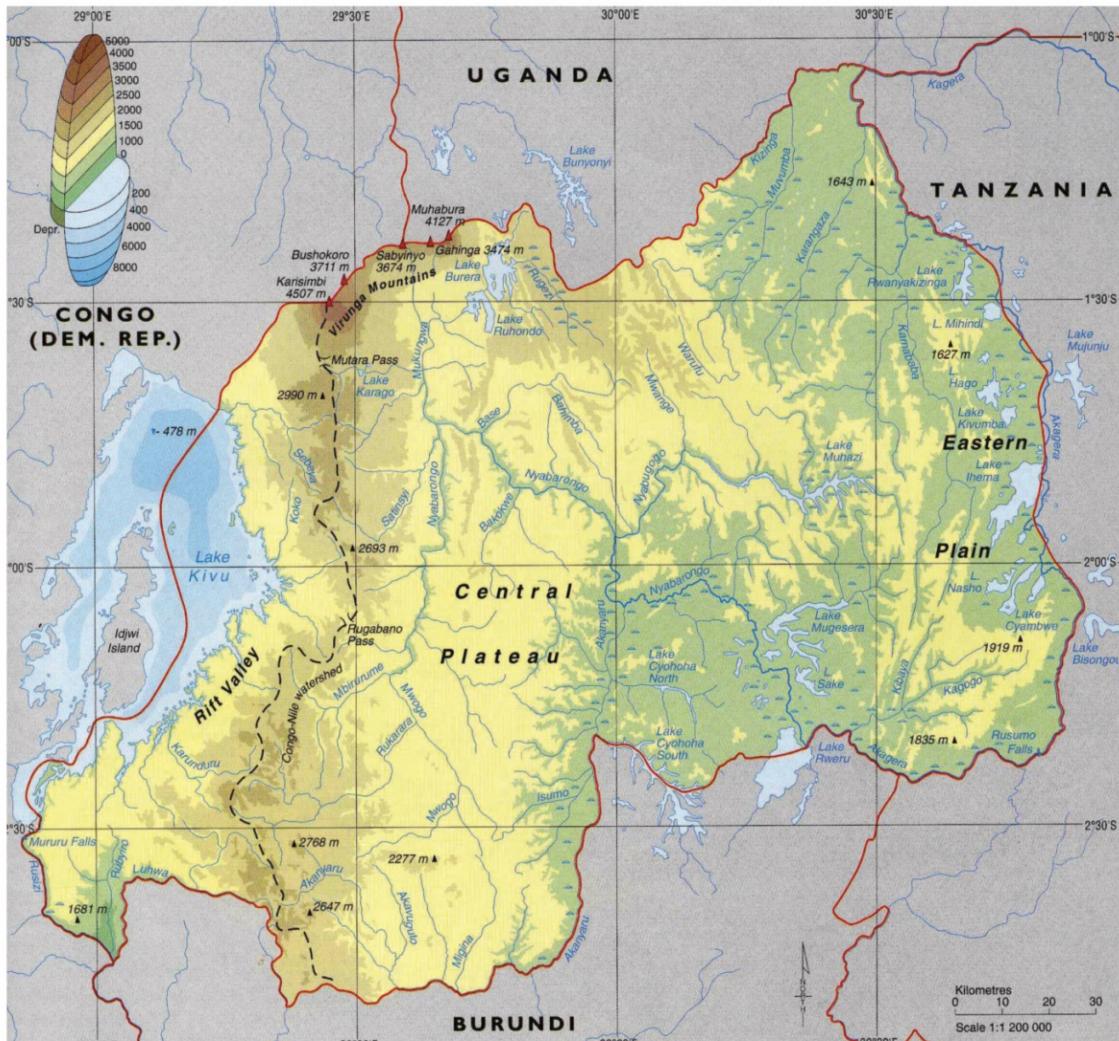
7.1 Major rivers and the drainage basins.



Activity 7.1

1. Identify the major river basins 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 layout 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 7.1

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.

7.2. Major lakes and their mode of formation



Activity 7.2

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

7.2.1. 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 m³.

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.

7.2.2. 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: These are small lakes that have been created by man especially in river valleys as reservoirs of water for crop cultivation especially rice. Examples are found in Eastern province such as Cyabayaga and Rwagitima; Rugeramigozi near Kabgayi (Muhanga district), and Mukunguri (Nyanza district).

7.2.3. 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 improves 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 cannot exist if there is lack of water.



Application activity 7.2

1. With examples, explain how people depend on water.
2. Describe human behaviors 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.

UNIT 8:

POPULATION IN RWANDA

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.

8.1. Population concepts and Population structure



Activity 8.1

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

1. Population, population density, birth rate, death rate, growth rate, fertility rate, life expectancy.
2. Find out and explain the population structure of Rwanda.
3. Write down your findings and present them in a class discussion.

8.1.1. 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.

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

(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:

$$\text{Death Rate} = \frac{\text{Number of deaths}}{\text{Total population}} \times 1000$$

(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.

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

(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 26,338sqkm then, its population density is

$$\frac{\text{Total population}}{\text{Area/size}} = \frac{9,300,000}{26338} = 353 \text{ persons per sq.km.}$$

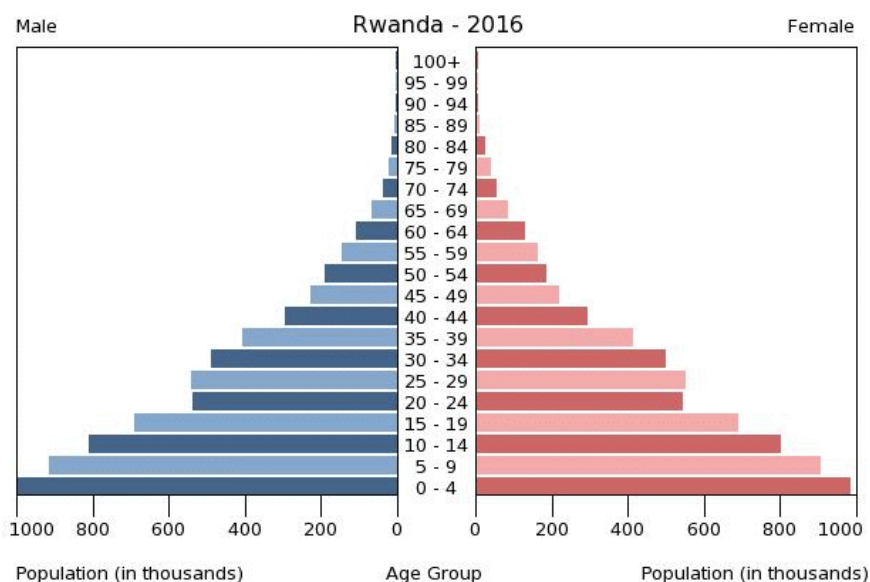
This means that for every one km² there are 353 people occupying it.

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

8.1.2. Population structure of Rwanda

Population structure refers to the composition of a given population. This composition is usually in terms of age and sex. The population structure is usually presented using a population **pyramid or an age-sex pyramid**.

A population pyramid illustrates the age and sex structure of a country's population and may provide insights about political and social stability, as well as economic development. The population is distributed along the horizontal axis, with males shown on the left and females on the right. The male and female populations are broken down into 5-year age groups represented as horizontal bars along the vertical axis, with the youngest age groups at the bottom and the oldest at the top. The shape of the population pyramid gradually evolves over time based on fertility, mortality, and international migration trends.

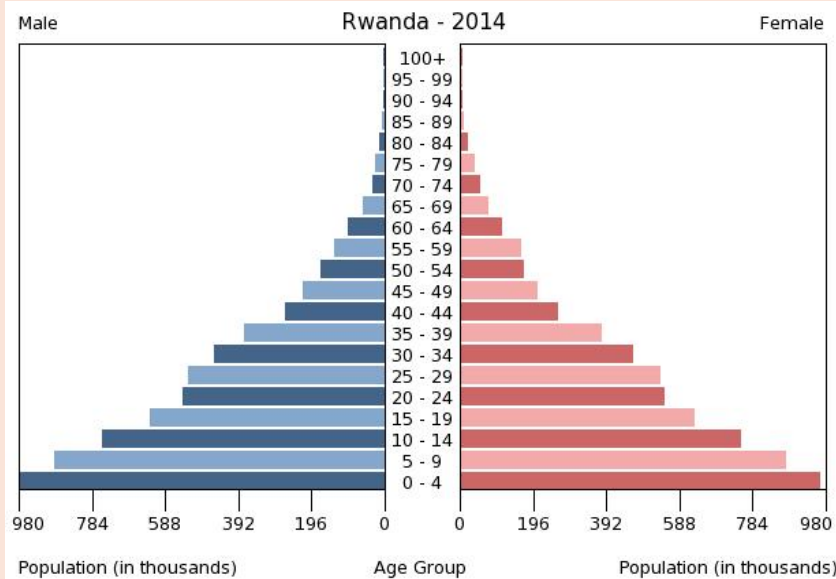


The population of Rwanda is dominated by most females than males in the ratio 53:47 respectively. In recent years the birth rates and death rates were higher. This is because the standards of hygiene, nutrition, access to family planning practices and disease control were lower leading to a high infant mortality rates and high birth rates. Today the birth rate is slightly reducing due to the government policy of limiting the number of children per family and emphasizing monogamous marriages. The number of children being born is higher than the active population and the elders. The life expectancy is also low (65-63 years of women to men respectively) compared to that of the developed countries (70 years and above). The base of the pyramid is therefore very wide and the top is very narrow.



Application activity 8.1

1. Country X has a total population of 56,211 inhabitants. Last year it registered 467 death cases and 3240 new born babies. Calculate the birth rate and death rate of this country.
2. Study the following pyramid showing the structure of the population of Rwanda in 2014 and interpret it.



8.2. Population growth in Rwanda



Activity 8.2

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%.

8.2.1. 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 leading 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.

8.2.2. 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

8.2.3. 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 can 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 healthcare. This will discourage people from having big families hence reducing the population growth.



Application activity 8.2

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.

8.3. Migration in Rwanda



Activity 8.3

Read this short story and answer the questions that follow.

UWIMANA Juliet was a resident of Kigali city for a long time. Due to her low income, the high rates of rent charged and her desire to save some money, she got a cheap house in a slum area that was always dirty and congested. She stayed there for some time and when she had saved enough money, she bought land in Nyamata area and decided to build her own house. She then shifted from Kigali City to Nyamata town. After moving, she got a better job in her new town. She likes the place because there is adequate space, clean water and fresh air to breath. The town is also very clean.

1. Name the push factors that influenced Uwimana's movement from Kigali City to Nyamata town.
2. Explain the pull factors that may have attracted her to Nyamata.
3. Apart from the factors that are mentioned in the story, discuss other causes of migration in Rwanda.
4. Identify the effects of migration in the case above.

Migration is the movement of people from one place to another. People move for various reasons that include; to work, to live or to be away from war or a disaster.

8.3.1. Types of migration in Rwanda

There are different types of migration:

i) Temporary migration

Temporary migration refers to the movement of people from one place to another for a short period of time. They usually move with the intention of going back to their places of residence.

ii) Permanent migration

Permanent migration involves the movement of people from one place to another without the intention of going back to areas where they moved from.

iii) Voluntary migration

This involves the movement of people from one place to another out of their own will. The people could be moving in search of employment opportunities, for adventure or other purposes.

iv) Involuntary migration

Involuntary migration involves the movement of people from one place to another by force. This type of migration usually occurs due to political instability, or hazards such as drought, earthquakes, and volcanic eruptions.

v) Internal migration

This is a type of population movement that occurs within a given country.

Forms of internal migration

a) Rural-urban migration

This is where people move from a village to town or city.

b) Urban-rural migration

This is where people move from towns or cities to villages.

c) Urban-urban migration

This is the movement that involves people leaving one town to another.

d) Rural-rural migration

This where people move from one village to another.

vi) External migration

This is a type of migration where people move from one country to another with either the intention of going back or never going back to the country of origin.

Emigration and immigration: Emigration is a situation where people leave a given area also known as a source area. For example, if Mr. Ntwali migrates from Ramiro village to Nyamagabe town, the act of leaving Ramiro is referred to as emigration and Mr. Ntwali, the person involved in the movement is called an emigrant. The people in the receiving area in this case Nyamagabe town will refer to Mr. Ntwali as an immigrant. The act of getting into Nyamagabe is known as immigration.

8.3.2. Causes of migration in Rwanda

The causes of migration are classified into two. There are factors which force people to leave a given area, these factors are known as **push factors**. There are also factors that attract people to settle in given areas. These factors are known as **pull factors**. Some of the causes of migration in Rwanda include the following:

- **Shortage of land:** An increase in population in a given area puts pressure on land which is a scarce resource. Shortage of land makes people to move from congested areas to areas where they can find land to settle on and to cultivate.
- **Insecurity:** People can move from areas where there is insecurity to areas with full security.
- **Government policy:** The government of Rwanda has established settlement schemes known as the imidugudu. Some people are requested to move to these areas due to communal benefits.
- **Religion:** There are some people in Rwanda who have moved from one place to another for religious reasons. The migration could be temporal or permanent. Worldwide, Muslims go to Mecca and Christians to Israel for religious journeys. These holy journeys in most cases cause temporary migrations.
- **Education:** Currently, Rwanda hosts many students both local and foreign in its institutions of learning. These people have moved from their original places of residence to the places where the institutions of learning are found temporarily. Students from Rwanda also go outside the country in search of education. In this way, they also migrate temporarily.
- **Natural hazards:** There are migrations that are caused by the occurrence of natural hazards such as floods, earthquakes and drought. Migration due to this reason is not a common occurrence in Rwanda.
- **Search for jobs:** The modern economic challenges push many people to migrate in order to look for employment opportunities in potential areas and towns with opportunities.
- **Research:** The need to carry out research for studies or for work may cause people to move from place to place.
- **Availability of water:** Many people move to places where they are assured of reliable supply of water. This factor is more important to pastoralist communities who need water and pasture for their livestock.

- **Business opportunities:** Traders move from place to place in search of business opportunities both within and outside the country.
- **Proximity to major transport and communication infrastructure:** This factor has an influence in the migration of people from place to place. Most people want to be near major airports or sea ports due to the variety of business opportunities that these facilities come with.

8.3.3. Consequences of migration in Rwanda

There are both positive and negative effects of migration. Some of the effects of migration in Rwanda are discussed below.

Positive effects

- **Increased markets:** The movement of people to other areas increases demand for various products such as food. This has an economic benefit to the host area where the economy develops.
- **Cheap source of labour:** The incoming immigrants provide cheap labour force.
- **Reduced population growth in the source area:** The source areas are relieved of population pressure on the available resources.
- **Reduction of illiteracy levels and acquisition of skills:** The rural–urban migration in search of education helps in reducing the illiteracy levels in the rural areas. There is also the transfer of skills to both sides.
- **Revenue:** Migration increases sources of revenue to the government when people do business from which the government gains taxes from.
- **Development of infrastructure:** Migration increases the population in the receiving areas. This influences the government to develop more social facilities in order to address the challenges of the masses.
- **Cultural exchange:** People who move to new places tend to move with their cultural practices and beliefs. The host areas tend to adopt some of the new practices from the immigrants. The immigrants also learn the cultural practices and beliefs of the host areas and adopt some of them. The cultural aspects exchanged include language, food and ceremonies. This exchange fosters cultural development.

Negative effects

- **Unemployment:** The increase in population as a result of the presence of immigrants creates a shortage of employment opportunities. This is because the supply of labour exceeds its demand.

- **Growth of slums:** The immigrants especially those who move from rural to urban areas lead to the development of slums. This is due to the economic constraints that hardly make it possible for them to afford renting better places.
- **Increased crime rates:** Some immigrants move into their host areas with bad social habits endangering the security of the host areas.
- **Congestion in towns:** Immigrants cause congestion in their host areas. The increasing population in urban areas is responsible for the congestion witnessed in the various urban centres.
- **Disease outbreaks:** Immigrants sometimes carry over diseases from their source areas into their host areas. The diseases tend to spread more causing stress to the local people in the host areas.
- **Moral decay:** The immigrants go into the receiving areas with their peculiar cultural habits. Some of these habits could be alien to the host areas and hence have negative influences. Such habits include prostitution and drug trafficking.
- **Environmental degradation:** The increase in population due to migration increases pressure on the available resources and the environment. An increase in population means pollution, cutting down trees and encroaching on reserved areas.
- **Stagnation of the rural economy:** The rural economy becomes stagnant since the young and energetic people migrate to urban areas to look for greener pastures. As they migrate, they leave behind less productive members of the population. This leads to unbalanced economic development in the country.



Application activity 8.3

Study the photograph below and answer the questions that follow:



1. What kind of migration is shown on the above photo?
2. Explain any other types of migration that happen in Rwanda.
3. Explain any five consequences of migration in Rwanda.



Skills lab

Discuss the advantages of population growth to a country like Rwanda.



End unit assessment

1. The following terms are used in population of Rwanda: describe them using examples:
 - (a) Birth rate
 - (b) Death rate
 - (c) Growth rate
 - (d) Life expectancy
2. Explain any six factors that influence population distribution in Rwanda.
3. Describe the population structure of Rwanda.
4. (a) Discuss five factors that influence population growth in Rwanda.
(b) Analyse five consequences of population growth in Rwanda.
5. (a) Name and explain the types of migrations.
(b) Discuss any six causes of migration in Rwanda.

UNIT 9:

RURAL AND URBAN SETTLEMENT 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.

9.1. Rural settlement



Activity 9.1

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.

9.1.1. Types of rural settlement

i) 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

ii) 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

iii) 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

iv) 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 reforms program that came along with the introduction of the umudugudu.



Planned rural settlement

9.1.2. Characteristics of rural settlements

Rural settlement is generally characterised by:

- The major economic activity carried out is agriculture.
- Houses are constructed using simple, cheap and semi-permanent materials.
- General limitation of social services like water, electricity, transport network, sanitation, etc.
- Low standards of living.
- Unemployment: majority of the people stay idle all day long especially when it is not a farming season.



Application activity 9.1

Using a sketch diagram, differentiate a linear to dispersed settlement

9.2. Problems and solutions associated with rural settlement in Rwanda



Activity 9.2

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 government's 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 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 endeavor 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 “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 9.2

Using a sketch diagram, differentiate a linear to dispersed settlement

9.3. Urban settlement in Rwanda



Activity 9.3

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



1. Identify the area shown in the photograph.
2. Name at least three areas where this photograph could have been taken in Rwanda.
3. Explain the characteristics of the area shown in the photograph.

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 population growth 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.

9.3.1. Characteristics of urban centres in Rwanda

There are many characteristics associated with the urban centres in Rwanda. They include the following.

- **They are administrative centres:** Urban centres in Rwanda are the headquarters for most of the government agencies and provinces. The urban centres host government offices.
- **They host various recreation facilities:** Urban centres have better hotels, museums and green belts, theatres and social halls. These facilities are used by both locals and tourists.



Amahoro Stadium

- **They have improved infrastructure and social facilities:** Urban centres enjoy a variety of infrastructure and social facilities that are of higher standards compared to the ones in the rural areas. The facilities include roads, highways, better hospitals, schools and higher institutions of learning, water fountains, electricity, street lights and cinema halls.
- **They have trade supporting aids:** Urban centres are hosts to financial institutions such as banks, insurance companies and other micro finance institutions that offer loans and credit facilities to the urban dwellers to carry out businesses.

- **They have a high population:** Urban centres have a high population. The ever increasing number of people migrating from rural to urban areas rapidly increases the number of people living in urban centres. This influx results in congestion and overcrowding in the urban centres.
- **They have slum settlements:** The rural-urban migration results in too many people living in the urban areas. The high population causes a shortage of resources including housing. Shortage in housing leads to the development of unplanned settlements around the edges of the urban centres.



A slum in Kigali city

- **They have poor waste disposal facilities:** Poor waste disposal in the urban areas of Rwanda is a common characteristic. In some parts of the towns and cities, residents dump wastes in the nearby water bodies while others create dumpsites near residential areas. This affects the environment, causing foul smell and eye sores. Other areas lack proper drainage systems leaving waste water and sewage to flow everywhere within the towns.



A poor waste disposal facility

- **They have trading centres:** Most urban centres are characterised by the presence of a variety of commercial services. The urban centres of Rwanda are the commercial hubs of the country.
- **They are characterised by high cost of living:** Urban centres are associated with high cost of living due to the dense population and sometimes because of shortage of some goods and services. The demand for the goods and services is always higher than the supply. This difference in demand and supply increases the cost of some items.
- **They have traffic jams:** In cities like Kigali, there are always inconveniences that are caused by traffic jams. This is because of too many people and vehicles coupled with narrow roads.
- **They have modern buildings:** Urban centres are associated with better and modern buildings and houses. The buildings are beautiful and some are of international stature.



Kigali Convention Center

- **Employment opportunities:** The economic activities in urban centres are a source of employment to many people. This is the main cause of migration from rural to urban areas.
- **Industrialization:** Most urban centres of Rwanda have industrial areas in their out-skirts. For example, the Masoro area in Kigali city is an industrial area.
- **Limited land:** There is usually a scarcity of land in the urban centres. The price of land in the urban centres is also very high.

9.3.2. Factors favoring the growth of urban centres in Rwanda

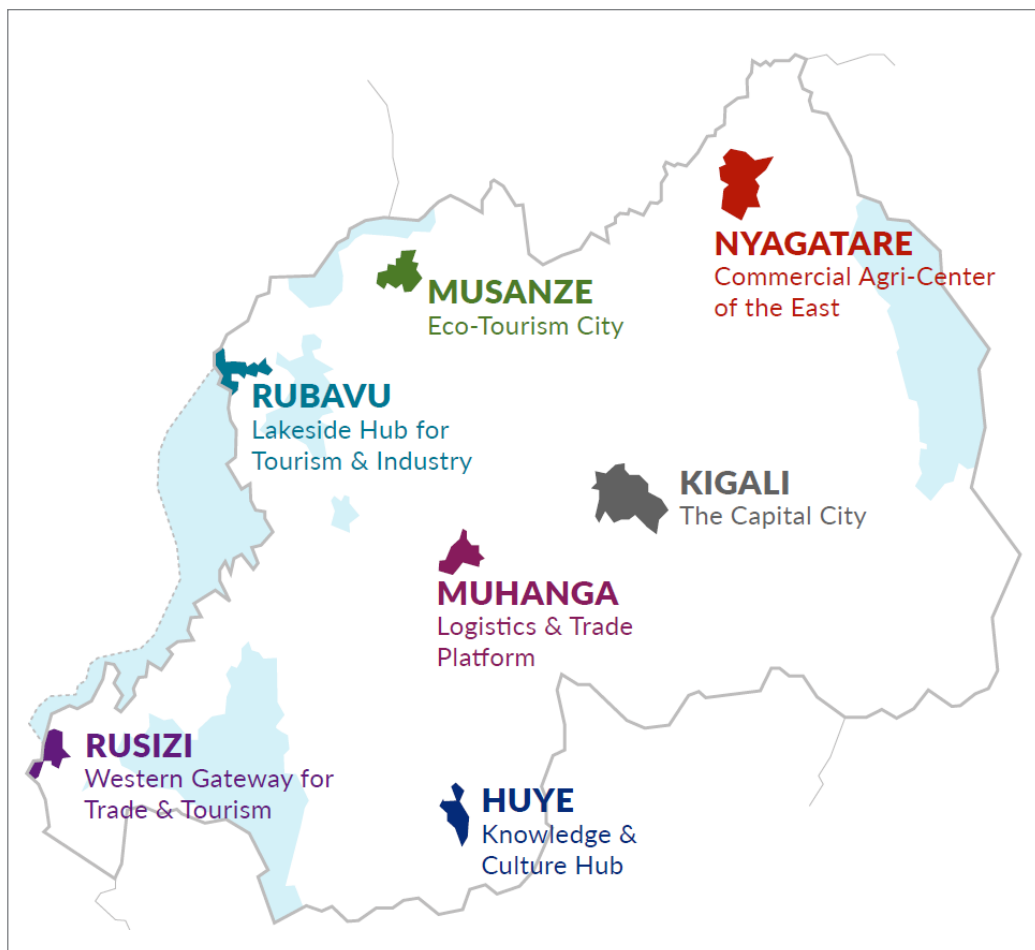
There are several factors that have contributed to the development and growth of urban centres in Rwanda. Some of the factors are discussed below.

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.

9.3.3. Major secondary cities in Rwanda and their location

Secondary cities of Rwanda



In order to better distribute economic growth across the country and accomplish the national urbanization target of 35% by 2020, the Government of Rwanda has identified six secondary cities to serve as growth poles: Huye, Muhanga, Nyagatare, Rubavu, Musanze and Rusizi. However, these cities currently face challenges in the management and provision of basic infrastructure services to their growing population sizes, which, in turn, affect the ability of the cities to develop their economic prosperity.

Huye and Muhanga cities



Source: Rwanda housing Authority

Huye is situated in the Southern province. The city was previously called “Astrida” and was considered to be the intellectual centre of the country. The city is composed of residential areas in the North and South, and a cluster with commercial, administrative and public institutions in the centre of the city. The agriculture sector is the backbone of Huye’s economic growth and the city has significant opportunities for resource-based manufacturing.

Out of the six secondary cities, **Muhanga** is the closest to Kigali, where most of its economic production is transported to the capital itself. Muhanga has the slowest population growth rate of all of the six secondary cities, with a rate of 1.1% which is half the national average of 2.6%. The Muhanga’s proximity to Kigali largely explains its slow population growth rate, as movement to the capital in search of opportunities overtakes migration to this secondary city. Agriculture employs nearly 80% of Muhanga’s district workforce and is correspondingly the largest sector of Muhanga’s city. The other dominating sectors are trade, industry and construction. A number of mining operations are active in Muhanga, but the mineral processing plant operates at only 20% capacity. Muhanga has the potential to become the commercial and financial services hub in Rwanda.

Nyagatare and Rubavu cities



Source: Rwanda housing Authority

Nyagatare is located in the Eastern Province and has the potential to become an agro-trade hub. Of all the six secondary cities, Nyagatare has the highest population growth rate, which stands at 6.2%. It also has one of the lowest population densities with 242 persons per km² compared to the national average of 445 persons per km², which is indicative of the district's current advantage of having a large amount of available land. The strategic law of limiting 5 hectares of land per person has attracted rural migrants looking for land opportunities. While Nyagatare is growing rapidly, with an urbanization rate of 9%, it remains the least densely populated city out of the six secondary cities. Overall, there is lack of infrastructure, such as water and energy, which poses increasing difficulties for accommodating and providing services to new urban dwellers. 80% of Nyagatare's workforce is engaged in agricultural activities and is well known for its cattle breeding and production of milk, which dominates the milk market in Rwanda.

Rubavu is the main tourist destination in Rwanda and is a strategic trading post. It is situated on the northern edge of Lake Kivu and shares the border with Goma in the Democratic Republic of the Congo (DRC). Out of the six secondary cities, Rubavu has the second fastest growing population rate and has the highest population density, which both surpass the national average and makes it the fastest urbanizing city. Rubavu is the only district where agriculture employs less than 50% of the workforce. Rubavu has several large industries that provide employment for its local population: it is home to Bralirwa Breweries, a beverage manufacturer that produces beer and juices; and is where the first Rwandan independent power project, methane gas project, KivuWatt, is situated. While tourism is a significant part of Rubavu's economy, it remains underexploited.

Musanze and Rusizi cities



Source: Rwanda housing Authority

Musanze is situated north of Kigali, it is best known as the tourism hub in Rwanda and thus has become the city with the highest per capita income, even compared to Kigali. Musanze hosts tourists for the internationally renowned eco-tourism activities that Virunga National Park offers, Gorilla and volcano trekking. The two secondary cities of Musanze and Rubavu lie in close proximity to one another, thus creating further potential to complement each other with regard to expanding their respective ecotourism sectors. Musanze has several well-established hotels and restaurants to support its tourism industry. Musanze district has the second highest population density of the six secondary cities but this is not matched with a high population growth. The district has the second lowest population growth figures of the six secondary cities. Agriculture is a vital part of Musanze's economy, employing 67% of the workforce.

Rusizi has the second highest population of the secondary cities and has a growth rate of 2% per annum, below the national average of 2.6%. It is the furthest secondary city from Kigali, located in the southwest of Rwanda on the border with DRC and Burundi, which has led it to sustain a substantial amount of trade and logistics opportunities. At five persons per household, it also has the highest mean household size in Rwanda. Rusizi's population density is also above the national average. These combined factors are placing stresses on the district's existing infrastructure and the availability of resources. Agriculture employs the majority of Rusizi's workforce. In addition, economic opportunities already exist in other sectors such as trade and low-tech industry. In particular, Rusizi is home to CIMERWA Cement, which is Rwanda's largest cement producer. High quality local limestone deposits make Rusizi the ideal location for cement production. Other than cement, Rusizi has a number of resource-based manufacturers that process rice, tea and other locally grown produce. Rusizi has underexploited potential in tourism, given its strategic location by Lake Kivu. The low proximity of Rusizi to Nyungwe National Forest is the driving force behind its physical structures, and economic opportunity.



Application activity 9.3

1. Explain the factors that have favored the urbanization in Rwanda.
2. Identify the characteristics of urban centres in Rwanda.
3. Discuss the importance of the growth of urban centres in Rwanda.

9.4 Problems of the urban centres and their solutions



Activity 9.4

Mr. Bahati is a resident of Kabuga. Every day he takes a taxi to go to the workplace in Kigali city. In the morning, he gets at work late because of traffic jam in Kigali city. He cannot afford class house in the city. He preferred living at kabuga 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.

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 their 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 9.4

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. (a) Giving examples, discuss four types of rural settlements that are found in Rwanda.
(b) Explain five characteristics of rural settlements 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. (a) Discuss five characteristics of urban centres in Rwanda.
(b) Explain five factors that have favoured urbanization in Rwanda.
4. Evaluate three positive and three negative effects of urban settlements in Rwanda.
5. Explain the role of the secondary cities to the development of Rwanda.

UNIT 10:

ECONOMIC ACTIVITIES IN RWANDA

10.1. 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.

10.1.1. Crop cultivation in Rwanda



Activity 10.1.1

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.
4. Explain how climate change is the challenge faced by farmers.

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.

10.1.1.1 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.

10.1.1.2. 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 farming

Small holder farming, 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 while some remove nutrients from the soil others add.

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.



Kitabi Tea Plantation

- **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 Plantation 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, sweet 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.

i) 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.

ii) 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.

10.1.1.3 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

10.1.1.4 Ways of improving crop production in Rwanda

Crop cultivation in Rwanda can be improved in the following ways:

- Organizing farmers into farming cooperatives so that they are able to cultivate land on a large-scale.
- Provision of improved seed varieties that have a short maturity period and high yielding capacity.
- Cross breeding the local breeds with the exotic ones so as to have improved breeds.
- Establishment of large scale irrigation schemes based on co-operative farming.

- e) Encouraging the farmers to use improved methods of farming to reduce wastage of resources. (f) Extending credit schemes to the rural farmers through SACCO.
- f) Mass education programs given to farmers with an aim of equipping them with the agricultural modernization techniques.
- g) Use of both artificial fertilizers and organic manures to improve productivity in the smaller farms.
- h) Establishment of storage facilities in every sector so that seeds to be planted in the next season are preserved.
- i) Implementation of land reform programs so that people are resettled in specific areas so that more land is created for agricultural activities.



Application activity 10.1.1

Visit a nearest farm:

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

10.1.2 Livestock farming in Rwanda



Activity 10.1.2

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.

10.1.2.1. 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.

i) Characteristics of pastoralism

Pastoralism in Rwanda is characterized by the following:

- Large herds of animals are kept.
- Animals kept are mainly for domestic purposes.
- Different local breeds are kept.
- Animals are grazed communally on natural pasture and on unfenced land.
- It is carried out in sparsely populated areas.
- Poor production in form of milk and meat.
- There is less use of veterinary techniques.

ii) Advantages of pastoralism

1. It leads to the development of industries such as milk processing industries (Nyabisindu, Rubirizi, Nyange, and Gishwati), leather and meat processing industries.

2. It is a source of dowry in many communities in Rwanda.
3. It is a source of food to the people since it provides meat and milk.
4. It is a source of fuel in rural areas since it is used to produce biogas.
5. It is a source of manure.
6. It provides employment to rural people.
7. It is a source of foreign exchange when milk, meat and skins are exported.
8. It is a source of income to people and the government through taxation.

iii) Problems of Pastoralism

1. Overstocking which result in overgrazing of existing pastures.
2. Shortage of pasture and water because of low and unreliable rainfall.
3. Spread of disease which leads to death of animals.
4. Poor transport facilities for the transportation of animals and their products.
5. Presence of animal predators such as lions, hyenas, tigers, etc in areas near national park.
6. Poor breeds of animals that give poor yields.
7. Fire outbreak during dry season which leads to destruction of pastures.
8. Shortage of veterinary services.
9. Shortage of land for animal rearing because of population pressure.

iv) Possible solutions to problems of pastoralism

- Construction of water valley dams and bore holes to ensure constant supply of water to the pastoral areas.
- Extending social services to pastoral areas.
- Establish veterinary institutions to train more veterinarians.
- Establish demonstration farms where farmers learn better methods of animal rearing.
- Provide loans to pastoralists in order to improve the quality of animals reared.
- Educating the livestock farmers on the importance of quality.
- Fencing and paddocking to ensure controlled grazing.

- Establishment of livestock processing industries.
- Introducing nutritious and drought resistant grasses (such as Alfalfa, elephant grass, Nandi grass, etc) into pastures to ensure constant supply of pasture.
- Establishing markets in pastoral areas for easy marketing of animals and animal products.
- Promotion of security.
- Working in cooperatives.
- Promotion of conservation facilities of products coming from animals.

10.1.2.2. 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 pastoralism to controlled grazing.

i) 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.

Factors hindering the development of dairy farming in Rwanda

- a) Poor climatic conditions characterised by prolonged dry seasons. This leads to shortage of water and pasture.
- b) The presence of pests and diseases that claim a large number of animals especially the exotic ones.
- c) The dairy farmers in Rwanda still use poor methods of farming.
- d) There is inadequate market for the dairy products both locally and regionally.
- e) The dairy farms in Rwanda are located in rural areas where roads are poor and impassable especially during the rainy season. The dairy products end up getting spoilt.
- f) Most farmers are poor and do not have enough funds. This has made many farmers unable to modernise their operations.
- g) Absence of veterinary services especially in rural areas.
- h) There are still inadequate modern storage facilities of dairy products. This has always made farmers incur losses.
- i) There is competition from imported milk products such as the condensed milk from South Africa and Holland.

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).
- It's 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).

10.1.2.3. Keeping of other livestock (small animals)

Small animals are reared in many parts of Rwanda; smaller animals are especially kept for both domestic and commercial purposes. They include: goats, pigs, rabbits / cuniculture, bees / apiculture, birds / poultry, etc.

i) Importance of keeping small animals

1. The animals lead to economic development through trade between rural and urban areas.
2. It does not require large plot of land.
3. These smaller animals are highly consumed by people, mostly in towns.
4. Smaller animals mature very fast and provide income
5. They don't suffer from numerous diseases.
6. They produce fast/more compared to big animals.
7. Less expenditure to take care of them.
8. They fight against malnutrition in terms of eggs and meat.
9. They produce manure used in agriculture.
10. They are sources of employment opportunities.

ii) Ways or Methods of improving smaller animals in Rwanda

- Use of improved, modern methods of farming such as paddocking.
- Supplementing natural pasture with artificial animal feeds.
- Extending veterinary services to all the areas where livestock keeping is practiced.
- Replacing the local breeds of animals with the exotic to increase the out-put. Where possible, cross breeding should be introduced.
- Milk processing industries should be established so that a large market for the dairy produce can be created.
- Pests and diseases should be controlled through constant spraying. Frequent checks and monitoring of diseased animals should be done in order to isolate the diseased animals in time to avoid the spread of diseases.
- The farmers should be organised into cooperative societies so that they pool resources together and be able to secure credit facilities from financial institutions.
- Several milk collecting centres should be established near the farmers to avoid wastage.
- Transport facilities should be established and the existing ones

rehabilitated.

- Cross breeding of traditional breeds with improved hybrids.
- Training farmers in the keeping of different kinds of smaller animals.
- Introduction of modern facilities for different animals.
- Supporting farmers of smaller animals by giving them loans and encouraging them to work in cooperatives.

10.1.2.4. Contribution (importance) of livestock farming in Rwanda

- Products from livestock are exported to earn the country foreign exchange.
- Animals provide food in form of meat, milk and its products.
- It is a source of income to the families in terms of money.
- It is a source of government revenue to the country through taxation.
- It is a source of employment opportunities to many people.
- It is one way of diversifying the country's economy.
- It leads to the development of agro-based industries by supplying raw materials.
- It facilitates the development of tourism industry like Inyambo.

10.1.2.5. General problems affecting livestock in Rwanda

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



Application activity 10.1.2

1. Identify the key factors influencing ranching in Rwanda.
2. Describe the challenges facing nomadic pastoralism in Rwanda.
3. Suggest different ways of improving livestock farming in your region.



Skills lab

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



End unit assessment

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

10.2. FORESTRY IN RWANDA

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



Introductory Activity

Birunga forest is a part of Birunga national park. People nearby the forest used to collect fire wood and trees for construction. But RDB advised them not to do so again due to benefits of the forest to the government. .

1. Identify other forests of Rwanda.
2. Show the importance of Birunga forest to people nearby.
3. Identify other threats facing this forest.

10.2.1. Major forested areas in Rwanda, their characteristics and Importance of forestry in Rwanda.



Activity 10.2.1

Using your past knowledge, the Internet and other geographical documents:

1. Draw the map of Rwanda showing the major forest areas.
2. Assess the contribution of trees in our day life.

Forestry refers to an industry that deals with preservation and exploitation of trees. A forest is an extensive piece of land covered with trees.

Major forests of Rwanda

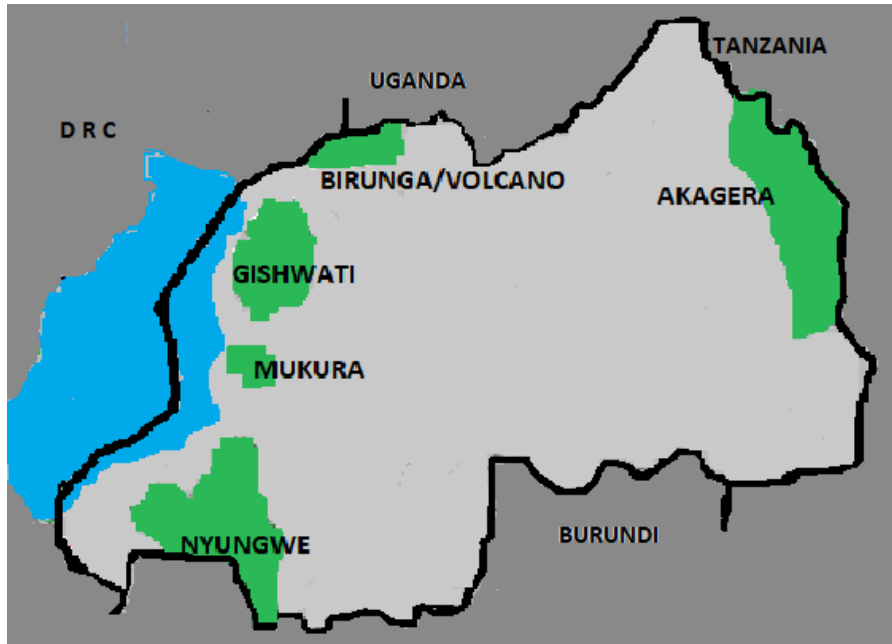


Figure 7: Major forests of Rwanda

10.2.1.1. Major forested areas in Rwanda and their characteristics

i) Nyungwe Forest

Nyungwe Forest is a high-altitude, montane tropical rainforest that is situated in the Southwestern part of Rwanda. It borders Burundi to the south. The forest covers an area of approximately 970 km² of rain forest, bamboo, grassland, swamps and bogs. The location of Nyungwe Forest places it between the watershed of the basin of the River Congo to the west and the basin of the River Nile to the east. The eastern part of the forest is believed to be the source of the Nile.

Characteristics of Nyungwe Forest

- It has a very rich biodiversity with a variety of flora and fauna.
- It has more than 200 species of trees and a wide range of flowering plants.
- It is located on a rugged terrain.
- It receives heavy rainfall throughout the year.
- There are marshy areas in the lowland areas of the forest.
- Trees have a large canopy that limits sunshine from reaching the forest floor.

- It has little undergrowth due to little or no sunlight reaching the ground.
- It has evergreen vegetation and has broad leaves.
- The trees grow tall.
- The forest produces hard woods.
- There is a wide variety of creeping plants.

ii) Gishwati Forest

This is the second largest indigenous forest in the country. Currently, it is a protected area. Gishwati forest is located to the northwestern part of Rwanda. It is found in the Western Province.

Characteristics of Gishwati forest

- It has various tree and shrub species with a wide variety of indigenous hard woods and bamboo trees.
- The trees in the forest grow very tall.
- It is located on an altitude of about 2669 metres above sea level.
- It occupies part of the Congo-Nile divide and the Albertine Rift.
- Gishwati forest is a protected area.

iii) Mukura Forest

This forest is located in the western part of Rwanda. It covers an area of about 12 km². It used to be connected to Gishwati and Nyungwe Forests in the past. However, due to intense deforestation the three were disconnected. A big part of the forest was destroyed. This caused the destruction of its biodiversity.

Characteristics of Mukura Forest

- The forest is located on an elevation of about 2600 metres above sea level.
- It has scattered trees towards the edges of the forest.
- It is located in the western side of the Congo Nile crest.
- It receives annual rainfall total of about 1500mm.

iv) Birunga Forest

The Birunga Forest is found in the Northern Province, in Musanze, Nyabihu and Burera districts of Rwanda. It is located near the volcanic mountains found in the area. It has a wide variety of tree species and other vegetation. The forest covers a land area of 7,800 km².

The characteristics of Birunga Forest:

- It has a wide range of biodiversity.
- It is a home to the mountain gorillas.
- The forest is also home to about 258 different species of birds.
- The vegetation types of the Birunga Volcanoes are diverse and vary with altitude.
- The forest is thick with different trees.

v) Akagera Forest

The Akagera forest is located in the Eastern Province of Rwanda, in Nyagatare, Kirehe and Gatsibo districts. This forest is a conserved area and one of the national parks in the country.

The Characteristics of Akagera Forest

- The forest has deciduous trees. The trees shed their leaves to reduce transpiration because of drought.
- It has a variety of trees and wild animals that attract thousands of tourists.
- The trees in the forest have thick barks to keep moisture.
- There are hardwood tree species in it.
- Trees are averagely short.
- The trees have Y-shaped branches.
- Valuable tree species that are scattered.

vi) Cyamudongo Forest

This is a small forest located in the Western Province of Rwanda in Nyamasheke district, Nkungu sector near Nyakabuye town close to the border with Democratic Republic of Congo. It is located on a high elevation area that is about 1924 metres above the sea level.

Characteristics of Cyamudongo Forest

- The forest has a dense canopy that hardly allows the penetration of the sun-light to reach the forest ground.
- There is dense vegetation with little undergrowth.
- The forest has a wide range of tree species.
- It has many climbing trees.
- The trees are very tall.

10.2.1.2. Importance of forestry in Rwanda

Forests in Rwanda have many uses, some of them are explained:

- **Recreation:** Forests are suitable places for relaxation and leisure activities. Several people go to forests and camp there for camp fire or retreat associations.
- **Source of raw materials:** Forests help human to have access to the raw materials that are needed in making various products such as furniture, pulp and paper.
- **Provide building materials:** Forests provide different types of materials used in the construction sector like Poles, timber, etc.
- **Source of wood fuel:** Forests provide wood fuel in the form of firewood and charcoal.
- **Source of food:** Forests are reliable comprehensive food for many communities that live near them. Special nuts, fruits, greens in the form of vegetables, mushrooms, yams among many others, are all collected at a free charge from the forests. These have enabled man to live a healthy life.
- **Source of foreign exchange:** Rwanda exports forest products such as pulp and paper, hardwood, softwood, timber.
- **Creation of employment opportunities:** There are a big number of people that are employed by the forestry sector as forest rangers, lumbermen, and forest conservation officers.
- **Homeland for flora and fauna:** forest area contributes to the development of the eco-tourism which has had its positive contribution towards the socio-economic development of Rwanda while others go for hunting, forest walking, animal tracking and canopy walking.
- **Source of herbal medicine:** Most of the medicines both processed or locally extracted originate from forests. The good examples are chinchona whose bark is used to make Quinine that treats malaria.
- **Support capital flow:** There are many local and foreign investors that contribute huge sums of capital into the economies of countries where forest exploitation is concerned. These investors come along with skills that are taught to the locals.



Application activity 10.2.1

1. Identify the products from timber.
2. Examine the contribution of Gishwati forest to the people around it.
3. Differentiate Akagera forest from Nyungwe forest.

10.2.2. Deforestation and forest exploitation measures in Rwanda



Activity 10.2.2

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



1. Describe what is happening in the picture above.
2. Give reasons to explain why people cut down trees in Rwanda.
3. From your observation, point out the measures put in place by the government of Rwanda to conserve forests.

Deforestation is the permanent destruction of forests in order to make the land available for other uses.

10.2.2.1 Causes of deforestation in Rwanda

Increased population: This increase has led to the high demand for fire wood, land for settlement and agriculture. This need has left many parts of the forests stripped, hence deforested.

Bush burning: Bush burning has claimed many parts of the forests in the country. The fires are sometimes caused by the locals, tourists or accidents.

Charcoal burning: This practice has caused serious deforestation in areas of Gicumbi, Eastern and Southern Provinces. The steep slopes are stripped of the trees leaving the soils bare. In the process of burning charcoal, bush fires may be caused.

Road and infrastructural development: There is massive development of various infrastructure in Rwanda. This has cost the country a huge number of trees as sites have to be prepared for the construction of schools, roads and hospitals.

Overgrazing: In areas where cattle keeping is still characterised by large herds of animals, the cattle overgraze in a limited area. During the dry season, the livestock feed on young trees leading to deforestation.

High demand for forest products: There is a need for harvesting trees in forests for products such as timber and poles that are required in the making of furniture items and other commercial products. This demand leads to deforestation.

Urbanisation: This has created the need for more land for the construction and expansion of urban centres as they struggle to implement their master plans. This leads to clearing of forested areas and forest plantations that are near urban centres.

Mining: Mining has also caused deforestation in many parts of Nyungwe Forest. Trees are cleared as the soils are dug up to create mining sites.

Climatic changes: Harsh climatic conditions occur as a result of deforestation. Ironically, the harsh conditions cause further deforestation by drying up young and immature trees. This is a common occurrence in the Eastern Province where during the dry season, many trees dry up.

10.2.2.2 Effects of deforestation in Rwanda

The effects of deforestation in Rwanda include the following:

- a) **Global warming:** Cutting down trees interrupts the global carbon cycle. The carbon dioxide in the air is greatly harvested by trees which store it. Global warming has increased because the forests and vegetation cover have been cleared.
- b) **Air pollution:** The carbon dioxide released into the atmosphere pollutes the air. Due to lack of forests, the carbon dioxide is not absorbed and therefore stays on in the atmosphere further polluting the air.
- c) **Interference with the hydrological cycle:** Deforestation leaves large quantities of trees cut. This interferes with the hydrological cycle. Trees absorb the rain water that infiltrates into the soils and loses it through evapotranspiration. This enables the water to go back into the atmosphere condensing and falling as rain again. This explains why deforestation leads to absence or reduction of rainfall in an area.
- d) **Loss of valuable tree species:** The clearance of trees and other vegetation when felling trees has led to disappearance of some species of both flora and fauna.
- e) **Severe soil erosion:** Trees play a great role in binding the soils together thus reducing the impact of soil erosion. Some tree branches also break the force of falling raindrops hence reducing erosion. When trees are cut, the soils are left bare and exposed to agents of erosion. Erosion degrades the soil by reducing its fertility and productivity.
- f) **Reduction of the natural evaporation cooling system:** The clearing and cutting of forested areas has limited the effectiveness of the natural evaporation cooling system. This system naturally regulates the temperatures in the areas where evaporation takes place. The moisture found above the ground within the canopies of trees protects the ground from the in-coming sun's rays by creating cool air. When the trees are cut, the air heats up and this has effects on the eco-system within the area.
- g) **Acidification of water bodies:** The excess carbon dioxide in the atmosphere due to lack of trees is eventually absorbed by water bodies. This acidifies the water making it unfit for human consumption.

10.2.2.3 Forest conservation and the management (policy measures) in Rwanda

Forest conservation is the practice of planning and maintaining forested areas for the benefit and sustainability of future generations or is the preservation and the protection of forests. **Forest management** is the process of planning and implementing practices for the stewardship and use of forests and other wooded land to meet specific environmental, economic, social and cultural objectives.

Measure for forest conservation and the management in Rwanda are the following:

- a) Establishment of conservation and protected forested areas.
- b) **Reforestation:** This is the planting of trees in areas that were once forested but were deforested. The government encourages the planting of trees and has even set aside specific days for tree planting.
- c) **Afforestation:** This is the establishment of forests or tree stands in areas where there was none before. Currently, in Rwanda, trees are being planted in areas where they never existed before. This practice has increased the coverage area of forests in country.
- d) **Introduction of improved tree species:** The traditional trees are now being replaced with improved tree species that mature quickly and are able to yield better quality wood.
- e) **Agroforestry:** The government of Rwanda through its agencies together with non-governmental organisations encourage its citizens to grow crops and trees at the same time. This is done to address the need of increasing the tree cover and to reduce the threatening risk of desertification especially in the Eastern Province.
- f) **Strengthening institutions concerned with forestry:** The government has provided full support to the Ministry of Forests and Natural Resources and the National Forestry Authority. These institutions are active at the grass root levels. There is also rigorous mass education on the importance of forest conservation and management.
- g) **Improved lumbering methods:** The government encourages the people engaged in exploitation of forest resources to use better and improved tree felling methods.
- h) **Alternative sources of fuel:** The government encourages its citizens

to use alternative sources of fuel such as biogas, solar energy and hydroelectric power. This will reduce the pressure put on the forest products especially firewood.

- i) **Intensive research:** The government has invested a lot of resources in research in relation to forests. The researchers are aimed at solving the problems that affect forests and to improve forest conservation and management.
- j) **Development of human resources:** The government of Rwanda has embarked on training foresters in order to equip them with all the required skills in forest conservation and management. They are given the technical and professional training so as to ensure that the forest resources are used sustainably.
- k) Restricting the use of poles and timber in the construction industry.



Application activity 10.2.2

1. As a student who has studied and understood the topic of forestry, draw a program that can enable your community to utilize the forest resources in a sustainable manner.
2. Explain how shortage of rainfall is an effect of deforestation in Eastern part of Rwanda.



Skills lab

With reference to your experience and skills acquired in this unit, explain how forest exploitation can be done wisely.



End unit assessment

1. With the help of a sketch map of Rwanda, identify and locate the forested areas.
2. Suggest the measures taken by the Rwandan government to ensure conservation and management of the forests in the country.
3. Examine the role played by forests around your school.
4. Analyse the ways of promoting sustainable utilization of forest resources in a country like Rwanda.

10.3. FISHING IN RWANDA

Key Unit competence: The student-teacher should be able to analyze the impact of fishing on the sustainable development of Rwanda.



Introductory Activity

One day, Tom a resident of Mubuga village travelled to Rubavu to visit Joy his relative. Upon his arrival, he was served with fish and potatoes a meal he enjoyed. This made him to ask its source. Joy told him that the source was Lake Kivu. This made the two to go and fish since Joy was good at fishing. Tom was amazed by the catch and when he was returning to his home village, he took some fish to his relatives since fish is used as medicine and for home consumption. Everybody at home was very happy and welcomed him with joy.

1. Identify the major fishing grounds of Rwanda.
2. Discuss the importance of fishing to the economic development of Rwanda.

10.3.1. Definition of fishing, major fishing grounds and importance of fishing



Activity 10.3.1



1. Briefly explain the above economic activity.
2. Mention the major fishing grounds of Rwanda.
3. Discuss the importance of the activity to the people who practice it and to the country.

i) Fishing

Fishing / pisciculture is an activity which involves extraction of valuable resources from water bodies. In Rwanda fishing activity is concentrated mostly on fish and is done purposely for food, commercial or sport.

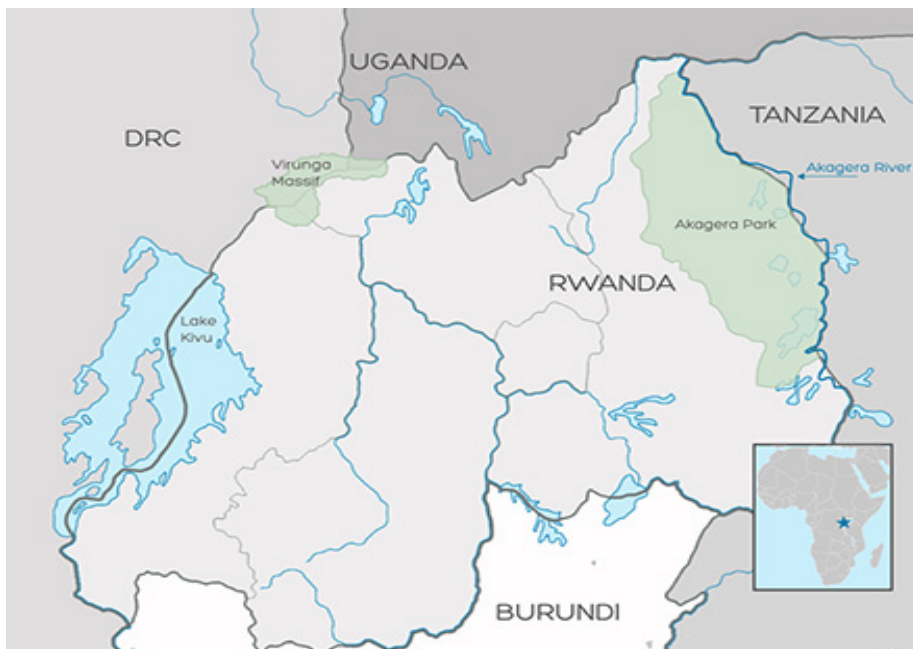
ii) Major fishing grounds in Rwanda

Fishing in Rwanda mainly takes place in Rivers, Swamps, Lakes and ponds. The lakes in Rwanda where fishing takes place include Lake Muhazi, Ihema, Cyohoha, Rweru, Burera, Ruhondo, Rwanyakizinga, Hago, Kivumba, Cyambwe, Nasho, Mugesera and Kivu. Despite the numerous fishing grounds present in Rwanda, Lake Kivu is considered to be the major fishing ground in the country. It is located on the border of Rwanda and the Democratic republic of Congo. The lake covers a total surface area of some 2,700 km² and stands at a height of 1460m above sea level.

The Rivers in Rwanda include Akagera, Akanyaru, Nyabarongo, Rusizi, Mukungwa, Base and Ruhwa.

The main swamps in Rwanda are Akanyaru on the boarder of Burundi, Mugesera, Rweru on the South-East, Akagera Swamp on the border with Tanzania, Nyabarongo and the Rugezi wetlands in the North and Kamiranzovu in the West.

Major fishing areas in Rwanda.



iii) Importance of fishing in Rwanda

Fish and fishing are of significant value to the social- economic development of Rwanda. The importance of fish and fishing may include the following:

- Fishing provides jobs to people who are employed in the fishing industry. They include the processors, fishermen, fish mongers and fish transporters.
- Fish is a source of food that is so rich in proteins. Proteins are an important component in human diet for good health.
- Fishing promotes both local and international trade hence improving international relations and the balance of trade between countries.
- Fishing promotes the growth of transport networks such as roads that connect fishing grounds and market areas.
- The revenue collected by the government through taxes in the industry is used in the development and provision of social services and facilities like schools and health centers. These facilities benefit the society.
- Fishing and fish are sources of income for people who are employed in the industry.
- Fishing provides market for other products from various economic sectors. Fishermen buy food stuffs from agriculture, timber from forestry and fishing gear and equipment from manufacturing industries.
- Fishing and fish provide raw materials to different industries like animal feeds industries, fish canning industries, fertilizer- processing and cosmetic industries.
- Fishing helps the country to diversify its economy. It provides alternative sources of income for the economy.
- Fishing facilitates tourism especially in areas of the country where it is carried out as a leisure activity or for sports.
- Fishing leads to growth and development of towns. In Rwanda, Rubavu town developed out of fishing activities. Gashora trading center is developing fast due to active fishing activities that take place on Lake Rumira.
- It provides research to higher institutions of learning.
- Fishing and fish products are sources of traditional medicines that are used by the people of Rwanda.
- The fishing industry has contributed to the development of other industries that have additional advantages to contribute to the economy. These industries include boat construction industries, fish processing industries and cosmetic industries.



Application activity 10.3.1

Suppose you are staying near a fishing ground area:

1. Using local examples show how you and your community would benefit from the fishing activity.
2. Assess the impacts of fishing on sustainable development of Rwanda.

10.3.2. Problems affecting fishing and their possible solutions.



Activity 10.3.2

1. Discuss the problems hindering the development of fishing industry in Rwanda.
2. Suggest some possible solutions to the problems facing the development of fishing industry in Rwanda

10.3.2.1. The main problems associated to fishing in Rwanda are:

- Lack of a fish eating tradition that does not consider fish as a high value commodity.
- Poor regulatory framework of the fishing effort and fishing methods.
- Uncoordinated and unfocused development projects leading to unsustainable outputs.
- Environmental pollution of water systems by excessive erosion of farmlands. Almost total depletion of natural fish stocks through overfishing.
- Inadequate fishing cooperatives that are geared towards harvesting with no inputs into the fisheries.
- Lack of private sector investments in the sub-sector.
- Lack of interest in fisheries and aquaculture at the district level hence low rating of the sector.
- There is very little local leadership support to fisheries and aquaculture development in almost all the districts.
- Lack of institutions for management of research and advisory services.
- There is no reliable data on the size of the fish stocks to guide management decisions.

- Poor linkage of aquaculture and other agriculture production systems.
- Insufficient trained human resource to manage the sector.
- Significant high post-harvest losses of the little fish harvested from the lakes.
- Lack of fisheries and aquaculture inputs including seed, feed, gear, equipment and others on the local market.

10.3.2.2. Solutions to the problems affecting fishing industry in Rwanda.

The following are some solutions to problems associated to fishing in Rwanda:

- The government has put up strict laws against use of crude fishing methods that catch immature fish.
- The over fished areas are also being restocked with improved fish species.
- Strict laws have been passed to help fight water pollution.
- The polluted water bodies are being cleaned and the pollutants removed.
- The Rwandan government is working to standardize the fishing products in the country. Rwanda will then be able to compete favourably with its neighbours.
- The government of Rwanda has encouraged fishermen to organise themselves into cooperative societies.
- The government of Rwanda is trying to establish well-facilitated warehouses and collecting centers that have deep freezers where the local fishermen can store their fish before marketing.
- The government is providing fishermen with modern facilities like refrigerators at subsidized prices.
- The government is opening up the remote areas through the construction of feeder roads which connect the fishing areas to the main roads.
- There is a mass education campaign of the importance of fish as a healthy source of protein. This is aimed at increasing the demand and local consumption of fish and fish products.

10.3.3. Ways of improving fishing and fish farming in Rwanda (future prospects).

A number of things should be done to improve fish farming and these include the following.

- **Development of new agencies that deal with fishing:** The government should consider establishing more agencies to address the issues that affect inland fishing in the country. Feeds that are more nutritious in order to improve their quality and size.
- **Protection of the country's fishing grounds:** The government should recruit more people to guard the fishing grounds of the country. The guards should be properly trained and given equipment to enable them carry out their duties well.
- **Restoration and protection of watersheds:** The government should put in more emphasis on the afforestation and reforestation programs especially in the watersheds as a way of controlling the problem of silting in the water bodies.
- **Control of water weeds:** There should be a serious campaign against water weeds especially the water hyacinth. The government in collaboration with the local communities should look for ways of removing the already present weeds and to prevent others from growing.
- **Restocking of over fished lakes:** The government should restock the lakes and rivers with low populations of fish.
- **Purchasing feed-making machines:** The government through fishing agencies should increase the production of fish feeds. There is an urgent need since fish in both natural water bodies and fish farms need fish feeds.
- **Commercialising fish farming:** The government should continue to encourage the population to embrace commercial fish farming as an alternative source of income.
- **Development of infrastructure around the fishing grounds:** The government of Rwanda should develop infrastructure especially roads leading to fish farms, fishing grounds and markets.
- **Increasing sheltered places:** The government should plan to build various sheltered and well facilitated places where the fishermen can store and preserve their catch as they await marketing.
- **Establishment of regional fishery promotion centers:** The government should plan to increase fishery promotion centers throughout the country.



Application activity 10.3.2

1. Find out other problems that affect the fishing industry in the country.
2. Analyse the methods of fish preservation and conservation in Rwanda.



Skills lab

Make a research on the better ways of fish preservation and conservation.



End unit assessment

1. With reference to specific examples, discuss the contribution of fishing to the economic development of Rwanda.
2. Examine the problems facing fishing industry in Rwanda and suggest some possible solutions to these problems.
3. Discuss some ways the government of Rwanda can do to improve fish and fish farming in the country.

10.4 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.

10.4.1. Types, distribution of the major minerals in Rwanda and methods of mining



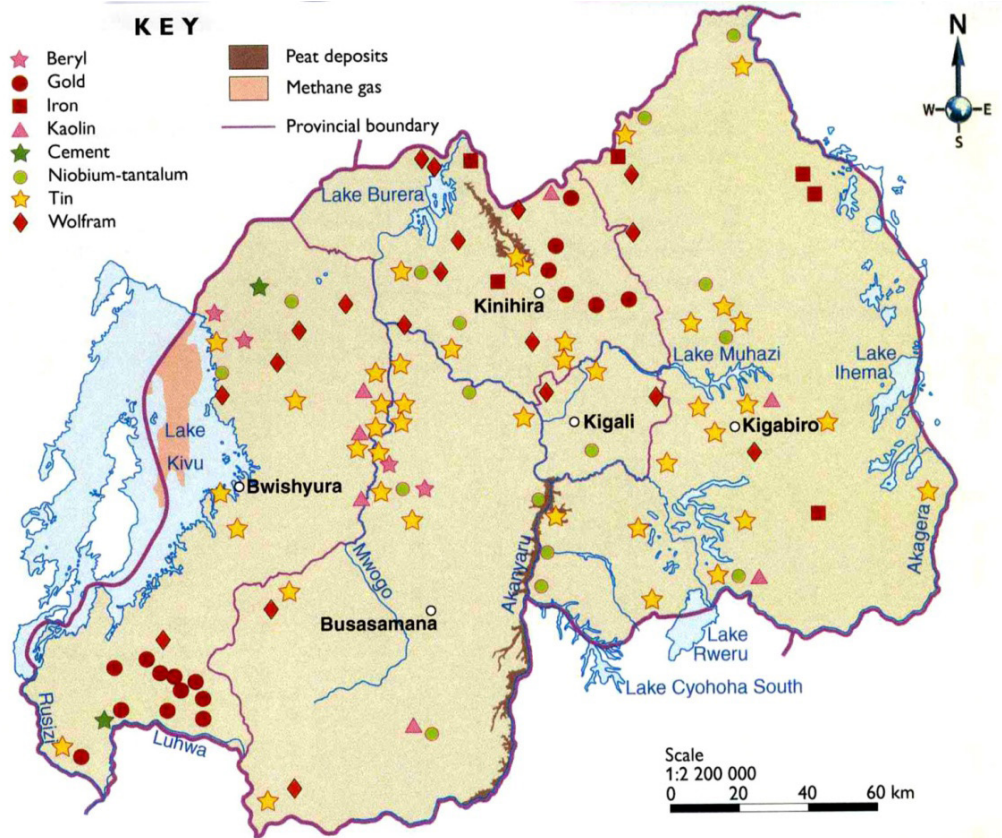
Activity 10.4.1

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

10.4.1.1. Types and distribution of the major minerals in Rwanda

TYPES OF MINERAL	PLACE WHERE IT IS FOUND
Cassiterite (Tin ore)	• Rwinkwavu • Musha • Bugarama • Rutongo • Gatumba • Mwaka • Rutsiro • Bisesero
Coltan	• Kabaya • Rutsiro • Ngoma • Nyagatare • Gatsibo • Rubavu • Rusizi
Natural and methane gas	Lake Kivu
Gold	• Nyungwe • Miyove in Gicumbi district • Nyamasheke
Limestone	• Bugarama in Rusizi district
Peat coal	It is found in marshy areas along Rivers Akagera, Akanyaru, Nyabarongo, Rusizi and around Lakes Burera, Ruhondo, etc.
Wolfram (Tungsten)	• Rwinkwavu • Gatumba • Rutongo • Nyakabingo • Bugarama • Gifurwe

Major mining areas in Rwanda



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

10.4.1.2. Methods of mining in Rwanda.

There are different methods of mining in Rwanda. They include the following:

a. Surface mining



Mining of Coltan in Ruhango District

This is done by removing or stripping surface vegetation, dirt, and, if necessary, layers of bedrock in order to reach buried ore deposit.

An **ore** is a rock that is hoped to be mined (or containing sufficient valuable minerals)

Techniques of surface mining include:

- i) **Open-pit mining or open cast method** is a surface mining technique of extracting rock or mineral from the earth by the removal of the upper layers of rock to get the mineral ore. Open pit or open cast mining is usually employed to exploit a near-surface deposit or one that has a low stripping ratio.

Open pit mines that produce building materials and dimension stones are commonly referred to as “**quarries**”.

- ii) **Placer method**: this is the mining of stream bed deposits also known as alluvial deposits for minerals. These alluvial deposits are formed when minerals are eroded from source, and then transported by water to a new place.

Panning is a form of placer mining that extracts gold from a placer deposit using a pan. It involves mixing of alluvial deposits with water. Proper agitation in water cause the mineral (gold) to sink to the bottom, while washing away the lighter stuff rises to the top and removed leaving the minerals behind.

b. Underground mining



Extraction of cassiterite at Rutongo

This is used when the ores lie deep below the surface. This mining consists of digging tunnels or shafts into the earth to reach buried ore deposits. Sub-

surface mining can be classified by the type of access shafts (passage which goes down) used, the extraction method or the technique used to reach the mineral deposit.

- a) Drift mining utilizes horizontal access tunnels.
- b) Slope mining use diagonal slopping access shafts.
- c) Shaft mining utilizes vertical access shafts.

Drilling method: drilling refers to the process of digging a hole through soil and rock to access geologic reservoirs that contain oil and gas. So this involves boring a hole using a drill to create a well for oil and natural gas production. It is used in extraction of natural gas in Lake Kivu.



Drilling Methane Gas in Lake Kivu



Application activity 10.4.1

1. Draw a sketch map of Rwanda and show the major areas where minerals are exploited or extracted.
2. Analyse the impact of the following methods on the physical environment:
 - Open cast mining method.
 - Drilling method.

10.4.2. Factors affecting the exploitation, importance and problems of minerals in Rwanda



Activity 10.4.2

Read the passage and answer questions:

Mr Kamali visited a mining area, where they extract gold and sand using placer mining method. There was conflict between neighbouring people and mining companies due to pollution and land degradation:

1. Identify other effects Mr Kamali may have found on mining site he visited
2. Examine the role played by mining activity.
3. Suggest the advices to give to mining companies to solve the mining problems.

10.4.2.1. Factors affecting the exploitation of mineral in Rwanda

- **The value of the mineral:** Minerals of high value such as gold are exploited at any cost. They can be mined without incurring losses.
- **Size of deposits:** when there is the availability of minerals in large quantities especially wolfram and cassiterite.
- **Grade of the ore:** When a given mineral has more ore is worth mining. The lower the ore, the less the mineral ore is economically viable for exploitation. This implies that only the minerals with high content of ore are exploited.
- **Transport costs:** This is a factor that determines whether the mineral is worth mining. The less bulky mineral ores are, the more it becomes suitable to exploit it and smelt or process it at hand's reach.
- **Mode of occurrence of minerals:** Minerals that are near the surface of the earth are more profitable to exploit since less expensive mining methods and equipment are involved. This means that, if the mineral is deep underground, it becomes costly to exploit it.
- **Labour:** Mining requires both skilled and semi-skilled labour. In developed countries, it is easy to get the required labour unlike in developing countries.
- **Capital:** The presence of adequate capital will encourage the exploitation of minerals. This is because mining requires heavy equipment that is expensive to purchase. When capital is not enough, it means that the mineral deposits can hardly be mined.

- **Markets:** Mining is majorly conducted for commercial reasons. Therefore, its success depends entirely on the presence or availability of enough market. If there is a high demand for a given mineral, such mineral will be exploited. It would even influence many investors to put a lot of funds in its exploitation.
- **Technology:** Mining requires appropriate technology. Countries with advanced levels of technology exploit their deposits better than developing countries with low levels of technological advancements.
- **Political climate:** The political stability in Rwanda has played a great role in influencing the exploitation of minerals. Foreign and local companies that have invested in Rwanda's mining sector have done so because of the prevailing peace and security. This allows them time and space to engage in mining activities.
- **Government policy:** Minerals can only be exploited when there are favourable and friendly governmental policies such as tax holidays, quick and on-line registration of companies and affordable licensing procedures.
- **Power:** Mining requires adequate supply of power and energy because of the heavy equipment used in the exploitation of minerals. Therefore, in areas where power is unreliable, it is very hard to exploit minerals that are deep underground.

10.4.2.2. 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 raw materials.
- 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.

10.4.2.3. Products from the minerals in Rwanda.

Some of the mineral products that are used in Rwanda include the following:

Cement, Jewellery, Chemicals, Metals, Electrical products, Glass, Ceramics, Arts, Batteries, Fertiliser, Medicine, Light bulbs filaments, X-ray tubes, Capacitors used in electronic devices, Laptop computers, Cellular phones, Jet engines, Rockets, Cutting tools, Camera lenses, Ink jet printers, Hearing aids, Pacemakers.

10.4.2.4. Problems affecting the mining and their solutions.

a) 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.

b) 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 10.4.2

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 is a variety of minerals in the environment. Make 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.

10.5 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.

10.5.1. Major sources and forms of energy, factors influencing and importance of energy in Rwanda



Activity 10.5.1

In her home, Mahirwe watches the television, she cooks food 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?

10.5.1.1. 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 rafine petroleum (diesel, petrol, kerosene) for transport, lightning at home and for generation of electricity.

10.5.1.2. Factors favouring the power and importance of power production in Rwanda.

a) The factors favouring the power production in Rwanda

The factors favouring the power production in Rwanda are the following:

- There is high demand for power in Rwanda due to rapid population, urbanisation and industrial growth.
- The availability of water falls in Rwanda such as at Ntaruka, Rusizi, Mukungwa, Rukarara and others have favoured power production.
- The presence of other power potentials such as solar energy, peat coal, methane and others favours the exploitation of power.
- The government policy to encourage the production of power.
- Availability of ready internal and external markets for the power.
- The political stability of Rwanda favours power production.
- Presence of large volumes of water in the rivers for the generation of hydroelectric power.

b) 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 10.5.1

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.

10.5.2. Problems hindering the development of energy, their possible solutions and case studies in Rwanda.



Activity 10.5.2

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

10.5.2.1 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.

10.5.2.2 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.

10.5.2.3 Case study: Mukungwa I, Mukungwa II, Rusizi II.

i) Mukungwa I and II power stations

These power and energy generating stations are located in the Northern Province of Rwanda in Musanze district. They are all situated along River Mukungwa. Which connects Lakes Burera and Ruhondo. River Mukungwa is an outlet of Lake Ruhondo. The Mukungwa I power station is located at the geographical coordinates that lie between latitude: 1°32'16.08" and longitude: 29°41'3.12". It is found at an altitude of about 1651 metres above sea level. The power station produces about 12 Mega Watts (MW) of power. Its construction began in 1978 and it began its operations in 1982. The station produces power of differing voltages basing on the need for the power generated.

There is one section that produces high voltage power that is meant to supply power and energy to Kigali while the other section produces medium voltage power that serves Musanze and Rubavu towns with their associated rural areas. The power station faces the challenge of reduction of the water levels in the dam that causes reduced power generation. As an effort to boost the electricity generation capacity of the station, another station, Mukungwa II was constructed to provide additional power to the national power grid.

Mukungwa II on the hand began its operations in 2010. It produces 2.5MW of power to the national power grid. These two power stations have created employment opportunities and provided reliable power supplies to the various institutions. The stations are responsible for the development of Musanze town which is a major tourist urban centre in Rwanda.

ii) Rusizi II power station

This power station was developed on River Rusizi which is the only outlet of Lake Kivu.

Rusizi I was established in 1958 while Rusizi II power station was constructed in 1989. The operations and management of Rusizi II power station was a joint project between Rwanda and her partners who are Burundi and the Democratic Republic of Congo. The Rusizi I power project has the capacity of producing 30 MW of hydroelectric power while Rusizi II has a capacity to produce approximately 44 MW of power.



Application activity 10.5.2

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 this would 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 well exploited, highlight the factors affecting oil fuel production in Rwanda.

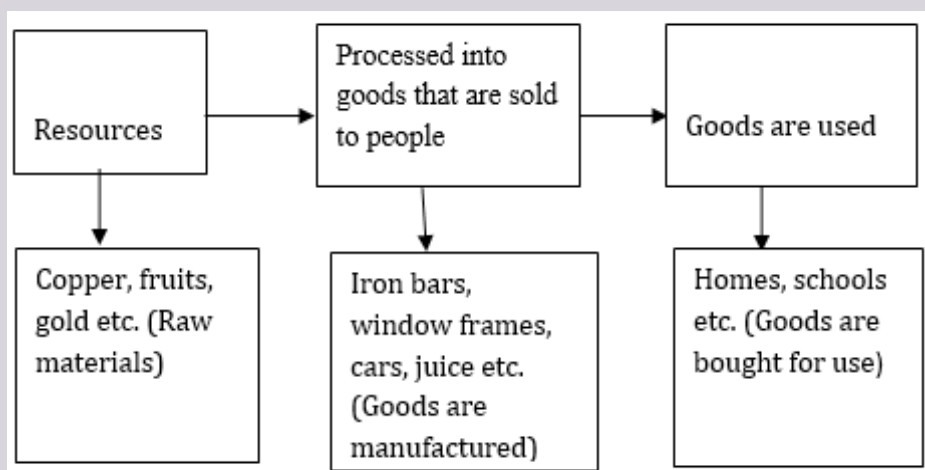
10.6 INDUSTRIALISATION IN RWANDA

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.

10.6.1. Industry and factors affecting industries in Rwanda



Activity 10.6.1

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?
2. Find out the factors that influenced its location.
3. Identify and explain the factors that affect the development of the industry in Rwanda.

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 / goods.

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.

iii) Factors influencing industrial development in Rwanda

The development of industries in Rwanda is influenced by a number of factors. Some of them are discussed below.

- **Availability of raw materials:** In areas where there is a constant supply of the required raw materials, industries grow and develop. For example, the presence of limestone at Bugarama has contributed to the success of CIMERWA.
- **The presence of a steady market:** Industries produce goods and services for commercial purposes. This means that the prosperity of industries depends on the availability of a ready market. For example the Inyange group of industries has developed and grown due to the high demand for its products both locally and internationally.
- **Presence of transport infrastructure:** The Rwandan industries heavily depend on the available means of transport in order to transport both inputs and outputs. This explains why industries are located near roads and water bodies such as Lake Kivu.
- **Technology:** Technological advances help an industry to grow. This is because it is technology that makes the conversion of raw materials into quality finished products possible. Industries in Rwanda are gradually mechanising their operations. This calls for improved technology for higher outputs.
- **Availability of power and energy resources:** Industries depend on power and energy to run machines that are used in the production of goods. Those that have access to a steady and constant supply of power develop faster since the production process is also quick.
- **Steady supply of labour:** Industries develop when there is a steady supply of labour. In urban areas like Musanze, Kigali and Rwamagana, there is a steady supply of labour due to the high population.
- **Government policies:** The government of Rwanda has designed various policies that aim at enabling the industrial sector to develop and grow. The registration of industries can be done online and be processed within 24 hours. Investors are also given tax holidays when they start operations for specific periods of time.



Application activity 10.6.1

1. Differentiate industry from industrialization
2. Explain other factors that influence industrial development in Rwanda
3. Visit any industry near your home or school and examine the factors that led to its location.

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



Learning Activity 10.6.2

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 Nyirangarama Enterprise.
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.

- 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 10.6.2

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

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



Activity 10.6.3

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 Masoro, 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 10.6.6

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.

10.7. TRANSPORT, COMMUNICATION AND TRADE IN RWANDA

Key Unit competence: The student- teacher should be able to investigate the impact of Transport, Communication and Trade on the sustainable development of Rwanda.



Introductory Activity

Read the passage below and answer the following questions.

In northern province of Rwanda there is a high production of potatoes. Mr. Murenzi imported a lorry in Japan to help the people to carry their harvests to the market instead of using their heads. Murenzi as a businessman extended his businesses and he started to export his products to China. Sometimes he goes there to purchase goods or calls his partners using his mobile phone, then orders his goods, and pays using his Visa card, and finally gets his goods without moving from Rwanda to China.

1. Outline the types of transport mentioned in the above passage.
2. Assess the economic importance of the transport that Murenzi introduced in Northern Province.
3. What form of communication did Murenzi use to get his products?
4. Mention other types of communication he can use to order for his goods.

10.7.1 Transport:

Transport is the physical movement of people, animals, goods and services from one place to another.

Modes of transportation and means of transportation are not the same thing. The **means of transportation** refers to the objects through which transportation is achieved. For example, cars, boats, motorcycle, aircraft are means of transportation because they are the objects that transport humans and goods from one point to another. On the other hand, these objects require a medium to move through; for instance, cars move through roads, boats move through water and aircraft move through air. The medium through which movement occurs by the various means of transportation is referred to as the **mode of transportation**. Land, water, air, pipelines and human portage are all mode of transportation.

Terminal is place where the travel /journey starts or ends (port, airport, and car park).

0.7.1.1. Major types of transport, their distribution, advantages and disadvantages and factors influencing the development of transport.



Activity 10.7.1.1



1. Differentiate the types of transport shown in the photograph above.
2. Which is the best type of transport and why?
3. Find out the advantages and disadvantages of water transport.

i) Major types of transport, their distribution, advantages and disadvantages

There are mainly three types of transport in Rwanda. These include:

a) Air transport

This involves the movement of goods, services and passengers by airplanes. There are two main international airports in Rwanda. They are:

- Kigali International Airport at Kanombe.
- Kamembe International Airport in Rusizi district.

There are also some airdromes in Rwanda; Huye in Southern province, Gako (Bugesera) in Eastern province, Gabiro (Gatsibo) in Eastern province, Nemba (Gakenke) in Northern Province, Musanze in northern province and Rubavu in western province.

This type of transport is not highly developed compared to road transport. This is because this type of transport is expensive. However, the government is trying its best to ensure that the necessary infrastructure is put in place to ensure that it is in use. There is a prospect of constructing a large airport in Bugesera district.

Advantages of air transport

- **It is fast:** It is the fastest mode of transport because no natural barriers to air transport.
- **It is convenient:** It is comfortable and less tiresome. As it is used to send costly, light and perishable goods. It is comfortable and less tiresome.
- **Time management:** Operations of air transport are on schedule and this ensures no time wastage.
- **It is not affected by relief features:** The presence of mountains, oceans and rivers create no obstruction to air transport.
- **It is useful for agriculture:** Aero planes are used to spray pesticides on farms.
- **Strategic importance:** This form of transport can be used in risky areas such as the war torn and troubled places to offer humanitarian services.
- **It is secure:** It is a relatively secure type of transport to use. There is security for the passengers and goods that are being transported.
- **It operates on fixed time schedules and routes:** This enables users to plan in advance.

Disadvantages of air transport

- **Risky:** The occurrence of air accidents leads to great losses of lives and goods.
- **Costly:** Air transport is regarded as the most expensive form of transport. The cost of purchasing and maintaining aircrafts and airports is very high. This leads to high freight charges and air fare.
- **Small carrying capacity:** The aircrafts have small carrying capacities. They are therefore not suitable for carrying bulky goods.
- **Affected by weather changes:** Very heavy rainfall, fog or snow may lead to cancellation of flights.
- **Highly trained personnel:** Air transport requires great skill from highly trained and qualified personnel. These skilled personnel are few in developing countries such as Rwanda.

- **Insufficiency of airport:** Air transport is not flexible since aircrafts only land in areas with airports.
- **Dangerous to transport inflammable products:** Some goods such as the highly inflammable ones are not allowed into airplanes.

a) Water transport

Water transport is a means of transport that involves movement of goods or people from one place to another by use of boats, ships and ferries on water. The inland water bodies in Rwanda have enabled the establishment of inland navigation. Water transport is present on Lakes Kivu, Muhazi, Burera, Rweru and Ihema. It is also present in River Akagera, Nyabarongo, and Akanyaru on a small scale. Water transport is considered to be the cheapest means of transport.

Advantages of water transport

- It is the cheapest method of transporting bulky and low quality goods.
- It does not require any route construction; it uses the already existing routes like lakes, rivers and others.
- Usually little time is wasted in traffic control as in case of road transport.
- Water transport is suitable for the transportation of fragile goods since there is very limited shaking.
- There are limited chances for robbery as in the case of road transport.
- Usually the costs of collection and delivery are minimized especially if the ports of dispatch are in the same water side.

Disadvantages of water transport

- **Not quick:** It is a slow means of transport compared to road and air transport.
- **It is risky:** Water transport is more risky as compared to other means of transport due to water waves.
- **Limited area of operation:** This type of transport can only be used in areas with lakes, canals and rivers.
- **Seasonal river:** Some seasonal rivers and canals cannot be used for transport throughout the year.
- **River course:** The Inland water transport is unreliable. Sometimes, rivers change their courses disrupting the normal routes.
- **Strong waves:** The water transport depends on the state of the water bodies. When there are strong and destructive waves, the vessels are destroyed and accidents are bound to happen.

- **Obstacles:** The presence of obstacles such as rocky islands and floating vegetation hinder the movement of vessels.
- **Shortage of ports:** The construction of ports is very costly.

(c) Land transport: Is the transport on the land.

Land transport includes:

Porter transport: Human head portage is the earliest form of transport used in Rwanda. Human portage is used by the majority in most parts of Rwanda simply because people lack capital and skills to develop modern transport networking. It is also commonly used in mountainous, swampy and forested areas where other means of transport cannot be used.

Pipeline transport: This involves the movement of liquids and gases from one place to another. In Rwanda, it is mostly used for transporting water for domestic and industrial uses. It is also used to deliver methane gas from Rubona (the shore of L Kivu) to BRALIRWA factory in Rubavu district.

Road transport: This involves the movement of goods and services by locomotives and auto mobiles from one place to another. Road transport is the most important means of transport in Rwanda. The future prospects show that a railway line linking Isaka (Tanzania) and Kigali is in plan.

Advantages of land transport

- Road transport is flexible i.e. passengers and goods can be delivered anytime and it can reach almost every part of the region.
- It is cheap compared to other forms of transport.
- It is more efficient in terms of time i.e. it can easily carry people and goods over a short distance.
- Road transport can be developed over steep gradient where railway or airports cannot easily be developed.
- Road transport does not require a large capital base to establish compared to airports.
- Vehicles that use roads do not need to run on time schedules compared to air transport.

Disadvantages of road transport

- Road transport is not a suitable method of transporting perishable goods especially over long distances.
- Road transport usually handles a specific and limited quantity of bulky goods.

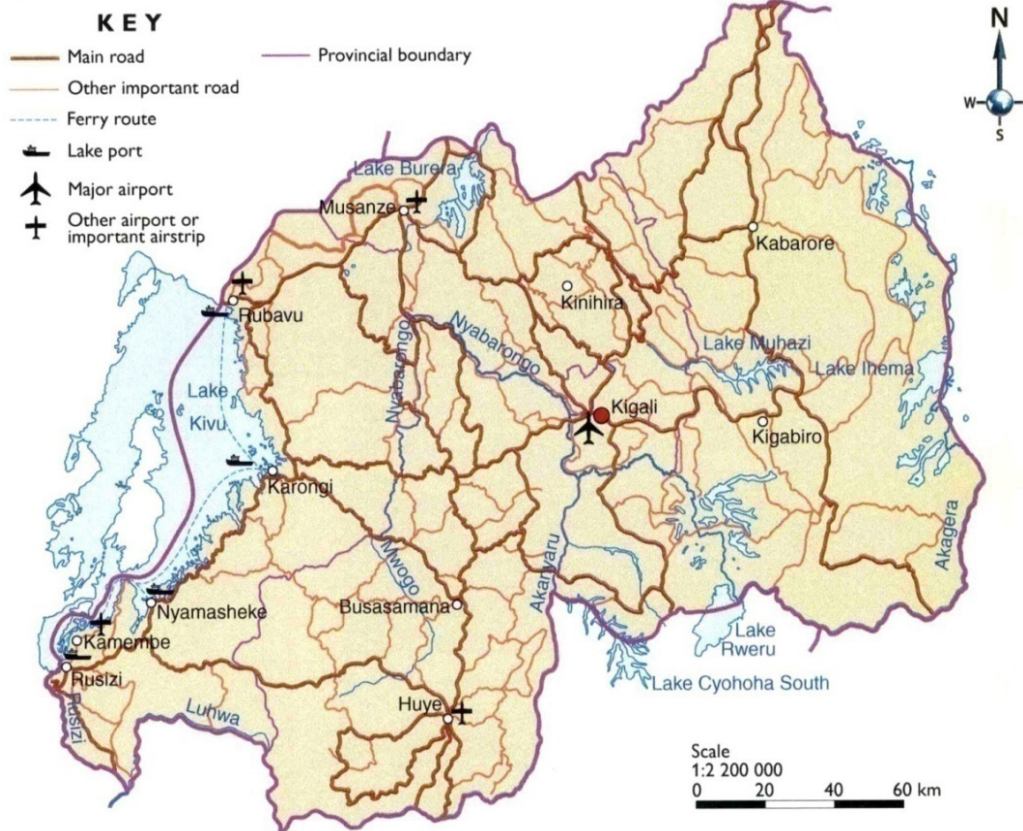
- A road vehicle often returns empty because of having no time table and this is rather uneconomical for example Trailers.
- Road transport can easily be affected by changes in weather.
- It is highly susceptible to attacks by high way robbery.
- In urban centers where there is traffic jam; road transport may end up being slow and expensive in terms of time and fuel.

ii) Factors influencing the development of transport.

There are both physical and human factors that influence the development of transport in Rwanda. They include the following:

- **Relief:** The physical nature of the country (mountainous) has hindered the development of transport in many parts of the country. Areas with gentle slopes in the Central and Eastern parts of the country have a network of well-developed roads.
- **Vegetation:** Some parts of the country especially those covered with vegetation like Nyungwe and Gishwati forests, are unavailable for construction of roads. Areas with little or no vegetation especially in the Eastern region of Rwanda are good for construction of transport facilities.
- **Presence of water bodies:** Water bodies in Rwanda consist of lakes and rivers. These water bodies have promoted water transport. Lake Kivu is especially used for trade between the Democratic Republic of Congo and Rwanda.
- **Fertile soils:** In Rwanda, areas with fertile soils that support agricultural activities are connected with a network of roads. This is due to the need of transporting the agricultural output and inputs that are needed or produced by the farmers.
- **Adequate capital:** The Rwandan government in partnership with developed countries and other international agencies is able to raise enough capital for the construction of transport facilities.
- **Business opportunities:** There are different businesses that have come up in Rwanda in the recent past. These businesses attract clients and more investors.
- **Industrialisation:** The construction of roads and other forms of transport is attributed to the presence of industries. The industrial areas have to be well served with adequate means of transport to facilitate industrial activity.

The main roads and airports of Rwanda



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



Application activity 10.7.1.1

1. Identify the factors to explain the shortage of airport in Rwanda.
2. Water transport is the cheapest means of transport in Rwanda. Discuss
3. Explain the influence of job opportunity in the transport of Rwanda

10.7.1 .2. Importance of transport on the sustainable development of Rwanda, Problems affecting the transport and possible solutions and the future prospects of transport in Rwanda.



Activity 10.7.1.2

Study the photograph below taken in a tax park and explain the problems affecting transport in Rwanda



Importance of transport to the economy of Rwanda

Transport contributes in various ways to the economic development of Rwanda. The following are some of the ways in which transport contribute to economic development.

- **Facilitation and promotion of trade:** Rwanda as a land locked country heavily relies on roads through Kenya, Uganda and Tanzania for its imports as well as exports.
- **Provide employment opportunities to many people:** There are many people employed both directly and indirectly in the transport sector either as vehicle operators, workers on road construction and others.
- **Facilitation on the distribution of goods:** Feeder roads are very critical in the distribution of goods and movement of passengers to upcountry areas.
- **Promotion of the tourist industry:** Roads help in the movement of travelers to tourist sites and other places of interest for example tourist areas such as Akagera and Birunga national parks are accessed using roads.

- **Stimulation of other sectors:** These sectors, industry, agriculture, fishing and mining heavily rely on the availability of roads by which raw materials are brought in finished products transported to market centers.
- **Promotion of international relations:** Transport promotes cordial international relations, since transport brings together leaders in face-to-face talks.

iii) Problems affecting transport in Rwanda

- Problem of land lockedness associated with high transport costs and delay of goods.
- Limitation of other important means of transport such as the railway line.
- The mountainous nature of the landscape which causes landslides.
- Accidents due to meandering (Zigzag) in hilly roads.
- Insufficient capital for terminal maintenance.
- High prices and price fluctuation of fuel.
- Climatic conditions especially the muddy or dusty days which make some roads impassable.
- Poor infrastructure development.
- Weak vessels such as wooden boats and rafts used in water transport.
- Traffic congestion or jam on roads.
- Limited navigable waterways.
- Inadequate skilled labour to be used in the construction of new roads.

iv) Possible solutions and future prospects of transport in Rwanda

- The government should construct strong bridges across rivers that connect areas of production and markets.
- The custom services should be electronically managed so as to reduce traffic congestions and unnecessary delays at the borders.
- There should be construction and rehabilitation of feeder roads connecting rural areas to the rest of areas of the country.
- New roads should be constructed and the old ones upgraded.
- The government should partner with financial institutions like the World Bank to enable the construction of better transport networks.
- Rwanda should improve its transport technology.

- The government should promote cordial relations with her neighbours in order to reduce the costs incurred in the importation as well as exportation of goods.
- The government should consider developing railway infrastructure in the relatively flat areas of the country.
- The government should come up with laws that restrict the vehicles that are allowed into the Central Business District of cities and towns.
- The government should also create an organised public transport system.
- The government through the traffic department should introduce traffic lights to control the flow of traffic.
- The traffic department should put up road signs for motorists in all roads and major highways.
- More speed bumps should be constructed on paved roads and major highways.
- The government should construct dual carriage roads in order to control traffic.



Application activity 10.7.1.2

1. "Rural Rwanda is still highly inaccessible." Discuss.
2. Using examples, explain the challenges affecting transport in Rwanda.
3. Suggest different ways Rwanda as a landlocked country can use to improve its international transport.

10.7.2. COMMUNICATION

10.7.2.1. Different means of communication and factors influencing the development of communication in Rwanda.



Activity 10.7.2.1

The business people in Rwanda no longer need to travel to each home advertising their goods. They use different means of communication to reach them easily.

1. Explain the different mean of communication business people use.
2. What do you think can be the factors influencing communication?

i) Means of communication in Rwanda

Communication is the transfer and reception of information, ideas and messages from one place to another and from one person to another.

In Rwandan society, communication was essentially by word of mouth. Today, there is faster and more efficient ways of transmitting messages. These include:

1. **Telegraph:** Telegraph enabled messages to be transmitted by cables as a series of electrical impulses. The signals were in the form of the Morse code, which could be easily interpreted. Most places were thus linked by telegraphic cables. Undersea cables were also laid below the oceans.
2. **Telephones:** This is where cables connected to a local exchange are used to transmit voice messages over long distances. The sound waves are changed into an electric current which is then transmitted to the receiver phone, where it is then interpreted by being retransformed into sound waves that can be interpreted by human ear. Due to technological improvement, the cable fixed phones are being replaced by smart mobile phones which perform various communication tasks.



3. **Television:** Television passes information to large masses of people through pictures and sound. It is a mass communication medium
4. **Radio:** is a way to send electromagnetic signals over a long distance, to deliver information from one place to another. It also usually stands as a machine which sends out and receives messages using air waves to a large mass of people.



5. Internet: Internet means “interconnected networks”. It is a large system of connected computers around the world that allows people to share information and communicate with each other. It is a system that links devices worldwide.



ii) Factors influencing the development of communication in Rwanda.

- **Relief:** High Mountains favour the establishment of transmitters for both radio, television and telephone lines. On the other hand, high mountains hinder the spread of communication.
- **Climate:** Sometimes climatic changes especially a clear weather influences the development of communication. On the other hand, a foggy weather or very heavy rainfall may hinder communication.
- **The size of the country:** A small country favours the spread, transmission and speed of communication
- **The level of technology:** Technological advancement like ICT is favouring the speed and transfer of messages and information.
- **The government policy** which encourages the development of ICT.

10.7.2.3. Importance of communication and Problems affecting communication and their solutions.

Communication is very important to the development of Rwanda.

- It has led to quicker and more efficient transmission and reception of ideas and information.
- It has led to dissemination of information especially to remote areas and this reduces the level of isolation.
- It contributes to more efficient administration and control intra-national and international territories.
- It has enhanced trade by transmitting information on market and prices.
- It has fostered the economic co-operation between the east African community countries.
- It facilitates education through distant learning, e-learning.
- It is now possible to access information on different domains from relevant web sites.

10.7.2.4. Problems affecting communication and the solutions.

i) Problems

Although the modern methods of communication have different advantages as stated above, they also have their own disadvantages. A number of factors hinder communication in developing countries like Rwanda.

- Small proportion of the population using modern facilities like TV's, fax and Internet. Largely used by urban population with high incomes.
- Inadequate capital for investment in the communication sector and therefore little has been done.
- Low technology level also limits modernization of communication.
- Effect of natural occurrences such as heavy rains, floods, landslides and others which may interfere with normal operations of communication systems.
- Inadequate skilled labour in information technology.

ii) Some solutions to the problems affecting communication development

- Training of personnel in information and communication technology and others has improved the situation of inadequate skilled labour.
- Popularization of information and technology in schools and colleges will stimulate career development in areas of communication.

- The effort to carry out regular rehabilitation of existing communication equipments has been going on. This will help to keep them functioning.



Application activity 10.7.2

Referring to televisions and Radios operating in Rwanda,

1. Explain the importance of telecommunication companies in the development of Rwanda.
2. Describe the reasons why there is a big number of radios in Rwanda.
3. Identify the negatives effects of Social media

10.7.3. TRADE

10.7.3.1 Types of trade in Rwanda and factors affecting the trade in Rwanda



Activity 10.7.3.1

Jyambere a student of Mabanga School was born in the village of Amahoro. Her girlfriend has a Laptop from China, imported by Jyambere's father. Other students use tools made in Rwanda like notebooks, bags and uniforms.

1. What are types of trade common in Rwanda?
2. Explain the role played by Jyambere's father in his community.
3. Identify the factors influencing trade in Rwanda.

Trade is the exchange of goods and services for money. Once money is obtained it may be used to buy other goods that are needed.

10.3.1.1. Different types of trade in Rwanda

If we exchange goods for others, we call this **Barter trade**. There are generally two major types of trade namely **internal and international trade**.

i) Internal trade:

This is trade carried out within a country. It is also known as domestic trade. The selling of food to towns from rural areas is an important part of internal trade. Internal trade can be carried out at two levels namely retail and wholesale trade.

- **Wholesale trade:** In a whole sale trade, goods and services are purchased in large quantities and sold to retailers. The principle headquarters of whole sale trade Kigali city. The secondary wholesale centres include Muhanga, Huye, Musanze, Rusizi and others.
- **Retail trade:** Retailers include open air market traders, roadside traders, moonlighters, hawkers and shopkeepers.

ii) International trade:

This is the exchange of goods between countries. It can be divided into two categories namely **Bilateral and multi-lateral trade**

- **Bilateral trade:** This is the exchange of goods and services between two countries. (e.g importation and exportation of goods between Rwanda and United States of America).
- **Multi-lateral trade:** This is the exchange of goods and services between several countries. Goods coming from other countries are called **imports** (in the buying country) whereas goods sold from the mother country to other countries are called **exports**.

10.7.3.1.2. Factors affecting the trade in Rwanda

Trade is influenced by a variety of factors. These include:

- **Political stability and security.** Rwanda's political stability and security encourages foreign investors to come into the country for trade purposes.
- **Transport and communication facilities.** Good transport and communication networks promote trade because it eases accessibility in and out of the country. The use of ICT and other Medias has moved trade to higher levels. Goods can be ordered, paid for and delivered via internet communication. This has made trade easier and faster.
- **Entrepreneurship.** Entrepreneurship abilities or skills also favour trade.
- **Regional agreement.** Regional economic arrangements or trading blocks such as EAC, CEPGL, and others promote trade.
- **Government policy.** The government of Rwanda encourages Rwandans to invest in trade by promoting private sector and protecting home industries.

10.7.3.2. Importance, Problems affecting trade, their possible solutions and prospects of trade to the economy of Rwanda

i) Importance of trade to the economy of Rwanda

- Trade has promoted good diplomatic relationship with the neighbouring and trading countries
- Trade has led to the development of infrastructures especially roads.
- Trade has led to an increase in the country's foreign exchange.
- It has favoured the development of trading centres within the country.
- Trade improves the standards of living of people.
- Trade increases government revenue through taxation.
- It is a source of employment to various numbers of people.

ii) Problems affecting trade in Rwanda, possible solutions and prospects

Problems affecting trade in Rwanda

There are many problems hindering trade between Rwanda and other countries. These include:

- **High tariffs:** These are taxes imposed on goods and services moved across border countries. Some countries impose tariffs on imports. This makes the country's imports very expensive.
- **Poor transport facilities/services.** Roads in poor conditions raise transportation cost and this discourages traders to invest in trade.
- **Poor political system.** Since colonialism, 1st and 2nd republics were characterized by political instability and insecurity which later degenerated into genocide and slowed down the development of trade.
- **Similarity in products.** Most neighbouring countries produce similar products especially primary products like coffee, Tea, sugar and others. This makes little demand for trading such products with other countries.
- **Land lockedness.** Rwanda is a landlocked country (does not have direct access to the sea). This increases the costs of doing business in Rwanda and limits trade.
- **Ineffective demand.** Demand for certain items is sometimes low due to poverty.
- **Lack of capital.** Rwanda is poor and does not have enough capital to invest in international trade.

- **Competition on the world market.** Rwanda like any other country competes with other countries on the world markets. The prices on the world market keep on fluctuating and this limits international trade.
- **Immature industrial development:** Rwanda doesn't have many local industries able to satisfy internal market.

Possible solutions and prospects

- Strengthening international relations by tightening security between member countries of trading blocks.
- Educating all masses especially in entrepreneurship and business education.
- Improving on the quality and quantity of goods produced in Rwanda to promote exports.
- Investing in trade and setting up trade centres more especially collecting and marketing centres for example creation of free trade zone at Masoro in Gasabo district.
- Rehabilitating the existing roads and constructing new ones; leading to richer areas especially those which are agriculturally productive and mineral rich areas.
- Encourage regional economic grouping and cooperation in order to promote trade.
- Putting in place policies and mechanisms of attracting foreign investors especially in trade.
- Harmonization of economic and monetary policies throughout the region.
- Export promotion and import substitution to protect private sector and home industries.



Application activity 10.7.3.1

- Explain the role played by region integration like COMESA in the trade of Rwanda



End unit assessment

1. Examine the relationship between trade and transport.
2. Assess the contribution of the Rwandan government in ensuring effective communication.
3. Explain the factors that have influenced the development of transport in urban areas than rural areas.
4. Describe the impacts of Rwandan landlockedness on its trade.
5. Examine the level of communication and the improvement of technology in trade of Rwanda and describe how this process can support the sustainable development of the country.

10.8. ENVIRONMENTAL CONSERVATION IN RWANDA AND TOURISM

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. What is environmental conservation?
2. Identify the role of environmental conservation.
3. Explain the relationship between environmental conservation and tourism.
4. Explain why Rwanda celebrate annually Kwita Izina event.

10.8.1. Environmental conservation



Activity 10.8.1

1. Analyse the components of environment.
2. Identify ways used by your community in conservation of the environment.

10.8.1.1. Environmental conservation and Types of natural resources (abiotic, biotic, renewable and non-renewable).

Environmental conservation refers to the efforts to preserve nature and its various elements. The government of Rwanda has established an independent authority REMA to champion the case of environmental conservation in Rwanda.

Natural resources are useful raw materials that people get from the Earth. They occur naturally, which means that humans cannot make natural resources. Instead, they use and modify natural resources in ways that are beneficial to them. Examples of natural resources are air, water, wood, oil, wind energy, plants, animals, soils, stones, mineral deposits, fossil fuels, land and forest. Natural resources form the natural capital of a nation.

Types of natural resources

There are several ways to classify natural resources, including where they come from and if they are renewable or not. If natural resources come from living things or organic materials, then they are considered **biotic resources**. Biotic resources include plants, animals, and fossil fuels. The three **fossil fuels** are coal, oil, and natural gas. Fossil fuels are classified as biotic resources because they were formed from the decay of organic matter over millions of years. On the other hand, **abiotic resources** originate from nonliving and inorganic materials. For example, air, sunlight, and water are abiotic natural resources. Minerals (gold, tin, iron, and diamonds) are also considered abiotic.

Renewable resources: they can be replenished naturally. Some of the resources, like sunlight, air, wind are continuously available. Their quality is not noticeably affected by human consumption.

Non-renewable resources: Non-renewable resources either form slowly or do not naturally form in the environment. Minerals are the most common resources in this category. Fossil fuels are also non-renewable resources because of their slow rate of formation.

10.8.1.2. Reasons for the conservation of natural resources in Rwanda

Conservation is the most efficient and most beneficial utilization of natural resources.

- We are recommended to conserve our natural resources because it is the main source of our daily needs such as air to breathe, food, water, clothes, shelter, etc.
- Conservation of resources is important because we want to make sure we can keep those resources available for as long as possible and have as much use for them as possible.
- Natural resources are essential for the development of Rwanda. For example, to generate energy, one needs fossil fuels, and for industrial development, mineral resources are highly required.

- Some natural resources are getting scarce with the increasing population, so it is crucial to conserve them.
- There is irrational consumption and over-utilization of natural resources. This has led to socio-economic and environmental problems.

10.8.1.3. Ways of conservation of the natural resources in Rwanda.

- Creation of protected areas like parks and natural reserves.
- Treating wastes by controlling sewage pollution, air and land pollution.
- Erosion control through limiting the number of animal grazing on land and applying afforestation and agroforestry.
- Reforestation and planting wind breakers.
- Terracing in hilly areas.
- Application of fertilizers so as to add fertility to the soil.
- Fight against poaching.
- Recourse to grouped settlement schemes.
- Inform the population about dangers of deterioration and destruction of environment.
- Provide to the population a moral ethics for better management of the environment.
- Strict laws against human malpractices such as indiscriminate cutting down of trees.
- Limit proliferation of industries that issue greenhouse effects.

10.8.1.4. Impact of conservation on the environment and the development in Rwanda

Natural resources are not limitless, and the following consequences can arise from the careless and excessive consumption of these resources.

Environmental degradation can lead to a scarcity of resources, such as water and farmable. Extreme weather events, such as severe flooding, increasing the spread of waterborne diseases such as malaria and diarrhea.

- Soil degradation: Soil may become infertile due to being over-exploited and over-treated with harsh chemicals which are often used to increase crop yield. Depleted soils increase the risks of malnutrition for farmers.
- Deforestation: Death and diseases can result from the localized flooding caused by deforestation.

- Extinction of species (loss of biodiversity): the extinction of plant and animal species will potentially affect the development of new drug; it will reduce ecosystem adaptability and lead to the loss of genetic resources.
- Forced migration.
- Atmospheric change: Ozone depletion is responsible for perhaps 300,000 additional cases of skin cancer a year and 1.7 million cases of cataracts.
- Greenhouse gas increase due to rapid industrialization.
- Water pollution and water scarcity and their associated problems.
- Natural hazard/ natural disaster.

10.8.1.5. Problems encountered in conserving the environment in Rwanda.

- The lack of enough human resources, they have inadequate skills and knowledge.
- Most of the areas where conservation programs are to be carried out are located in remote areas, where access is difficult and tedious.
- Rwanda has a high population growth rate and density. This has increased pressure on the available resources.
- Harsh climatic conditions such as prolonged dry seasons that challenge conservation programs.
- Lack of funds and in some cases, inadequate funding to support environmental conservation.
- Natural disasters such as landslides, floods and natural fire outbreaks hinder conservation measures.
- High levels of ignorance in the rural areas where the people do not fully understand the usefulness of environmental conservation.
- Development programs that destroy the environment.
- The rugged terrain poses a challenge to conservation programs since it encourages soil erosion.
- Increased demand for industrial raw materials is a challenge to the environmentalists.



Application activity 10.8.1

With reference to the natural resources and their types, complete the missing resources and product or services

Resources	Products or services
Plants	Wood, paper, cotton clothing, fruits, vegetables, tourism, chair
Air	
	Coins, wire, steel, aluminum cans, jewelry
Oil	Electricity, fuel for cars and airplanes, plastic
	Foods (milk, cheese, steak, bacon) and clothing (wool sweaters, silk shirts, leather belts), tourism
Coal	
Water	Hydroelectric energy, drinking, cleaning
	Solar power, photosynthesis
Natural gas	

10.8.2. TOURISM

10.8.2.1. The forms of tourism, major tourist attractions and factors influencing tourism in Rwanda.



Activity 10.8.2.1

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.
- 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.

ii) 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 part 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 and lake Muhazi.
- **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 10.8.2.1

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

10.8.2.2. Importance and prospects of tourism in Rwanda, Problems affecting the tourism in Rwanda and the solutions



Activity 10.8.2.2

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

i) Importance and prospects of tourism in 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 cultures (cultural dances and music) various historical sites such as King's 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.

iv) Case study:

Nyungwe forest: Nyungwe Forest became a National Park since 2004. It is a vast mountain forest found in the South Western part of Rwanda. It shares border with Burundi in the South. The largest Lake in Rwanda, Kivu and the Democratic Republic of Congo lie on the west side of the park. It occupies an area of about 1020 sq.km and has an elevation of 1600-2950 m above sea level. At this elevation, the forest receives an annual rainfall of 2000 mm.

Clearly establishing Nyungwe forest as a national park was a good decision for Rwanda because the country was decidedly looking to expand its tourism sector and determined to increase tourist numbers at the time.

It is rightly celebrated for the rich variety of its fauna and flora. At least 200 different types of trees are found in this forest, along with hundreds of different flowering plants. Home to more than 275 bird species. It is also a home to monkeys, chimpanzees. Another of its exciting attractions besides all the animals, birds and trees of 50 m high, 200 m long canopy walk. It is also where the far source of River Nile is found.

Birunga National park: This is a spectacular national park dominated by the Virunga Mountains. It is a home to about 30% of the global population of mountain Gorilla. It has 115 mammal species including: the golden monkeys, silver monkeys, elephants, buffaloes, giant forest hog, bushpig, bushbuck, black-fronted duiker, spotted-hyena, yellow –backed duiker and leopard among others.

Akagera National Park: it is named after the Akagera River which runs along its eastern boundary. It is a classic safari game reserve. It is situated in north eastern part of the country. It was created in 1934, and originally covered an area of 2677.41 square kilometers. Today, it covers 1,021.29 square kilometers. Over 90 mammal species in this park range from buffaloes and elephants to the tiny elephants-shrew and bush baby, 530 birds' species and 35 fish species.

Akagera national park has a variety of open savannah mixed together with a network of swamps and lakes fed by the Akagera River on the border with Tanzania. It is one of the few areas in the country, rich in biodiversity. Being a plain land, Akagera Park boasts of big and small game, whose number is fast multiplying thanks to the strict measures put in place by the government through RDB and other stakeholders.



Application activity 10.8.2.2

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 attractions.



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.
4. Poaching is one of the major challenge in tourism and environment conservation.
 - What does poaching mean?
 - Why do people poach?
 - Suggest possible solutions to poaching.

UNIT 11:

CIVILIZATION OF PRE-COLONIAL RWANDA

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



Introductory Activity

Observe the below picture and explain which kinds of activities people you see on it are performing. Which idea does the picture suggest you about the social organization of the pre- colonial Rwanda?



Introduction to civilization

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. To civilize, is said, is to pass from a social status to a more advanced one in terms of moral or intellectual order.

Civilization comprises different components or indicators. The following are the main indicators that every civilization might be made up of:

- **Society:** This implies a set of relations that binds together people or groups of people;
- **Cultural:** This is how people express themselves through the creation of objects, experiences and feelings in painting, sculpture, music, dance, theater and literature;
- **Religious belief:** This is how people belonging to a given society explain what they believed or accepted on the basis of faith;
- **Intellectual:** This is how people form ideas, theories, create mental patterns and designs through experiences and make sense out of them;
- **Economic activities:** This is the way through which people organize themselves to meet their economic needs;
- **Political:** This is how people governed involving matters of authority and obedience, including who makes the laws, decides on foreign relations such as war and peace, collects taxes, dispenses justice and provides services needed by the general public;
- **Territory:** This means geographical space on which civilization must develop.

11.1. Social organization of the Pre-colonial Rwanda

11.1.1. 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.



Members of a nuclear family

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.

The husband was the natural head of the family and he was therefore the first socially responsible person. Moreover, all the members of his family recognized his authority.

In general, a family played several roles. It was the basic unit of cooperation and economic production. It produced all that it needed. In any case, people only went to the market if it was unavoidable. For a polygamous family, every nucleus family consisted of an independent unit of production. It was the husband who sold his labor. The occupations for women depended on the social status of the family (rich families had big-sized livestock while poor ones kept small-sized livestock). According to the Rwandan mentality, an increased number of children brought happiness and strength to the family.

Marriage of a daughter made it possible to extend alliances with other lineage groups. A daughter was considered as a linking factor between families. The lineage and eventually the army were responsible for the socialization of children.

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.

Apart carrying a proper genealogic remembrance, the members of the same lineage have kept a minimum residential unity.

In the traditional Rwanda, two types of lineages were distinguished: the 'minor lineage', *inzu* and 'major lineage', *umuryango*. A minor lineage was created when members of the same family could be named after a common and real ancestor, thanks to his fame yielded from his great achievements. On the other side, the birth of a major lineage was done when within a minor lineage there was the emergence of another strong leader whose descendants could be recognized under his name but who went on also being named after their former eponym ancestor.

The following are examples of names of some lineages:

1. Abarashi of Nyakarashi
2. Abananura of Kananura
3. Abahindiro of Gahindiro

Clan

"The term "clan" means a group of people who claim to be descendants from one common mythical ancestor. It is a legendary group or a fabulous ascendancy to which a group of people are attached. However, it is not always possible to establish all the genealogic ties between the common ancestor and the entire group.

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.

The clan is a group, which is characterized by a biological relationship shared by members who show mutual solidarity. The clan's totem symbolizes unity among its members.

The word "clan" corresponds to the term "ubwoko" in Kinyarwanda language and its institution neither has a chief or a particular internal organization". Besides, the clan implies a social category and not a corporate group and it has no procedures that manage business of common benefits. The clan is different from a small lineage "inzu" and from a big lineage "umuryango". The clan is not even a residential grouping; its members are located all over the country.

In reality, the clan is not a descendant group but clan members have common ties which are instead social identities of individual identification in relationship with others, a way to find friend almost from anywhere and benefit from their hospitality or their support. These entities also play a role in marriage because in principle the exogamy of clans prevails in the choice of the partner.

Clans also have animal totems and when possible animal taboos. The main clans had totems as their recognition sign, in this situation they were from animal species: an animal, a bird, a mammal, batrachians and a reptile. The following are totems that have been identified and their animal totems:

No	Clan	Totem
1	<i>Abanyiginya, Abatsobe, Abasindi</i>	Crested crane (<i>Umusambi</i>)
3	<i>Abazigaba, Abanengwe</i>	Leopard (<i>Ingwe</i>)
4	<i>Abagesera</i>	Wagtail (<i>Inyamanza</i>)
5	<i>Abasinga</i>	Kate (<i>Sakabaka</i>)
6	<i>Abacyaba</i>	Hyena (<i>Impyisi</i>)
7	<i>Ababanda</i>	Crow (<i>Igikona</i>)
8	<i>Abega, Abakono and Abaha</i>	Frog/Toad (<i>Igikeri</i>)
9	<i>Abashambo</i>	Lion (<i>Intare</i>)
10	<i>Abahondogo</i>	Peak (<i>Ishwima</i>)
11	<i>Abongerera</i>	Gazelle (<i>Isha</i>)
12	<i>Abungura</i>	Pigeon (<i>Inuma</i>)
13	<i>Abasita</i>	Abasita have Jackal <i>Nyiramuhari /Umuhari/ Imbwebwe</i>)
14	<i>Abanyakarama</i>	-
15	<i>Abashingwe</i>	-

Certain clans have taboo. Abanyiginya have impwi as their taboo. Impwi is a variety of antelope living in high altitude forests, with short horns and rounded cheeks. Abega have as taboo Ifuti which is a calf which at birth has come out with first its back rather than the head. Abagesera have a monkey as taboo. Abasinga have as a taboo Inka y'Inyombya which is a cow with (small black and brown parts on the skin).

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



People transporting a bride

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 and after organizing ceremonies where big quantities of beer were served. The dowry generally consisted of a cow, but it could also consist of goats and hoes, depending on the region. As for people of lower social standing, dowry consisted of services rendered by the future husband in the home of his future father-in-law. In actual fact, this last category was tantamount to free marriage.

Solidarity

Solidarity is a result of an alliance between individuals and families and the feeling which pushes people towards mutual assistance. This manifest itself through various actions and attitudes:

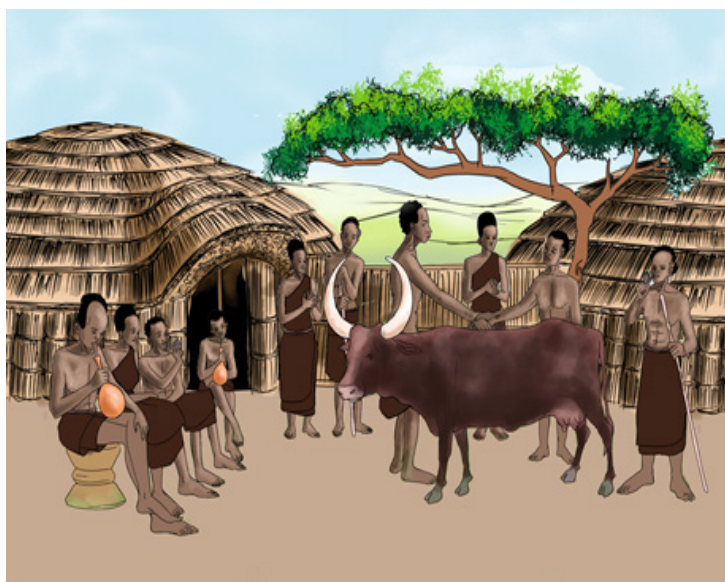
Blood pact (Kunywana / Guca ku nda).

Blood pact was more serious and permanent because it involved a ritual of blood. The individuals who wanted to make this blood pact would suck a little of each other's blood and drink it to signify eternal or unending friendship.

Rescuing (Gutabarana)

Rescuing was physical mutual help. It also meant being very close to the family friend in order to help and support each other. For instance, this could be the case in time of emergency like when a friend or a neighbor had lost a member of his or her family.

Giving a cow (Guhana inka)



A ceremony of receiving and giving a cow

Giving cow to each other also strengthened friendship between families and individuals. This practice was considered as important so that the person who received the cow would at times swear by the name of donors: “*Yampaye inka ...!* (He gave me a cow!)”

11.1.3. Division of labor

In the Rwandan society, it was 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: fishing, hunting, digging the fields, building houses, herding cows or goats and serving in the army;

For women: taking care of children, cleaning the house, preparing the food, weaving, fetching water and to collecting firewood;

For children: collecting firewood, fetching water, herding cows or goats, sweeping or cleaning 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).



Application activity 11.1

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.
3. The clans of the *Abanyiginya*, *Abega*, *Abagesera* and *Abasinga* had animal totems and animal taboos. Examine the significance of these animals vis-à-vis these clans.

11.2. Cultural organization



Learning Activity 11.2

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. Use internet and other relevant documents to perform this activity.

11.2.1. 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. For instance, in naming their children, Rwandans referred to the idea of the role played by *Imana* in their day-to-day activities and life. These names are like: *Ndayisaba* (I implore God), *Ndayisenga* (I pray God), *Niyibizi* (It is God who knows), *Habyarimana* (It is God who procreates), Harerimana (It is God who nurtures), etc.

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) one called “shadow”. 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*”. (From the verb “*Kuzima*” meaning to cease existing). Rwandans distinguish three categories of *Abazimu*:

- *Abazimu b’abakurambere* (Spirits of ancestors)
- *Abazimu bo mu muryango* (Spirits of ancestors from the large family)
- *Abazimu b’ibyinjirizi* (Spirits of intruders)

Guterekera or cult for ancestors

This rite concerns to offer some things as food or drinks to *Umuzimu*. That rite took place in small huts called *Indaro*. The gestures are accompanied by oral requests formulation according to circumstances. The offertories are symbols because are the smallest. The offertories are the things which were liked by *Umuzimu* during his/her life.

Kubandwa

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



People of Ancient Rwanda performing the rite of kubandwa

Source: www.Africamuseum.be

According to the tradition, *Ryangombe* was a hunter whose origin area is Nkole in Uganda. But other areas are supposed to be his origin as well as *Bugoyi*, *Ndorwa* and *Bwanamukari*. *Ryangombe* is the son of *Babinga* and *Nyiraryangombe*. He had three ladies *Nyirakajumba*, *Gacubya* and *Karyango*. He had also two boys named *Binego* and *Ruhanga* and two girls *Bukiranzuzi* and *Nyabirungu*.

The first stage of *kubandwa* is “**Kwatura**” (initiation ceremony). By accomplishment of this stage, a novice is admitted in the community of *Imandwa* and he gets a new name and new parents. He is called from now “**Uruzingo**”

The second step, called “**Gusubizwaho**” or “**Gusubira ku ntebe**” (confirmation ceremony), the novice is invited to sit once again on the seat of *Ryangombe*. By this confirmation, he/she takes the definitive name and became *Imandwa*. This name of *Imandwa* also refers to the specialist and the medium of the cult.

As far as the ‘*Ukubandwa*’ or feast for the initiated members was concerned, this ritual was organized in terms of solemn and public ceremonies. It was accompanied by gestures, speeches and chants in honor of the “king of spirits” who was *Ryangombe*. Its membership was generally restricted to those who were already initiated, and those who had applied to become candidates for initiation. The non-initiated members were called ‘*Inzingo*’. After death, the ‘*Inzingo*’ were taken to *Nyiragongo*, an active volcano, whereas the ‘*Imandwa*’ were compensated after death. They joined *Ryangombe* in paradise in a place where a volcano had gone extinct, i.e. in *Muhabura* and specifically to *Karisimbi*.

A similar cult was practiced in the north of the country and it was rendered to Nyabingi. Legend traces Nyabingi’s origin to Ndorwa or Karagwe. She was a noble woman never married and died very old. After her death, her followers (*Abagirwa* or *Ababyukurutsa*) spread her cult. Legend says that she was the daughter of Nyakajumba and Nyabunyana.

Introduction of Nyabingi’s cult in Rwanda corresponded to the end of reign of Kigeli IV Rwabugiri and it was known in Umutara, Rukiga, Kibari, Murera, Buhoma, Bugamba, Bugoyi and Kanage.

The rites of *uguterekera* and *ukubabandwa* were performed so as to appease the departed spirits. As result, the spirits gave mercy and protection to the all members of the family that has performed these rites.

In most cases, the rite of *uguterekera* and that of *ukubandwa* were preceded by another rite of *ukuraguza*, (divination). For all intents and purposes, the ancient Rwandese always consulted diviners. The diviner knew how to interpret the signs of the visible world and God’s willingness.

11.2.2. Rites and Taboos

The Rites (*Imigenzo/Imihango*) and taboos (*Imiziho*) 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

These were activities that were performed in a particular way or occasion during ceremonies such as the naming a child (*Kwita Umwana* or *Gusohora umwana*), marriage, funerals...

Taboos

These were activities that were not allowed to be done because they could bring curses. E.g. *Kwica inyamanza* (killing a wagtail), *kwicara ku isekuru* (sitting on a motor), etc.



Application activity 11.2

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 note to explicate the following terms: taboo, *uruzingo*, *guterekera*, *kubandwa*

11.3. Political and military organization

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.

11.3.1. Political organization

The Pre-colonial Rwanda had several institutions reinforcing the king and his representatives. These institutions include *Ubwiru* (court secrets), *Ubugake* (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. In effect, the structure of King's political organization was complex. But all in all, the entire system of government rotated around the king and the court.

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 king gave land to cattle keepers who became his direct clients and who were only indebted to

him. The *Ibikingi* were similar to sub-chieftaincy divisions of the colonial era. There were two types of *Ibikingi*: the 'administrative *Igikingi*' and 'pastoral *Igikingi*'. It should be noted that some administrative *Ibikingi* could coincide with pastoral *Ibikingi*.

- Some *Ibikingi* depended on royal authority ruled by the king's representative called "*Igisonga*";
- Others belonged to the chiefs of the traditional militias;
- The last category of *Ibikingi* was known as "*Ingarigari*" belonged to the Queen-Mother.

Administration in Pre-colonial Rwanda was centralized; all powers were in the hands of the *Umwami* (King) and he was assisted in his functions by *Umugabekazi* (Queen-mother), Custodians of the esoteric code (*Abiru*) and chiefs.

The King (*Umwami*)



A picture of King Yuhi V Musinga with his family members. (A picture taken in 1910)

Source: https://en.wikipedia.org/wiki/Yuhi_V_of_Rwanda#/media/File:Musinga.jpg

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 term *Imana* (God) refers to the Creator but also to the essence of life and the fertility of the land and humans. The king and dynastic drums were the center of unity in the kingdom.

The king was the sole proprietor of everything and had the 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.

The 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 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. The most remembered queen-mother in the history of Rwanda is Kanjogera under the reign of King V Musinga.

The 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.

Abiru were responsible for the continuity of tradition and were under the authority of the king. Their function was hereditary. They were also responsible for knowing:

- The order in which queens were chosen and the matri-dynastic clan (*Ibibanda*) of the next queen-mother (*Abega, Abasinga, Abaha Abazigaba, Abagesera and Abakono*);
- Rules of enthronement of the new king (*Inzira y'ubwimike*);
- Rules regarding decoration of royal drums

Ubwiru was an institution with a text of eighteen *Inzira* (but only seventeen are available). In Pre-colonial Rwanda, *Ubwiru* was a very important legal reference and can be compared to a constitution in modern Rwanda. The content of *Ubwiru* is presented as follows:

- *Irage ry'abami* (permanent last wills of the kings);
- *Umurage w'ingoma* (will of succession to the throne);
- *Inzira z'ubwiru* (fixed official text of the ritual);
- *Intekerezo z'ubwiru* (history and comment of the three preceding titles).

We have 18 rituals or inzira z'ubwiru:

1. *Inzira ya Gicurasi* (procedures for mourning or more specifically, the procedures of closing national mourning);
2. *Inzira y'Umuganura* (procedures done after harvesting)
3. *Inzira y'Umuriro* (procedures done during the enthronization of a new king)
4. *Inzira y'Ubwimika* (procedures of enthronization of new king the enthronization of new king was kept secret and hidden to foreigners)
5. *Inzira y'Ishora* (procedures related to cattle);
6. *Inzira y'Urwihisho* (ceremonies done when in Burundians were enthroning their king, the king of Rwanda was asked to hide himself)
7. *Inzira ya Rukungugu* (procedures done in the period of hunger or famine);
8. *Inzira ya Kivu* (procedures done during the period of heavy rains or floods);
9. *Inzira y'Umuhigo* (procedures done when the king wanted to do hunting);
10. *Inzira y'Inzuki* (procedures done when there were problems of honey production);
11. *Inzira ya Muhekenyi* (procedures done when there were animal diseases);
12. *Inzira yo Kwasira* (procedures done during the decoration of the royal drum)
13. *Inzira yo Kwambika ingoma* (procedures done when decorating royal drum with male's genital organs of army chief killed on the battlefield);
14. *Inzira y'Inteko* (procedures done before Rwanda had to attack an enemy country)
15. *Inzira y'Inkiko yabyaye Umugaru* (procedures done when the country has been attacked by the outsiders)
16. *Inzira y'Ikirogo* (ceremonies done on the burial of the dead king)
17. *Inzira y'Urugomo* (procedures done by the new king in order to avoid conflict between his brother when their father had died before to resolve those conflicts)
18. *Inzira y'Amapfizi* (procedures done concerning the bulls of the king)

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 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 services;
- Distributing land and withdrawing it from others if it was felt necessary.

The great chiefs (*Abatware b'intebe*) were largely responsible for the recruitment and mobilization of the mass as far as the protection and maintenance of security of the country were concerned.

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 chief of army (*Umutware w'ingabo*)

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

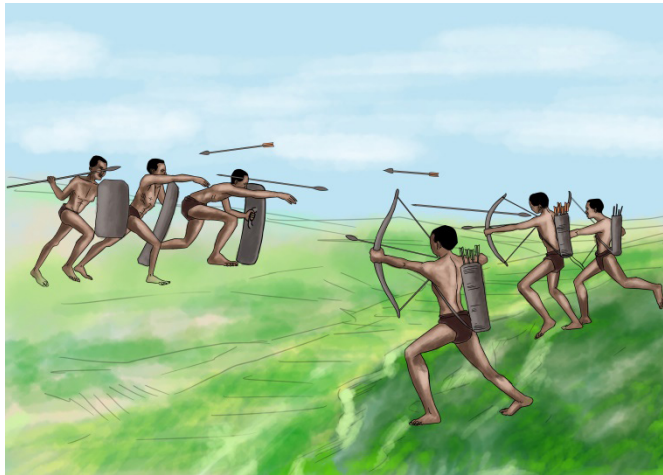
11.3.2 Military organization

In traditional Rwanda, the military institution was very strong and powerful. The army in Ancient Rwanda had the following roles:

- Expanding country;
- Participating in the different wars;
- Fighting against cattle rustlers and various raids;
- Ensuring territorial security

The army was a vehicle for strengthening certain cultural and social values. At every beginning of a new reign, the king had to start training his own army of young Rwandans. 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, discipline, the quality of being a man, “*kuba umugabo*”.

They received also special military training consisting of physical exercises, shooting with bows and arrows, throwing javelin, composing and memorizing of heroic poems, dancing,...



Ancient Rwandan fighters armed with traditional weapons

The royal army was organized in militias (*Imitwe y’ingabo*) under the command of the army chief at royal court’s level as well as at *Ibikingi*’s level. The Royal army lived in military camps called “*Ingerero*”. The organization and formation of the militias corresponded to the formation of the “Cattle army” (*Imitwe y’Inka*). This cattle army was reserved to feed the related militias.

Examples:

Militia (Umutwe w'ingabo)	Cattle-army(Umutwe w'inka)	Reign
Abakaraza	Imirishyo	Ruganzu I Bwimba
Abashakamba	Umuhozi	Mibambwe Gisanura
Nyaruguru	Inkondera	Cyirima Rujugira
Imbanzamihigo	Abazatsinda	Cyirima Rujugira
Abacyemba	Imisugi	Cyirima Rujugira
Imvejuru	Inkabuzima	Kigeli Ndabarasa
Inzirabwoba	Indirikirwa	Mutara Rwogera
Uruyange	Ingeyo	Yuhi Gahindiro
Abashozamihigo	Ingaju Rwamaraba	z'I Kigeli Rwabugiri



Application activity 11.3

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 500 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.

11. 4. Economical organization



Learning Activity 11.4

Use internet or textbooks and answer the following question: The economic domain, in the Pre-colonial Rwanda comprised 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.

11.4.1 Agriculture

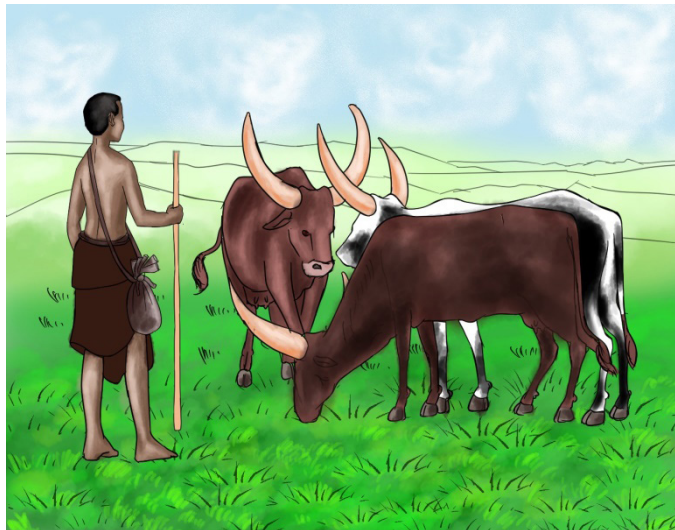
Agriculture was the principle activity characterized by archaic production method (tools, crop rotation system, conservation methods...) which gave poor yields. Agriculture was subsistence in nature; this means individual or the family consumption. Cultivation was carried out according to the climate seasons such as *Umuhindo* (short rainy season), *Urugaryi* (short dry season), *Itumba* (long rainy season) and *Icyi* or *Impeshyi* (long dry season).

The main crops cultivated were beans, sorghum, peas, maize, yams, bananas, tobacco, sweet potatoes, local green leaves (*Isogi*)... The Rwandans used to cultivate one part of land at a time leaving the other in order not to exhaust the fertility (fallowing).

11.4.2. 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.

Cattle rearing occupied a very important place in Rwandan life because the cows were the measure of wealth and expressed the social prestige. Products from cows were milk, meat, butter, hides and skins used for clothing.



A herd's man

A cow was also used to cement social relations between the different families when they exchanged it as a sign of love and friendship. Cows were also given as dowry or marriage settlement.

11.4.3 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.

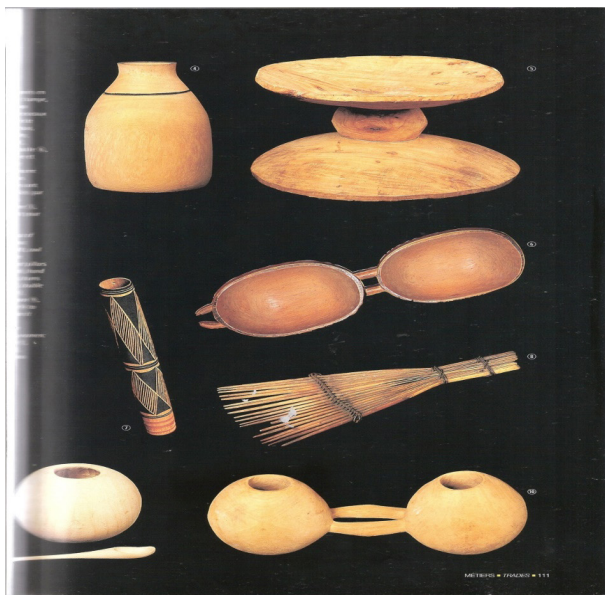
The clothes made were the following:

- *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 producing hoes such as:

- Buberuka: *Amaberuka*
- Buramba: *Amaramba*
- Rusengesi: *Amasengesi*

Wooden tools included bowl (*Imbehe*), mortal (*Isekuru*), banana wine press (*Umuwure*), milk pot (*Ibyansi*, *Ibicuba*), etc.



Some wooden tools used in traditional Rwanda

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, Page 57

Ceramic products made from clay mixed with Insibo included the pots known as intango, uduherezo, inzabya, ibibindi and inkono.

Weaving was done by women and it was admired for its finesse. Material used in basket making included *urumamfu* (wild millet grass), *intamyi* (papyrus stems), *Uruhivu* (raphia fibers), *ibirere* (dead banana leaves). The women produced bee hives, baskets, mats... These products were used in daily life for decoration, carrying things, conservation of harvested crops.

11.4.4 Trade

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

Many markets or commercial centers throughout the country especially the north western 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 following:

- The salt from Lake Eduard;
- The bracelet from Masisi and Buhavu;
- The perfume from Ijwi Island.



Application activity 11.4

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 those ones they could import from outside.
2. Explain the role played by the cow in the Pre-colonial Rwanda.
3. 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.

11.5. Socio-political and economic dependences



Learning Activity 11.5

Carry out a research using internet or textbooks and answer the following question. In the Pre-colonial Rwanda, pastoral clientelism (*ubuhake*), dependences based on land (*ubukonde*) and *uburetwa* were the main dependences in which most of Rwandans were involved in. How these dependences were implemented?

11.5.1. Pastoral clientelism (*Ubuhahe*)

It was a social, political and economic dependence of Pre-colonial Rwanda that was mainly based on the cow. It was a 'customary contract' which was not obligatory between the owner of cattle, a rich man known as *Shebuja* (Patron) and a person who wished to acquire cow called *Umugaragu* (Client or Servant). The latter who was often poor, socially weak and isolated asked the wealthier for social protection. Once the demand was accepted, the seeker accepted to perform duties for patron.

The duties varied but included cultivating the fields of the patron, looking after cattle, repairing homesteads, guarding homes at night, provision of water, be at the disposal of his patron by staying around him, be the messenger, escort his patron at war, give cows in the event of epizootics, in the event of bereavement (*Indorano*) and take a part in patron's happy or sad events, etc.

In return, the patron protected the client against those who were socially stronger than him and others likely to be enemies, compensated someone who is wronged by his client (*Kugura*), gave bull-calves and milk, assisted the client in court (*Kurengera*), revenged the client (*Guhorera*), gave a hoe when the client is a cultivator who cannot get one easily and would take part in client's happy or sad events.

A client who refused to fulfill his duties was deprived of all the cows he would have been given by the patron (*Kunyagwa*).

It should be noted that a patron could have several clients who all depended on his wealth and the need for protection. In such case, the patron distributed different specific duties to different clients according to their capacity and competence.

Ubuhahe was officially abolished on April 1st, 1954 by King Mutara III Rudahigwa. This abolition had the following objectives: to establish cattle as personal property, to ensure individual freedom, to establish trade freedom and to allow the emerging of individual initiatives.

11.5.2. Dependence based on land (*Ubukonde*)

It was a right which gave authority to the clan and lineage heads on their respective zones as collective land (*Isambu* or *Ubutaka*). This collective land was managed by the clan head that was responsible for allocating land inside his zone of influence to his subjects (*Abagererwa*). Before one starting to work on the land, he had first to seek the blessing and investiture of the clan chief.

The ceremony of investiture consists of giving a small knife called *Inkonzo* to *Umugererwa* which symbolized suzerainty of the clan and the right to clear the forest and cultivate the land at the same time. The investiture also conferred to the receiver (*Umugererwa*) and his descendants an inalienable right of ownership on the fields to be cultivated.

Unlike *ubuhake*, *abagererwa*, did not pay homage to the clan heads (*Abakonde*). They only paid homage to the head of the family after harvesting by offering some product of the harvest to him including some sorghum, millet, beans and peas.

Ubukonde existed especially in Murera, Rwankeri, Buhoma, Bushiru, Bugoyi and Kanage. It was also known in former prefectures of Kibuye, Cyangugu and Byumba.

11.5.3. *Uburetwa*

Uburetwa consisted of the duty for each man to work two days per week (the traditional week had only five days) for a politico-administrative leader without any compensation. The *uburetwa* was directly related to land and to land services. Before 1900, it was based on lineages (*Umuryango* or *inzu*) and family representatives could carry out the required duties in the name of the whole group.

In 1927, the Belgian administration reduced *uburetwa* for each male adult to one day per week (this time a week of 7 days). The chief had the right to benefit from 52 days unpaid working days per year. For the Belgians, that represented a progress, because before the *uburetwa* was to be performed during 2 days of traditional week.

However, due to the “rationalization” of *uburetwa* introduced by the Belgian colonial administration, *uburetwa* became a burden to be assumed by every adult male and any individual deemed fit for service. Meanwhile, *uburetwa* started to involve more people than before.

In 1933, another royal declaration reduced the number of days of *uburetwa* that is to say, 13 days per annum for the chief and 10 days per annum for the deputy chief. Even the *bagaragu*, within the framework of *ubuhake*, were constrained to provide annual services.



Application activity 11.5

1. The institutions of *ubuhake* and *ubukonde* were based on mainly on animal rearing and agriculture. Justify this assertion.
2. Establish the relationship between *ubugererwa* and *ubukonde*.
3. Explain the modifications operated by the Belgian colonial administration to the institution of *Uburetwa*.



Skills lab

In groups and by using a role play, analyze the civilization of the Pre-colonial Rwanda. Then after, compare it to the current civilization by focusing on the positive aspects that deserve to be maintained and the negative ones to be abandoned.



End unit assessment

1. Explain the different components of the civilization.
2. Identify the Rwandan clans and their animal totems.
3. Find out the role played by the nuclear family in the Pre-colonial Rwanda.
4. Differentiate a lineage from a clan.
5. 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.
6. Explain the role of *Itorero* in the military organization of Rwanda.
7. Describe the duties of the patron (*shebuja*) towards his servant (*umugaragu*) and vice-versa.
8. How the institution of *uburetwa* was implemented in the pre-colonial and colonial period.

UNIT 12: COLONIAL RWANDA

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 European powerful countries. 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 of Rwanda and discuss the major reforms that the Germans and Belgians have introduced in Rwanda.

12.1. German occupation of Rwanda



Learning Activity 12.1

By using various books and internet, describe and discuss:

1. The causes of colonization of Africa and Rwanda by European countries.
2. The role played by the explorers in the process of colonization of Rwanda.

The voyages of the first explorers in Rwanda aimed at seeking to discover “the source of the Nile”. The first group of explorers who got interested in Rwanda, though unsuccessfully, was composed of Burton, Speke and Grant, who were all British army officers in India. They reached Lake Victoria and Tanganyika towards November 1861. John Hannington Speke who was stationed in Karagwe managed to see volcanoes of Rwanda but he did not try to visit it.

The first European who came to explore Rwanda is Sir Henry Morton Stanley who reached Akagera River and baptized it "Alexandra Nile" in 1875. He camped on an island located in Lake Ihema. But when he tried to penetrate Rwanda, he was stopped by a flight of arrows and spears shot by Rwandans.

The second explorer is a German Doctor Oscar Bauman. Coming from Burundi, he penetrated Rwanda and reached Southern region on September 11th, 1892 and left on the 15th September 1892. He was looking for the source of the Nile and when he attempted to penetrate the Central Rwanda, he was attacked by the Banyarwanda at Nyaruteja in present day District of Gisagara (Bwanamukari).

The successful explorer of Rwanda is Comte Gustav Adolf Von Götzen, a German administrator. He entered Rwanda leading a caravan of 362 people surrounded by 127 soldiers. He was with Lieutenant Prittwitz and Doctor Kersing.



A picture of Adolf Gustav Von Goetzen

Source: https://commons.wikimedia.org/wiki/File:Gustav_Adolf_von_G%C3%B6tzen.jpg

Arriving from Mwanza, Von Götzen entered Rwanda after crossing Akagera River above Rusumo falls. He met Prince Sharangabo, the son of king Rwabugiri, near Rwamagana. The latter received him on May 25th, 1894 at Kageyo in Kingogo (Ngororero District). Von Götzen stayed there up to the 2nd June 1894 before leaving in the direction of the volcanoes.

During the International Conference held in Berlin from November 1884 up to February 1885, Rwanda, Burundi and Tanganyika fell into the sphere of influence belonging to Germany. Then after, these three territories formed a German African territory which was named German East Africa with Dar-es Salaam as a capital (*Deutsch Ost Afrika*).

The Germans colonized Rwanda until 1916 because of their defeat at the end of the First World War by the Belgians and British. Henceforth, Belgium became the colonial master of Rwanda up to July 1st, 1962, the date of the recovery of independence of Rwanda. Both Germans and Belgians undertook different reforms which led to political, economic and social transformations of Rwanda.

Gustav Von Götzen who arrived in Rwanda in 1894 was not only an explorer but he was also the first Governor General of the *Deutsch Ost Afrika*. After him, another German mission led by Captain Ramsay arrived at Runda on March 20th, 1897 under the reign of King Yuhi V Musinga. Captain Ramsay was the regional military chief of Tanganyika – Kivu whose capital was at Ujiji in present-day Tanzania. On this occasion, Captain Ramsay managed to give to King Musinga a German flag as a symbol of German authority.



A German colonial flag

Source: <https://commons.m.wikimedia.org/wiki/File:Reichskolonialflagge.svg>

From 1898, the occupation of Rwanda by German was a reality. Rwanda became a German protectorate with Musinga and Bethe Pact concluded on March 5th, 1898 and the 20th German province in East Africa.

Causes of colonization of Rwanda by Germans and Belgians

The European countries came to colonize Rwanda because of the following reasons:

Need of cheap labor: Especially Belgians needed a work force to cultivate their plantations in Kongo;

Need of areas to invest their surplus capitals: 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 were 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 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



Application activity 12.1

1. Describe the process through which Rwanda become the protectorate of the German
2. Evaluate the reasons why European countries came to colonize Africa and Rwanda in particular.

12.2. German administration and its impact



Learning Activity 12.2

1. Using various books written on History and the internet, analyze the effects and achievements of German colonization in Rwanda.
2. The German colonizers came in Rwanda while the King Musinga administration was facing security problems. Evaluate the role of German colonizers in the process of the pacification of Rwanda.

The German protectorate was committed to ensure indirect rule for Rwanda, meaning 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:

A. 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.

B. Civil administration phase: 1907-1916

This step started when Rwanda became a residence, and administrative services were transferred from Usumbura to Kigali and with 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 in Nyarugenge district now.

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).

After the events of Rucunshu and the death of Kabare in 1911, Ndungutse, whose real name was Birasisenge, had wanted to proclaim himself the

legitimate king by claiming to be a descendant of Mibambwe IV Rutarindwa and Muserekande, nicknamed “Nyiragahumuza”.

The organization of the Ndungutse rebellion in the north of Rwanda was due to many reasons including the following:

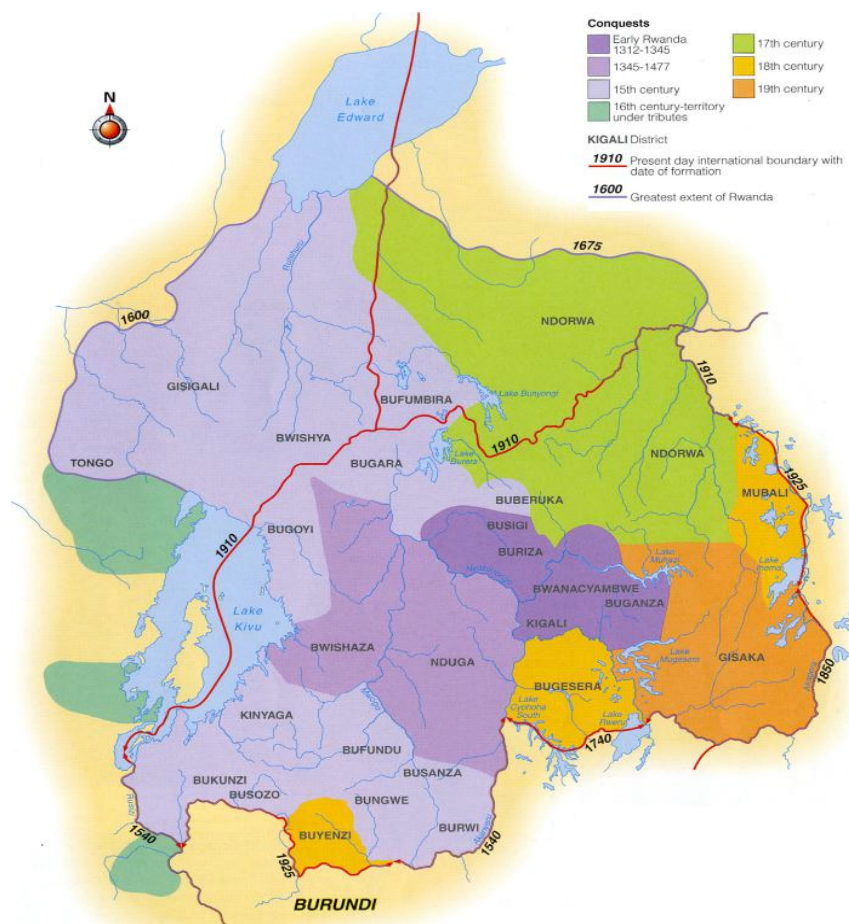
- The people of this region wished to recover their autonomy which had been highly compromised by the Royal court of Rwanda;
- They were also subjected to the forced labor introduced by the Germans during the fixing of frontiers in 1910;
- At the time, the populations were also being obliged to provide food for the Germans thus forced them to resist against both the Germans and central authority of Rwanda.

Ndungutse was joined by Rukara son of Bishingwe. He was one of the *Abarashi* warrior commanders during the reign of King Kigeli IV Rwabugili who resisted colonization at the time; he lived at Gahunga (Musanze District). He was known by killing Father Loupias, nicknamed Rugigana who was a white priest in Rwaza Catholic parish. Father Loupias was killed because his interference in the conflict between Rukara and Sebuyange of Kabaya over the limit of their territories. It was during a punitive expedition against Rukara that he joined the Ndungutse rebellion.

On top of this rebellion, there was also Basebya. The latter was a son of Nyirantwari of Rugezi and the member of the *Abashakamba* militias of Kigeli IV Rwabugili. With his band of warriors known under the name of *Ibijabura*, Basebya conquered Buberuka, Kibali and the whole of Bukonya.

With this trilogy, Musinga's power would be seriously challenged. Following the expedition of Ndungutse in Bumbogo and Buberuka, the acting Resident Representative, Lieutenant Godivius, nicknamed Bwana Lazima, decided to fight against the opposition. He went into it on April 13th, 1912 and Ndungutse and Rukara were killed a few days later; Rukara was hanged and Basebya arrested by chief Rwubusisi, son of Kigenza, a cousin of King Musinga suffered the same fate on May 5th, 1912.

Another major event which happened during this phase of civil administrators is the delimitation of Rwanda's borders. The borders in north were cut basing on the Britain interests and Rwanda lost its big territory today located in Uganda. The first agreement between German and British happened on July 1st 1890, and the second on May 19th 1909. The borders in west were cut later. 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.



Map of Rwanda showing the delimitation of Rwanda.

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, Page 36.

By this delimitation, Rwanda had lost a part equal to one half of its actual size. Ijwi Island, Bwishya and Gishari were annexed to Belgian Congo while Bufumbira went to Uganda. During the fixation of those frontiers using the maps, neither local realities nor the structure of the local population were taken into account.



Application activity 12.2

1. While cutting borders during the process of the colonization, Rwanda lost a big part of his land. Justify assertion.
2. After coming in Rwanda for the colonization purpose, the Germans 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.

12. 3. The coming of missionaries in Rwanda



Learning Activity 12.3

Using books and the internet, analyze the role of missionaries in the socio-economic transformation of Rwanda.

At all African continent, after the coming of colonizers, the missionaries followed.

After the coming of German administrators to Rwanda, they were followed by leaders of churches mainly Catholics and Lutheran Protestants. During the Belgian rule, more religious groups came in: Adventists in 1919, Anglicans in 1918, Pentecost in 1941 and Methodists in 1943.

Roman Catholic Missionaries

Roman Catholicism was brought in Rwanda by the “White Fathers” headed by the Apostolic Vicar of Southern Nyanza (Tanzania) Bishop Joseph Hirth. They were part of the “*Sociétés des Missionnaires d’Afrique*” founded in 1868 by Archbishop of Algiers, Cardinal Charles Lavigerie.

Bishop J. Hirth came to Rwanda from Shangi where Captain Bethe was staying and arrived at the royal court in Nyanza on February 2nd, 1900 accompanied by Fathers Brard and Paul Bartholomew and Brother Anselme.

They were received by a certain Mpamarugamba as the king. But this was appointed by divination and Musinga was yet teenager. Later on, in July the Europeans would have seen King Musinga for the first time.



A picture of King Yuhi V Musinga with the White Fathers

Source: <https://face2faceafrica.com/article/refusing-to-be-baptized-as-catholic-this-rwandan-king-was-deposed-by-belgians-in-1931>

At the royal court, the Missionaries requested the land to settle and their request was accepted. The land given was at Save in Bwanamukari where they founded their first mission on 17 February 8th, 1900. In the following years, they established other following missions:

Mission	Date of foundation	Founders
Zaza	1/11/1900	Fathers Bartholomew, Zumbiehl and Pouget
Nyundo	25/04/1901	Fathers Bartholomew, Weckerle and Leon Classe
Rwaza	20/11/1903	Fathers Leon Classe, Dufays and Brother Hermenegilde
Mibilizi	23/11/1903	Fathers Zumbiehl, Verfurth and Cunrath
Kabgayi	9/05/1906	Fathers Lecoindre, Desbrosses and Brother Fulgence
Rulindo	26/04/1909	Fathers Boission, Dufays and Durand
Murunda	17/05/1909	Fathers Dufays, Ecomard and Soubielle
Kansi	13/12/1910	Fathers Lecoindre, Dufays and Brother Rodriguez
Kigali	21/11/1913	Fathers Donders, Zumbiehl and Brother Alfred

The first Rwanda priests were ordained on the 7th October 1917 and were Donat Reberaho and Balthazar Gafuku; while the first Rwandan bishop is Aloys Bigirumwami, sacred on the 1st June 1952 at Kabgayi by Bishop Laurent Deprimoz.

Introduction of Protestant Missions in Rwanda

The Protestant Church was introduced in Rwanda by the Missionaries of the Bethel Society. The first Pastor was Emmanuel Johanssen. He arrived in Rwanda from Bukoba, in Tanzania.

German Protestant missionaries were received at the royal court in Nyanza on the 29th July, 1907. They founded their first mission at Zinga, near Rwamagana in 1907, Kilinda in 1907, Rubengera in 1909, and Remera – Rukoma in 1912.

When the Germans were defeated by the Belgians during the 1st World War in 1916, these Protestants left Rwanda. Their missionary stations were occupied by “*Société Missionnaire Belge*”.

The first Seventh Adventist Church was established at Gitwe by Pastor Meunier in 1919. Thereafter, other missions were established at Murambi in Buganza and Rwankeri in Buhoma.

Achievements of the Christian missionaries in Rwanda

The role played by missionaries in Rwanda is multidimensional. From their arrival, the White Fathers started training Rwandans. They taught them how to cook, horticulture, building, woodwork, forging, shoemaking, binding etc.

They also taught them how to read and write, arithmetic and drawing. They taught them rudimentary foreign languages like Swahili and German. In general, Christian missionaries created schools, both primary and secondary schools.

Missionaries also wrote dictionaries and grammar books in Kinyarwanda. They also carried out some studies on Rwandan culture.

In Agriculture, missionaries introduced Western and tropical crops: Irish potatoes, cassava, groundnuts, oranges, pineapples, coffee etc.

They also introduced new domestic animals like pigs and turkeys in Rwanda to improve on the animal production. They introduced products like cheese, jam and plants such Cyprus, filao, grevilia and eucalyptus which are widely used in woodwork and building.

They trained local clergy: The first two Rwandan priests (Donat Rebero and Balthazar Gafuku) were ordained in 1917. The minor seminary of Kansi was transferred to Kabgayi in 1913.



Application activity 12.3

4. Explain the criteria for choosing the location of christian missionaries in Rwanda
5. Analyze the roles of the catholic missionaries in Rwanda.

12.4. First World War in Rwanda



Learning Activity 12.4

Using different books or internet, analyze the causes of failure of German troops during First World War in Rwanda. What has been the impact of this failure on Rwanda?

The First World War (1914 – 1918) was a war mainly among the European countries which eventually spread to Africa and Asia among the countries that had been colonized by Europeans.

In Rwanda, the Germans fought with the Belgians who had colonized Congo (Democratic Republic of Congo). The front-lines in Rwanda were at Bugoyi in the North-Western region, and Cyangugu in the South- Western region.

It was the Germans who have started the fighting by attacking Belgian Congo in September 1914, after minor incidents the Germans invaded Ijwi Island. The Belgians responded and fought back. After a short time, Lake Kivu had been won back and Shangi post had been overrun and removed.

In Rwanda, the Belgians with British troops had been deployed in two directions: one of Gisenyi opened the fighting on April 18, 1916. Another was of Cyangugu, under Colonel Olsen, who, after conquered the island of Nkombo and occupied Cyangugu, went on to Kigali.

By the Gisenyi front, Colonel Molitor (Belgian) after crossing the Volcanoes through Uganda, he passed to Gatsibo going to Kigali which was occupied on the 6th May 1916; while Nyanza fell on 19th May, 1916. After that, the Belgians continued with the war on the Rwandan territory towards Burundi.



Belgian troops in Kigali Military camp after conquering Kigali. It was on May 6th 1916

Source: https://upload.wikimedia.org/wikipedia/commons/b/ba/Bundesarchiv_Bild_105-DOA3056%2C_Deutsch-Ostafrika%2C_Askarikompanie.jpg

During the 1st World War, Musinga, king of Rwanda did all to support Germany by availing soldiers for German East Africa. This support included providing armed warriors called *Indugaruga* and *Izuruguru* among others and supply in food. Therefore, there was agreement and collaboration between King Musinga on the one side and Dr Kandt and Captain Max Wintgens, *Bwana Tembasi*, commanding the German troops in Rwanda from 1914 to 1916 on other side.

Like in other countries, the most effects of the World War I in Rwanda were the starvation and famine known as *Rumanura* or *Rumanurimbaba* due to the destruction of the food crops like bananas and suspension of sorghum cultivation as ordered by the Germans in order to deny cover to the enemy. The victory of the Belgians over the Germans had ended the German Protectorate over Rwanda and marked the beginning of the Belgian rule.



Application activity 12.4

1. Discuss the reason why the Belgian troops defeated German ones.
2. The WWI was an international conflict. Do you think that Rwanda was involved in this conflict? Explain your answer and assess the consequences of this war on Rwanda.
3. According to you, why the end of this war was followed by the famines? How German colonizers managed to solve this problem?

12.5. 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).

12.5. 1. Belgian military occupation and its reforms (1916 – 1926)



Learning Activity 12.5.1

By using the textbooks and internet, analyze the social, political and economic transformations operated by the Belgians in Rwanda during Belgian military occupation.

The Belgians did not wait for the peace conclusions to act on the sovereignty of the conquered territories. Right after the conquering Rwanda in May 1916, the Belgian troops were replaced by occupation troops. The Belgian military High Command of German Eastern Africa was handed over to the Royal High Commissioner General J.P Malfeyt, with his residence at Kigoma in Tanganyika.

The Royal High Commissioner had the role of maintaining order and public safety over all territories and managed them while waiting for the end of the war and the future peace treaty. On April 6th, 1917, Major De Clerck was appointed resident of Rwanda and he arrived at Kigali on May 3th, 1917. The residence of Rwanda was divided into three military territories in 1917 and later in 1921 in to 4 military territories: The Western territory with Rubengera as territory capital, the Northern territory with Ruhengeri as territory capital,

the territory of Nyanza with Nyanza as capital and the Eastern territory with Kigali as territory capital. The purpose of this territorial division was to facilitate the implementation of military orders relating in particular to food requisition and the recruitment of carriers.

In May 1919, Major de Clerck was replaced by F. Van Den Eende who was the first Belgian civilian resident. But at the end of 1920, he was replaced by George Morteau as resident. The civil administration was maintained within military occupation system which ended practically in 1926.

Measures to weaken the king authority and the jurisdiction of the chiefs

From 1917, Rwanda was governed from Kigoma by a Royal High Commissioner. However, the Belgians had maintained the indirect rule based on the German model. Local authorities were retained as agents of colonial occupation. The king and territorial chiefs were allowed to exercise their functions under the guidance of the new colonial authority.

In 1923, a law was put in place through which king Musinga was notified of his prohibition to appoint or dismiss chiefs and notables without the permission of the resident, representative of the Belgian Government. The heads of provinces also could neither appoint nor dismiss their subordinates without prior agreement of the resident.

As a matter of fact, doing so made the Belgian administration gradually become the final source of authority. The chiefs and deputy chiefs were no longer subordinates of Musinga, the king of Rwanda but those of the substitute Belgian administration.

Suppression of the right to death

One of the first measures undertaken by the Royal High Commissioner in agreement with the Belgian government, it was that King Musinga was stripped of the right to condemn his subjects to death and life. However, he kept to hear appeal cases.

The chiefs who traditionally had the power to hear and resolve differences in their areas of jurisdiction and had the right to emit punishments saw their powers reduced. The Belgian resident (Belgian administration) was given the right to hear appeals from such cases.

Freedom of worship of 1917

In July 1917, there was a good understanding between Major De Clerck and the Catholic religious authorities, in particular bishop Hirth and his general vicar Reverend Leon Classe. Under the instigation of these two missionaries, king Musinga was forced to sign a decree proclaiming freedom of worship.

Therefore, the royal power became secular since the king was forced to destroy his politico-religious power. Rwandans had considered the King as their unique religious leader who communicated with Imana through some sort of magical power and he was for them, a source of life and prosperity for the whole kingdom.

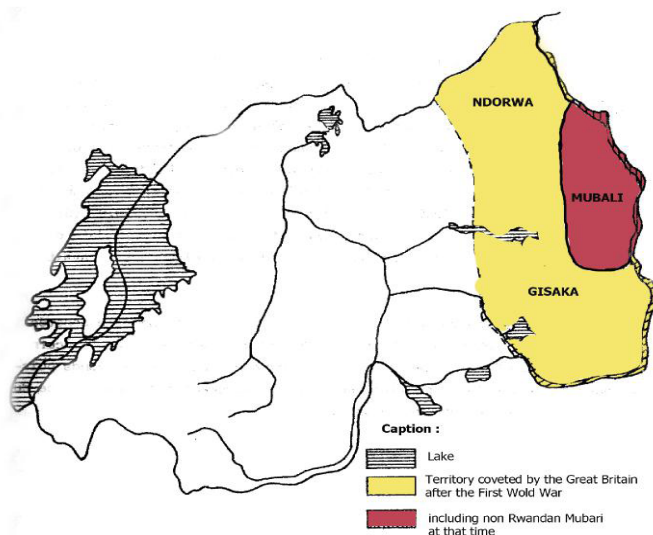
Measures to suppress some gifts

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

- **Imponoke:** This consisted of cows given as gifts to the chiefs who had lost their cattle in huge numbers.
- **Indabukirano:** These were cows given to new chiefs upon assuming duties as new leader in area. This gift was masked as a form of congratulatory gift but it often amounted to an encouragement to have some favors from the chief.

Gisaka affair or the Orts – Milner convention of 1919

Just before the signing of the Versailles Peace Treaty of 1919, Belgium accelerated to put forward some negotiations with Britain concerning the redistribution of former German colonies in East Africa. It was in that context that Belgium succeeded in signing an agreement with Britain that came to be known as “Orts – Milner Convention”, Orts for Belgium and Milner for Britain; signed on May 30, 1919.



Gisaka affair and the " Orts – Milner convention

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, Page 83* “

According to that agreement, Belgium accepted to cede to Britain the territories of Gisaka, a part of Ndorwa, a part of Buganza and a part of Mutara from Rwanda and Bugufi from Burundi. This was equal to 1/8 of the country.

In compensation, Great Britain had accepted to support the Belgian demand for ratification of the tracing of frontiers of its colony on the mouth of Congo River. Actually, it was through the Treaty of Simulambuco in 1885 between the kings of Portugal and Cabinda's princes, that a Portuguese protectorate was decreed, reserving rights to the local princes and independent of Angola. Cabinda once had the Congo River as the only natural boundary with Angola, but in 1885, the Conference of Berlin extended the Congo Free State's territory along the Congo River to the river's mouth at the sea.

By receiving Gisaka and other territories, Britain would now be able to realize its project of building a railway line from Cape to Cairo which according to their wish, would pass entirely in an area controlled by the British and join together the whole of its colonial empire.

With the abandoning of the British ambitious project of building this railway, Gisaka lost its economic and political value. The two countries abolished the Orts – Milner Convention and informed the League of Nations. The League took note of this and on August 31st, 1923, it approved the repossession of territory by Rwanda. Britain evacuated it on the 31st, December 1923.



Application activity 12.5.1

1. Why Belgians weakened the power of Musinga during military mandate?
2. Why not Rwanda did lose its territories during Gisaka affairs?

12.5.2. Rwanda under Belgian mandate



Learning Activity 12.5.2

Using books and internet, analyze 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.

Definition of the mandate

Mandate, in ancient Roman law is a contract in which one person agreed to perform a gratuitous service for another in return for indemnification against loss. After 1st World War, 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.

The mandates were divided into three classes (A, B and C), according to the presumed development of their populations for self-government by League of Nations.

Rwanda was put under the mandate B with Belgium as a mandatory power. This mandate had been approved on the 20th October 1924 by the Belgian parliament. Rwanda which was from 1916 – 1924 called “a territory under occupation” was officially known as a “territorial under mandate B”.

Administrative reform: 1926-1931

The administrative reform initiated by Belgian Authorities started in 1926 and brought the following changes:

1. Rwanda 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 (*umutware w’ubutaka*), chief of the cattle (*umutware w’umukenke*) and chief of the army (*umutware 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 structures was discriminatory because it excluded the Hutu, Twa and Tutsi of modest background in favor 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.

Deposition of King Yuhi V Musinga in 1931

During the German protectorate rule, king Musinga had collaborated with the German administrators who had supported him to defeat the Northern rebellions. But he was opposed to the missionaries' activities, especially to the Catholic Church. He considered Christianity as one way of undermining the kingship.



[King Yuhi V Musinga](#)(1895 -1931)

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

The situation became worsened with the coming of the Belgians with their collaboration with the Catholic Church authorities. King Musinga refused to be baptized. Then, according to the report of the Vice Governor General Voisin in 1931, king Musinga “had been accused of being opposed to moral, social and economic activities of the colonial administration. He was at the same time accused of being “hostile to the work of the missionaries.”

These attitudes brought conflicts between the King and the colonial administration, the Catholic missionaries as well as Rwandan collaborators of the Belgians.

On November 12th, 1931, Governor General Charles Voisin announced the deposition of King Yuhi V Musinga at Nyanza and he was obliged to leave Nyanza, the royal court, to Kamembe in Kinyaga. On that date, Rudahigwa,

his son and chief of Nduga-Marangara, was proclaimed King by Vice-Governor General Voisin, on the 16th November, 1931. On the same date, Rudahigwa was enthroned under the royal name of Mutara III.



A picture of King Mutara III Rudahigwa (March 1911 – 25 July 1959)

Source: <https://alchetron.com/Mutara-III-Rudahigwa>

Although he 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 whereas the first place was in the hands of his Majesty King of Belgium, followed by the Minister of colonies. Under the Minister of colonies, there was the Governor General of Congo, followed by Vice- governor general of Rwanda-Urundi and then Resident. The King was under the Resident authority. He had a contract and a salary.

- In 1940, Musinga was moved from Kamembe to Moba, near Bukavu in Democratic Republic of Congo (D.R.C.). He spent the last bitter years of his life at Moba, where he died on October 25, 1944.

Transformation 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 labor policy

During the Belgian colonial rule, the Belgians used cruel forced labor in Rwanda, called “Akazi”. Forced labor was mainly in plantations of the forests, carrying things, road construction, building of churches, schools and hospitals and the digging of anti-erosive ditches.

By this forced labor, every able-bodied adult man, no matter how many they were in a single family, was expected to work a specified number of days per week for the colonial government. 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 traveling 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 labor had two negative effects:

Firstly, the economy of the country suffered and famines were never ending because natives no longer had time to work on their farms. Instead of alleviating famines as originally intended, this period was characterized by the following famines: Rumanura (1917 – 1918), Gakwege (1928–1929) and Ruzagayura (1943–1944).

Secondly, forced labor became so insupportable that people started fleeing it to neighboring country like Uganda in search of free and paid work.

Obligatory food crops

Compulsory cultivation of food crops (Shiku) mainly focused on food crops such as cassava and sweet potatoes. There was increase in their production after the change of reign in 1931.

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 concretized. It covered more people and it was paid in form of money.

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.

The Belgians also encouraged the plantation of trees and they introduced new methods of farming such as land following, crop rotation, application of organic manure 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 (Western Province), and Karama (Eastern Province). The Rubona agriculture research station was to deal with agricultural problems affecting average attitude land, Rwerere station in Gisenyi dealt with those affecting higher attitude while Karama station was for low attitude areas.

In the area of animal rearing, the colonial power concentrated on higher animals like cows and goats. Soon after, sheep and pigs were encouraged. Research centers were established at Nyamiyaga – Songa in Southern Region Cyeru in Northern Region and Nyagatare in Eastern Region. Animal health centers 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 MINETAİN (*Société des Mines d'Étain*) 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

Before the coming of the Europeans to Rwanda, trade existed in Rwanda in form of barter system. This was a direct exchange of goods with other goods. Despite the introduction of the rupee by the Germans, the monetary economy has been reinforced in Rwanda. It was not until 1930 that the monetary economy has been re-enforced came to 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.

The country had few small rural markets, there were especially for buying and selling agricultural products, animals and traditional handcrafts. Professional trade came into existence after the establishment of regional towns in the headquarters of territories. Most traders were Europeans and Asians like Belgians, Greeks, Portuguese, Indians, Arabs from Oman and Pakistanis.

As for external trade, the main partners were Belgium, 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.

During the Belgian mandate, roads were constructed to facilitate trade and commercial activities and effective colonial administrative control especially after 1927 when the first vehicle arrived in the country. 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

1. Education

The traditional education was undermined by the abolition of the traditional education, *Itorero* in 1924. 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. In 1933, this school absorbed the students from the former school for the sons of chiefs that was created in Nyanza from 1907.

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). Then after, programmes have been improved.

In 1925, the colonial administration had committed itself to finance education under certain conditions (subsidized education system): acceptance of administrative inspection and employing qualified teachers. From that time, primary education which was limited to a lower level was expanded. For instance, in 1925, the number of pupils was 20,000, in 1935 was 88, 000 pupils and in 1945 the number had risen to 100, 000 pupils in primary schools.

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*” which in 1933 absorbed the pupils of the former school for the sons of chiefs that was located at Nyanza. The post primary level in *Groupe Scolaire* started after 1937 with the Secretarial and Administration Sections for training chiefs and sub-chiefs, primary teachers, agricultural extension workers and medical assistants. It was in 1940 that the school had its first 30 graduates.

Other secondary schools were established as the following:

- 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).

2. Christianity

The spread of Christianity and Christian culture benefited a lot from the 1926 administrative reform, which required that to be a chief or sub-chief one must have a minimum western education acquired from the colonial school in Rwanda. 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 baptized converts also increased from 13, 400 in 1928 to 320, 000 in 1945.

3. 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”. It consisted of providing health care to the population.

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 following hospitals throughout the country:

- 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, Medical auxiliaries also opened at Astrida and 2 schools for assistant nurses at Kabgayi and in Kigali. By the end of the Belgian mandate, there were 4 rural hospitals and about 10 dispensaries built by the colonial administration. At the time there were 16 private public hospitals and 34 dispensaries.

4. Introduction of identity card

In 1935, the Belgian colonial administration introduced a national identity card on basis of ethnicity. The Banyarwanda who possessed 10 or more cows were registered as Batutsi, whereas those with less were registered as Bahutu. Abatwa were considered not only as those with no cows but as the “pygmies” and as those who survived by pottery activities. You could see two people born from same parents given identities mentioning different ethnics group (one Hutu and another, Tutsi).



Application activity 12.5.2

Answer the following questions:

1. Analyze the impact of forced labors and obligatory cash crops on Rwandan people during mandate period
2. In 1932, the identity card was introduced in Rwanda, mentioning if a person is a Hutu, Tutsi or Twa. Discuss the impact of this identity card in great lakes conflicts.
3. Discuss the reason why Musinga was deposited by Belgians.

12.5.3. Rwanda under Belgian trusteeship (1946–1962)

Towards the end of the 2nd World War, 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 the local people who would manage the country after attaining independence.

In order to help 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 have been done in 1948, 1951, 1954, 1957 and 1960.

Economic reform

The first mission of the UN in 1948 realized that the Belgian government had not done much in social economic development and recommended that the social and economic domains had to be promoted in order to help Rwanda to become autonomous. In reaction to this recommendation, 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. The financing of the Ten Year Development Plan was done in two ways:

- Local financing done through increasing the rate of tax on cattle, instituting tax on polygamy and putting in place surtax on exports.
- External financing by creation of a “Fonds du Bien-Etre Indigène” by Belgian government with 2 million francs. Belgium also committed itself to annual financial aid which increased, from 150 million per annum in 1950 – 1951 to 560 million in 1961.

On the side of the local authorities, the socio-economic reform done was the abolition of the socio-economic dependence system based on the cow or Ubuhake by the royal decree of king Mutara III Rudahigwa on the 1st April 1954. This abolition had two objectives:

- To liberate the pastoral clients (Abagaragu) who used to spend much of their time working for their patrons (Bashebuja); 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 following councils:
 - **The “*Conseil de sous-chefferie* (The Council of Sub-Chief)”**: it was composed of a sub-chief who presided over it and 5 to 9 members elected by an electoral college designed by the sub-chief.
 - **The “*Conseil de chefferie* (The Council of Chiefs)”**: It was made up of the chief himself who was its chairperson and 10 to 18 members of whom 5 were sub-chiefs elected by their peers, others were notables elected from members of a college made up of 3 notables from a sub-district. The 3 notables were chosen by the sub-district council from among its members.
 - **The “*Conseil du Territoire* (The Territorial Council)”**: It was composed by:
 - The head of the territory
 - Chiefs from the territory
 - A number of sub-chiefs which had to be equal to the number of chiefs. The sub-chiefs who sat on the Territorial Council were chosen by their fellow sub-chiefs from their ranks.
 - **Notables on council**. Their number was equal to that of chiefs and sub-chiefs. They were elected from an electoral college composed of 3 people elected by each “*conseil de chefferie*” from among its members.
 - **The “*Conseil Supérieur du Pays* (The High Council of the State)”**: It was chaired by the king and composed of:
 - Representatives of the 9 councils of the 9 territories (Cyangugu, Astrida, Nyanza, Kigali, Kibungo, Byumba, Ruhengeri, Gisenyi and Kibuye),
 - 6 chiefs elected by their peers,
 - A representative elected by each council of the territory from the members who sat on it;
 - 4 people chosen because of their understanding of the problems of the country and 4 people chosen due to their level of assimilation to western civilization.

Only the nationals would be members of these councils and they served for a period of three renewable years. The councils established were only consultative and they did not have any power in decision making.

From the “*Conseil superieur du pays*”, a memorandum called “*Mise au point*” was prepared on February 22, 1957. It was mainly addressed to the UN Trusteeship mission to Rwanda and to the Belgian administration.

This document was critical to colonial power. It talked about discrimination based on color, the monopoly of the missionary led education which has questionable quality, and finally the document demanded more representation of Rwandans in the political administration of their country.

To the “*Mise au point*”, the Belgian authorities mobilized an elite group of the Hutu to write another memorandum in counter attack, which they named “*Le Manifeste des Bahutu*” or “*Note sur l’aspect social du problème racial indigène au Rwanda*” the issued-on March 23, 1957. The signatories of this memorandum were Grégoire Kayibanda, Joseph Habyalimana Gitera, Calliope Murindahabi, Maximillian Niyonzima, Munyambonera Sylvestre, Ndahayo Claver, Sentama Godefroid and Sibomana Joseph among others. They protested against the monopoly of power by the Tutsi and against all social injustices.

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.

In order to address the situation, king Mutara III Rudahigwa created a committee to study the “Muhutu – Mututsi social problem” on the 30th March 1958. In June 1958, the “*Conseil supérieur du pays*” came out with a reaction on the report of the committee. They noted that there was no Hutu – Mututsi problem but a social – political problem on the level of political administration and that problem was not ethnic in nature. The “*Conseil supérieur du pays*” members went further to demand the abolition of the ethnic mention in the identity cards but this was not done.

The situation was worsened with the creation of the political parties in Rwanda. But quite before, the relations between the king and the colonial power on one hand and between the king and the Catholic Church on the other hand, were to a certain extent bitter. Many researchers say that these relations between the King Rudahigwa and the Belgian Colonial Masters were due to their future interests in Congo. Actually, Belgians considered Rwanda as the strategic way to Congo. On the other side, the Catholic church was accusing Rudahigwa to have become a socialist.

Some elite Rwandans spearheaded by king Mutara III Rudahigwa were advocating for secular schools not based on religious denominations and hence a breakup of the monopoly enjoyed by the Catholic Church in the education.

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 authorized the creation of the political parties in 1959.

In the meantime, king Rudahigwa died in Bujumbura on the 25th July 1959 in mysterious circumstances. He was buried in Mwima on the 29th July, 1959. At that occasion, a new king was proclaimed in the name of king Kigeli V Ndahindurwa.

The creation of political parties

By the time, the following political parties had been founded:

1. ***Union Nationale Rwandaise (UNAR)***. The Rwanda National Union Party officially formed on the 3rd September 1959. Its President was Francis Rukeba and other leaders were Michel Rwagasana, Michel Kayihura, Pierre Mungarurire, Come Reberaho and Chrisostome Rwangombwa. It was basically a nationalist, monarchist, anticolonialist and reformist party. It demanded immediate independence.
2. ***Rassemblement Démocratique du Rwanda (RADER)*** (The Rwanda Democratic Assembly): Its members were: Bwanakweri Prosper, Ndazaro Lazarus, Priest Bushayija Stanslas and Etienne Rwigemera. This party was quite close to the colonial administration and the Catholic Church. It advocated for a constitutional monarchy.
3. ***Parti du Mouvement pour l'Emancipation Hutu (PARMEHUTU)***.

The Movement for the Emancipation of the Hutu was formed on October 1959. It was officially launched as a party on the 18th October 1959 with Grégoire Kayibanda, as its President. Other prominent members were Niyonzima Maximilien, Ndahayo Claver, Murindahabi Calliope, Makuza Anastase, Rwasibo Jean Baptiste and Dominique Mbonyumutwa.

It advocated for the privatization of property especially land and codification of customs. At first, it was apparent that, it was for constitutional monarchy but finally it advocated for a republican state. On the 8th May 1960, during its meeting at Gitarama, the abbreviation of MDR (Mouvement Démocratique Républicain) was adopted to PARMEHUTU.

4. Association pour la Promotion Sociale de la Masse (APROSOMA).

The Association for Social Promotion of the Masses was founded along before on the 1st November 1957 by Joseph Habyalimana Gitera and became a Political party on February 15th, 1959.

Other prominent members were Munyangaju Aloys, Gasigwa Germain and Nzeyimana Isidore. Its political program was not different from that of PARMEHUTU.

Apart from national political parties, there were other local political parties. Many of them were created around 1960. These are:

AREDETTWA: *Association pour le Relèvement Démocratique de Batwa* or Association for Democratic Elevation of Batwa founded by Laurent Munyankuge from Gitarama. This party was absorbed by PARMEHUTU.

APADEC: *Association du Parti Démocratique Chrétien* or Association of Christian Democratic Party founded by Augustin Rugiramasasu.

ABAKI: *Alliance des Bakiga.*

MEMOR: *Mouvement Monarchiste Rwandais.*

MUR: *Mouvement pour l'Union Rwandaise.*

UAARU: *Union des Aborozi Africains du Rwanda.*

UMUR: *Union des Masses Rwandaises.*

UNINTERCOKI: *Union des Intérêts Communs du Kinyaga.*

After political parties had been formed, they set off for intense mobilization of partisans through public political meetings. These meetings were followed by violence.

The 1959 crisis in Rwanda

In their agenda, many political parties had the divisive ideology, based either on region or ethnic group. On the November 1st, 1959, Mbonyumutwa Dominique, a member of PARMEHUTU, (who was a chief of Ndiza), was molested by a young Tutsi as he was leaving a Catholic Church service at Byimana parish, in the former prefecture of Gitarama, now in Ruhango District.



President Mbonyumutwa Dominique (1/1961 – 9/1961).

Source: <https://www.flickr.com/photos/ubwizarwanda/10607855176>

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. From the 7th to 10th of the same month there was a “Counter-attack” organized by the members of UNAR against the principal leaders of PARMEHUTU and APROSOMA. Attacks have been stopped because of intervention of the “*Force Publique congolaise*” led by Colonel Guy Logist.

The violence had mainly the following effects:

1. The houses of Tutsi and Hutu members of UNAR were burned and destroyed systematically.
2. Many Tutsi were killed (at least 200 people), internally displaced and became refugees in neighboring countries like in Burundi, Uganda, Tanzania and Belgian Congo (almost between 150.000 and 200.000 people)
3. There were arbitrary arrests, imprisonments and assassinations.
4. The 20 chiefs were dismissed and 150 sub-chiefs were replaced by the members of PARMEHUTU assisted by Colonel Guy Logist.

Since November 25th, 1960, the administrative reforms were introduced by Colonel Logist:

- 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,
- The 10 territories became prefectures headed by the *préfets*.
- The High Councils 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 4th, 1960. King Kigeli V Ndahindurwa could not hide his hostility for that council because it actually substituted his powers.

From 26th June to 30th July, 1960, communal elections took place with the following results: PARMEHUTU got 70.4% corresponding to 2,390 communal councilors, APROSOMA got 7.4% corresponding to 233 communal councilors, RADER got 6.6% corresponding to 206 communal councilors and UNAR got 1.8% which corresponded to 56 communal councilors. 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 bourgmestre. 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 26th, 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 25th January, 1961, the resident general conferred upon these institutions the powers of autonomy.

The “*Coup d’Etat*” of Gitarama

On the 28th January, 1961, the famous “Coup d’état of Gitarama” took place. At that time, a meeting took place in a market in Gitarama in which about 2,900 councilors 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.
2. The abolition of the kingdom emblem, the royal emblem drum Kalinga.
3. The abolition of *Abiru* institution.
4. The proclamation of a republic.
5. The election of the first president of Rwanda, Mr. Mbonyumutwa Dominique.

6. The formation of a government made up of 11 ministers with Grégoire Kayibanda as prime minister.
7. Creation of a supreme court.

On the February 1961, the Belgian Trusteeship recognized that regime and transferred the power of autonomy to them. A new tricolor flag of Red, Yellow and Green was exhibited. September 25th 1961, legislative elections and a referendum were organized 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 1st July, 1962, independence was recovered to Rwanda; the Belgian flag was replaced by the Rwandan flag.



Application activity 12.5.3

1. Analyze the political reforms done in Rwanda by Belgians during trusteeship period.
2. What are measures that Belgians took in Rwanda in order to increase the agricultural production?

12.5.4. Effects of Belgian colonization of Rwanda



Learning Activity 12.5.4

Carry out a research on effects of Belgian colonisation, discuss the effects of Belgian colonisation of Rwanda. Present result to the class

The Belgian colonization started from 1916 until 1962, the date corresponding to the recovery of Rwandan independence. This colonial rule brought different reforms on the political, economic and social domains of Rwanda.

Political effects

Change in the traditional administration

Belgians used indirect rule as their administrative method. With this, they stripped off the traditional powers of the *Mwami* (king) and reduced his position to being ceremonial. They rejected the ancient administration of Rwanda that was based on the functions of the three chiefs at *igikingi* level. The former cattle, land and army chiefs were abolished and replaced with one of chiefs. They reduced the power of the king including barring him

from appointing or dismissing his chiefs. Finally, King Yuhi V Musinga was deposed in 1931. This meant that the entire administration was in the hands of Belgian administrators.

Formation of councils

During the Belgian administration, there was formation of councils. These were mainly to prepare Rwandans for autonomy that was to enable them gain total independence.

Formation of political parties

Belgian colonial rule led to the formation of political parties like PARMEHUTU, UNAR and RADER; These were to compete for power during the transition to democracy. However, this was not achieved at all.

Economic effects

Improvement in agriculture

There was transformation in crop cultivation as well as animal husbandry. For instance, they introduced new food and cash crops like cassava and coffee to solve famine and increase the volume of exports respectively. The growing of cash crops was compulsory so as to improve Belgian economy. This was followed by introduction of research centers and animal breeding centers in places such as Karama, Songa and Rubona. These centers were meant to produce better quality seeds in food and cash crops, fast growing and drought resistant varieties as well as quality animal breeds. However, they used forced labor (*shiku*) where people provided free labor on European gardens as well as plant coffee on their farms by law. Other cash crops introduced included cotton, tea and pyrethrum.

Generation of electricity

In the field of energy, from 1958, the dams were constructed to produce hydro-electric power. These included Mururu on Rusizi River and Ntaruka Hydro- electric power stations.

Establishment of industries

The Belgian colonial rule Belgians established BRALIRWA, a beer manufacturing company. It officially started operating in 1959. In addition, the management of the Breweries of Congo and Burundi, then under the management of Brasseries de Leopoldville (Brewery of Kinshasa), decided to build a brewery in the western region of Rwanda (in Gisenyi) on the northern shores of Lake Kivu.

Introduction of commercial mining

Mining activities started in 1930 with two main companies: Rwanda-Urundi Tin Mines Company (MINETAIN: *Société des Mines d'étain du Ruanda-Urundi*) and Muhinga-Kigali mining company (SOMUKI: *Société Minière de Muhinga-Kigali*) in 1934. Other mining companies that were established include GEORWANDA and COREM.

Construction of roads

In the 1920s and 1930s, Belgians constructed various roads to facilitate trade. However, European administrators generally overlooked the abuses of those officials who embezzled funds collected as taxes, road construction and human abuses in plantation farming.

Introduction of taxes

Belgians also introduced the collection of taxes. The introduction of cash taxes instead of agricultural produce was intended to increase cultivation of coffee as a cash crop in their favor. This was very unfair for the majority who not employed and could not pay cash taxes.

The traditional manufacturing sector was discouraged

Imported substitutes were encouraged hence replacing the locally produced products since they were of better quality than locally made products. The imported goods included clothes, salt, knives and hoes. This led to poverty and suffering to local entrepreneurs.

Introduction of forced labor

Many economic reforms that were introduced were implemented using the forced labor policy. However, this destroyed their aims because instead of solving the economic problems, they led to famines where the energetic people fled to the neighboring countries to engage in paid labor.

Social effects

Abolishment of traditional education

The Belgian colonialists abolished traditional education through itorero and replaced it with colonial education. The Belgian colonial government in collaboration with missionaries established schools like GS Astrida, teacher training schools and seminaries.

Establishment of health centers

Belgians also set up health centers to take care of the people. The government hospitals established during the Belgian rule included the hospitals at Kigali, Butare, Nyanza, Kibuye, Gisenyi, Ruhengeri, Byumba, Kibungo and Rwamagana. Gishari Tuberculosis Centre was established by the Belgian colonial government in 1955.

Construction of churches

They also constructed churches in different parts of the country like in Kabgayi, Ngoma-Mugonero and Gahini. This was to facilitate the spread of Christianity.



Application activity 12.5.4

Discuss achievement and failures of Belgian colonization in Rwanda.



Skills lab

By reading different sources of information related to the colonial period of Rwanda, examine the negative effects of the Belgian colonization on your country you still observe today and propose different strategies that can be adopted to overcome them.



End unit assessment

Answer the following questions:

1. Why European countries came to colonize Africa?
2. Discuss the achievement of christian missionaries in Rwanda in the colonial period.
3. Explain how Rwanda has been involved in First World War.
4. Explain the circumstances under which the Belgian Rule was established in Rwanda.
5. Identify the political, economic and social and socio – cultural performance of the Belgians in Rwanda.
6. Explain the causes and the effects of 1959 crisis in Rwanda.
7. Describe the different steps that led to achievement of independence in Rwanda.

UNIT 13:

THE FIRST AND THE SECOND REPUBLICS OF RWANDA

Key unit competence: The student teacher should be able to examine the achievements and the failures of the First and the Second Republics of Rwanda.



Introductory Activity

After recovering its independence, Rwanda adopted a republic system. The First Republic (1962 – 1973) and the Second Republic (1973 – 1994). Both republics have contributed to the social, political and economic evolution of Rwanda. However, due to different factors, those republics declined by 1973 and by 1994 respectively.

To which extent did the First and Second Republics collapsed by 1973 and 1994 respectively?

13.1 Achievements of the First Republic



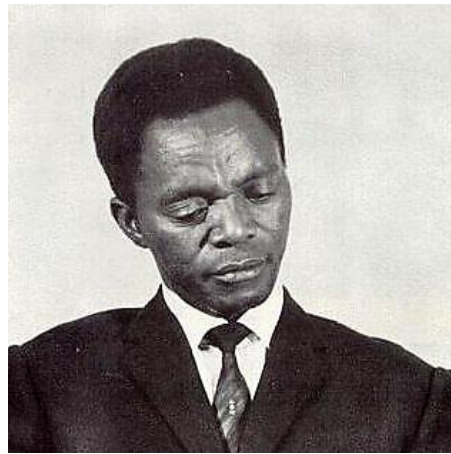
Learning Activity 13.1

Research on internet or in textbooks and answer the following question: After the recovery of independence, the First Republic recorded the success in political, economic and social evolution. Examine such achievements under the First Republic.

On the 1st July 1962, Rwanda recovered its independence from Belgian colonization which dated from 1916; then, since 1962 up to 1973, Rwanda was under the First Republic. Under this period, some achievements and political institutional changes were recorded.

The Constitution

In 1962, Rwanda under the Republican form of government acceded to independence without a well formulated constitution. In this regard, on 28th January 1961, during the “Gitarama coup”, PARMEHUTU leaders prepared something that had a semblance of a constitution but which did not qualify to be considered as such because this text was neither published in the Official Gazette of Ruanda- Urundi, nor was it published in Rwanda’s Official Journal. To avoid a constitutional vacuum, a constitution project was proposed by PARMEHUTU and APROSOMA parliamentary groups. The vote took place during the meeting of November 23rd, 1962; 33 votes for, no vote against and 4 abstentions (3 from UNAR and 1 from APROSOMA). The final text was signed on the following day, that is, on 24th November 1962 by 40 Members of Parliament.



Grégoire Kayibanda, President of Rwanda from October 1961 to July 1973.

Source: <https://www.facebook.com/pg/GregoireKayibanda/about/>

The government

By independence, Rwanda had also a government headed by a President of the Republic and a Parliament. According to the constitution, the power of the government is allocated to the President of the Republic who is at the same time Head of State and to the Ministers whom he himself had appointed. At the beginning of every term, the President was elected directly by simple majority through adult universal suffrage.

In addition, according to the Constitution, the President was supposed to appoint and disappoint any of the Cabinet Ministers and later inform the National Assembly about the matter. In practice, the President communicated the composition of government to the National Assembly which took note on the decision without subjecting the matter to vote.

Under the First Republic, eight governments succeeded one another. The first one, formed after independence in May 1962, consisted of a coalition government which was composed of the UNAR party (2 ministers), PARMEHUTU and APROSOMA. On 6th February 1963, there was a ministerial reorganization and all cabinet ministers from UNAR were dismissed, ostensibly owing to budgetary constraints according to Grégoire Kayibanda. However, in actual fact, the reason behind was to expel opposition political parties which later ceased to be part of government from 1963.

The National Assembly

The Parliament supervises the action of the President of the Republic and his government. Under the 1st Republic, there were three legislatures elected respectively in 1961, 1965 and 1969 until the dissolution of the Parliament following the July 5th, 1973 Coup d'Etat.

During the first legislative mandate, MDR-PAPMEHUTU was a dominant party (with 35 seats), but there were also UNAR Members of Parliament (MPs) (7) as well as MPs from APROSOMA (2). In the Assembly that was constituted after the elections of 3rd October 1965, all opposition parties were no longer represented. All MPs originated from MDR-PAPMEHUTU.

The Supreme Court

The Supreme Court was instituted in the first Constitution of the Republic of Rwanda. However, the Supreme Court was nonexistent in fact that it could not refuse a law which the President wished to pass. Thus, in 1973, when President Kayibanda wanted to stand for another term, he modified some articles of the constitution. Since the latter did not confer any independence to the judges, the latter were fearful of being dismissed. This led to the paralysis of the judicial system through intrigue and arbitrary decisions by the judges.

Economic evolution under the First Republic

Just after the independence, the First Republic faced many economic problems. The main Rwanda offices were still in Bujumbura which had been the colonial capital of Ruanda-Urundi. Rwanda was under equipped. There were few economic infrastructures, in the capital of Kigali. It had no airport; the country did not have a radio, any tarmac road, any telephone line and there were university or any other institution of high education. Everything had to come through Bujumbura or through Belgian Congo.

In addition to the lack of infrastructure and the under equipment of Rwanda, the food security was also another crucial problem. In fact, this problem was due to land overexploitation in the regions anciently populated, high population density and erosion.

To solve this poverty and shortage of land, the First Republic resorted to the policy of the creation of farms in the former prefectures of Gitarama, Kibungo and Rural Kigali and committed to sensitize people of the prefectures of Ruhengeri, Gikongoro, and especially Butare to go to settle there.

Moreover, Rwanda lacked the financial means to undertake developmental projects. The country had only one donor, Belgium which created financial dependence on its donors in all domains.

Another economic problem faced by Rwanda was the poor functioning of the monetary and customs union between Rwanda and Burundi. Moreover, the two countries did not have good relations because they had two different political systems; Rwanda was a Republic while Burundi was a Constitutional Monarchy.

The country was going through an extremely difficult crisis including deficits in the balance of payments, because in 1962 inflation began to reach 50 percent and by 1964, inflation had risen to 300 percent. The Rwandan currency depreciated and agricultural and mineral production went down. This created a big fall in exports, which brought about a big gap in foreign exchange and the incapacity of Rwanda to serve its imports.

Despite the economic problems above mentioned, the regime of the First Republic managed to make some modest achievements. The First Republic inaugurated some financial institutions like banks which helped to finance a few factories and industrial companies. The National Bank was established in January 1964, the commercial Bank in 1962, and the Rwanda Development Bank in 1968.



Image of the Commercial bank of Rwanda

Source: <https://twitter.com/ClaudeKabengera/status/1026801081823752193>

This last bank had a mission to solve the problem of financing industrial companies. In fulfillment of this mission, la *Banque Rwandaise de Développement* (Rwanda Development Bank) financed several industries.



Image of Rwanda Development bank

Source: <http://rwanda-corporate-review.blogspot.com/>

In the sector of infrastructure, some projects had been conceived to macadamize all the road axes linking the country to the outside world in the frame-work of the five-year development plan (1966-1971). In order of priority, the following roads were to be macadamized:

- Kigali- Gatuna; Kigali-Rusumo;
- Kigali- Butare and Ruhengeri- Cyanika

It is essential to note that before the coup d'Etat that put an end to the First Republic in 1973, only one of the above mentioned roads had been started to be macadamized: the Kigali- Gatuna road from 1971. But the construction of this road will be completed during the Second Republic in 1977. In addition to this achievement, there was the construction of the Rusumo Bridge at the Akagera River linking Rwanda and Tanzania and that of Nyabarongo River.

In the sector of rural development, the emphasis was placed on the reclamation of marshlands in order to improve agricultural production and the distribution of improved seeds and plants in some parts of the country. Besides, there was introduction of new crops like rice. In terms of animal production, some cattle dips were put in place to fight ticks which attack cows.

Socio-cultural evolution

Education system

In the sector of education, the First Republic managed to make some but very few achievements. Since its existence the regime of the First Republic strived to give free education services. In the 1962 Constitution, and according to the education policy of 1966, the general basic principle was to

make primary education compulsory and free for all children up to the age of 15. Following this arrangement, new orientations were introduced in the organization of primary education for boys and girls, as well as in secondary and higher learning institutions.

A “double-intake” system was introduced in primary schools during the academic year of 1969 - 1970. This system meant that every teacher had two groups of pupils to teach: one group in the morning and the other in the afternoon.

However, the increase in intake for pupils resulting from the double-session program had problems. These included inadequate teaching staff who were not well qualified, poor teaching content which was not appropriate to the realities on the ground and finally, there was lack of school materials such as books, chalk, dusters. Even the state of school buildings was appalling.

In order to overcome the above problems, the government took the following actions:

- As early as 1963, more qualified teachers were urgently trained by putting in place a training period of two years for trainers of trainers;
- A “pedagogic training center” was set up in order to improve the quality of head teachers who were destined to become inspectors after six months of internship. This was done in the perspective of reorganized primary education at provincial level in various sectors;
- Opening of 12 audio–visual centers by the Gitarama Radio School in favor of radio teaching programs for uneducated rural children in a 4 years program.
- Creation of a special post- primary cycle for girls to replace the 8 former post primary domestic training colleges (3 years in boarding school) for “privileged” young girls.
- Training of headmistresses and female teachers in women technical schools (2 years’ terminal cycle after ordinary level) in Nyanza, Mubuga and Remera;
- In 1971 - 72, the number of secondary schools increased from 24 to 63;
- For boys, some of those schools offered ordinary level orientation, diversified upper levels, technical secondary studies in agriculture, veterinary, medical training, etc. lower teacher – training education and finally professional education;
- As for girls, who had been marginalized for a long time in terms of education, a common cycle of orientation, diversified upper levels,

lower teacher–training education, middle education and social, medical and domestic training were introduced.

It should be reminded that at the time of independence, the country of Rwanda was not well equipped in terms of secondary schools. It possessed few secondary schools such as Groupe Scolaire of Astrida in Butare, Kicukiro Government Technical School in Kigali, Saint Andrew College in Kigali, Christ the King College, etc.

During this period, there was not any for higher education. In fact, the first university was opened on November 3rd 1963 in Rwanda. The initiative to establish higher education finally was born during the First Republic. This University was launched in Butare (Huye District today) with the assistance of two countries: Switzerland and Canada. It was started by a Canadian priest called Levesque as Rector with 50 students distributed in three faculties: medicine, arts and sciences. It also operated a school called *Ecole Pratique des Langues Modernes* (Practical School of Modern Languages) and a Higher School for Nursing.



Image of National University of Rwanda

Source: <https://talloiresnetwork.tufts.edu/national-university-of-rwanda-rwanda/>

By 1971-1972, the number of students had reached 470. The Higher Institute of Education (*Institut Pédagogique National* (IPN) started in 1966.

Health

In health sector, the First Republic also tried to make some efforts. The focus was put on the construction of new dispensaries whose number increased from 67 to 142 in 1972. Moreover, the other accent was placed on finding the solution to the problem of malnutrition and poor conditions of hygiene. As remedy, some social medical centers were constructed to provide sanitary or health education in order to give some trainings on how to avoid and prevent certain diseases. At this occasion, the breastfeeding mothers were

provided with some skills in maternal health care and the government also set up nutritional centers for malnourished children.

To take care of disabled children, a center for physically handicapped children was built at Gatagara and another Psychiatry Centre for the people with mental disability was built at Ndera. This center known as CARAES Ndera is run by the Gand Brothers of Charity. Regarding preventive medicine, vaccination campaigns were initiated between 1965 and 1970.



Application activity 13.1

1. Assess the political changes undertaken under the First Republic.
2. Examine the economic achievements recorded by the First Republic, from 1962 up to 1973.

13.2 Failures and downfall of the First Republic



Learning Activity 13.2

By 1973, the First Republic reached to its end by a coup d'Etat of the 5th July 1973. Use internet or textbooks and discuss the failures and factors that led to this decline.

Through the coup d'Etat of the 4th – 5th July 1973, the First Republic was at its downfall. This was caused by long standing failures that even dated from its beginning. Many factors were responsible for this downfall.

Institutionalization of discrimination against Tutsi

The First Republic, under President Grégoire Kayibanda, institutionalized discrimination against Batutsi and periodically used massacres against the Tutsi as a means of maintaining the status quo.

In 1965, Rwanda was declared a one-party State under MDR-PARMEHUTU, which was the architect of the racist ideology. The regime of Kayibanda did not manifest a good will to repatriate the Rwandan refugees. Instead, it used to kill the Tutsi at a very attack of Inyenzi.

In 1972, President Kayibanda met his closest friends in order to revive his *sinister plan*. This plan consisted of chasing Tutsi from schools and higher institutions as well as from all public and private establishments. In February 1973, the massacre of the Tutsi was organized and coordinated

by Kayibanda's government. Evidence to prove the above assertion is abundant, the most important of which is as follows:

- Names of "undesirable" Tutsi civil servants were hung on notice boards on the same day, in the night of 26th and 27th February 1973;
- Orders for Tutsi to leave establishments were formulated everywhere in the same manner;
- No province was spared and all Tutsi were affected.

The real causes of the 1972-73 events were within Kayibanda's regime itself. He provoked these events with the view of reconstituting the unity of his party, PARMEHUTU. The Tutsi who were portrayed as the real enemies of the Hutu was just a scapegoat. The 1972-73 events led to the coup d'Etat of 5th July 1973 which was carried out by the Defense Minister, Juvénal Habyarimana.

Regionalism

In 1965, the PARMEHUTU managed to win every seat of the National Assembly. However, in spite of this achievement, this political party was experiencing since 1963, considerable internal tensions. These tensions fell into two categories:

Some concerned inter-personal rivalries and the distribution of jobs as the party organs and State structures came closer and closer. There was increasing discontent among emerging cadres, students and individuals with primary and secondary education. Very fierce local political competition was combined with rivalries on the national level. *Bourgmestres* and *préfets* competed intensely, whereas the former drew upon their clientele networks and the legitimacy that came from having been elected, the latter instrumentalized State structures and party influence. In this context of division, court struggles and competition for access to jobs, there was a strong temptation to manipulate the ethnic rift to unify the regime.

Later on, regional rivalry appeared fully during the exercise of power when *ubukonde* was debated. This form of real estate clientelism practiced in the north of the country had been weakened by the assertion of central authority during the colonial period. To many notables from the Ruhengeri and Gisenyi regions, who were real estate patrons themselves, supporting PARMEHUTU meant pushing for the disappearance of Tutsi political real estate patrons which the central authorities had implanted in the north during the colonial period. It also meant supporting the restoration of full, comprehensive *ubukonde*, just as it had functioned before the central State had intervened. Faced with the southern politicians who wished to abolish *ubukonde*, the northern notables' stubborn resistance achieved not only the preservation of customary *ubukonde* in the *préfectures* of Ruhengeri and Gisenyi, but

also the suppression of the legal existence of political *ubukonde*, a vestige of colonization.

The purges which began in February 1973 were initially provoked by students, but also encouraged – or perhaps led – by the authorities. Along with PARMEHUTU, the authorities aimed at uniting the regime by defining a common enemy. Northern soldiers (particularly Alexis Kanyarengwe, the Chief of Police, who was from Ruhengeri) who, in turn, wished to cause a political crisis, also targeted the Tutsi population. In fact, the purges, which initially consisted in posting lists of Tutsi students and staff, asking them to leave universities and companies, later evolved beyond the control of the central authorities. They came to bear certain demands, both social (general resentment of the rich) and regional (opposition between the south and center of the country on the one hand, and the north on the other).

Consequently, Grégoire Kayibanda punished several northern dignitaries by dissociating them from the jobs and locations associated with wielding power: Alexis Kanyarengwe was appointed director of the Nyundo seminary; Major Nsekaliye was assigned to a tea cooperative in Byumba. All the general secretaries of the government ministries were replaced, as well as nine of the ten *préfets*. It seemed the divide between the south and the north was firmly established.

During the months of February – March 1973, purges were organized in schools and in the administration against the Tutsi population. Tutsi students designated in lists posted in all secondary school institutions and universities and signed '*Mouvement des Étudiants*' ('Students' Movement') or '*Comité de Salut Public*' ('Committee of Public Safety'), were under threat and had to flee from these institutions.

By mid-February, the movement reached the National University of Butare and the secondary school of Kabgayi managed by Josephite brothers. This movement, which had originated in the educational system, spread to administrations and private companies, following the same process: in ministries, hospitals, banks and shops, the Committee of Public Safety put up lists identifying the Tutsi. Private individuals were requested to fire their Tutsi servants. After the towns, this phenomenon reached the countryside. In the *préfectures* of Gitarama and Kibuye, the Tutsi' houses were burned down and they were told to leave. Several hundred people were killed.

Several hypotheses have been put forward about the source of this chaos. Though orders were transmitted through the administration, they may have originated from the entourage of Grégoire Kayibanda. According to other hypotheses, they may also have come from Alexis Kanyarengwe, the Chief of Police, who was from Ruhengeri.

Afterwards, the violence seems to have escaped the control of the central authorities. The names of certain ministers appeared on the lists drawn up in Kigali. In Gitarama, several rich Hutu traders' stores were attacked and looted, as well as the residences of certain politicians, including that of Rwasibo Jean Baptiste. On March 22nd, Grégoire Kayibanda made a pacification speech and announced the creation of a ministerial commission in charge of inspecting schools.

Another cause of the rivalry between the North and the South was that PARMEHUTU members of the South especially in Gitarama, the home area of President Kayibanda tended to systematically monopolize PARMEHUTU and Government power in a form of nepotism at the expense of the Northern region. For example, in the last Government formed by President Grégoire Kayibanda in 1972, there were six ministers out of eighteen i.e. one third originating from Gitarama, the region of Kayibanda. The latter was accused of behaving like a monarch president who played around the numerous intrigues within his servants.

In addition, there was a failed coup attempted by a certain Nyatanyi Pierre who was then chief cabinet of President Kayibanda and a certain Muramutsa Joachim, commandant of the Kanombe unit. These two officers were from the north and the south because the coup was interpreted as being coup of the North against the South. The two officers were imprisoned only to be pardoned later by President Habyarimana when he took over power in the coup d'Etat of 1973.

Need for constitutional amendment

Another factor that contributed to the fall of the First Republic was the need for constitutional amendment which was voted on May 18th, 1973 by the National Assembly. This amendment increased the duration of presidential terms of office from five to seven years and allowed Grégoire Kayibanda to stand for a third term. Even though, the National Assembly supported the amendment of the constitution, the country was already divided according to the two main regions: north and south; the first willing to take the power and the last wanting to maintain it.

When it came the time of voting this report, Members of parliament were not unanimous. On the contrary, they were divided into two camps. There were those who sympathized or supported that report and these who were against it. The supporters of the report were punished by being suspended from decision making organs of the Party and were even prevented from contesting the legislative elections of 1969. To safeguard the Constitution, the senior officers of the National Army carried out a coup d'Etat that put to end the regime of the First Republic.

The 5th July 1973 Coup d'Etat

The blow for the downfall of the First Republic was the Coup d'Etat of 1973 carried out by 11 senior officers of the national army commanded by Major General Juvenal Habyarimana. Such other senior officers were Lieutenant Colonel Alexis Kanyarengwe, Majors Aloys Nsekarije, Major Benda Sabin, Major Ruhashya Epimague, Major Gahimano Fabien, Major Jean Népomuscène Munyandekwe, Major Bonaventure Ntubitura, Major Serubuga Laurent, Major Buregeya Bonaventure and Major Simba Aloys. This team was called “Comrades of the 5th July”.

On this day, the high command of the National Guard made a national declaration to the population; mentioning the following points:

- Mr. Kayibanda is discharged of his duties as president of the Republic.
- Major general Juvénal Habyarimana will assume the constitutional prerogative of head of state.
- The government has been forced to retire and is temporarily replaced by a “committee for peace and national unity” composed of 11 officers and presided over by Major General Juvénal Habyarimana, until total re-establishment of peace in the country.
- The national assembly is dissolved.
- Political activities are forbidden throughout the entire territory of the Republic. The various organs of the party are dissolved.

Rights and liberties are guaranteed by the 24th November constitution, with the exception of 16 articles which have been suspended.



Application activity 13.2

By 1973, the regime of First Republic was deposed through the 5th July Coup d'Etat. Analyze the main reasons for the downfall of the First Republic.

13.3 Achievements of the Second Republic



Learning Activity 13.3

Evaluate the political, economic and socio-cultural achievements under the Second Republic. Use internet or textbooks to answer this question.

After the Coup d'Etat of the 1973, the coup leaders dissolved the National Assembly and suspended the 1962 Constitution and banned all political

activity. They, at the same time, put in place what they called a National Peace and Unity Committee composed of 11 senior officers to replace the ousted government. Given the state of insecurity, the country was going through before the coup d'Etat of 5th July 1973, this committee was greeted with a lot of hope among many Rwandans, even among the refugees who were living outside the country. On top of the new hope, in his declaration on July 5th 1974, much was said about national peace and unity and criticized regionalism, public immorality and corruption.

Political evolution under the Second Republic

After the coup d'Etat of 1973, Rwanda undergo through different political changes.

Creation and institutionalization of MRND

The “*Mouvement Révolutionnaire National pour le Développement*” (MRND) or National Revolutionary Movement for Development was created two years after the coup by the President Juvénal Habyarimana. It was set up in order to fill the vacuum created by the dissolution of PARMEHUTU government on 5th July 1975.

It was “Party State” whose objective was to unify, stimulate and intensify all efforts of all Rwandan people with a view to enhancing economic, social and cultural development in an atmosphere of national peace and unity.

In 1977, the Commission for Administration and Institutional Affairs of MRND prepared a new constitution. In October 1978, the constitution was adopted by Government and the MRND Central Committee.

On the 20th of December 1978, the new Constitution was adopted by the population in a referendum with a reported 89% of the casted votes. At the same time Habyarimana was elected in a universal suffrage as President of Rwanda at an alleged 99% majority.



Image of MRND Cell member's card

Source: <http://www.memorialdelashoah.org/rwanda/fiches/carte-membre-mrnd-fiche222.html>

Article 7 of the Constitution made Rwanda a single party State under the MRND and made each citizen a member of it from birth. In reality, this was the establishment of a One-Party political system. The President of MRND party had to be the sole presidential candidate and all Rwandan citizens were automatically members of MRND. The new Constitution abolished the National Assembly and replaced it with the *Conseil National de Développement* (CND) or National Development Council (NDC).

Constitution of 1978

On accession to power, the President announced that constitutional order would be re-established within five years. Having governed by decree, it became necessary to introduce a constitution. The Constitution of 20th December 1978 was designed by three specialists namely the legal adviser in the Ministry of Public Service, the MRND legal adviser in the Ministry as well as the Vice – Dean of the law faculty at the *Université Nationale du Rwanda* (National University of Rwanda).

The content of the constitution drew significantly from the 1962 constitution from which it borrowed many elements after adapting them to the political context of the day. The constitution makers were strongly inspired by the governing principles provided by the President of the Republic, the MRND Central Committee and the commission of political, administrative and judicial matters. In other words, the three constitution makers simply expressed in writing the wishes of the president of the Republic.

The constitution was approved during the December 1978 referendum. The text provided for a presidential term of five years with a possibility of re-election without exceeding two successive terms. The same constitution stated that in case of temporary or definite disability to exercise power, the President of the Republic would be replaced by the Secretary General of the ruling party. And, in case of simultaneous disability on both of them, the post of President of the Republic was supposed to be occupied by a member of the Central Committee of MRND who would be elected by his colleagues. In order to avoid duplication of power between the President and that the MRND president, the 1978 constitution proposed the MRND President as the sole candidate to the presidency of the country.

The new constitution gave overwhelming powers to MRND and its president. MRND was from this time enshrined in the constitution. Its organs became omnipresent in the entire life of the people and country

The 1978 constitution established a presidential structure with a very powerful executive, sometimes with clauses that seemed strange. Article 56, for example, gave the President the power to be the supreme custodian

of the constitution, a role which is normally played by the constitutional court. In addition, the President of the Republic was not directly accountable to CND. On the contrary, the ministers and permanent secretaries were answerable to the Parliament. In other words, the Members of Parliament could not question the President. The ministers were supposed to assume that responsibility before the CND. Incidentally, the President could dissolve the CND.

It should be noted that even if the President was answerable to CND, the latter could not threaten him since the ministers were all Members of Parliament who were appointed and could be dismissed by the President. They could not in any way challenge their boss.

The legislature was linked to the executive. The judiciary was undermined in favor of the executive with the suppression of the Supreme Court. Article 81, Section 2 provided that the President of the Republic was the Custodian of the Independence of the Judiciary.

Institutionalization of Community work (*Umuganda*) and facilitation by MRND

In order to consolidate its power and its grip on the country, the MRND regime resorted to two methods of rural mass mobilization and recruitment of supporters in the entire country. These were community work (*Umuganda*) and facilitation (*gushyushya Urugamba*) both of which were inspired by the Salongo and Sakanyonsa bands from Zaire's MPR (*Mouvement Populaire de la Révolution*).

Communal work and facilitation were political instruments aimed at controlling the population and ensuring its support to the regime. During the facilitation process, the founding President was idolized, praised and glorified with slogans like "*Prezida fondateri, Ramba, Sugira, Sagamba, Tera imbere, Turagushyigikiye!*" These slogans transcended everywhere during such functions. The president was a cult leader of sorts.

That politics of controlling the population in order to ensure its allegiance only brought about rivalry. In 1980, a conspiracy against the regime led by Major Lizinde and his associates flopped. The coup plotters were tried by a tribunal which sat in Ruhengeri; they were condemned to death on 14th July, 1982. President Habyarimana pardoned them by changing their capital punishment to life imprisonment. Lizinde and many of his associates remained in prison up to 23rd January, 1991, the day they were set free by an attack on their prison by the Rwandese Patriotic Front-*Inkontanyi*. Lizinde and Biseruka joined the liberators.

Ethnic and Regional balance

Although the First Republic was established along lines of ethnic discrimination against the Tutsi, the Second Republic was basically made of Hutu who originated from the northern parts of the country. This policy established regional quotas according to ethnic groups. These quotas were based on the criterion of proportional representation according to population as far as education and employment in the public service and private sector were concerned. MRND radicalized this process.

The so-called policy of *“Equilibre ethnique et regional dans le service et dans l’enseignement”* or “ethnic and regional balance” prevented the best performers to join the education field, the army, the police and other posts which they deserved or wished to join. The policy marginalized the Tutsi as well as the Hutu from other districts apart from Gisenyi and Ruhengeri.

Economic evolution

In social and economic matters, MRND had opted for “a system which neither favored frantic capitalism and without limitations nor extreme communism which suffocated the liberty and initiative of the individual”. Committed to a denial of both capitalist and communist extremes, the MRND regime used the methodology of rhetoric on development as its main ideological pillar. The government under the Second Republic conceived development as the best means of overcoming ethnic and regional contradictions.

The 1974 - 1982 period was a very important phase of economic growth because of favorable rates of exports. On the one hand, there was an increase in coffee exports, and on the other hand foreign aid also increased.

Coffee was therefore considered as the irreplaceable base of Rwanda’s economic development because it contributed a lot to the revenue of the population. The growth of financial inflows from bilateral and multilateral aid was particularly important. The countries which provided aid included Germany, Belgium, France, Switzerland, and USA. International organizations which gave aid were: World Bank, European Economic Community, and International Fund for Agriculture, etc.

In order to stimulate the economic evolution in Rwanda, there was establishment and implementation of the *“Second Five-year period of the economic, social and cultural development plan”* which covered the period from 1977 up to 1981. This plan had four missions:

- Ensuring food security of the population and the population growth rate;
- Promotion of human resources management;
- Improvement of the social conditions of individuals and the community;

- Improvement of the Rwandan position vis-à-vis external relations.

The objective of this second five year development plan was the creation of many jobs especially in the secondary sector in order to provide young people in rural areas with opportunities to participate in the social and economic life of the country.

From 1982 to 1986, the “*Third Five-year period of the economic, social and cultural development plan*” was also adopted with the following aims:

- To improve food security for the population in terms of both quality and quantity;
- To promote jobs at sustainable wage levels that cover the basic needs while emphasizing training programs in order to increase labor productivity;
- To improve the population’s health conditions, promote access to shelter and produce goods for mass consumption;
- To develop external relations and encourage the equilibrium of international trade conditions.

In this context, the Rwandan diplomatic representation in foreign countries increased. In 1979, Rwanda had hosted the Sixth Franco–African Conference and in 1976, Rwanda had just been a co-founder of the *Communauté Economique des Pays des Grand Lacs* (CEPGL). Rwanda also hosted the headquarters of the Kagera River Basin Development Organization (KBO). From all those organizations, Rwanda was expected to achieve the following advantages:

- To widen the market;
- To open new investment opportunities;
- To promote the specialization in many fields of life;
- To increase employment opportunities;
- To raise the national revenue;
- To accelerate industrialization process.

Concerning infrastructure development, the five following infrastructures were put in place by the Second Republic:

- Asphalted of several roads which reached a distance of 888.5 Km by 1989;
- Construction of several buildings to serve as offices for different Ministries and hospitals as King Faisal Hospital;
- Extension of electricity network;

- Construction of Kanombe Airport;
- Construction of Amahoro National Stadium.

From 1980 to 1987, the country enjoyed an economic growth due to a combination of positive external and internal factors like good climatic conditions, increasing in places of coffee, tea and minerals and a considerable external capital coming into the country.



Image of Kigali international airport

Source: <https://paliagnes-rwanda.skyrock.com/1875726937-L-aeroport-de-Kanombe.html>

Socio - cultural evolution

Health

Under the Second Republic, many attempts were made like the expansion of the health sector: the dispensaries were transformed into health centers and more medical personnel were trained. Health centers increased from 32 in 1974 to 50 in 1975.

The government of Rwanda had also put in place a policy which aimed at creating nutritional centers in order to educate parents of nutritional diets and hygiene.

In the same context, the Government of Rwanda had to improve hygiene conditions by putting emphasis on the most vulnerable groups such as women and children. In order to find a solution to hygiene related-problems, the government of Rwanda put in place a policy which aimed at creating nutritional centers within the Health centers in such a way as to simultaneously achieve curative care and preventive education, including vaccination, nutrition, maternal and child protection.



Image of Kigali King Faisal

Source: https://twitter.com/easteco_org/status/997186271570223104

Another achievement registered in the health sector was in 1979 that the Rwandan Government established the Broad-Based Vaccination Programme (PEV/BVP) whose objective was to reduce infant mortality through vaccination against certain targeted diseases: tuberculosis, whooping cough, tetanus, polio, measles and diphtheria.

In 1987, the Rwandan Government established the National Programme for the Fight against AIDS (PNLS) whose objective was to control, prevent, reduce and conduct research on AIDS. In the same year, the Government launched the National Programme for Fight against Malaria (PNLM) and in 1989, the Programme for Acceleration of Primary Health Care (PASSP) was put in place. This programme aimed at encouraging the participation of the population in self-sponsorship and management of health services in their health centers.

Education

In this sector, some achievements were attained such as:

- The construction of new primary and secondary schools and many reforms have been made at all levels of education in Rwanda;
- In 1978 – 1979, the system of primary education teaching was revised. The primary cycle changed from 6 years to 8 years. Training in professional skills was introduced in Primary 7 and P8, and Kinyarwanda became a language of instruction from P1 up to P8.
- At the secondary education level, the Ordinary Level was reduced and specializations sections now started in the Second year of secondary education. But this reform failed due to the following reasons:

- Lack of teaching aid materials;
- Lack of qualified teachers in various newly introduced subjects in the new curriculum;
- Lack of appropriate evaluation methods for the reform.

So, in 1991, there was the revision of this reform where the primary education cycle was brought back to 6 years.

At University level, the national Institute of Education for Teacher Training was fused with certain department of the National University of Rwanda. The creation of the new campus at Nyakinama in the 1980 – 1981 was a result of this fusion. The duration of studies in the Faculties of Arts and Education was reduced from 5 to 4 years.



Application activity 13.3

1. Analyze the political changes that were undertaken under the Second Republic.
2. Evaluate the socio – cultural achievements of Rwanda under the Second Republic.

13.4 Failures and downfall of the Second Republic



Learning Activity 13.4

Carry out a research using internet or textbooks and discuss the different factors that caused the failure of the Second Republic; which later on led to its downfall.

Lack of freedom of speech and press

The Second Republic was against the freedom of speech and press. This was justified by intimidation and imprisonment suffered by anyone who attempted to criticize the Regime of the Second Republic. For instance, on September 18th, 1990 the trial of the priest André Sibomana, who was the director of the bi-monthly publication Kinyamateka, and three of his journalists opened in Kigali after the publication of articles denouncing corruption in the government in this newspaper. On July 3th and 6th, 1990 the Cour de Sûreté de l'État (State Security Court) had Vincent Rwabukwisi, the editor-in-chief of Kanguka and Hassan Ngeze, the editor-in-chief of Kangura, arrested.

The first was accused of having interviewed Umwami Kigeri V Ndahindurwa in exile in Nairobi and of plotting with refugees, and the second of having breached the peace.

Economic crisis

The economic improvement was fragile towards the end of the 1970-1980. This was due to an economic crisis which became worse during 1980-1990. It was especially from 1984-1986 that the crisis exacerbated and reached its highest point during 1990-1993. This economic was caused by many factors.

The external factors which had favored economic growth were reversed with tendentious reduction in foreign aid and serious deterioration of the terms of trade. At home, internal factors of structural nature like the reduction in agricultural production and failure to control population growth, weighed negatively on the economic situation. Therefore, this led to a fall in domestic resources.

Besides, the drop in domestic resources led to famine; which worsened the situation to an increase in imports and a reduction in the value of exports precisely linked to the deterioration in the terms of trade, i.e. reduced prices of exports, notably coffee which saw its prices drop dramatically.

Furthermore, the country experienced economic imbalances with a big reduction in resources whereas its demands kept on increasing. These imbalances were mainly manifested through three types of deficits: commercial, food and budgetary deficits. The inability of exports to counterbalance the necessary imports led to a commercial deficit which worsened all during 1980-1990.

By the end of the 1980s, the regime centered on Juvénal Habyarimana was becoming ineffective. The crisis was aggravated by the slump of coffee prices which brought into the country more than 80% of the revenue. During the same period, sections of the civil society began denouncing injustices and abuses and clamored for democracy.

In January 1990, one-sixth of the Rwandan population was affected by a famine which killed 250 people, according to the government. In 1991, Rwanda signed an agreement with the World Bank to implement a Structural Adjustment Plan (SAP) which led to the devaluation of the Rwandan franc on two occasions: its value fell by 40 % in November 1990, then again by 15 % in June 1992. Though the SAP was only partially implemented, the main effect of the devaluation was skyrocketing inflation, which reached 19.2 percent in 1991.

The imprisonment and killing of the politicians of the First Republic

Nevertheless, during the two years that followed, the former ‘barons’ of the First Republic were assassinated or imprisoned. During the following years (between 1974 and 1977), 58 people – individuals who were close to Grégoire Kayibanda and public figures of the First Republic – were assassinated upon orders from Théoneste Lizinde, Chief of Security at the Interior Ministry. According to some sources, the repression affected up to 700 people.

Institutionalization of ethnic and regional balance or quota system

The Regime of Habyalimana was not a model of democracy as its leaders claimed. The regime coerced and aligned people behind political option within a single party system and partisan politics based on ethnic and regional segregation. The regime had created the Rukiga-Nduga conflicts which were characterized by the exclusion of Tutsi and Hutu of Nduga from schools and main posts of the direction of the country.

This deplorable exclusion highly institutionalized by the Second Republic right from 1981 was known as “ethnic and regional balance or quota system”. The system saw the Tutsi children excluded from secondary and tertiary education. This policy also tended to discriminate against the Hutu from the South by allocating them fewer places in secondary schools and in University, in the national army, administration and diplomatic service on the basis of ethnic and regional belonging, while at the same time reserving the best and numerous positions in all fields to the Hutu from the North as can be seen from some written sources.

This policy was in fact applied in all sectors of the national life and it constituted a serious violation of human rights. It has undermined the regime of the Second Republic significantly as it was seriously contested by the democratic forces which militated for change and it ended up by leading the MRND regime to its downfall in 1994.

Centralisation of the power in the hands of a small group of people “Akazu”

Between 1985 and 1990 most of administrative positions were reserved for Hutu in a tacit quota system. In fact, power was held by elites from the north of the country, in contrast with the ‘pro-southern’ orientation of the First Republic. One-third of the 85 most important governmental positions were given to persons born in the *préfecture* of Gisenyi. After ten years of economic growth, the economic crisis and regional favoritism destabilized the government. Rivalry for posts increased, power struggles became fiercer, and mafia-type behavior and structures thrived. One of the main power centers was known as the *Akazu* and was organized around Agathe

Kanziga, Juvénal Habyarimana's wife, and her brothers. In April 1988, the assassination of Colonel Stanislas Mayuya, who was considered the likely successor of the President, was instigated by this power center.

The division of the northerners began in 1980s when two highly regarded senior military officers, colonel Alexis Kanyarengwe and Major Théoneste Lizinde were accused of plotting a coup d'Etat to overthrow Habyarimana. Lizinde was accused of having killed some politicians who had served in the First Republic from the Southern part of Rwanda. This misunderstanding brought about divisions among the politicians and people from the North of Rwanda. The result was that political power was now being monopolized by a small part of Northerners from Bushiru in the ex-commune of Karago. Finally, power came to be concentrated in the hands of President Habyarimana and his immediate family and the family of his in-laws. This came to be termed "AKAZU" meaning "from one single household".

Increasing of dictatorship

In addition to the personality cult, President Habyarimana set up a dictatorship regime. The Habyarimana regime had already become a totalitarian regime. There was a single political party; the Revolutionary National Movement for Development (MRND) and all the powers were concentrated in the hands of a small group of family members of President Habyarimana. No single decision could be made whatsoever without prior approval and/or blessings of the dictator's consent.

Mismanagement of refugees' problem and Refusal of their return

The problem of refugees in Rwanda dated from 1959 with the mass killing which was organized against the Tutsi. This problem was differently managed by the two Republics.

In 1973, the Second Republic put in place a joint ministerial commission of Rwanda – Uganda for the repatriation of Rwandese refugees living in Uganda. The circular issued on 25th October 1973 reiterated the previous instructions on the re-integration of the refugees. The refugees had to express in writing their desire to return. The request had to be addressed to the country of origin through the High Commission for refugees and the hosting government. The refugee whose request was rejected stayed in the country of exile or looked for another.

In 1982, the regime of the Second Republic reversed decision that refugees had to settle in their countries of asylum because Rwanda was occupied to full capacity and that it did not have any more land. In 1986, the central committee of MRND revisited this issue and suggested that refugees be naturalized.

When the refugees rejected that alternative, the Rwandese government put in place a “special commission to look into problems of Rwandese emigrants on 9th February 1989.” In May 1990, the above commission published its first report entitled: “Rwanda and the Refugees problem: Context, history and solutions”. Two solutions were proposed i.e. repatriation and naturalization. These involved settling refugees in their countries of asylum.

In June-July 1989, the Central Committee of MRND, the highest decision-making body in the Habyarimana regime, examined the problem of Rwandan refugees scattered around the world, especially in the neighboring countries. As a solution, the Central committee resolved that the refugees cannot return massively into the country. The Central Committee strongly advocated that refugees should find a way of integrating themselves into their respective countries of asylum. According to the Central Committee, Rwanda was overpopulated and incapable of receiving and accommodating her own people back. Only those who had the capacity to cater for themselves, it was decided, should apply individually for consideration to repatriate.

This position of President Habyarimana and his Government prompted the refugees to call for an International Conference in Washington in August 1988 in which they rejected this position and reaffirmed their inalienable right to return to their homeland, and this led to the National Liberation War on October 1st, 1990. Hence leading to the downfall of the Second Republic.



Application activity 13.4

1. By 1994, the downfall of the Second Republic was visible. Explain.
2. Examine the different ways used by the regime of the Second Republic to manage the problem of Rwandan refugees.



Skills lab

Use different textbooks or internet, discuss how leaders of the First and Second Republics had perpetuated the divisionism policy initiated by the colonizers. Then after, show how the same policy led to the perpetration of the 1994 genocide against Tutsi and at the same time suggest how the present-day leaders have to behave in order to avoid such errors.



End unit assessment

1. Evaluate the achievements of the First Republic from 1962 – up to 1973.
2. Assess the factors which led to downfall of the First Republic.
3. After the 5th July 1973 coup d'Etat, the leaders of the Second Republic promised the Rwandans the better political, economic and social situation. Examine the achievements scored by the Second Republic.
4. By 1994, the Second Republic collapsed and different factors are considered as responsible for this collapse. Discuss such factors.

UNIT 14:

THE 1990-1994 LIBERATION WAR IN RWANDA

Key Unit competence: The student teachers should be able to assess the causes, unfolding and the consequences of the Liberation war of 1990-1994.



Introductory Activity

From October 1990 up to July 1994, Rwanda was undergoing the Liberation war started by Rwanda Patriotic Front. To which extent this war was inevitable?

14.1 The causes of the 1990 – 1994 liberation war in Rwanda



Learning Activity 14.1

Through the use of internet or by visiting your school library, examine the factors that motivated Rwanda Patriotic Front (R.P.F) Inkotanyi to plan for the 1990 – 1994 Liberation War.

The long and hard life in exile

The events of 1959 have led to the exile of many Rwandans who left the country after the unrest period marked by violence and massacres of the members of *Union Nationale Rwandaise* (UNAR) and against the Tutsi in general. Such violence was committed by some members of the *Parti du Mouvement de l'Emancipation Hutu* (PARMEHUTU) supported by Belgian authorities. The resistance organized by refugees' groups called *Inyenzi* and their efforts to return home were in vain.

Consequently, the refugees were desperate and lost hope to one day they could recover their dignity as Rwandans. In exile, refugees had bad living conditions. Such bad living conditions coupled with lack of employment and good education in hosting countries pushed them to think of a solution to return home.

The regionalism and ethnic based divisionism

Both, the First Republic (1962-1973) and the Second Republic (1973-1994) maintained and institutionalized “ethnic” labels (Hutu, Tutsi, Twa) in identity cards and the quota system. As a result, ethnic and regional equilibrium had to be respected in different sectors such as administration, enrolment in secondary and tertiary schools and in the army.

Under the First Republic, the dictatorship led Kayibanda’s regime to trust few people. Therefore, since the late 1960s the power was in the hands of few people from some *communes* of Gitarama. The same situation was observed under the Second Republic where again few people from some parts of the former Ruhengeri and Gisenyi *préfectures* occupied key positions in the country. As far as the political plan was concerned, both Republics were characterized by identity-based ideology.

During the First and Second republics, hatred against Tutsi was reinforced; very political crisis was blamed on Tutsi who were treated as scapegoats. This case was raised when refugees’ troops called *Inyenzi* attacked Rwanda in 1963 and later before the 1973 Habyarimana’s coup d’Etat against Kayibanda’s regime.

The refusal of return for Rwandan refugees

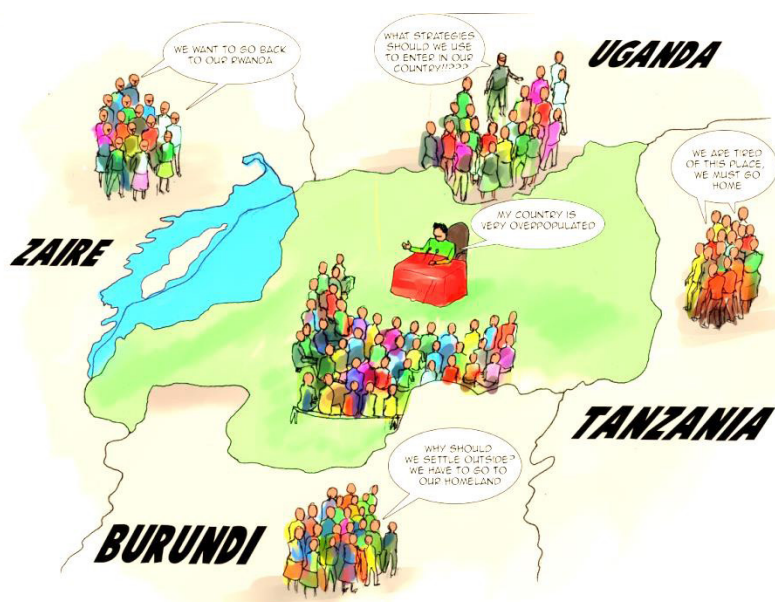
Since 1959 and under the First Republic, the Tutsi ran away from the violence and mass killing organized against them; they did so because they had to save their lives. Generally, they ran towards church missions, schools and other places considered as safe to protect them from danger. Others decided to leave the country as soon as possible to look for asylum in neighbouring countries. Although the Government of Rwanda had since 1964 requested that refugees be settled in their countries of asylum, it did almost nothing to help them. On the contrary, its policy consisted of making life for them very difficult in those countries. The Rwandan embassies watched refugees closely in their countries of asylum.

In 1973, the Second Republic put in place a joint ministerial commission between Rwanda and Uganda for the repatriation of Rwandan refugees living in Uganda. The refugees had to express in writing their desire to return home. The request had to be addressed to the country of origin through the High Commission for Refugees and the hosting governments. Any refugee whose request was rejected stayed in the country of exile or looked for another hosting country. Only few refugees managed to return to Rwanda after facing many challenges created by security agents.

In addition to this suspicion and hindrances to return to Rwanda, Tutsi who had stayed in the country faced a lot of problems. Those who were displaced during the 1959 violence could not recuperate their properties. Most of the time, their properties were illegally taken by *bourgmestres* and their friends and this is why they were a source of trials. In 1966, President Kayibanda prevented refugees to claim their properties.

In 1975, President Habyarimana put in place a decree stating that Tutsi refugees' assets should become public properties. This decision was due to the refusal of political leaders who did not want to return the land to its owners.

The 1990 – 1994 Liberation War was inevitable insofar as the problem of the refugees was left pending, while the living conditions in the countries of asylum became unbearable. Many people were disillusioned by the attempts of integration in host countries.



Refugees aspiring to return home

The intimidation and killing of opponents

The Second republic did not accept and tolerate any opposition. Any person who tried to oppose it was jailed. Even if political assassinations were not frequent, they existed. For instance, the deaths of the former Chief Editor of Kinyamateka newspaper, Father Sylvio Sindambiwe and Félicula Nyiramutarambirwa, former member of the MRND Central Committee are believed to have been planned by the regime. Thus, the 1990 – 1994

Liberation War was organized in order to fight against such injustice in the country.

The increase of dictatorship in Rwanda

During the Second Republic, only a single political party, MRND was allowed to operate as it was stipulated by the 1978 constitution. In practice, the powers were concentrated in the hands of a small group of people from the President's family and his family in-law called *Akazu*. No single important decision could be made without prior approval of the President and his MRND.

Mismanagement, corruption and embezzlement of public fund

By 1977, the foreign aid funds considerably increased to finance diverse projects undertaken with a lot of amateurism. These big projects of "integrated development" failed and left nothing tangible to the farmers. These projects distorted the Rwandan economy: excessive debts, corruption, negligence of subsistence crops for the benefit of the exportable farm produce (coffee and tea), stressed disparities between the capital city and the countryside, etc.

The majority of the population did not benefit from the transfers of important foreign funds in the form of grants and loans on the contrary, the poverty of the population increased: food insecurity, malnutrition, farmers dispossessed of their lands and suffered from famine.

On the other hand, since 1975 a bourgeoisie has emerged, made of top executives in the political, military and administrative hierarchy as well as some big merchants. This concentration of wealth is at the origin of the gap between the great majority of the population and the handful of wealthy persons who constitute a predatory bourgeoisie with practices of corruption, nepotism and regionalism. The rural environment was in clear economic and food regression.



Application activity 14.1

Explain the role played by the following factors for the outbreak of the 1990 – 1994 liberation war in Rwanda:

- The regionalism and ethnic based divisionism
- The refusal of return for Rwandan refugees

14.2 The course of the 1990 – 1994 liberation war in Rwanda



Learning Activity 14.2

By searching on internet or visiting the school library, make a research on the 1990 – 1994 liberation war in Rwanda. Describe the course of this war.

The foundation of the RANU and birth of the RPF Inkotanyi

The root course of the 1990 – 1994 liberation war in Rwanda was the foundation of the “*Rwandese Alliance of National Unity*” (RANU). It was created by young intellectuals who were educated at Makerere University in Uganda. In 1976, the future founders of RANU began emigrating from Kampala to Nairobi.

The first meeting which prepared the foundation of RANU took place in August 1979, in a secondary school (Limuru, 30 km from Nairobi). A dozen persons, almost all former Makerere university students, met there. It is during this meeting that the eventuality of creating a political organization was discussed. Some had come with very advanced ideas on the objectives, the statutes and the program. The discussion was about these points. No consensus was however reached at this stage of the process, certain participants being less prepared than others. RANU was created while rounding up another meeting, which took place in Nairobi on December 3, 1979 in another school, Lenana School, former school for European youth (White). RANU would be headquartered for pretty long in Nairobi, until after its 4th Congress of December 1987, when the headquarters shifted to Kampala.

Among the RANU’s objectives, included the following:

- Fighting against ethnic divisions and the ideology of divisionism by the Habyarimana regime
- Fighting against grabbing Rwanda’s wealth by a small group of people
- Instilling into the Rwandans a sense of consciousness as far as their rights were concerned...
- Finding an appropriate solution to the refugee problem
- Fighting the Habyarimana dictatorial regime
- Uniting all Rwandans including those living inside the country and in the Diaspora in order to restore national unity.

The main organs of RANU were the Congress that met after every two years, the General Assembly that held annual meetings and regional committees from local, regional and central levels. During RANU's recruitments, members had to take an oath (*kurahira*). RANU operated on democratic principles i.e. decisions were taken by the majority. The organs of expression and mobilization were: *Alliancer* which was replaced by *Vanguard* in 1987. It was published at Kampala in English. Later on, another newspaper, called *Inkotanyi* was also created in 1989 in order to mobilize Kinyarwanda speaking readers. In 1990 with the Liberation War (1990-1994), the *Vanguard* disappeared and *Inkotanyi* relocated to Burundi and took the name of *Huguka*.

On December 26, 1987, a congress of RANU representatives met in Kampala (Uganda) and decided to replace RANU with the *Rwandese Patriotic Front* (RPF) under the influence of Rwandans who had joined the National Resistance Army (NRA) in Uganda. The RPF *Inkotanyi* was led by a charismatic leader Major General Fred Gisa Rwigema.

The political programme of RPF Inkotanyi articulated on the following eight points:

- Restoration of unity among Rwandans.
- Defending the sovereignty of the country and ensure the security of people and property.
- Establishment of democratic leadership.
- Promoting the economy based on the country's natural resources.
- Elimination of corruption, favoritism and embezzlement of national resources.
- Promoting social welfare.
- Eliminating all causes for fleeing the country and returning Rwandan refugees back into the country.
- Promoting international relations based on mutual respect, cooperation and mutually beneficial economic exchange.

The military option

The RANU statute included a principle called *Option Zero* aiming at liberating Rwanda by force. But RANU could not achieve this objective because it was composed of intellectuals without a military wing. In the meanwhile, Rwandan refugees benefited from Ugandan crisis of the 1980s. Three young Rwandans namely Fred Gisa Rwigema, Paul Kagame and Sam Byaruhanga joined Yoweri Kaguta Museveni's guerrilla with an idea of using a military option to liberate Rwanda. Due to the persecution of Kinyarwanda-speaking people living in Uganda and their expulsion by Milton Obote's regime in the

1980s, other young Rwandans decided to join the Museveni's guerrilla war in order to acquire experience that would help them to wage an armed struggle to force their return to Rwanda. The guerrilla war and Museveni's final victory constituted the essential turning point in the life of the movement.

The beginning of the Liberation War

After benefiting from their participation in the NRA guerilla warfare and the victory achieved by the latter, the Rwandan military officers observed the structures of the Ugandan army, which they later used to recruit and train a number of Rwandan soldiers. When the war started in 1990, the RPF could count on about 3,000 well trained soldiers of various grades. The Liberation War was launched by RPF *Inkotanyi* and its armed wing, the Rwandese Patriotic Army on October 1st, 1990 led by late Major General Fred Gisa Rwigema. This army was composed of not only male but also female combatants.



A picture of Late Major General Fred Gisa Rwigema

Source: RPF Archives.

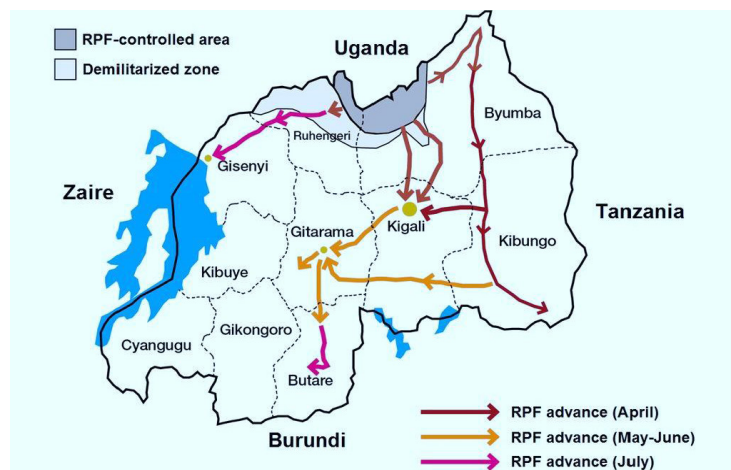
The RPF first launched an attack in Umutara at the beginning of October, 1990; but this attack was not successful because of the death of Late Major General Fred Rwigema on October 2nd, 1990. After being pushed from Umutara, the RPF resorted to using guerrilla tactics in the northern region of Rwanda.

The government of Rwanda alleged that it was surprised by that attack, even when the ordinary people were aware of an imminent attack by refugees. The discriminative ideology against the Tutsi reappeared in speeches and the national media. The subject of discussion was that RPF was a reincarnation of the *Inyenzi* of the 1960s and that it was made up of Tutsi feudal monarchists who did not accept the “1959 Hutu revolution”.

Due to the RPF raid, the Habyarimana regime started to launch a vast operation to eliminate the political opponents after gunshot fire in Kigali in the night of October 4th-5th, 1990. The regime made people to believe that it was an attempt by the rebels to attack the capital whereas it was a false attack meant to allow a presidential move to justify a massive cleansing operation against the Tutsi and other opponents of the regime. Between 7,000 and 10,000 people were arrested and imprisoned arbitrarily. Large scale massacres took place throughout the country, especially in Kibiriria, Mutara, Mukingo, Murambi and Bugesera where Tutsi were molested, imprisoned or killed together with those who dared to criticize the regime. They were called *ibytso*, traitors or accomplices.

Attack on Ruhengeri (January 1991)

On the morning of January 23rd, 1991, the RPA attacked the town of Ruhengeri. The Rwandan forces in the area were taken by surprise and were mostly unable to defend themselves against the invasion. One of the principal RPA targets in Ruhengeri was Ruhengeri prison. The RPA stormed the buildings, and the prisoners were rescued and several of them were recruited into the RPA. Some political prisoners such as Théoneste Lizinde, Stanislas Biseruka and Brother Jean Damascène Ndayambaje were also released from prison.



A map showing the advance of the RPF in 1994.

Source: https://en.wikipedia.org/wiki/Rwandan_Civil_War.

Extension of guerrilla war (1991-1992)

From the success recorded during the attack on Ruhengeri, the RPA began to carry out a classic hit-and-run guerrilla war tactic. It attacked the government armed forces, called *Forces Armées Rwandaises* (FAR), repeatedly and frequently and made some territorial gains composed of a small territory alongside the border. The conquered territory was extended following other gains until the setting up of Ruhengeri, Mutara and Byumba fronts. In 1992, RPF/RPA headquarters was set up at Mulindi in Kiyombe commune, in Byumba *préfecture*.

Peace process (1991-1993)

In order to find a solution to the war between the RPF and the government, a series of meetings were held at many places. The first meeting was held at Mwanza in Tanzania, on October 17th, 1990, in this meeting, the Government of Rwanda accepted a dialogue with internal and external opposition. However, this was not immediately respected by the Government. Other meetings were also held at Gbadolité on October 26th, 1990; Zanzibar on February 17th, 1991 and Dar-es-Salaam on February 19th, 1991. The question of refugees was a paramount top discussed.

In all these negotiations, RPF was not directly negotiating with the Government of Rwanda. For the first time, RPF directly negotiated with the Government of Rwanda at N'sele on March 25th, 1991. The RPF and the Government of Rwanda signed the N'sele Ceasefire Agreement (of 29th March 1991) and a political settlement which provided for, among other things, cessation of hostilities, withdrawal of foreign troops, exchange of prisoners of war and finally, serious political negotiations to end the conflict. This agreement remained a dead settlement because soon after the Government of Rwanda and RPF accused each other of violating the cease-fire.

Military pressure from RPF, pressure from the international community and internal opposition led to a serious peace process negotiation. In June 1992, the Arusha peace negotiations started and were concluded on 4th August 1993. Peace talks pursued at a very high level in the region, drawing in heads of state and foreign ministers.

The core negotiations on a future peace agreement had participants and observers from five African countries: Burundi, Zaïre, Senegal, Uganda and Tanzania; four Western countries: France, Belgium, Germany and the USA with the presence of the OAU delegates. The United Nations Organization (UNO) was brought in at the intervention of the OAU and the United Nations High Commission for Refugees (UNHCR) attended as observers. Britain, Canada, the Netherlands and European Union closely monitored the process

from their local embassies. Nigeria was represented at the Arusha- linked Joint Political Military Committee.

The Arusha process represented a multi-prolonged strategy of conflict resolution. The preliminary phase was designed to obtain a cease-fire. In July 12th, 1992, a cease-fire was decided between RPF and the government. OAU force known as Neutral Military Group of Observers (GOMN: *Groupe d'Observateurs Militaires Neutres*) was put in place to observe the cease-fire.



A picture of Arusha International Conference Centre. Venue for peace talks between the government of Rwanda and RPF - Inkotanyi to end the war.

Source: https://en.wikipedia.org/wiki/File%3AAICC_Arusha.jpg

During the negotiations process, the regime did its best to make the country ungovernable. In this regard, Rwanda experienced massacres of Tutsi and moderate Hutu. Moreover, insecurity affected some public places due to some attacks by means of grenades. Due to this violence and insecurity; the RPF Inkotanyi launched an attack on February 8, 1993. In fact, the RPF was nearing the gates of the capital, Kigali, because they had reached Tumba commune (Today in Rulindo District). But soon after, due to the international pressure to resume negotiations, the RPF returned to its positions before February 8, 1993.

The Arusha Peace Agreement was preceded by the signing of the agreement on a new ceasefire. In this agreement, the following protocols formed an integral part of that agreement:

- The N'sélé ceasefire agreement of 29th March 1991 between the government of the Republic of Rwanda and the Rwanda Patriotic Front as amended in Gbadolite on 16th September 1991 and in Arusha on 12th July 1992;

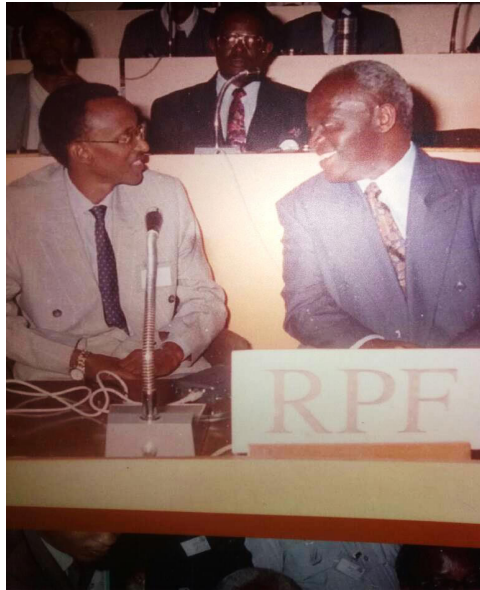
- The agreement protocol between the government of the Republic of Rwanda and the Rwanda Patriotic Front relating to the rule of law signed in Arusha on 18th August 1992;
- The agreement protocols between the government of the Republic of Rwanda and the Rwanda Patriotic Front on the power sharing arrangement in the framework of a broad-based transitional government signed in Arusha on 30th October 1992 and 9th January 1993 respectively;
- The agreement protocol between the government of the Republic of Rwanda and the Rwanda Patriotic Front on the repatriation of Rwandese refugees and the resettlement of displaced persons signed in Arusha on 9th June 1993;
- The agreement protocol between the government of the Republic of Rwanda and the Rwanda Patriotic Front relating to the integration of the armed forces of both parties, signed in Arusha on 3rd August 1993;
- The agreement protocol between the government of the Republic of Rwanda and the Rwanda Patriotic Front regarding various questions and final provisions, signed in Arusha on 4th August 1993.



A picture of the delegates of the Republic of Rwanda during the signing of Arusha Peace Accord on August 4, 1993.

Source: RPF Archives.

The Arusha Peace Agreement was supposed to have been implemented within 37 days, beginning with the establishment of the institutions of the presidency, the cabinet and the National Assembly. This agreement was not implemented; however, its principal provisions now constitute the Fundamental Law of the Republic of Rwanda.



A picture of the delegates of RPF during the signing of Arusha Peace Accord on August 4, 1993 (Major Paul Kagame on the left and RPF Chairperson Alexis Kanyarengwe on the right).

Source: RPF Archives

After the signing of Arusha Agreement in December 1993, the French military detach that was in Rwanda left and a UN intervention force arrived. The UN peacekeeping force was known as United Nations Mission for Rwanda (UNAMIR). Its mission was to supervise the implementation of the Arusha Peace Agreement of August 4, 1993.

On December 28, 1993, 600 soldiers of the third battalion of RPF arrived at the *Conseil National de Développement* (CND) and had a mission to ensure security of the RPF future ministers and members of the Parliament in the new Broad-based Transitional Government.

On January 5, 1994, President Habyarimana was sworn in as President in accordance with the Arusha Peace Agreement, but blocked the swearing of other members of the Broad-based Transitional Government.

On April 6, 1994 at 20:30, the Presidential airplane, the *mystère Falcon 50* from Dar-es-Salaam was hit by two missiles and Presidents Habyarimana of Rwanda and Cyprien Ntaryamira of Burundi were killed. The long-planned Genocide against the Tutsi immediately started and boycotted the implementation of Arusha Peace Agreement and other peaceful ways.

The end of the Liberation War

On April 6, 1994, the deaths of the Presidents of Burundi and Rwanda in a plane crash ignited several weeks of intense and systematic massacres in which over one million Tutsi perished. Less than half an hour after the plane crash, roadblocks manned by Hutu militiamen often assisted by Gendarmerie (paramilitary police) or military personnel were set up to identify Tutsi and supposed RPF accomplices.

On July 4, 1994, Kigali fell into the hands of the RPA. The members of the so-called Interim Government (called *Abatabazi*), members of the FAR, the armed groups, and many people who were involved in the Genocide and the general population, fled mainly to Zaïre, current Democratic Republic of Congo (DRC) and Tanzania. Millions of civilians fled because they had been told by the Government officials, soldiers and militia that the RPF would kill them. Thousands died of water-borne diseases. The camps were also used by former Rwandan government soldiers to re-arm and stage invasions into Rwanda.



A picture of RPA troops entering in Kigali City after the fall of the capital

Source: <https://www.newtimes.co.rw/section/read/206929>

On July 19, 1994, the RPF established the Government of National Unity with four other political parties namely *Parti Libéral* (PL), *Parti Social Démocrate* (PSD), *Parti Démocrate Chrétien* (PDC), and *Mouvement Démocratique Républicain* (MDR). Pasteur Bizimungu became the President, Major General Paul Kagame, Vice President and Minister of Defence and Faustin Twagiramungu, Prime Minister. Weeks later, a 70-member Transitional National Assembly was formed consisting of representatives of the RPF,

the four other original parties plus three other smaller parties, namely, the *Parti Démocratique Islamique* (PDI), the *Parti Socialiste Rwandais* (PSR), and the *Union Démocratique du Peuple Rwandais* (UDPR), as well as six representatives of the RPA.



Application activity 14.2

1. Search on internet or other documents the Arusha Peace Agreement and read the Protocol of Agreement on the rule of law. Can you claim that the Arusha Peace Agreement (see the Protocol of Agreement on the rule of law) had innovative strategies for building a better and peaceful Rwanda? Explain your statement.
2. Make a summary of events which have marked the course of the liberation war in Rwanda from 1990 up to 1994.

14.3 The effects of the 1990 – 1994 liberation war in Rwanda



Learning Activity 14.3

From 1990 up to 1994, Rwanda was under the liberation war initiated by RPF Inkotanyi on the 1st October 1990. Analyze the effects brought by that war in Rwanda by using internet or textbooks.

The loss of lives and destruction of properties

Since the war started, there was increase of insecurity in Rwanda; in fighting areas some soldiers could shoot at people; ransack their houses and rape girls and women. In addition, due to the fighting, a number of people were killed and others wounded including soldiers and civilians. The killings led to the problem of orphans and widows.

In some areas, the reaction of the Habyarimana's government was to attack and kill the Tutsi population of the interior of the country. For instance, from 1991 to 1993, there were the massacre of Abagogwe social group in retaliation against an RPA attacks. The similar killings were also done in Kibirira, Bugesera, Kibuye, Murambi and in Umutara. These killings were also seen by some analysts as a strategy of strengthening the Habyarimana regime in difficult conditions and uniting all Hutu against a same enemy.

By this war, some public infrastructures like offices, roads and bridges, specifically in the northern regions of Rwanda were destroyed. Besides, the private properties were also destroyed like houses and shops.

The decline of the Rwandan economy

The war and the pressure on Habyarimana's regime led to the collapse of the Rwandan economy. The prices of main export commodities such as coffee decreased at the international market thus the country witnessed a hard economic situation. Besides, foreign aid decreased and the *franc rwandais* (Rwandan franc) lost its value. Main sectors of economic activities declined and Rwandans' financial conditions worsened. In fact, because of the war, the North corridor was closed and this led to the stoppage of commercial exchange with Uganda. The war also increased the military expenditure of the Government of Rwanda and the military expenses kept impoverishing the country.

Displacement and exile of many people

Due to the fighting during the 1990 – 1994 liberation war; more than one million Rwandans fleeing the battle fields were displaced inside the country and they were not working. These Rwandans were in great need of shelter, food and other basic needs to use in their daily life. At the end of the war, Government officials, soldiers and militia fled to the DRC, ex-Zaire, Tanzania and Burundi taking with them millions of civilians. Thousands of them died of water-borne diseases.



A picture of the Rwandan refugees 'camp at Goma in East of Zaire (Today Democratic Republic of Congo).

Source: https://upload.wikimedia.org/wikipedia/commons/f/f0/Rwandan_refugee_camp_in_east_Zaire.jpg

Apart from the negative effects brought by the Liberation war fought from 1990 to 1994, on the other side, this war also brought positive results to the Rwandan society as stated in the following paragraphs.

Restoration of national unity: Thanks to the liberation war won by RPF, many achievements were made in the matter of building the national unity like equal justice, peace and security, end of segregation, etc.

Fighting against the public malpractice: The RPF Inkotanyi aimed at Fighting against the corruption, favoritism and embezzlement as they were the result of the liberation war.

Improvement of the image of Rwanda: The 1990 - 1994 liberation war contributed to the improvement of the righteous image of the country. Rwandans are well-known all over the world as a good example of reconciliation, people living together on the same land, victims and criminals, after the 1994 genocide against the Tutsi.

Promotion of good diplomatic relations with other countries: By the end of the 1990 – 1994 liberation, the country promoted international relations based on mutual respect, cooperation and mutual economic exchange. This helped the country to reduce economic and political dependency towards foreign countries.



Application activity 14.3

The Liberation war of 1990 – 1994 has positively and negatively affected the Rwandan society. Explain.



End unit assessment 14

1. Different factors justify the reasons which led to the outbreak of the 1990 – 1994 liberation war in Rwanda. Identify and explain them.
2. Compare and contrast the RANU's program to the RPF Inkotanyi's program.
3. The 1990 – 1994 liberation war was fought into different stages. Describe the course of the liberation war.
4. Assess the output of the liberation war of 1990 – 1994.

UNIT 15:

THE 1994 GENOCIDE AGAINST THE TUTSI

Key Unit competence: The student-teacher should be able to explain the causes, course and consequences of the genocide against the Tutsi.



Introductory Activity

The 1994 genocide against the Tutsi was a carefully planned and executed exercise to annihilate Rwandan Tutsi population and moderate Hutu who did not agree with the prevailing extremist politics of the time. It was the fastest and cruelest genocide ever recorded in human history whose atrocities have torn the hearts of the survivors. Many books and movies have been produced on 1994 Genocide against the Tutsi in Rwanda. Using them, analyze the causes that led to this Genocide, its course and effects.

15.1. Causes of Genocide against Tutsi in Rwanda



Learning Activity 15.1

Using various documents and movies talking about Genocide against Tutsi in Rwanda, analyze the causes of the genocide against Tutsi in Rwanda.

It is so hard to identify the roots and causes of the 1994 genocide against the Tutsi in Rwanda in reference to the bonds that linked Rwandans before the coming of colonizers. In fact, during this period, all Rwandans were united and shared the elements for national cohesion like same king, clan, language, ideal or values, same army, culture and same country. But the following facts had contributed to the disunity of Banyarwanda and led to the genocide:

The loss of cultural identity

The influence of colonial education is responsible for the derision and diminution of the Rwandan culture. The colonial education made Rwandans adopt Western culture at the expense of their own. They were conditioned to regard his traditional as archaic and barbaric.

During the colonial period, the colonial masters deliberately applied a policy of “divide and rule”. The colonialists took the Tutsi and Hutu as two distinct “ethnic groups” instead of looking them as two social categories. The loss of their common cultural identity and the policy of divide and rule resulted in the first pogroms and massacres of 1959 and very far to the 1994 genocide against the Tutsi.

The hatred culture of Rwandans vis-à-vis other Rwandans under the two Republics

Rooted from colonial period and because of bad leadership under the First and the Second Republics, the hatred culture was promoted and supported by divisionism worsened by regionalism and nepotism. This undermined the national unity among the Rwandans.

Hatred indicators showed through vilification and name calling that Rwandans were accustomed to using while addressing each other. Such names like “snake, enemy, malicious, fake, false, robber...” All that fueled hatred against each other.

Institutionalization of untruthfulness and the culture of impunity

Under the two Republics, the crimes were committed with the beliefs that the culprits will never be apprehended. Indeed, some people who committed big and atrocious crimes were rewarded by being promoted to important administrative positions. Corruption, favoritism, cheating, embezzlement and diversion of public funds, suspicion and mistrust were common.

The poor management of resources and poor conditions of life

In Rwanda, there was an imbalance between the demographic growth and economic production. This imbalance appeared, in particular, in the insufficiency of the resources allocated to health care, education and environmental conservation. This affected population welfare. However, the problem did not come from the population, but rather from poor management of the available resources and denial of other to share the little available hence to eliminate, on part of Rwandans, in hope to be satisfied.

The social inequality

During the colonial period, the colonizers had favored the Tutsi aristocracy which was in power and their children to the detriment of the social classes. When their alliance broke up in the period of 1950s, the colonizers recognized that they had committed error by supporting the Tutsi on power considered as “minority” (*“Rubanda nyamuke”*) and rejecting the Hutu, the “majority” (*“Rubanda nyamwinshi”*). Those ideas were the origin of the events of 1959 known and so called “the 1959 revolution” characterized by mass killings against the Tutsi.

Under the two Republics, the social inequality was maintained and encouraged by exclusion and favoritism. It was under the Second Republic that the policy of “ethnic and regionalism balance” was introduced. The people were encouraged to safeguard the “results of the 1959 revolution and 1962 independence”. On their climax led to the massacres of 1990 – 1993, preparing the 1994 genocide against the Tutsi.

The ethnic based ideology

All the above mentioned causes could not lead to a crime of genocide without any genocidal ideology. The genocidal ideology in Rwanda had many functions as elsewhere like the proposal of the situation interpretation, the indication or point out the authors of this situation and mobilization or collective sensitization for fighting against the threats.

The genocidal ideology identified the two antagonist groups like “Us” and “Them” or “You” and after having proceeded by the nomination or qualification of those two groups.

From 1990 with the attack of RPF – Inkotanyi, the ideological speeches pointed out the “double threat presented by the Tutsi (of internal and of external) against the Hutu”. Between 1990 and 1994, the Tutsi have been qualified as the “enemy”, “outsiders” and “suspected” complots. From those qualifications, many newspapers and medias in general, called upon all Hutu for their self-defense, “to kill before being killed”.

Beside, the presentation of the threats against the Hutu. Another act was the dehumanization or qualification of enemy not as humankind but as an animal. Not also a normal animal but very harmful and very dangerous to the person like rats, snakes or cockroaches. The aim was to incite to direct and public or mass reactions against the “common enemy of the Hutu”, the Tutsi.

This shows that a genocide crime before being act of physical destruction of enemy, the genocidal ideology begins by the mental construction developing the vision of a “group-enemy” to be exterminated.



Application activity 15.1

1. Analyze the role of media in propagating the hate that led to genocide against Tutsi in Rwanda.
2. Evaluate the reason why Genocide against Tutsi was possible in Rwanda.

15.2. Course of the Genocide against the Tutsi



Learning Activity 15.2

Use internet and various documents, describe the course of the 1994 genocide against the Tutsi.

Genocide against the Tutsi started in the night of 6th April 1994, immediately after the crash of the Presidential airplane. Planners of the genocide saw in the death of the president a precious occasion to carry out a general genocide of the Tutsi as well as physical and ideological elimination of Hutu in the opposition. The attack against the presidential plane and his shooting down took place in the Kanombe military zone.

From the early hours of 7th April 1994, following the power vacuum and incitement from the media and genocidal planners, the *presidential guards*, *Interahamwe* and *Impuzamugambi* militias started a systematic elimination of Tutsi and key political personalities of the opposition. By the mid-morning of 7th April, 1994, the genocide movement had already spread to various regions of Rwanda.



Interahamwe militia

Source: Aegist Trust

On same date of April 7th, 1994 there was a meeting of the High Command of the F.A.R (Forces Armées Rwandaise) at E.S.M (Ecole Supérieure Militaire) after which “*Hirondelle operation*” was adopted. It considered of violating the cease-fire and breaking the fighting against RPF. By this operation, the Kigali City was “cleaned” using the list of the people to be killed just established.

On 8th April 1994, while an open campaign to massacre the Tutsi was going on in Kigali city and other regions of the country, a new government was installed. The former president of CND (*Conseil National de Développement*) and member of MRND, Théodore Sindikubwabo was made President of the Republic. Jean Kambanda, from the extremist wing of MDR known as *Hutu power* became head of the government that was exclusively made up of ministers belonging to extremist factions that were in favor of the genocide against the Tutsi.

On 9th April, an official communiqué announced the formation of a new government made up of extremist leaders of five parties, four of which belonged to the so-called opposition (MDR, PSD, PL and PDC). The four political parties were represented in the government because of their “power” element that was favorable to the genocide.

As soon as they started exercising power, the new authorities spent time allowing the genocide to spread and materialize with efficiency. It was in these context that southern and central regions of Rwanda embroiled in genocidal violence from 9th April 1994. By installing a government comprising personalities from the south and center of the country, the genocide organizers were looking for submission of the regions as well as entangling them into the genocide.

In order to prove their aptitude in executing their functions, the new leaders incited the population to exterminate the Tutsi from their regions of origin. During the meetings which were organized at various administration levels, these leaders emphasized two ideas. The first one was to attribute to the Tutsi responsibility of the war and other misfortunes suffered by the Hutus. These ideas provided a fertile ground for resentment, aggravated hatred and justified the commitment to kill without any state of mind.

In a meeting held on the 11th April 1994, the interim Prime Minister Kambanda Jean called on leaders at *L'Hôtel des Diplomates* in Kigali, apart from Jean Baptiste Habyalimana, the leader of Butare Province, to apply in their respective Prefectures “*Hirondelle operation*”. He also openly called for “*Insecticide operation*” and what he called “the final solution” aimed at systematic extermination of the Tutsi and their accomplices, without “sparing neither babies, nor women, nor aged people as the insecticide does to

cockroaches. It was after this meeting that genocide spread throughout the whole country. It was “*Apocalypse*” promised one day by Colonel Théoneste Bagosora.



The members of the government “Abatabazi” with Sindikubwabo Theodore as President and Jean Kambanda as Prime Minister

The night of April 6th – 11th, 1994, there was assassination of Prime Minister Uwiringiyimana Agatha, 10 Belgian of UN Peacekeeper soldiers, several ministers, opposition political leaders, businessmen and civil servants in Kigali City.



Prime Minister Agathe Uwiringiyimana (18 July 1993 – 7 April 1994)

Source: <https://www.youtube.com/watch?v=mi4T0ojFbmY>

After the 11th April 1994 horror had spread throughout the entire country except Gitarama and Butare Prefectures.

April 12th, 1994, the government of Kambanda auto called “*Abatabazi*” fled the capital of Kigali due to the advance of the RPF – Inkotanyi and settled in Gitarama, at Murambi.

April 19th, 1994; Butare plunged into genocide and massacres after the inflaming speech of President Sindikubwayo Théodore after the dismissal of the Prefet of Butare. After April 21st, it was now the turn of Gitarama to sink low in Genocide after the dismissal of Uwizeye Fidel (Préfet) by Jean Kambanda.

To ensure that the massacres were carried out rapidly and effectively some elements of the Presidential Guard were deployed in Butare Province. Thus, in the course of the week from 19th to 26th April, the province had already lost more than 150,000 Tutsi. On 2nd July 1994, when Butare town fell to the RPF Armed Forces, it had more than 230,000 genocide victims.

In order to accelerate the massacre and ensure extermination of the Tutsi, the government had distributed large quantities of arms and ammunition to the militia and local population under the guise of “*civil self-defense*”. It was in this context that the so-called *security* system was strengthened.

Security measures consisted of mainly setting up road-blocks, checking identity cards and putting to death all Tutsi. The aim of this security action plan was to exterminate the Tutsi in the shortest possible time. All along the genocide, RTLM and the National Radio guided the killings. They called upon the population to erect barriers and to proceed on a systematic search to ensure that no Tutsi escapes the massacre. They provided precise targets and zones to attack.

Finally, it should be noted that it was the RPF – Inkotanyi soldiers who stopped the genocide and everywhere they were scored victory over the genocidal forces. It was on 4th July 1994 with the liberation of Kigali City and Butare that the 1990 – 1994 liberation War was generally over and genocide stopped.



Application activity 15.2

1. Explicate the “Hirondelle operation”.
2. Explain the role played by the following leaders in preparation and execution of the 1994 genocide against the Tutsi: Kambanda Jean and Sindikubwabo Théodore

15.3. Effects of Genocide against the Tutsi



Learning Activity 15.3

Read different documents or use internet assess the effects of the 1994 genocide against the Tutsi.

The consequences of the genocide are numerous at all levels of life and the most negative impact of the 1994 genocide against Tutsi is the human disaster never seen in the country. In fact, more than one million of men, women and children had been killed in 100 days.

The genocide against the Tutsi led to the destruction of infrastructures and equipment where the public properties like offices, communication lines, etc. and private properties as the houses were massively destroyed.

Another consequence of the 1994 genocide against Tutsi is physical mutilations. During the genocide, the perpetrators did not only kill the victims but they also damaged the body of some Tutsi who managed to survive.

The 1994 genocide against Tutsi led to a high level of psychological trauma. This situation was caused by the sexual abuse like raping and torturing of the victims by the killers.

Excessive degradation of human dignity this was due to inhuman crimes committed during this genocide like cannibalism, raping even the burial of alive people in some areas. In some areas also the killers mutilated the body of victims.

In addition, the 1994 genocide against Tutsi had caused the devastation of the environment. For instance, many forests had been cut down, huge plantations had also been damaged, and number of domestic animals belonging to the Tutsi had also been slaughtered and consumed.

There is also increase in the HIV/AIDS prevalence in post genocidal period because during the genocide against the Tutsi, the perpetrators used the rape of women and girls as their weapon.

The 1994 genocide against the Tutsi led to the decadence of the country's economy. During the period of genocide, most of the active population was involved in committing it, the economic activities were abandoned because the perpetrators were killing the Tutsi while the victims obviously could not work and participate in such economic activities.

Disgrace of Rwanda's international image: after the genocide against the Tutsi, the image of country was only seen in negative sense by considering almost all the Rwandans as the killers. The Rwanda was also seen as a country totally destroyed and without any humanity.

Rapid increase of the number of widows and orphans and that of the disabled people: the genocide against the Tutsi led to the death of more than one million of the Tutsi and left many widows and orphans who had lost their family's members.

At the end of the 1994 genocide against Tutsi, more than one hundred thousand suspected of having participated in committing genocide had been apprehended and imprisoned. Considering the big number of these prisoners who waited to be judged, it was difficult to give justice to both victims and prisoners in a reasonable period.



Application activity 15.3

1. The 1994 genocide against the Tutsi led to both human and environmental disaster. Explain this statement.
2. The 1994 genocide against the Tutsi had a very bad impact in the sector of justice. Discuss this assertion.
3. Women are the category of people which deeply suffered during the 1994 genocide against the Tutsi. Write down a text of 200 words to explain how this happened.



Skills lab

Assess the 1994 genocide against the Tutsi.



End unit assessment

1. Analyze different stages that led to the outbreak of the 1994 genocide against the Tutsi.
2. Discuss the role played by international community in the 1994 genocide against Tutsi.
3. Explain why the genocide against the Tutsi started later in the Prefecture of Butare.
4. Describe the cruelty of the 1994 genocide against the Tutsi.

UNIT 16:

BASIC ECONOMIC CONCEPTS AND THE IMPORTANCE OF ECONOMICS

Key Unit Competence: Be able to use the basic concepts of economics appropriately and appreciate the role of economics in society.



Introductory Activity 16

Kamaliza and Kamanzi, born of Mr. and Mrs. Niyorembo, are both boarding students in form 4 in upper secondary. On top of asking for many items they want for school, they also want to be escorted by their parents up to school on the day of opening. Mr. and Mrs. Niyorembo, have always provided Kamaliza and Kamanzi what is most necessary for their studying, leaving other items unprovided for. They have also always failed to get time to escort them since they have got tight schedules at their work places. Kamaliza and Kamanzi, at first, were always annoyed of their parents not escorting them and not providing all they wanted from them at the time of need. The two parents sat down their children and showed them how it is always wise to fulfill the most pressing things first with the little resources they have. They also made them understand that their work schedule was too tight to always let them be escorted to school. Kamaliza and Kamanzi therefore, have gotten used and always taken what is given to them as long as it is basic to their life as well as studying. They have appreciated their parents' role in endeavoring to show them a sense of direction and up bringing them into responsible and watchful citizens.

From the above scenario, in groups, share your views on;

- Why you think Mr. and Mrs. Niyorembo would not provide all that their children requested for at the time they were asked to.
- List down the so many things you require or even need to do in life. Would you full fill them at ago? Do you access or do them at any time you want? Justify.
- Identify the field of study you would put the above scenario.
- Who needs the knowledge of economics and when?

16.1. Meaning and origin of economics

16.1.1 Meaning of Economics:



Activity 16.1

- a) On pieces of paper, write down what you understand by the term Economics.
- b) By research, find out what was said by Adam Smith, John Stuart Mill, Alfred Marshall, Lionel Robins about economics?
- c) Analyse the different definitions researched on and describe the difference amongst them.
- d) Describe the origin of economics.

Many people hear the word “economics” and think it is all about money. Economics is not just about money. It is about weighing different choices or alternatives. Some of those important choices involve money, but most do not. Most of your daily, monthly, or life choices have nothing to do with money, yet they are still the subject of economics. For example, your decisions about whether it should be you or your roommate who should be the one to clean up or do the dishes, whether you should spend an hour a week volunteering for a worthy charity or send them a little money via your cell phone, or whether you should take a job so you can help support your siblings or parents or save for your future are all economic decisions. In many cases, money is merely a helpful tool or just a veil, standing in for a partial way to evaluate some of the goals you really care about and how you make choices about those goals. Therefore, economics is a wider thing than just use of money in daily life.

For that reason, therefore, there is no single definition of economics upon which all the economists are mutually agreed. Every definition is criticized by the different economists from different angles. Therefore, it is difficult to describe the subject matter of economics in a few words, and proper definition of economics is still a question mark. However, several economists have defined Economics differently in the following ways;

1. **Alfred Marshall** defined Economics as “a study of man in the ordinary business of life”. It enquires how man gets his income and how he uses it. Thus, it is on one side, the study of wealth and on the other and more important side, a part of the study of man.
2. **Adam Smith** defined Economics “as the study of the nature and causes of wealth of nations and the means through which we can increase production”.

3. **J.S. Mill defined** Economics as “a practical science of production and distribution of wealth and problems involved in production and distribution.”
4. **Jean Baptiste Say**, defined Economics as “the science of production, distribution and consumption of wealth”.
5. **Lionel Robbins** defined Economics as “a science which studies human behaviour as a relationship between ends and scarce means which have alternative uses”.

From the above definitions, many economists consider Robbins’ definition the most appropriate. This is because:

- It gives the fundamental causes of the economic problems such as unlimited human needs, limited means to satisfy man’s needs, the alternative uses for the resources and the different importance of wants.
- Robbins’ definition emphasizes scarcity as a foundation of Economics, otherwise without scarcity, there would be no Economics.
- Man’s problem is not accumulating wealth, but satisfaction of human needs.

16.1.2: Origin of economics

The modern word “Economics” has its origin in the Greek word “**Oikonomos**” meaning a steward. This word can be divided into two parts, “**Oikos**”, meaning a house and “**nomos**”, meaning a manager. The sum up of the two words is what economics is all about. Literally, Oikonomos means house manager.

There is an economic aspect to almost any topic we mention – education, employment, housing, transport, and defense. Economics has developed into a comprehensive theory of how the society works. But as such, it is difficult to define. Economics developed as a separate discipline from moral viewpoint in an attempt to understand how man undertook decisions on production and consumption so as to maximize profits and utility respectively.

The classical economists, especially Alfred Marshal defined economics as the “Study of man in the ordinary business life”. This definition appears too vague based on what Economics is concerned with. Any definition should take account of the guiding idea in Economics, which is scarcity. The great American economist Paul Samuelson thus defined it as: “The study of how people and society choose to employ scarce resources that could have alternative uses, in order to produce various commodities and to distribute them for consumption, now or in future amongst various persons and groups in society.

The study of Economics basically rotated and still rotates around the problem of scarcity. All resources are scarce. The resources are not enough to fill everyone's wants to the point of satiety. Therefore, the concern of Economics is all about how man can make the right choice to utilize the scarce resources to meet his unlimited needs.

Economics is thus based on four fundamental characteristics of human existence and investigating what happens when they all exist together. First, the needs of human beings are without limit. Second, those needs vary in value or importance. Third, the resources available for satisfying those needs are limited. Fourth, the resources have alternative uses. . As a result a right decision has to be made on how to use limited resources which have alternative uses to satisfy unlimited human needs.



Application activity 16.1

- a) After the research and discussions carried out, what do you understand by the term Economics?
- b) What is the major basis of economics?
- c) Describe the origin of economics.

16.1.3: Importance of studying economics.



Activity 16.2

- a) Identify the possible professions you would pursue for higher studies after the study of Economics course in TTC
- b) Explain how Economics will prepare you to pursue those professions in future.
- c) Explain how the study of Economics will help you to identify and interpret the effects of the major economic events and problems that have taken place in your society or country.
- d) Explain how you can find solutions to the problems identified above.

The study of Economics is important to the learner and the society in the following ways;

- As a career subject, Economics prepares students for further academic and professional qualifications in fields like Commerce, Statistics,

Mathematics and Environmental Sciences, among others.

- It equips learners with the knowledge regarding what takes place in the world of business.
- It makes it possible for learners to understand and appreciate economic problems existing in their countries, regions and the world, thereby finding solutions to those problems.
- It equips learners with the knowledge and skills required for them to fully participate in the economic activities aimed at developing their economies.
- It enables learners understand the scarcity of resources and get knowledge on how the available resources can be utilized maximally.
- It enables learners to understand the basic economic concepts and principles of Economics and how to apply them in daily life.
- It prepares learners for employment in various fields such as policy makers and economic planners, hence improving their livelihoods.
- The study of economics can also provide valuable knowledge for making decisions in everyday life. It offers a tool with which to approach questions about the desirability of a particular financial investment opportunity, the benefits and costs of alternative careers, and the likely impacts of public policies like universal health care and a higher minimum wage.
- The study of economics enables us to become critical consumers of statistically based arguments about numerous public and private issues rather than passive recipients unable to sift through the statistics.
- Study of economics helps a person in understanding of human behaviour and in cultivating analytical and argumentative skills that are crucial in the present-day labour market.



Application activity 16.2

How is the study of economics helpful to you and the entire economy?

16. 2. Basic terms used in economics;



Activity 16.3

Visit the library and undertake research on the following:

- a) Meaning of price, commodities, goods, services and market.
- b) Difference between wealth and welfare.
- c) Difference between needs and wants.
- d) Resources
- e) Meaning and components of economic agents.
- f) Identify forms, characteristics, advantages and disadvantages of different economic systems.

Write down your research findings. Present your findings to the whole class

16.2.1: Price

Price is the relative monetary value of a good, service or resource established during a transaction. Or it can also be referred to as the rate at which a commodity is exchanged in the market.

Types of prices

- a) Market price: This refers to any price existing in the market at a particular period of time, regardless of how it is determined.
- b) Equilibrium price: This is the price established in the market when quantity demanded is equal to quantity supplied. Such prices change from time to time as determined by the market forces of demand and supply.
- c) Normal price: This refers to the long run established price after a long period of price fluctuations.
- d) Reserve price: This refers to a minimum price acceptable to a producer or a seller in order to sell the commodity.

16.2.2: Commodities.

A commodity is anything that comes about as a result of production. It is a general term that refers to goods and services collectively.

16.2.3: Services

A service is an intangible commodity that satisfies human wants e.g. education, entertainment, transport, tourism, medication, telecommunication etc. Services are intangible and thus cannot be stored and don't result in ownership by the buyer.

16.2.4: Goods

These are tangible items that satisfy human desires. For example, food, uniform, desks, school bag, plates, mattress, television, vehicles etc. Goods can be of the following types.

- a) Economic goods.** These are goods which are relatively scarce in supply and have opportunity cost. They are paid for i.e. have money value and provide satisfaction to the consumers. E.g. cars, uniform, shoes, bags etc.
- b) Free goods.** These are goods that are naturally in abundant supply, they are not paid for, and provide satisfaction to the consumers. E.g. sunshine, rain water, air etc. They have no opportunity cost or price to produce or consume them. Music is also a free service because, once a song is composed, everyone is free to sing the tune.
- c) Public goods.** These are goods that one individual can consume without reducing its availability to others and from which no one is deprived. They can also be defined as goods that are owned and enjoyed collectively by the whole society. Examples of public goods include roads, law enforcement, national defense, public parks, public clocks, bridges, streetlights. They are characterized by the following; they are “non-rivalrous” (don't reduce or run out in supply as people consume them), they are “non-excludable,” (available to all and cannot be withheld, even from people who do not contribute to their public funding.) and non-divisible (provided in totality and therefore benefits everyone).
- d) Private goods.** These are goods that are exclusively purchased and owned for consumption by an individual. Their consumption by one individual prevents another individual from consuming them. Private goods are rivalrous, excludable and divisible. For example, personal cars, houses, shirts, dresses etc. The majority of private goods must be purchased for a cost. This cost offsets the fact that the use of the good by one prevents the use of the good by another. Purchasing the item secures the right to consume it.

- e) **Normal goods:** These are goods whose demand increases as the consumer's income increases and vice versa. Examples of normal goods include food staples, clothing, and household appliances.
- f) **Inferior goods:** Inferior goods are goods whose demand drops as consumers' incomes rise. In other words, as consumers' incomes rise, they would rather have a more costly alternative than inferior goods. However, the term "inferior" doesn't refer to quality, but rather, affordability.
- g) **Merit goods:** These are goods which an individual or society should consume on the basis of its importance rather than the ability to pay for it. A merit good can also be taken as a good which when consumed provides external benefits to the society, although these may not be fully recognized. Examples include education, safe water, healthcare. This implies that, when consumed, a merit good creates positive externalities i.e. the public benefit is greater than the private benefit.
- h) **Demerit goods:** A demerit good is a good or service whose consumption is considered unhealthy, degrading, or otherwise socially undesirable due to the perceived negative effects on the consumers themselves and the entire society. A demerit good can have a negative impact because it is harmful, unhealthy to the individual consumer or has negative externalities. (Costs imposed on third parties) Examples of demerit goods are, alcohol, cigarettes, drugs, junk food, gambling, prostitution etc.
- i) **Capital goods:** These are any tangible assets used by one business to produce goods or services as an input for other businesses to produce consumer goods. They are also known as intermediate goods, durable goods, or economic capital. The most common capital goods are properties, plants, and equipments or fixed assets such as buildings, machinery and equipment, tools, and vehicles.
- j) **Consumer Goods:** A consumer good is any good purchased for consumption and not used later for the production of another consumer good. Consumer goods are sometimes called final goods because they end up in the hands of the consumer or the end user. Examples of consumer goods include food, clothing, vehicles, electronics, and appliances. Consumer goods can be durable goods (have a lifespan of more than three years), nondurable goods (meant for immediate consumption with a lifespan of less than three years), and services (Haircuts, entertainment, and car repairs).

16.2.5: Market

It can be taken as an arrangement between buyers and sellers to carry out transaction. Market is not a place because it can take place anywhere. A market is one of the many varieties of systems, institutions, procedures, social relations and infrastructures whereby parties (sellers and buyers) engage in exchange. Markets can be either local/ domestic or international/ foreign. A market is characterized by the following essentials; buyers, sellers, medium of exchange (money) and goods and services.

16.2.6: Wealth

Wealth refers to the stock of valuable assets held by an individual (individual wealth), a firm/an organisation (business wealth) or a country (social wealth), at any particular moment of time. Wealth is characterized by the following;

- a) It has value: Wealth can be expressed in monetary terms.
- b) It is relatively scarce: Wealth is not found easily.
- c) It is transferable: Wealth can change ownership and possession from time to time.
- d) It possesses utility: Wealth gives satisfaction to the owner.

16.2.7: Welfare

This refers to the wellbeing of people. It's the satisfaction that the individual or society derives from wealth. Welfare is dependent on factors like employment, income distribution, labor conditions, leisure time, production and the scarce possible uses of the environmental functions. Economic welfare is the level of prosperity and standard of living of either an individual or a group of persons. In the field of economics, it specifically refers to utility gained through the achievement of material goods and services.



Activity 16.4

On a monthly basis, Mr. Munana has a list of items that he has to satisfy with his monthly earnings. From his income, he has to pay rent, food, school fees for his children, medication and transport to and from work. He also wishes to buy a smart phone, go out for a picnic with his family, buy jewelries for his wife and plait his daughter's hair.

Required;

- a) Based on the above scenario, identify Mr. Munana's needs and wants.
- b) Which of the two is basic and which is not? Support your answer.
- c) Suppose you are the one, which ones (from (a) above) would you satisfy first? Justify your answer.

16.2.8: Needs

Needs are things that man cannot live without. Or these are things that we must have to survive. They are basic to being alive. For example, water, food, shelter, clothing, medical care etc.

16.2.9: Wants

These are human desires that man can live without. These are things that one wishes to have but which may not threaten one's existence. They are things that make life pleasurable or comfortable. E.g. mobile phones, cars, radio, TVs etc. wants may be material, immaterial, private or public. The following are the characteristics of wants:

- i. Wants are unlimited i.e. they are many.
- ii. They are insatiable: i.e. It is impossible to satisfy all human wants.
- iii. They are dynamic. I.e. they change with time, age and place.
- iv. They are competitive: i.e. they compete with each other for available resources.
- v. They are completely interdependent: i.e. The satisfaction of one want may result into satisfaction of another. E.g. The decision to buy a car satisfies the human desire for transport but in the due course, it also satisfies the human desire for prestige in society.

16.2.10 Resources.

These are means of production or inputs to production. They are at times referred to as factors of production. Resources can be natural (e.g. land), human resource (labour and entrepreneurship) or man-made (capital).

16.2.11 Economic agents:

These are units that undertake economic activities in an economy. They are decision taking units in the economy. Each nation's economy is composed of four major sectors plus its interaction with all foreign economies, which is the fifth sector known as the foreign sector. Economic agents include:

- **The households** who are the suppliers of resources and consumers of commodities.
- **The firms** which acquire and transform raw resources into useful goods and services which are then sold to consumers/ households or other firms for a profit.
- **The Financial sector** which includes all the non-industrial firms whose sole purpose is financial intermediation and financial services (deposits, lending, and payment and investment services) like commercial banks, investment bank, brokers, financial companies and insurance companies.
- **The government** which has legal and political power to control firms, financial sector and households; directs, controls, stabilizes and regulates the activities of firms, households, and foreign sector through taxation, subsidization and borrowing.
- **The foreign sector** which produces goods and services for sale to other countries (exports) and buying goods and services from other countries (imports).

16.2.12: Economic Systems:



Application activity 16.3

1. Categorize the following products into goods and services, share your views to your seatmate, with supporting reasons.
2. Cars, education, healthcare, houses, communication, chairs, beds, refrigerators flasks, textbook, pens, tourism, entertainment, banking, research.
3. Examine the contribution of each economic agent towards the development of the economy.



Activity 16.5

In different countries, the way resources are owned, controlled, allocated and the general distribution of goods and services is different. In some countries, resources are owned and controlled by individuals with limited or no government intervention, in others they are owned, controlled and distributed by the government while in some others both the private individuals and the government own and participate in resource allocation. Basing on this case study, visit the library, carry out research and in general class discussion;

- a) Explain the meaning of an economic system.
- b) Identify the major economic systems that exist in the world.
- c) Discuss the characteristics of the economic systems mentioned above
- d) Discuss, briefly, the advantages and disadvantages of each economic system named above.

Economic systems refer to the ways economic agents are organized to form one organized unit of an economy. It shows how societies determine ownership, direction and allocation of resources in their economies. Each society has its own system of resource allocation which can be seen as below;

a) Free enterprise/ free market/ laissez faire/ unplanned/ capitalistic economy:

This is an economic system where productive resources are privately owned and economic decisions are highly guided by forces of demand and supply. In such economic system productive resources are entirely owned, distributed and allocated by private individuals without government interference.

Characteristics of a free enterprise market:

- Private ownership of productive resources e.g. land.
- An individual has the power to exploit others through the activities they do.
- The producers aim at profit maximization. ie resource allocation and economic decision are based on profit motive.
- There is stiff competition in an attempt to acquire high profits thus quality improvement and efficiency.

- The ineffective persons and those without resources are allowed to remain poor or even made poorer.
- There is consumer sovereignty (freedom) i.e. Consumer is the king implying that he has the capacity to influence the productive decisions of the producers.
- An entrepreneur is free to choose any economic activity in which to invest his/ her capital.
- There is no government intervention in resource allocation.
- The allocation of resources is controlled by the invisible hand of the market that operates through demand and supply for commodities and their prices.
- Freedom to accumulate riches makes man more individualistic.
- One's ability and energy to access wealth will determine the level of his/her welfare.

Advantages of a free enterprise economic system.

- The system is automatic and doesn't require government intervention i.e. the government satisfies collective wants but does not compete with private firms.
- It promotes consumer sovereignty i.e. the consumer has absolute power to determine the nature of goods to be produced, when to produce them, through their buying habits, how they want them and at the price they can afford.
- The factors of production are privately owned and production takes place at the initiative of private enterprises. This encourages more people to join the different lines of production thus creating employment opportunities.
- The existence of profit motive makes people and firms to work hard to produce goods and services. It motivates producers or entrepreneurs to produce goods and services.
- There is more flexibility in the system since there are no fixed laws imposed by the government.
- Freedom of entry into the production process by private producers promotes competition among producers. This in turn leads to production of more and better quality output at lower prices.
- It allows efficient allocation of resources to the most efficient uses from the least efficient uses.
- There is great responsibility by the private sector as individuals which leads to the production of high quality goods and services

- It encourages development of entrepreneurship in an economy due to free entry and exit and this leads to increased levels of output in the economy
- Government is left with enough time and resources to concentrate on law making and defense due to reduced role of the government in the system.
- There is a wide variety of commodities produced due to many producers engaged in production and this increases consumer's choice.

Disadvantages / Short comings of free market economy

- Creation of monopoly firms when inefficient firms are pushed out of the business due high degree of competition. Monopoly firms exploit the consumers through high prices and low quality.
- In a free market system, focus is on private benefits which give rise to social costs like pollution and noise that lead to poor welfare.
- People with low incomes have to go without some goods and services because the demand structure may reflect the needs of only one particular group i.e a high income group.
- It leads to unemployment once inefficient firms are knocked out of production.
- At times the process of adjustment may take long and the society may suffer.
- Essential goods which are not profitable may not be produced in such economic system because producers only aim profit maximize.
- There is over exploitation of resources in such economic system which leads to quick resource exhaustion because producers only aim profit maximization.
- The government may get difficulties in implementing some of its good policies in the economic system since all resource ownership, distribution and allocation is in hands of private individuals.
- Income inequalities arise in the economy plus all its negative effects because in such system producers always charge prices differently.

b) Centrally planned/Centralized/Planned/Socialistic/Command economy.

Centralized economy refers to the economy where resource ownership, distribution and allocation is done by the government on behalf of its citizens.

c) Features of a planned economy:

1. Resources are owned and allocated by the government.
2. Private individuals are not allowed to own resources.
3. Government makes the economic decisions.
4. Government determines the price of goods and services.
5. Government controls all aspects of economic production. i.e. Government decides what to produce and how to produce.
6. The government sets the priorities for production of all goods and services.
7. Government creates laws, regulations and directives to enforce the central plan.

Merits/Advantages of centrally planned/Socialistic/Centralized/Planned economy.

1. There is limited consumer exploitation because prices are controlled by the government.
2. Social costs like pollution can easily be controlled by the government.
3. There is provision of public goods like roads which cannot easily be provided by private individuals because they are non-profitable.
4. There is provision of essential goods and services by the government at low prices because the government aims at social welfare of people.
5. It leads to equal distribution of income in an economy. This is because resource allocation and distribution is done by government.
6. It leads to economic stability since resource allocation and distribution is done by government.
7. It reduces the powers of private monopolies since there is government regulation of monopoly practices. For instance the government fixes prices in the markets..
8. There is proper utilization of resources due to government intervention.
9. There is preservation of nature and general environment from individual activities like pollution.

Demerits/ disadvantages of command economy

1. There is provision of poor-quality goods and services because there is limited competition.
2. There is limited consumer's choice because it's the government to determine what to be produced.
3. There is also misallocation of resources because resources may be allocated due to political motives.
4. It also causes unemployment because government is the only employer since all resources are owned and distributed by the government.
5. It also leads to delay in decision making because everything is controlled by the government.
6. There is also wastage of resources by many people because they know that resources are owed by the government.
7. It promotes monopoly powers in the market (statutory monopoly)
8. There is underutilization of resources due to limited competition
9. It discourages private investment in the country when all resource ownership, distribution and allocation is in hands of the government.
10. High corruption may arise in government owned venture
11. There are high levels of bureaucracy (red tape) i.e delay in decision making when all decisions about resources are in hands of the government.

C. Mixed economy.

This is an economic system where the resources are owned, distributed and allocated by both government and private individuals.

Features of mixed economy.

1. Resources are allocated, distributed and owned by both private individuals and government.
2. The government set instructions which are supposed to be followed by private sector in resource allocation.
3. There is free entry and exist in the market but influenced by the government.
4. The prices are determined by both government and the forces of demand and supply.
5. The private sector is under the regulation of the state.

6. Individuals have some influence over the use of natural resources.
7. Consumers have freedom of choice since there is variety of firms or producers.
8. Producers have the incentives to work hard due to high level of competition from both the private and public sectors.
9. Necessary/key strategic goods and services are produced by the state. E.g. defense.
10. Certain sectors of the economy are left to private ownership and free market mechanism while others are dominated by the government ownership and planning.

Advantages of mixed economy.

1. It increases employment opportunities because employments are provided by both government and private individuals.
2. There is equal distribution of resources because resources are both distributed by the government and private individuals.
3. It creates regional balanced growth when resources are both distributed by the government and private individuals.
4. There is price stability in the economy because the government can easily control prices set by private individuals.
5. There is proper allocation of resources in the economy since government can influence the resource allocation by private individuals.
6. Public goods are not ignored in the economy since the government also has hand in resource allocation and distribution.
7. It also increases the levels of investments since the investments are done by both government and private sector.
8. There is no consumer exploitation due to government intervention.
9. There is preservation of nature and general environment from individual activities like pollution due to government intervention.

Disadvantages of a mixed economy.

1. Government interference in the economy may result in state monopolies which may lead to exploitation of consumers.
2. It may also lead to over exploitation of resources in the economy since resources are both allocated and distributed by government and private individuals.

3. The government may undermine the private sector because the government is financially bigger than private sector.
4. There is also resource wastages in unnecessary advertisements since there is competition between government and private individual.
5. There is excessive competition which might lead to duplication of services and goods.
6. It encourages production of harmful products since there is existence of private individuals
7. There is sometimes consumer exploitation due to limited government influence
8. Price instabilities due to private individual influence.
9. There is poor decision making since private individuals and government tend to have different ideologies.



Application activity 16.4

Identify, with vivid examples, the economic system to which your country belongs.



Skills lab

1. Basing on your school setting, make investigation and write down how things are done. Make a report of your findings and compare with how they should be and present your findings and suggestions to the principal from which he or she will base to make long lasting policies for the development of the school.
2. Visit any nearby secondary school, meet senior three students who are about to register for their national exams. Ask them of the combinations they are willing to take in high school or TTC. After, provide convincing advice to win them towards the study of economics so as to diversify the society's benefits from their study of economics.



End unit assessment

1. a) Economics was defined by many economists differently, which one do you think is most appropriate and why.
b) Explain why you would put more strength in studying Economics.
2. a) Distinguish between wealth and welfare. Show the relationship between the two.
b) How does individual and business wealth affect society wealth?
3. a) Explain the role of the various economic agents in the development process of any economy.
b) Describe how the various economic agents are organized to allocate resources in an economy.

UNIT 17:

NATURE AND SCOPE OF ECONOMICS

Key unit competence: Be able to describe the nature and scope of economics as applied in various domains.



Introductory Activity 17

Keza and Mugisha were both students in form 3, lower secondary. One day, when they were going home, Keza asked Mugisha which combination he would like to pursue at the Advanced level. Mugisha's answer was MCE because he wanted to take sciences, and Keza said she would like to take HEG because she wanted an arts combination. Keza could not believe in what Mugisha told her, since she believed that economics is for only arts combinations. They were both surprised of the boundaries of economics subject. They, therefore, ended up agreeing to carry out further investigation to be convinced that Economics can be taken up by both arts and science combination students.

Required:

- What do you think are the limits of economics as a subject?
- At what level are economic problems handled?

In this unit, we are concerned with the range of matters that economics as a discipline covers. The scope of economics refers to the limits within which economic problems can be discussed. We shall look at the methodologies used by different economists to arrive at their conclusions so as to answer the question. This can be looked at in 3 ways:

- Economics as an art and as a science.
- Normative and positive economics.
- Micro and macroeconomics.

17.1: Economics as a science or an art.



Activity 17.1

Explain why Economics is described as both an art and a science subject.

There is a great controversy among the economists regarding the nature of economics, whether the subject 'economics' is considered as science or an art.

17.1.1: Economics as an art.

From the different definitions by different economists as seen in unit 16, economics is looked at as a science. E.g. according to Lionel Robbins, J.B Says, J.S. Mill etc. Therefore, economics is an art (social science subject) because it studies human beings and the decisions they make to influence the economic environment of the society they live in.

Economics as an art (social science) seeks to explain the economic basis of human societies and shows how a particular society solves its economic problems. It utilizes the facts of science for practical purposes. For example, through scientific analysis based on observation, and reasoning, economists build models that explain economic phenomena.

17.1.2: Economics as a science

Economics as a science subject, uses scientific approaches when establishing truths about an economic event. It defines concepts and quantifies them for purposes of evaluation and testing. As a science, economics depends on scientific methods to prove right or wrong any claim that is made. As a science Economics is a systematized body of knowledge got by observation and experiment and it uses a scientific method to process theory.

All in all, economics is both a science and an art since it combines both scientific and non-scientific methods of inquiry and hence becoming a social science rather than a pure science.

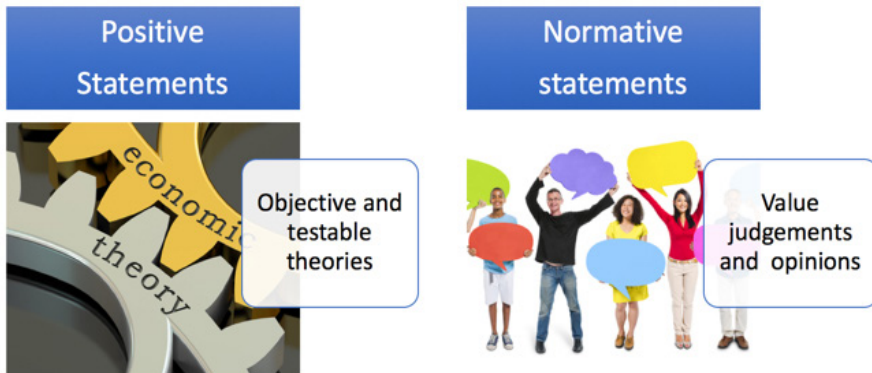
Therefore, from all the above discussions we can conclude that economics is neither a science nor an art only. However, it is a golden combination of both. According to Cossa, science and art are complementary to each other. Hence, economics is considered as both a science as well as an art.



Application activity 17.1

With the use of different examples, describe economics as an art of a science.

17.2: Normative and positive economics.



Activity 17.2

Analyse the statements below and categorize them into factual and nonfactual statements, by writing 'F' for factual and 'N' for nonfactual.

1. Government-provided healthcare increases public expenditures.
2. The government should provide basic healthcare to all citizens.
3. The rising price of crude oil on world markets will lead to an increase in transport costs most countries worldwide.
4. A reduction in income tax will improve the incentives of the unemployed to find work.
5. Unemployment is more harmful than inflation.
6. The government should increase the minimum wage to 10,000frw per hour to reduce poverty.
7. The retirement age should be raised to 70 to combat the effects of our ageing population.
8. Pollution is the most serious economic problem.

To make policies of businesses or of any country, we need both positive economics and normative economics. We need to know facts and then use our judgment to form policies that will help individuals and the society at large.

17.2.1: Positive Economics:

Is a branch of Economics that studies variables the way they are, that is, the way they exist in real life. Positive economics is factual and can be verified. It uses objective explanations. For instance, a statement like 'Prices for agricultural products fluctuate frequently' is a positive statement.

17.2.2: Normative Economics:

Is a branch of Economics that studies variables the way they ought to be, as a desirable condition. It uses subjective explanations. Normative economics is fiction. They are not facts; rather they are opinions of economists who tell us what they think. It can be true for some and false for others. They can not be tested either. E.g. 'Prices in the market should be stable,' is a normative statement.



Application activity 17.2

Write down your own statements that show the difference between normative and positive economics.

17.3. Branches of economics



Activity 17.3

Analyse the case study below and answer the questions that follow.

Nyinawumuntu, a science student at University of Kigali, was studying biological ecosystem. She set out to focus on fish life in the lake. While Ntare, also a science student at University of Rwanda Huye Campus, took an overall view and instead considered the entire ecosystem of the lake from top to bottom. Both Nyinawuntu and Ntare study the same lake, but each has a different starting point, perspective, and focus.

Required:

- Visit the library or the internet and categorize each student's approach in an economic sense.
- What makes the two approaches different?
- In an economic sense, how are the two approaches useful in economic policy and resource allocation?

17.3.1: Microeconomics

Is a branch of Economics that studies individual units of the economy. Such units may be households, firms or prices of commodities, among others. It looks at how these single units function individually. It looks at areas such as household decisions on consumption, the firm's production and profit maximisation decisions, market prices and their regulations.

17.3.2: Macroeconomics:

Is a branch of Economics that studies all units of the economy as an aggregate. It looks at the whole economy as a single functioning unit. This is because the different individual units of the economy are interrelated. It looks at areas like the causes of economic growth, changes in interest rates and their effects on the economy, effects of monetary and fiscal policies.

Therefore, we can say that the main **difference between** microeconomics and macroeconomics is scale. However, the two are complementary because aggregate production and consumption levels are the result of choices made by individual households and firms. The major change in individual households and firms result into a change in aggregate.



End unit assessment

1. Describe why Economics is described as both an art and a science subject.
2. Using different statements, differentiate between Normative and Positive economics.
3. Using examples, discuss the difference and relationship between Micro- Economics and Macro-Economics.

UNIT 18:

FUNDAMENTAL PRINCIPLES OF ECONOMICS

Key unit competence: Be able to demonstrate a good understanding of the fundamental economic principles and their applicability to daily life.



Introductory Activity 18

Analyse the case study below and answer the questions that follow;

Human beings hardly get satisfied in life. Those who are unemployed wish one day to be employed. The employed on their part, wish to get promotion and a salary increase. Those with small vehicles desire to own bigger vehicles like Toyota Prados. Those owning bigger vehicles wish they could own jets. People living in rural areas want to move to urban areas, while those in urban areas want to own land in rural areas. Countries too desire to own some assets but they cannot access them.

Required:

- Identify other scenarios showing that human beings, families or governments are never satisfied.
- Why is this always the case?
- Suggest any solutions to the above scenarios.

18.1: Definition of the fundamental principles of Economics:

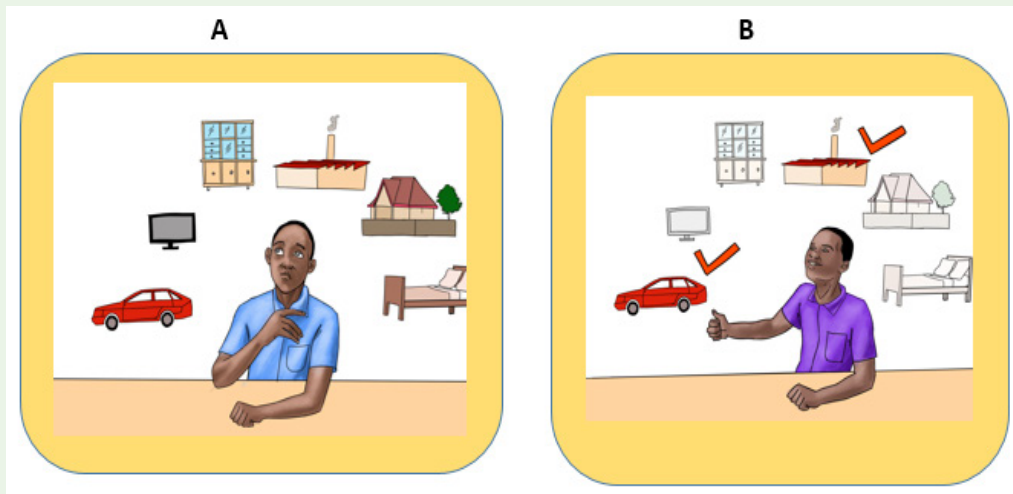


Activity 18.1 a)

Visit the library or the internet and research on the fundamental principles of economics, identify and distinguish them.



Activity 18.1 b)



In the diagram above, the two brothers are offered a variety of alternatives to choose from.

B has already taken a decision by picking a car and a firm while **A** has not yet decided.

- What term can you use to refer to the car and firm that B has picked?
- How would you call the remaining items that B has not picked?
- Why do you think B cannot pick all the items?
- Do you think B took the right decision? Support your answer.
- How can you advise A to also take his choice?
- If you were the one which items would you pick and why?

Human wants are unlimited but the resources to satisfy them are limited. As a result, the basic principles of Economics explain this concept. These principles further show the fundamental problems of human beings in their bid to try and use the scarce resources to satisfy the unlimited wants. These principles are:

- Scarcity.
- Choice.
- Opportunity cost.

a) Scarcity;

This refers to the limitedness of resources relative to human desire for them. Scarcity in the economic sense means that the available resources are not sufficient to satisfy human wants. Due to the problem of scarcity, one has to make rational choices by satisfying the most pressing wants first and then the least pressing ones last. Scarcity is the limited availability of a commodity or resources, which may be in demand in the market. . As a result, there is need to prioritize by making a list of one's wants in order of satisfaction. On the list, the most pressing needs are put at the top to be satisfied first, then the fewer pressing ones are put last. This list is known as the **scale of preference**.

b) Choice

This refers to the act of taking a rightful decision among available alternatives or among different possible solutions/options. Choice arises out of scarcity. Because resources are limited in supply and wants are unlimited, choice must be made on what wants to satisfy immediately and what to satisfy later, what to satisfy now and what forego. For instance, a student who has a fixed amount of money can opt to buy a textbook to use in the classroom, rather than buying sports shoes to be worn over the weekends.

c) Opportunity cost

This refers to the second best alternative foregone when a choice is made. Opportunity cost is not entire range of commodities missed; it is just one item that is next to the item chosen on the scale of preference. It can be illustrated using the opportunity cost curve, which shows the amount sacrificed on one commodity in order to get more of another.

18.2 The relationship between scarcity, choice and Opportunity cost



Activity 18.2

Describe the relationship between scarcity, choice and opportunity cost.

Since all things are limited (scarce), one has to make choice on how the available means (resources) shall be used. Individual consumers/ producers will therefore have to decide which of their needs/wants have to be given priority and forego others thus making opportunity cost. This relationship can also be explained by the use of Production Possibility Frontier (PPF) curve.



Application activity 18.1

With example explain and define any two types of scarcity

18.3: Production possibility frontier (PPF):



Activity 18.3

Utexrwa Industries produce two products: Shirts and Trousers . It can produce the following quantities using the same level of resources.

Combination	Quantity of trousers	Quantity of shirts
A	0	150
B	20	100
C	30	80
D	40	60
E	50	40
F	60	0

- Referring to the table above, identify the commodity that is highly produced.
- Explain what the firm can do to increase on production of the less produced commodity.
- Derive a curve showing the possible combinations of trousers and shirts produced by Utexrwa by plotting the quantities of shirts on the y-axis and the quantities of trousers on the x- axis.
- Carry out research on the assumptions on which the curve obtained above is based and its importance. Make general class representation.

18.3.1: Meaning of PPF

A production possibility frontier (PPF) is a locus of points showing the possible combinations of two commodities that can be produced when all the resources are fully utilized. It is also called the product **transformation curve** or the **opportunity cost curve**.

18.3.2: Assumptions of the PPF

- It assumes that only two commodities are produced.
- It assumes that the level of technology is fixed and constant.
- It assumes that all resources are fully utilised.
- It assumes that same resources are used to produce either or both of the two goods.

18.3.3: Importance of the PPF

- The PPF shows whether there is economic growth or decline in the country. An outward shift indicates economic growth. An inward shift indicates economic decline.
- The PPF shows the rate of unemployment by showing the rate at which resources are employed or utilised. Points along the PPF show full employment and utilisation of resources. Points inside the PPF show the unemployment and underutilization of resources.
- The PPF shows the combination of goods and services that can be produced in an economy.
- It indicates technological advancement within an economy. When the level of production increases, the PPF shifts outwards. This indicates technological advancement.
- The PPF also shows the economic problems of scarcity, choice and opportunity cost. Production cannot go above the PPF. Thus any producer has to make a choice due to limited resources. There is a limit in the total amount of products that can be produced at any time. increase in production one commodity reduces the amount produced of another commodity .
- It helps to answer the basic economic questions of:

What to produce?

How to produce?

For whom to produce?

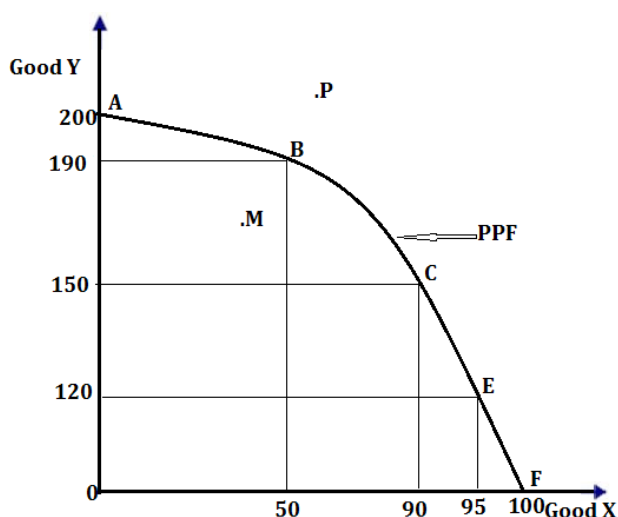
When to produce?

Where to produce?

It shows efficiency in production. i.e. points along the PPF indicate efficient utilisation of the available resources. Points inside the PPF show inefficient use of resources while points out of the PPF show overutilization of resources.

The hypothetical production possibility schedule

Combination	Quantity of X	Quantity of Y
A	0	200
B	50	190
C	90	150
E	95	120
F	100	0



A PPF curve

In the above illustration, A and F are the possibilities in which the producer can produce either 200 units of Good Y only or 100 units of Good X only with given resources. However, the assumption is that both are produced. There are therefore various combinations A, B C, E and F that can be produced.

On combination A, only good Y can be produced and nothing of X; at B, 190 units of Y and 50 units of X; At point C, 150 units of Y and 90 units of X ; at E, 120 units of Y and 95 units of X; while at F, 0 units of Y and 100 units of X are produced.

The PPF shows that when more units of Good X are produced, less units of Good Y are produced. This implies that the producer withdraws some resources from the production of Good Y and uses them in producing more units of Good X. This transforms resources producing Good Y into production of Good X. It is for this reason that the curve is also called a **transformation curve**.

Point M inside the PPF, indicates that the level of output is attainable but undesirable. This is because rationality requires that one prefers more to less. Point P outside the PPF, is not attainable using the available resources. However, it may be attained should the available resources be increased.

18.3.4: Shifts in the PPF:



Activity 18.4

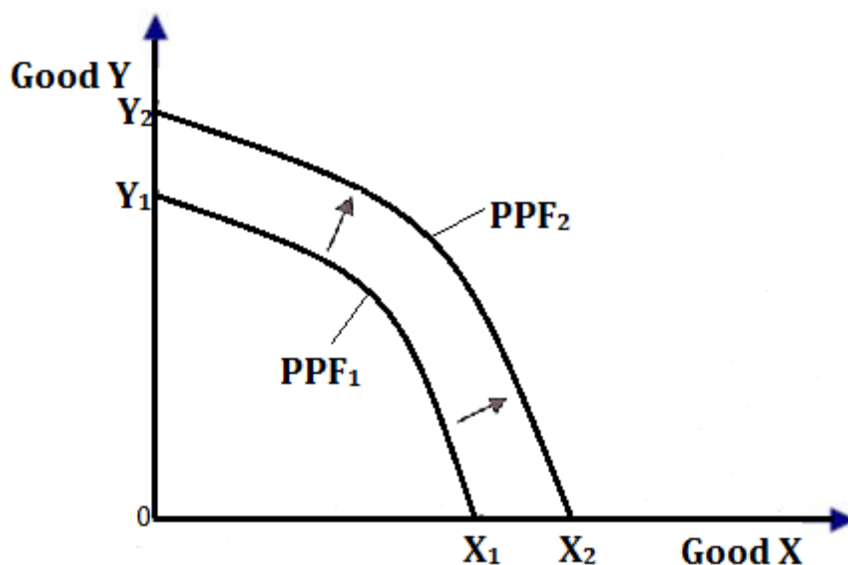
Undertake research on the PPF and thereafter in whole class discussion:

- Illustrate the different directions that PPF can take.
- Describe the economic implication for each direction that PPF can shift to.
- Explain the reasons why the PPF may shift to either directions illustrated above.

The PPF may shift inwards or outwards. A shift of the PPF inwards indicates economic decline while a shift of the PPF outwards indicates economic growth.

Shifts in the PPF can either be inwards or outwards.

(a). a shift of the PPF outwards

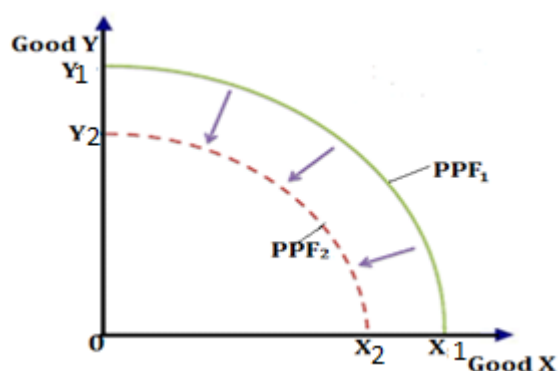


Shifts in the PPF

An outward shift from $Y_1 X_1$ to $Y_2 X_2$ indicates economic growth. This may be due to any of the following reasons:

- Discovery of new natural resources.
- Advancement in technology that leads to production of more goods and services.
- Expansion of markets that encourage production of more goods and services.
- Improvement in the skills of labour that results into efficiency in production.
- Increased investment as a result of improved entrepreneurship skills.

(b). A shift in the PPF inwards



An inward shift from $Y_1 X_1$ to $Y_2 X_2$ indicates an economic decline. Similarly, there is a reduction in the quantity produced of both Goods Y and X. This may be due to any of the following reasons:

- Lack of new natural resources.
- Decline in the invention and use of technology that leads to production of poor quality and fewer goods and services.
- Decline in the markets which discourages production of more goods and services.
- Decline in the availability of trained manpower, through retrenchment of workers. This results into less output and inefficiency in production.
- Decreased investment as a result of poor entrepreneurship skills.



Application activity 18.2

Under what circumstances may the theory of opportunity cost be applicable?

18.4. Economic questions



Activity 18.5

Case study

Utexrwa Industries Ltd is a firm that deals in production of t-shirts, shirts and dresses. In starting the firm, proprietors made a number of choices concerning its location, the tools and human resources to employ, the time to engage in production, and the kind of goods to produce. They also identified the consumers of their products.

Make research on economic questions, identify and describe the various economic questions, using the above case study.

In allocating resources in the production of goods and services, countries and production firms face a number of fundamental economic questions.

These fundamental economic questions include:

a) What to produce?

Here the firm needs to decide on the nature of the goods to produce. The firm may decide to produce capital goods or consumer goods.

b) How to produce?

The producer has to decide on the methods and techniques to be used in the production process. The producer may decide to use capital intensive techniques of production or labour intensive techniques of production. The technique of production minimizes costs while at the same time maximizes the level of output.

c) When to produce?

The producer is required to decide whether to produce now or to produce in future. The producer is normally guided by the demand for the products in the market. The best time for production is when the demand for the goods or services is the highest.

d) Where to produce?

The producer has to determine on the location of his or her firm or industry. The location will depend on availability of the market, the source of raw materials, security and transport and communication networks. All in all, a thorough assessment of the impact of that firm to the environment must be carried out and evaluated.

e) For whom to produce?

The producer considers the target consumers that will use the goods to be produced. The producer may be for the young, the rich, the poor, the rural people or for the urban people.



Skills lab

Visit any business setting around the school, or invite any business person around, and interview him/ her about the questions he/she had in the mind before starting that business and how he/she applied them. Seek advice from him or her on how to start a business club. Basing on the advice given and the knowledge, skills, and attitude gained from the unit, write a business proposal.



End unit assessment

1. Describe the fundamental economic principles.
2. With the help of the PPF, explain the relationship between the fundamental economic principles mentioned above.
3. How does the PPF explain economic growth or decline in a country?
4. Discuss the major economic questions that an entrepreneur has to answer as he or she prepares to engage in production.

UNIT 19:

EQUATIONS AND FRACTIONS IN ECONOMIC MODELS

Key unit competence : Be able to describe economic phenomenon using mathematical tools.



Introductory Activity 19

When a country wanted to know the value added by individual producers on commodity, they decided that the output approach was to be used. The value added was to be detected by checking the revenues of individual producers of every commodity at various stage of production. A model was developed to relate total revenue on cassava and quantity produced that year. Then, the cost of the materials would be subtracted from this revenue to get the real value added to a commodity. The following model was formed: $R=10Q$

Where R is the total revenue in Rwanda Francs and Q is the quantity of cassava sold that year in Kilograms.

The value-added model was $VA=R-C$, where VA is the value added in Rwanda Francs, C is the annual total cost used in Rwanda Francs and R is already defined above.

If citizen Y used 1000 frw that year in production as cost and sold 200 kg of Cassava, what was his value added on the cassava he produced that year? If the national income statistics personnel found out that Mr. Muhire added no value to his cassava sold that year, what was his expenditure after selling 1500 kg of cassava.

19.1 Equation in Economics

19.1.1 Linear equations and graphs:



Activity 19.1

The table below shows the sales revenues and advertising expenditures of Quality Supermarket.

ADVERTISING EXPENDITURE (FRW '000000')	SALES REVENUE FRW '000000')
1	24
2	28
3	32
4	36
5	40
6	44
7	48

- Explain the relationship between advertising and sales as reflected in the above table.
- Determine the sales revenue generated at 9 million FRW and 10 million FRW levels of advertising. Give reasons for your answer.
- Illustrate the above information on a graph. (sales on Y axis while advertising on X axis).

Facts

A linear equation is a mathematical representation that expresses simple relationship between variables. It is made of one or more than one variable. E.g. From the table given in the question above, we can see that the supermarket makes more sales as a result of higher advertising. This shows a relationship between advertising expenditure and sales revenue. We can say that the higher the advertising expenditure, the higher the sales by the supermarket.

Sales revenue therefore depends on advertising. In this case we call sales revenue a dependent variable while advertising an independent variable. This is because sales depend on advertising. Advertising is independent because it is not being affected by sales or any other factor. We will come across such cases in Economics and Mathematics more often.

This relationship can be expressed as an equation, as follows:

$Y = a + b x$, where y is the dependent variable (sales revenue in this case), x is the independent variable (advertising in this case),

a is a constant figure. It represents the amount sold without any form (at zero level) of advertising i.e. If **$x=0$, $y = a$** .

In the activity 19.1, sales made without advertising are lower than 24,000,000 FRW. (Assuming advertising begins at 1 million FRW).

a is a coefficient. It shows how much y will change every time x changes by one unit.

If x changes from some value (x_1) to another value (x_2), then y will also change from

$$y_1 = a + bx_1 \text{ to}$$

$$y_2 = a + bx_2$$

The change in y_1 usually written as $y_2 - y_1 = (a + bx_2) - (a + bx_1)$, will be

$$y_2 - y_1 = a + bx_2 - a - bx_1$$

Collecting like terms, we get, $y_2 - y_1 = (bx_2 - bx_1)$

Dividing through by $bx_2 - bx_1$, we get: $y_2 - y_1 = bx_2 - bx_1$ $y_2 - y_1 = bx_2 - bx_1$

$$y_2 - y_1 = b(x_2 - x_1) \quad b = \frac{y_2 - y_1}{x_2 - x_1}$$

The above case is an example of a **linear equation**. Linear equations are referred to as **first degree polynomials**.

From the table above, following advertising and sales figures of Quality Supermarket, we can see that sales increase by 5 million from 1 million advertising expenditure. Therefore, at zero advertising expenditure, sales would be $20m - 5m = 15$ million.

Therefore, our equation, $y = a + bx$, would be $y = 15 + 5x$.

Given this equation, we can be able to find out:

The amount of sales arising from a given expenditure in advertising. The amount of advertising necessary to generate a desired amount of sales revenue.

Example 1

The sales revenue generated by 10 million advertising expenditure would be:

$$Y = 15 + (5 \times 10)$$

$$= 15 + 50$$

$$Y = 65\text{m}$$

Example 2

If Quality Supermarket targeted sales revenue of 75 million FRW, determine the advertising expenditure that it would have to incur.

Solution $y = a + b x$

$$75 = 15 + 5x$$

$$60 = 5x$$

$$x = 12$$

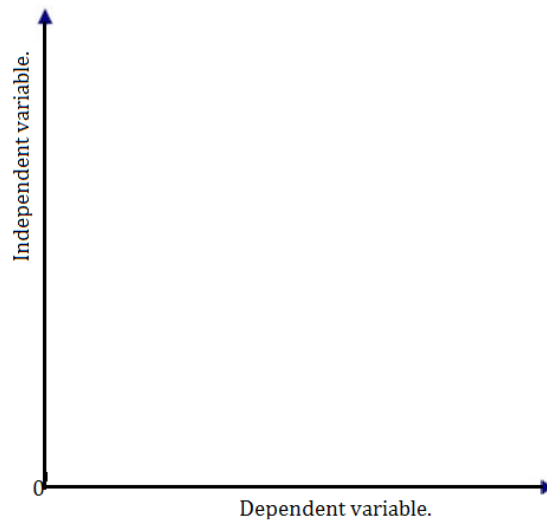
Therefore, the amount of advertising needed to yield 75 million FRW would be 12 million FRW.

(b) Sketching linear graphs

The data from the table on sales and advertising for Quality Supermarket (Activity 4.1) can be plotted on a graph.

The graph has two sides called axes. The upright side (side having an arrow pointing up) represents the vertical axis. The bottom side (side having an arrow pointing to the right) represents the horizontal axis.

The values of the dependent variable (sales revenue in this case) will be represented on the horizontal axis. The values of the independent variable (advertising expenditure in this case) will be represented on the vertical axis.



A Cartesian plan

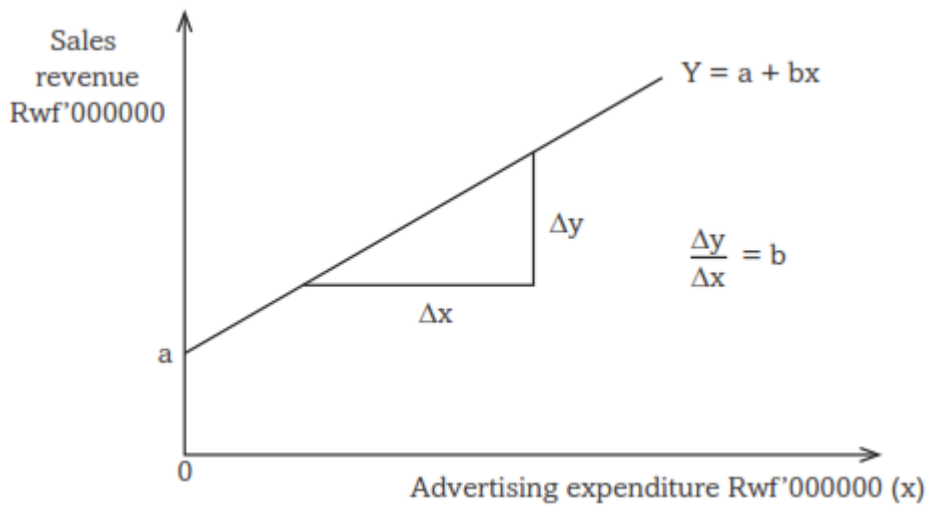
Values on the horizontal axis increase as we move to the right, from the point of origin. Similarly, values on the vertical axis increase as we move upwards, from the origin.

In the case of Quality Supermarket, y stands for sales while x stands for advertising.

Each row of the table gives us a pair of numbers, or a combination of x and y . We have 1 and 20, 2 and 25 and so on. These pairs are written as $(1, 20)$, $(2, 25)$...

To plot the pair (x, y) begin at the origin where the two axes meet. Count rightward x units on the horizontal axis and then count y units above this level, parallel to the vertical axis. Mark this spot. Continue with the process for the different pairs of x and y . After identifying and marking all the pairs, then connect the pairs. This can be done by drawing a line that passes through all the points.

Using the example of Quality Supermarket, all the pairs are along the same so the slope of the line.



Graph of a linear equation showing how to calculate gradients

The slope 'b' tells us the rate at which the y variable changes with a unit change in x.

Recall

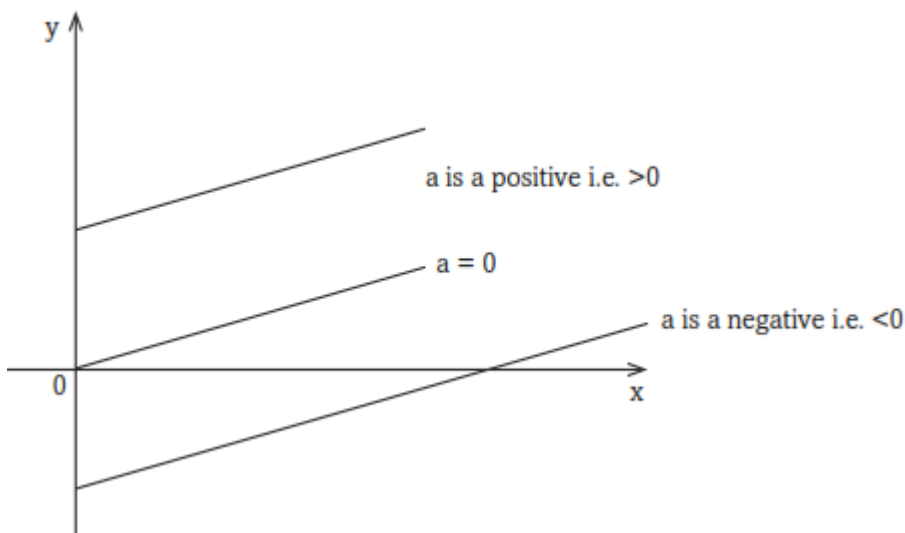
What do we call 'b' in Mathematics?

Note that 'a' has no effect on the slope of the graph.

Let us point out that the value of 'a' can be either positive, negative or zero. When the value of 'a' is positive, the graph will intercept the vertical axis above the origin.

When the value of 'a' is negative, the graph will intercept the vertical axis below the origin.

When the value of 'a' is zero, the graph will intercept the axis at the origin.



Graph of a linear equation when the line passes through, above and below the origin

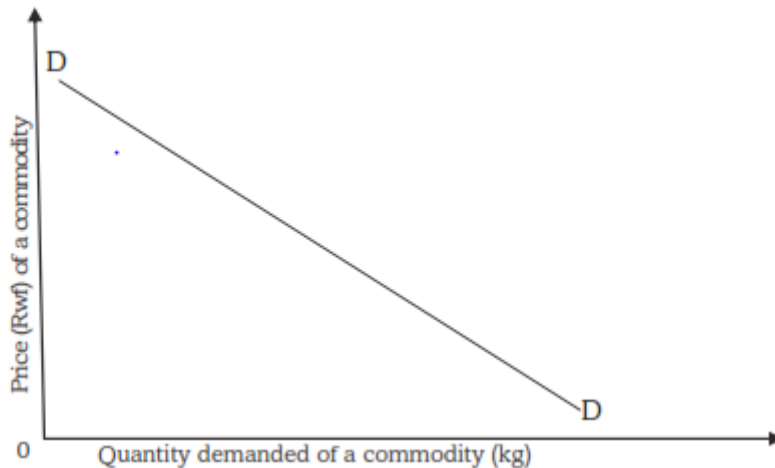
Examples of linear equations in economics

There are several types or examples of linear equations as used in Economics.

The main examples are:

1. The production possibility frontier as seen in unit 18; a graph that shows combinations of goods and services that can be produced with a given level of resources.
2. The demand function; an equation showing the various quantities of goods purchased by customers at given prices.
3. The supply function; an equation showing the various quantities of goods brought to the market by suppliers at a given market price.
4. Isocost line; a graph showing different combinations of labour and capital that can be purchased by a given firm.

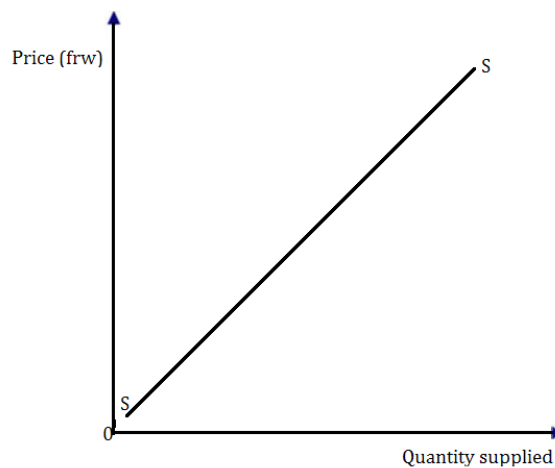
The demand curves



Demand curve

The demand curve shows the relationship between the quantity demanded of a commodity and the price of that commodity. This is a negative slope. It shows that an increase in the independent variable (price) leads to a decrease in the dependent variable (quantity demanded).

The supply curve



Supply curve

The supply curve shows the relationship between the quantity supplied of a commodity to the market by suppliers and the price of the commodity. This has a positive slope. It shows that both the price (the independent variable) and quantity supplied (the dependent variable) change in the same direction.



Application activity 19.1

Given that $Q_d = 48 - 4p$. What would be the Quantity demanded in case price was;

- i) 0 ii) 2, iii) 4 iv) 6 v) 8 vi) 10 vii) 12
ii) What would be the price in case quantity demanded was;
a) 44, b) 36, c) 28.

19.1.2 Nonlinear equations and nonlinear graphs



Activity 19.2

- a) The following tables show the changes in variable Y as a result of changes in variable X.

Table 1

x	1	2	3	4	15
y	1	3	7	12	20

Table 2

x	2	4	6	8	10
y	0	6	10	13	15

- b) Sketch the information given in Tables 1 and 2 on their respective charts.
c) Describe the relationship between the two variables as revealed by the charts.

Non-linear algebraic equations are polynomial equations of a degree that is greater than one. They are mathematical relationships that describe non-linear graphs. They take various types. For instance, we have the following main non-linear equations:

- a) Polynomials
b) Logarithmic equations
c) Conic equations
d) Exponential equations

19.1.2.1 Features of nonlinear equations

1. In nonlinear equations, the independent variable has a certain power to it. If we have y as the dependent variable and x as the independent variable, the relationship could be:

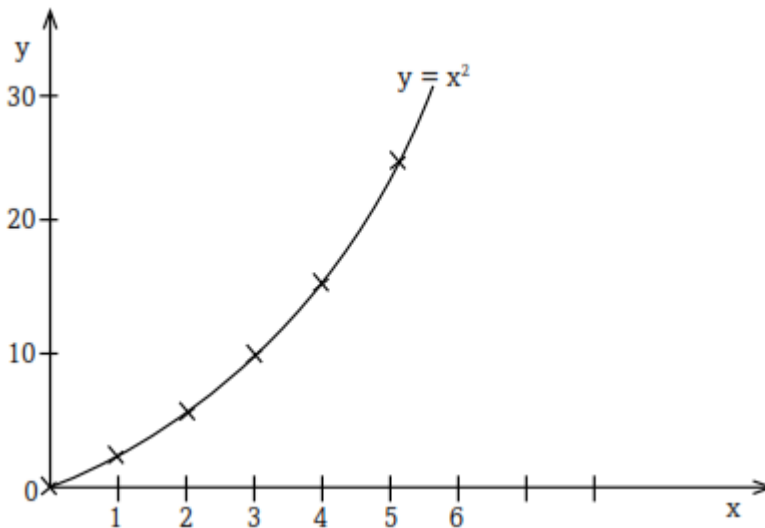
$y = x^2$ or it could be $y = a + x^3$, where ' a ' could be a constant figure and would constitute the Intercept on the y -axis in a chart.

2. The features of nonlinear equations vary, depending on the gradient or slope of the curve.
3. Where there is one independent variable whose power is greater than one, the dependent variable will increase at an increasing rate as the power of the independent variable rises.

For example if $y = x^2$, and the values of x are 0, 1, 2, 3, 4, 5

Then the value of y will be 0^2 , 1^2 , 2^2 , 3^2 , 4^2 , and $5^2 = 0, 1, 4, 9, 16$ and 25 .

The graph from the equation above would curve upwards as y increases at a faster rate than x . This is shown below.



A non-linear graph of second degree polynomial

4. Where the power of the independent variable (x) lies between 0 and 1, then the value of y will also be increasing as x increases.

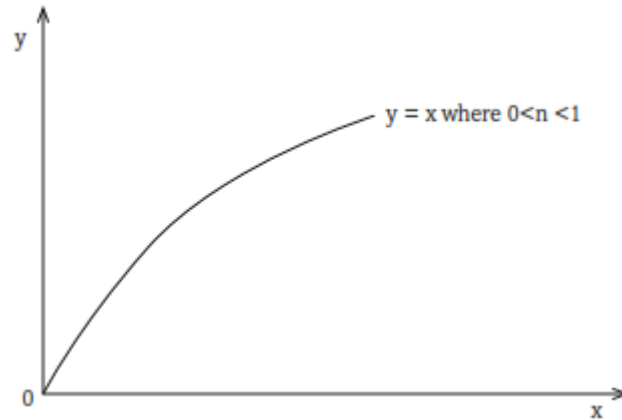
Example

When the equation is $y = x^{0.5}$, If $x = 1, 2, 3$, then

$$y = 1^{0.5}, 2^{0.5}, 3^{0.5}$$

$$= 1, 1.414, 1.712$$

X	1	2	3
Y = $x^{0.5}$	1	1.414	1.712



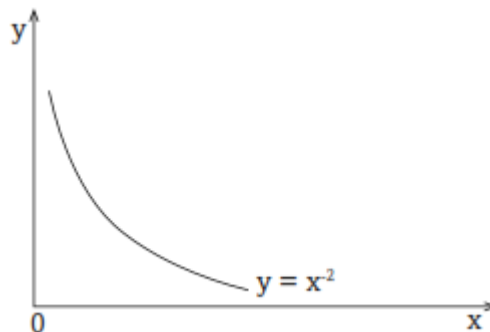
A non-linear graph where the power lies between 0 and 1

- Where the power of y is negative with the value of x being positive, the graph derived would slope downwards. This graph would take a convex curve shape.

In this case, the dependent variable (y) increases as the independent variable (x) decreases.

Example;

If $y = x^{-2} = \frac{1}{x^2}$, Where x = 0 1 2 3 4, then
y = 1 0.25 0.11 0.0625



A non-linear graph where the power is negative (less than zero)

19.1.3 Simultaneous equations



Activity 19.3

At a certain point, two small scale businessmen noted that their bank accounts had 110 and 600 dollars respectively. The first man decided to increase his account by 30 dollars every year for n years. The second decreased his bank account balance by 40 dollars every year for n years. After n years, the bank balance in each year was p dollars. Assuming that no other transactions were done in these accounts,

- Express p in terms of n in each case
- Use each equation to make a table of values for n and p for each person, for values of n not **more than 10 years**.
- Do you think there will be a time when their bank balances will be equal? If yes, when and how much will it be?
- How do you describe the relations in (ii) above.

19.1.3.1 Necessary conditions for simultaneous equations

These conditions include that:

- There should be more than one functional relationship, between a set of specified variables such as x and y or q and p .
- That all the functional relationships are in linear form. It is then that we try to find the value of the unknown variables in the equations. In the case where we have only two variables in the equations, it is then possible to subject the equations to graphical solutions.

Simultaneous equations can be solved using various methods.

19.1.3.2 Methods used in solving simultaneous equations



Activity 19.4

Taking P for price and the other unknown for quantity, solve the simultaneous linear equations. They represent the various demand and supply functions we come across in our daily lives. Illustrate your findings on graphs. Make class presentations.

1. $Q = 3P + 2$, $Q_s = 2 - P$

2. $3P + 7Q = 10$, $4P - Q = 3$

1. $5P + 10Q = 10$, $2P - Q = 1$

2. $5P + 3Y = 7$, $4P - 5Y = 3$

Note: You can use any of the above methods earlier learned, or any of these methods.

- a) Elimination method
- b) Matrix method
- c) Graphical method
- d) Crammer's method
- e) Inverse method

a) The substitution method

This method entails representing one unknown in terms of the other unknown.

Example

Find the values of x and y in the following equations using

a) the substitution method.

$20x + 6y = 500$ (i)

$10x - 2y = 200$ (ii)

If we arrange equation (ii) so as to define or represent y in terms of x, we get:

$10x - 200 = 2y$

Dividing through by 2, we get:

$$5x - 100 = y$$

We then substitute the new value of y (obtained in equation (ii)) in equation (i) as follows:

$$20x + 6y = 500 \dots (i) \text{ Now becomes}$$

$$20x + 6(5x - 100) = 500 \dots (iii)$$

On opening the brackets, we get:

$$20x + 30x - 600 = 500$$

On collecting like terms, we get:

$$50x = 1100; x = 22$$

We would then substitute the value of x in equation (ii) to get:

$$220 - 2y = 200$$

$$220 - 200 = 2y$$

$$20 = 2y$$

$$y = 10$$

b) Row operation method

We can also use the row operation to get the same result. Using the above example,

$$\text{Where } 20x + 6y = 500 \dots (i)$$

$$10x - 2y = 200 \dots (ii)$$

$$\text{Multiplying equation (ii) by 3, we get: } 30x - 6y = 600 \dots (iii)$$

$$\text{Adding equation (iii) to equation (i), we get } 50x = 1100 \rightarrow x = 22$$

We then substitute for x in any of the equations to get $y = 10$.

We can apply the concept to solve for demand and supply relationships, when given the demand and supply functions.

Note: Unlike in the usual linear relationship between the dependent and independent variables, in this case, our relationships are expressed in a reversed manner.

For example, $p = f(q)$ and not $q = f(p)$. The dependent variable is on the horizontal axis while the independent variable is on the vertical axis. This is

because price is normally measured on the vertical axis. The principle is the same and the idea is to get the true relationship of the variables.

Therefore, if we are given the following demand and supply equations:

$P = 840 - 0.4q$ as a demand schedule and $P = 120 + 0.8q$ as a supply schedule,

We can solve for both p and q

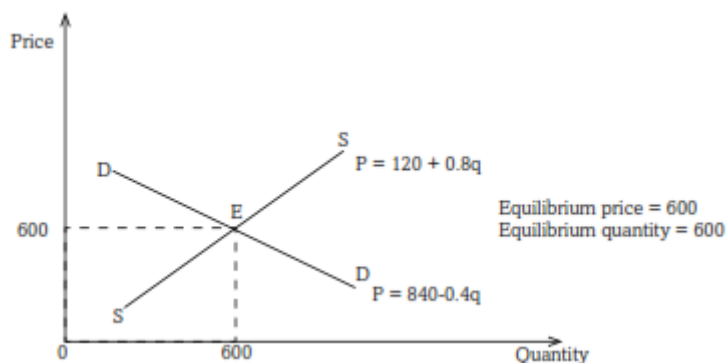
- i) Multiplying demand schedule by 2, we get: $2P = 1680 - 0.8q$
- ii) Adding the new demand schedule to the supply schedule, we get:
 $3P = 1800 \longrightarrow P = 600$
- iii) Substituting for P in any of the equations, we get: $600 = 120 + 0.8q$
 $0.8q = 480$
 $8q = 4800 \longrightarrow q = 600$

We could also use the equation method to solve for the demand and supply quantities such that: $840 - 0.4q = 120 + 0.8q$

$$840 - 120 = 1.2q$$

$$720 = 1.2q \longrightarrow q = 600$$

Substituting for q in any of the two equations, we get: $P = 600$



Graph showing equilibrium price and equilibrium quantity



Application activity 19.2

In Byumba market, the relationship between the supplies of Irish potatoes was studied against the price per kilogram. The economic researcher came up with a linear relationship between the two variables as $Q_s = 20 - 3P$, where Q_s stands for the quantity of Irish potatoes supplied and P is the price per Irish in Rwanda Francs.

Another study was done in the same market about the quantity demanded of that same commodity relating to its price. The following linear relationship was formed: $Q_d = 5 + 2P$; where Q_d is quantity demanded in kilograms and P is the price per kilogram of Irish potatoes in the market in Rwanda Francs. What would be the equilibrium quantity and price?

19.1.4 Differential equations and graphs



Activity 19.5

- a) The total cost of a firm is given by the equation

$$TC = 3Q^3 - 2Q^2 + 60Q + 8$$

If the value of $Q = 1$ kg, determine the marginal cost.

- b) (b) Given that the total revenue (TR) of a firm is given by the equation,

$$P = 100 + 2Q^2 + Q, \text{ find marginal revenue when } Q = 1.$$

A differential equation is a mathematical equation that relates some function with its derivatives. Functions are usually represented by physical quantities. Derivatives represent the rates at which the physical quantities change. Thus differential equations define the relationship between the two.

Differential equations have types. For instance:

- Ordinary differential equations.
- Partial differential equations.

An ordinary differential equation (ODE) is an equation that contains a function of one independent variable and its derivative. These equations can either be linear or nonlinear. For instance, $y = 2x + 8$.

Then, $\frac{dx}{dy} = 8$

A partial differential equation (PDE) is a differential equation that contains unknown multivariable functions and their partial derivatives. These equations are used to formulate problems involving functions of several variables. For instance, $y = 2x\partial x + 8$

19.1.4.1 Linear and non-linear differential equations

Maxima and minima points

Maximum (maxima) and minimum (minima) points have an important application in Economics.

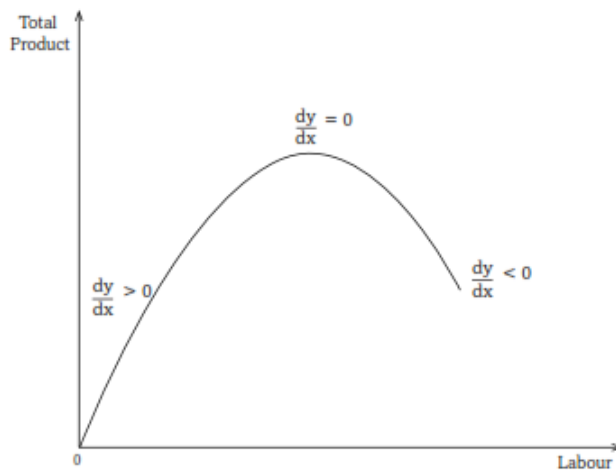


Fig 19.13: A graph showing its maximum point

Economic application

Marginal revenue function (MR)

$$MR = \frac{\Delta R}{\Delta Q}$$

Marginal cost function (MC)

$$MC = \frac{\Delta C}{\Delta Q}$$

$$\text{Marginal utility} = \frac{\Delta U}{\Delta Q}$$

At maximum profits

$$\frac{\Delta C}{\Delta Q} = 0$$

At maximum Revenue

$$\frac{\Delta R}{\Delta Q} = 0$$

Example

Given A total revenue function

$$TR = 120Q - 2.5Q^2$$

Find marginal revenue function.

The derivative is denoted dy/dx or $f'(x)$ and is given by dividing the change in y

Variable by change in change in x variable.

$$\frac{\Delta x}{\Delta y} = \frac{\text{change in y}}{\text{change in x}} = \frac{dx}{dy}$$

Rules of differentiation (Elementary level/basic level)

Constant rule if given a function $y=k$ where k is a constant, then $dy=0$

$$\frac{dx}{dy} = 0$$

Power function rule

Given a function $y=x^a$, Then,

$$\frac{dx}{dy} = (ax)^{a-1}$$
 Power function multiplied by a constant If given $y=Axb$

$$\text{Then, } \frac{dx}{dy} = b(Ax)$$

The sum rule.

Derivative of the sum of two or more functions equals the sum of the derivatives of the functions if $W(x) = W(x) + Y(x)$

$$\text{Then } \frac{dx}{dy} = W'(x) = W'(x) + Y'(x)$$

The difference rule

The derivative of the difference of two or more functions equals the difference of the derivatives of the functions.

If $U(x) = u(x) - g(x)$

Then

$$\frac{dx}{dy} = U(x) = u_1(x) - g_1(x)$$

Both ordinary and partial differential equations are broadly classified as linear and non linear equations. A differential equation is linear if and only if the unknown function and its derivative appears to be power 1. Otherwise it

is non linear. For instance, $\frac{dx}{dy} = 8$ is a linear differential equation. dx

$y = 8x + C$ is a non linear differential equation.

In Economics, differential equations are essential in computing marginal values of a

nature $\frac{dx}{dy} = 8$

For example

Marginal revenue = $\frac{\Delta \text{total revenue}}{\Delta \text{Quantity sold}}$, This is the additional revenue accruing to the firm from the sale of an additional unit of output

Marginal product = $\frac{\Delta \text{Total product}}{\Delta \text{Variable factor}}$, This is the additional/extra units of output that are derived from the employment of an additional unit of a variable factor.

Marginal cost = $\frac{\Delta \text{Total cost}}{\Delta \text{Quantity produced}}$, This is the additional cost of producing and extra unit of output.

19.1.5: Fractions in economics:

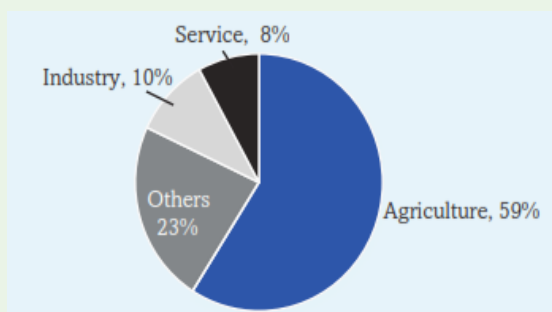
19.2 Fractions in economics



Activity 19.6

The annual budget for country X was 550b US \$. It was allocated as shown below.

Sectoral budgetary allocation



Use the figures above to answer the questions that follow:

- Determine how much was allocated to the service sector.
- Express the agricultural allocation in billions as a ratio of the total Budget
- What fraction of the budget went to other sectors?
- What proportion of the 550b \$ was allocated to the industrial sector?
- Agriculture was allocated a lion's share of the budget. In your own view, what do you think could have been the reason for this.
- Identify the sectors that may be included in the 'others'.
- Would you take the above to be a good budgetary allocation to suit your country? Support your answer.

Facts

A fraction is an expression of numbers with a numerator and a denominator.

A fraction is written as; $\frac{x}{y}$, $\frac{n}{p}$, $\frac{z}{m}$. etc. or $\frac{1}{2}$, $\frac{3}{4}$, $\frac{10}{70}$, etc.

The numerator represents part of the whole unit and denominator is the whole. In a class for instance, if you are 60 students and half of them are

boys, then we will say 30 out of 60 or half the class are boys. Or $\frac{30 \text{ boys}}{60 \text{ students}}$



Application activity 19.3

Simon, a large-scale farmer, has the following livestock on his farm:

1. 50 dairy cattle, 40 of which are currently being milked;
2. 100 beef cattle, 60 of which are cows;
3. 200 goats, 40 of which are he- goats.

Required:

a) Determine:

- i) The total number of livestock that the farmer has.
- ii) The total number of male livestock.
- iii) The total number of cattle.

b) Determine the fraction of

- i) she goats to the total goats on his farm.
- ii) beef cattle to the total cattle.
- iii) He goats to total goats
- iv) Dairy cattle to the total cows.

c) Discuss the reasons that may have made Simon to:

- i) Keep more goats than cattle on his farm.
- ii) Keep more beef cattle than dairy cattle.

19.2.1 Ratios



Activity 19.7

Work out the following:

- For a sugar-producing firm, the ratio of total fixed costs to total costs is 4:10. Determine value of its total variable costs if it spends 40 millions FRW as fixed costs.
- In a class, the ratio of girls to boys is 7:3 and the ratio of day scholars to boarders (both girls and boys) is 2:8. If the number of boarders is 400 students, determine the number of and girls in this class.
- Mbabazi works with Rwanda Environment Authority and consumes 400000 FRW of her net salary per month. If the ratio of her savings to net salary is 6:20, determine how much she saves.

Facts

Simply stated, a ratio is a number representing a comparison between two things that are in a way related. It can be represented as $\frac{x}{y}$ or $x:y$, 4: 12, 21:45, 40:50 etc. Ratios can be further simplified to the lowest form possible e.g.;

$4:12 = 1:3$; $21:45 = 7: 15$, $40: 50 = 4:5$ etc.

For example, if we look at the farm of Simon in the activity given at the beginning of this unit, we see that there are 40 dairy cattle that are being milked out of 50. Therefore, the number of dairy cattle that is not being milked is 10. From this information, we can derive the following ratios:

The ratio of the number of cows being milked to the total number of dairy cattle is 40:50. This can also be expressed in the form of a fraction as $\frac{40}{50}$.

- The ratio of the dairy cattle that are not being milked to those that are being milked is 10:40. This ratio can also be expressed as $\frac{10}{40}$.
- The ratio of the number of the cattle that are not being milked to the total number of the dairy cattle is 10:50. This ratio can also be expressed as $\frac{10}{50}$.
- The ratio derived can be further simplified to the lowest form possible such that in i), we would get a ratio of 4:5, in ii) we get 1:4, while in iii), we get 1:5.



Application activity 19.4

From the information given in the activity at the beginning of this unit, determine:

- a) The ratio of beef cattle to the total number of cattle in the farm.
- b) The ratio of bulls to cows
- c) The ratio of cattle to goats in the farm.
- d) The ratio of the he goats to the she goats.

19.2.2 Proportions



Activity 19.8

Visit the National Institute of Statistics Rwanda website [statistics/] and write short notes after discussion on the following:

- Contribution of each of the following sectors to Gross domestic product (in \ percentage) of ratio: Agriculture; Industry; Services
 - a) Percentage of population living below poverty line.
 - b) Economic growth for year 2017, 2018.
 - c) Population growth, fertility rates.
 - d) Gender composition of total population.
 - e) Literacy levels.

A proportion is the quantity of a given item that is part of the whole amount or number of that item. For example, supposing Mwiza who earns 200,000frw a month saves 100,000frw every month. Then the proportion of income saved by Mwiza is 100,000frw out of 200,000frw. It is further simplified to 1 out 2. We can therefore say that out of every 1frw that Mwiza earns, she saves 2frw. This is the marginal rate of saving by Mwiza.

At the macro level, we could also be able to determine the proportion of the total budget that the Government spends on either education or on health or on armament. In this way, we could be able to gauge whether resources are being optimally allocated or not.

19.2.3 Percentages



Activity 19.9

Work out the following:

- Umuhoza spent 20000 FRW of her monthly salary on transport. Express this as a percentage of her salary if she earns 250000 FRW monthly.
- In a class of 40 students, 25 are girls. Express the number of boys as a percentage of the whole class.
- Given that the price of commodity X increased from 500 FRW to 850 FRW per unit, what is the percentage change in price of commodity X?
- Twahirwa and Umuhoza work for KSW Ltd. Their salaries were increased last month. Twahirwa now earns 200000 FRW up from 100000 FRW. On the other hand, Umuhoza now earns 500000 FRW up from 370000 FRW. Compare their increments and discuss who got a bigger increase. Explain your answer.

Percentage is a way of expressing the magnitude of a given quantity in relation to 100 such quantities. It shows the amount, number or rate of something as part of a total of 100. Any quantity or fraction or proportion expressed as a percentage must have the symbol %. The concept of % is very important in economic analysis because it gives a quick glimpse of the magnitude of a given variable in relation to a total. For example, in the case of the firm of Simon in Activity 19.7 given at the beginning of this unit, we saw that the ratio of the dairy cattle being milked to the total number of dairy cattle was 4:5 or $\frac{4}{5}$. This is because, out of the total 50 dairy cattle, 40 were being milked. To find the percentage of these cattle being milked to the total number, we would divide 40 by 50 and then multiply by 100 for example $\frac{40}{50}$ then multiply the result by 100. This would give us a figure of 80. We would then say that 80 percent of the dairy cattle on the farm are being milked. This is written as 80%.

For example, if we are told that the youth of country X constitute 60% of the total population of that country, this gives us an immediate and clear idea of the magnitude of the population problem.

At the work place, it would also be more meaningful to talk of the number of female employees in percentage terms as a way of determining the extent of equity in employment. It is also more meaningful to the common person

when changes in certain economic parameters are expressed in terms of percentages rather than in absolute terms. We are therefore more comfortable when told of a 10% increase in the cost of living or a 20% increase in the level of wages.

In microeconomics, percentage is mainly used to determine the degree of changes in:

- Price
- Quantity
- Elasticity
- Costs
- Profit
- In macroeconomics, calculation of percentages is mainly done to determine macroeconomic indicators like:
 - Gross domestic growth (GDP)
 - Inflation rates
 - Unemployment rates



Application activity 19.5

Refer to application activity 19.6 in this unit, determine:

- a) The percentage of the he-goats to total number of goats on the farm
- b) The percentage of the bulls to the total number of beef cattle on the farm.
- c) Interpret the percentages calculated in a) and b) above.

19.2.4 Reciprocals

The reciprocal of a number would be given by dividing 1 by that number. For example, the reciprocal of 4 would be $\frac{1}{4}$. In the case of fractions, the reciprocal would be derived by inverting the fraction. Thus, the reciprocal of $\frac{2}{5}$ would be $\frac{5}{2}$.

The concept of reciprocals is widely applied in economic analysis. For example, it is used in the calculation of the multiplier in banking and investment decisions. In such a case, the multiplier is determined by calculating the reciprocal of the marginal propensity to save. This is based

on the assumption that people's income is spent on either consumption or saving. The proportion of the income that would be spent on saving is what would be referred to as the marginal propensity to save.

19.2.5 Averages and index numbers

19.2.5.1 Averages



Activity 19.10

If a cement firm employs 60 people in production of 4200 sacks of cement, calculate personal contribution of labour in that production process in terms of sacks.

When loosely stated, the average refers to the centre of a series of data. It is one of what is commonly referred to as measures of central tendency. It is found by adding the values of the data provided and then dividing by the total number of values. For example, if we are given the weekly sales of a shopkeeper as follows:

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
\$90	\$120	\$80	\$60	\$60	\$150

Then the average sales for the shopkeeper would be: \$103.3.

(Obtained by adding the daily sales, then dividing the sum by six, the number of days).

We would then say that the average daily sales for the shopkeeper is \$103.3.

This concept is used in various ways as an aid to decision making. It could be used to determine the average level of wages earned by a given group of workers, or to determine the average sales made by a team of salespersons. In Economics, the concept of the average is very important. For example, economists use the concept in analysing investment and production decisions. They will therefore talk about the average cost of production which is the total production divided by the number of units produced, as opposed to the average revenue which is the total revenue divided by the number of units sold. Comparison of the two averages can indicate the direction in which a business is going.

Average is similar to arithmetic mean. It is calculated as the sum of items divided by number of items. It measures how much does a single variable

contribute to a total. i.e $\frac{\text{Sum of items}}{\text{Number of items}}$),

In Economics we are interested in variables like

Average costs (AC) = $\frac{\text{Total cost}}{\text{Output}} = \frac{TC}{Q} = \frac{TFC+TVC}{Q}$ This is the cost per units of output.

How much expense does producing each unit of output take?

a. **Average product (AP)** = $\frac{\text{Total cost}}{\text{OuVariable factor}} = \frac{Q}{L} \text{ or } \frac{Q}{C}$, This is output per unit of the variable factor.

For instance, if you employ ten workers (units of

labor) and all together carry 1000 bricks in an hour. How many bricks will each person have carried?

b. **Average revenue (AR)** = $\frac{\text{Total revenue}}{\text{Output}} = \frac{TR}{Q} = \frac{Q}{C}$, This is revenue per unit of output sold.

How much income does each unit of output produced and sold bring to the firm?

19.2.5.2 Index Numbers

Index numbers in Economics are usually used to establish changes in the cost of living of the people. They are usually constructed to show the difference in the price of a commodity from one period to another. In constructing such index numbers, we select one year which we belief to have been relatively stable, and call it the base year. We give this year an index value of 100. For example, if the price of sugar in 2010 was \$1.00 while in 2014 it rose to \$1.2, then the price would have risen in the period by 40%.

If we take 2010 to be the base year, then the index value for 2014 would be 140. The figure 140, which relates the two prices for the two years, is called the price relative. If this was true for a wide range of commodities, then we could assert that the cost of living has risen by 40% between 2010 and 2014.

To determine such change in the cost of living, we construct what is called a **consumer cost of living index**. In this case, we consider a range of commonly used consumer products and get their relative price changes in the period under review. We then get the average of this price changes so

as to determine an overall change in the cost of living.

In Economics, index numbers are used in prices of commodities to arrive at **simple price index**, especially to determine the **consumer price index**. They are also used to determine the rate of human development to derive **human development index**.

19.2.6 Absolute values

This is the measure of quantity irrespective of direction or nature. Or the absolute number is the actual number without any consideration of the sign. In making calculations, we come up with a figure that has either positive or negative. However, such a sign may not be of any importance for making the desired decision. The magnitude of the number without considering the sign is what may be important. E.g. if we have -4, we look at $|4|$ without the negative sign. This is the idea behind the concept of absolute numbers.

In Economics, when we talk about elasticity of demand, the coefficient of elasticity could be either positive or negative. However, for decision-making purposes, it is the absolute number that is considered.



Application activity 19.6

Given that the price of a commodity is increased from 200 to 500 and quantity demanded increased from 2-5 per day. Calculate the P.E.D and the type of commodity.



End unit assessment

Every year, our country prepares an annual budget. The allocations for every sector are always in percentages or some estimated amount. Using the last annual budget,

Represent the information on a graph.

Suggest reasons why some sectors get a higher share of the budget than others.

Key unit Competency: Be able to analyse the determinants and value of demand in allocation resources in the market.

20.1. Introduction to price theory.



Introductory Activity 20

Discuss about the following:

- a) Identify and list the different commodities used in your daily life.
- b) Identify the current market prices for each commodity identified.
- c) How would you react if the prices of the commodities listed above doubled?
- d) Discuss and explain how the above prices are determined in a market.
- e) Make group presentations

The price theory is the basis of Economics and it is the study of prices. It is basically concerned with how prices for products are determined, the function of price in the market, how producers and consumers respond to price changes etc. We use the word price mostly in this unit. One should therefore ask himself or herself what this economic term “price” is! Price is what we must give in to get what we want. In the monetary economy where we use money as a medium of exchange, price is the money paid in exchange for a product. In other words, **price is the relative value of an item expressed in monetary terms.**

In a market place, there are many different groups of people. Each group has its own reason for being in the market. Some have brought their commodities for sale (sellers) while others have come to purchase commodities to satisfy their needs (buyers). The two parties meet, either physically or online, with an aim of exchanging a particular commodity at a price. Different commodities in a market have different market values or prices expressed in monetary terms.

20.1.1: Price determination



Activity 20.1

Read the following passage and answer the questions that follow.

Of recent, the number of trucks carrying fuel from the port of Mombasa in the Republic of Kenya into Rwanda reduced. It is said that the cause of this was some barriers along the route that disrupted importation of crude oil into Rwanda. At pump stations countrywide, there has been scarcity of fuel. If the government had not acted quickly to address the situation, pump prices would have shoot up tremendously.

Required;

- a) Discuss the effect of scarcity of fuel on:
 - i) The pump price of fuel.
 - ii) The price of commodities in the markets countrywide.
 - iii) The amount of goods and services that people can be able to purchase from markets.
- b) Explain the ways in which the government may have used 'to address the situation above.
- c) Other than the government determining prices, how else are prices determined in markets in your country?
- d) From the passage, what do you think determines the price levels in markets in a country?

From your discussions, make a class presentation.

In a market, there are different ways through which prices are determined. These include among others the following.

- Haggling/bargaining: This refers to the negotiation process between buyers and sellers about the price of a given commodity. The seller keeps on reducing the price and the buyer continues to increase the amount he/she is willing to pay. The process continues until when the buyer and the seller agree on the same price.
- Fixing prices by signing treaties: This is where buyers and sellers come together to fix a price for a commodity through signing an agreement. The price agreed upon can later be revised by amending the treaty.

- Sales auctioning: This takes place when there is one seller and many buyers competing for the commodity by offering high prices. The commodity is taken by the highest bidder i.e. one who pays the highest price.
- Resale price maintenance: This is where prices of commodities are fixed by the producers or manufacturers up to the final consumer. A uniform price is set at all levels of distribution thus there is no bargaining e.g. prices of airtime, newspapers, magazines, soft drinks etc.
- Fixed prices by Government: This is where prices are fixed by the government. This price can be either minimum price or maximum price depending on the prevailing conditions in the economy. It is most common with merit goods.
- Market forces of demand and supply: This is where the price in the market is determined by the market forces of demand and supply. .
- Price cartels: This is where producers producing similar commodities agree on a price at which their commodities should be sold. It is also called perfect collusion.
- Price leadership: This is where a leading firm (the price leader) sets a price for its goods and services and other firms follow the same price. It is also called imperfect collusion.

20.1.2: Factors that determine prices in the market.

The various factors that determine price levels in the market include:

- Cost of production: Cost of Production refer to the expenses incurred by a producer in the process of production. Therefore, the higher the costs of production, the higher the price for final goods and services in the market and vice versa. This is because if a producer wants to recover the amount spent in production and therefore earn some profits (as the major aim), he/she must increase the price for the commodity produced.
- Level of competition in the market: Where there are many producers in the market for a similar product, there is stiff competition, supply is much, which makes prices to be low in the market by most firms so as to attract customers easily and faster. But where there are a few sellers or one seller in the market, prices tend to be high as supply of commodities tends to be low.
- Government policy: Government through price legislations can influence the level of prices especially if it is an essential but scarce or strategic to the economy. E.g. water, electricity, fuel etc. Therefore, the

government may fix a minimum price or a maximum price depending on the prevailing economic conditions in the country.

- Demand and supply of the commodity: When the demand for the product seems to be higher than the output, the producer will raise the price. However, if the output is more than the demand, and in order to capture the market, the price is slightly reduced.
- The type of the product: Manufactured or processed commodities have a higher price than unprocessed ones. Similarly, branded commodities are always highly priced than those which are unbranded.



Application activity 20.1

Discuss the practical application of resale price maintenances in the market.

20.2: Demand



Activity 20.2

Read the following case study and answer the questions that follow.

Miss Dushime requires so many things for survival and comfort. Therefore, she has to struggle to attain her desires. At times she has capacity to purchase what she desires, but she may or may not purchase. At certain times, she does not have the capacity to purchase, though the desire still holds.

Required:

Based on the case study about Dushime, visit the library or internet and

- Define demand
- State the law of demand
- Express the law of demand using a demand schedule and demand curve.

Demand is the desire backed by the ability and willingness of a consumer to buy a commodity in a particular market at a given price in a given period of time. It can also be defined as the quantity of a commodity that buyers are willing and able to buy at a given price in a given period of time.

In absence of purchasing power, demand is not effective thus individuals must be able and willing to buy them. Therefore, **effective demand** refers to the actual buying of the commodities. Or it's the demand which is backed by the ability to pay (money). Demand that is not backed by ability to pay (money) is called **latent demand**.

20.2.1. The law of demand.

The law of demand states that “**Ceteris paribus, the higher the price of a commodity, the lower the quantity demanded and the lower the price of commodity, the higher the quantity demanded**”. The law of demand expresses the relationship between the quantity demanded and its price. The law can be explained by the demand schedule and demand curve.

20.2.2: The demand schedule;

This is a numerical representation or table showing quantities demanded of a given commodity at different price levels. A demand schedule can be for an individual buyer of a given commodity or it can be for all the consumers in the market for same commodity.

For example;

a) Individual demand schedule for pineapples

Price (Frw)	Quantity in kilograms
1400	5
1200	10
1000	15
800	20
600	25
400	30
200	35

b) Market demand schedule for pineapples.

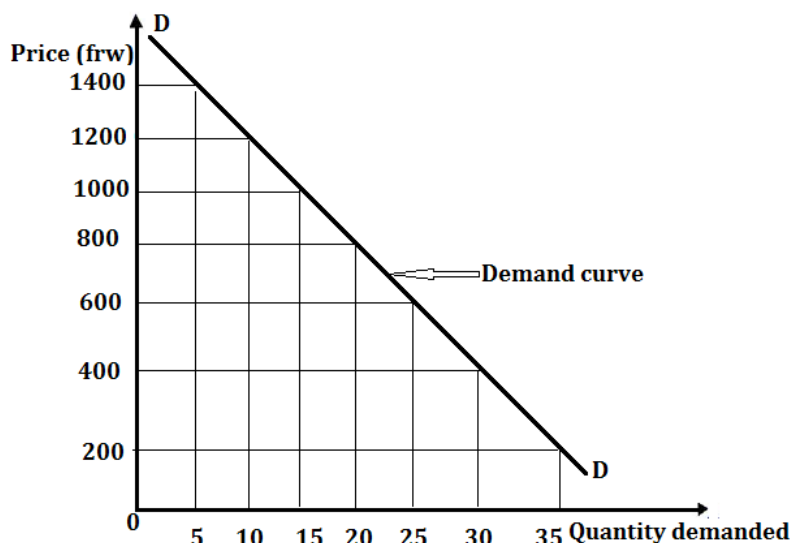
Price (frw)	Consumer A	Consumer B	Consumer C	Market demand
1400	5	2	3	10
1200	10	4	6	20
1000	15	6	9	30
800	20	8	12	40
600	25	10	15	50
400	30	12	18	60
200	35	14	21	70

20.2.3: The demand curve

The demand curve is the graphical representation of the quantities of a commodity demanded at various prices in the market at a given period of time. It is a locus of points showing different quantities demanded by the consumer at different prices. It is derived from a demand schedule. It is drawn on the assumption that the higher the price the lower the quantity demanded and vice versa; other factors remaining constant. It depicts the law of demand.

Using the above individual demand schedule, a demand curve can be illustrated as below.

Illustration of a demand curve



From the above figure, DD is the demand curve. At a lowest price 200frw quantity demanded is high (35 units) while at a highest price 1400 frw less is demanded (5frw).

A demand curve can be for an individual obtained from an individual demand schedule or for all the market demand by all individuals for a given commodity from a market demand schedule. A market demand curve appears flatter than an individual demand curve because it is a summation of all individual demands of a given commodity.



Application activity 20.2

Basing on the law of demand stated above, formulate

- An individual demand schedule of your own and illustrate the information on a curve.
- A market demand schedule of your own and illustrate the information on curve.

20.2.4: Factors that determine quantity demanded of a commodity.



Activity 20.3

Analyse the demand schedules for clothes by Mukunzi and Muriza, and answer the questions that follow.

Price (frw)	Quantity demanded by Mukunzi	Quantity demanded by Muriza
10,000	12	3
8000	14	6
6000	16	9
4000	18	12
2000	20	15

Required:

- Explain why units of clothes bought go on increasing as prices reduce and vice versa.
- Explain why you think Mukunzi bought many units of clothes than Muriza at the same price levels.
- Other than price changes, what else do you think would make the two not to buy the same units of clothes.

1. Price of the commodity: The higher the price of a commodity; the lower the quantity demanded and the lower the price of a commodity, the higher the quantity demanded, *ceteris paribus*.
2. Price of other commodities: The price of one commodity may affect quantity demanded of another commodity. The amount of a commodity demanded can be affected by changes in price levels of related commodities in 2 ways:
 - a) Substitute commodities: Substitutes are commodities that serve the same purpose. When the price of one commodity increases, the demand of another goes higher and vice versa. For example, when price of OMO increases, demand for NOMI also increases.
 - b) Complementary commodities: Complementary commodities are goods that are jointly demanded/ bought e.g. paper and pen, shoe and shoe polish, paraffin and lamp, phone and sim-card, guns and bullets, cameras and films, car and fuel etc. In case of these commodities one is almost useless without the other. Thus, when the price for one falls, people buy more of it and as they buy more of it, the demand for its complement increases. E.g. When the price of cell phones reduce, more people buy phones and this increases the demand for sim cards. Or when the price of cars increase, the demand for cars reduce leading to a corresponding decrease in the demand for fuel.
3. Level of consumer's income:
 - a) For a normal good, an increase in consumers' income will lead to an increase in quantity demanded of a normal good while reduction in consumers' income will lead to low quantity demanded *ceteris paribus*. E.g. bread, rice etc. they have positive income elasticity of demand.
 - b) For inferior goods, the higher the income, the lower the quantity demanded and lower the income, the higher the quantity demanded *ceteris paribus*. They have negative income elasticity of demand.
 - c) For essential commodities or necessities, the changes in incomes don't affect quantity demanded. They have zero income elasticity of demand.
4. Government policy: Government policy like taxation affects quantity demanded. For example, when taxes are increased, the quantity demanded reduces and when taxes are reduced, (there is subsidization) quantity demanded increase, holding other factors constant.

5. Price expectation: If the consumers expect an increase in price of a certain commodity in future, they tend to buy too much of that commodity now which increase its quantity demanded. If they expect a reduction in price of a commodity in future, they buy less of that commodity now reducing the quantity demanded.
6. Seasonal factors: When the season is favorable to a commodity, quantity demanded increases e.g. The demand for umbrellas increases during rainy season, demand for christmas cards increases during Christmas season etc. When the season is not favorable the demand of that commodity reduces.
7. Inflation: Inflation leads to high prices which reduces demand and vice versa.
8. Tastes and preferences: When the tastes are favorable towards certain commodity ies, the demand of that commodity will be high and when unfavourable, the demand will be low.
9. Income distribution patterns in an economy: Other factors equal, when incomes are evenly distributed in an economy, the demand for households in the economy will be high and when unevenly distributed, demand will be low.
10. Size of the population: A higher population size has a higher purchasing power than a small one thus leading to high demand and vice versa.
11. Fashion: If goods are on fashion, they will be highly demanded unlike when they are out dated or out of fashion.
12. Habit: Some commodities are consumed out of habit for example if it is a habit for someone to consume beer, he or she will buy more of it and vice versa.
13. Credit availability: If credit is available at low interest, people will be able to access it and borrow for consumption thus increase their quantities demanded and vice versa.
14. Bandwagon: Some people will always demand more or less of a commodity because their friends have bought more or less of it thus increasing or decreasing quantity demanded of it.
15. Amount of advertising: Highly advertised commodities attract more customers thus increasing their quantity demand and vice versa. This is because advertising influences people's decision to buy highly.
16. Social cultural and political factors: Demand for most commodities tend to increase during festive seasons like Christmas, Easter, Eid, independence. However, some social culture and political factors

can lead to less demand of a commodity. For example, some cultures, religions forbid their people to consume some commodities thus leading to less quantity demanded of them.

17. Education: This influences people's tastes and preference. Where there is a difference in people's level of education, their consumption levels over certain commodities differ. For example, highly educated people demand more of newspapers than uneducated ones.
18. Age structure: When the composition of a certain population is dominated by a certain age group, demand is influenced accordingly. For instance if the majority of the population are young people, demand for entertainment gadgets increases and vice versa, *ceteris paribus*.

20.2.5: Types of demand (interrelated demand):



Activity 20.4

Study the following sets of commodities and answer the questions that follow.

Set A

Butter and margarine; Tea & Coffee; Colgate & White dent; Private schools and public schools; Rice and Macrons; Potatoes and cassava.

Set B

Cars and fuel; Cars and tyres; Shoes and Polish; pen and ink; Mobile Phones and Sim Cards; Computer Hardware and Computer Software; Torch and Battery.

Set C

Wheat for producing bread, biofuels or feeding livestock; Land for farming or building houses; an iPhone used as camera, for internet access and making phone calls; Water for cooking, bathing, washing, mopping, drinking; Wool for carpets, blankets, jackets.

Set D

Shoes and phone; mattress and shirt; computer and bicycle; pen and plate; water and airtime.

Required:

- a) What economic name is given to the demand for each set of commodities A, B, C & D?
- b) Explain the relationship between commodities in each set A, B & D.
- c) Explain how price changes affect demand of commodities in each set.

Interrelated demand is a situation where demand for one commodity affects or is affected by demand for another commodity positively or negatively.

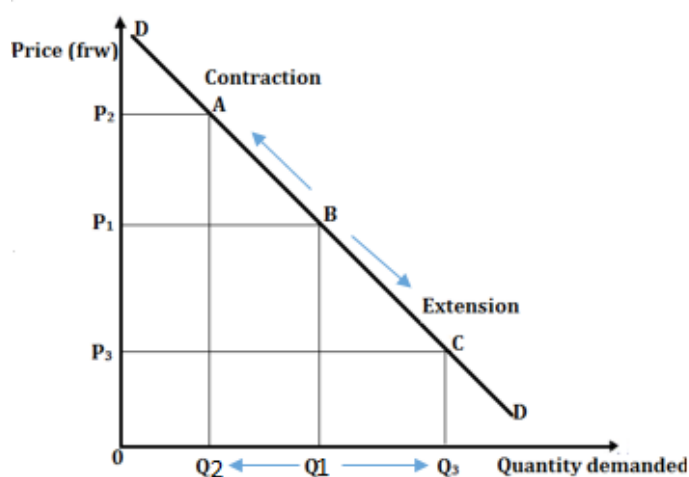
The following are types of demand;

1. Joint/complementary/twin demand: This is demand for commodities that are consumed together for greater satisfaction such that an increase in demand for one automatically will lead to an increase in demand for the other commodity. and vice versa. e.g. cars and petrol, phone and sim card, pen and ink, camera and films, toothpaste and toothbrush etc.
2. Competitive demand: This refers to demand for commodities that serve the same purpose (substitutes) such that an increase in demand for one will lead to a decrease in demand for the other e.g. Nomi & Omo, Colgate and Close up, beans and peas, blue band and jam etc.
3. Composite demand: This is demand of a commodity which serve several purposes/ uses such that its total demand is got by adding up quantities demand for several uses e.g. timber, water, electricity etc.
4. Derived demand: This is demand for a commodity not for its own sake but as a result of its purpose it is used to serve i.e. demand for this commodity is the direct result of the demand for a commodity it is used to produce. e.g. demand for factors for production like land, labor capital as a result of demand for commodities which can be produced using these factors of production. etc.
5. Independent demand: This is demand for commodities which is not affected by the demand for other commodities. For example the demand for aeroplanes is not related to demand for needles, or demand for shoes is not related to for cups etc.
6. Direct demand: This is demand for commodities for the direct satisfaction of the consumer. Consumer goods
7. Latent demand: This is demand for a commodity which is not backed or supported by purchasing power.
8. Effective demand: This is demand for a commodity which is supported or backed by the purchasing power (cash/money).

20.2.6. Change in quantity demanded & change in demand

a) Change in quantity demanded.

A change in quantity demanded refers to an increase or decrease in quantity demanded of a commodity due to a change in price of that commodity, other factors held constant. A change in quantity demanded can be illustrated by the movement along the demand curve upwards to the left (contraction / decrease in demand) or downwards to the right (expansion/ increase in demand) as below;

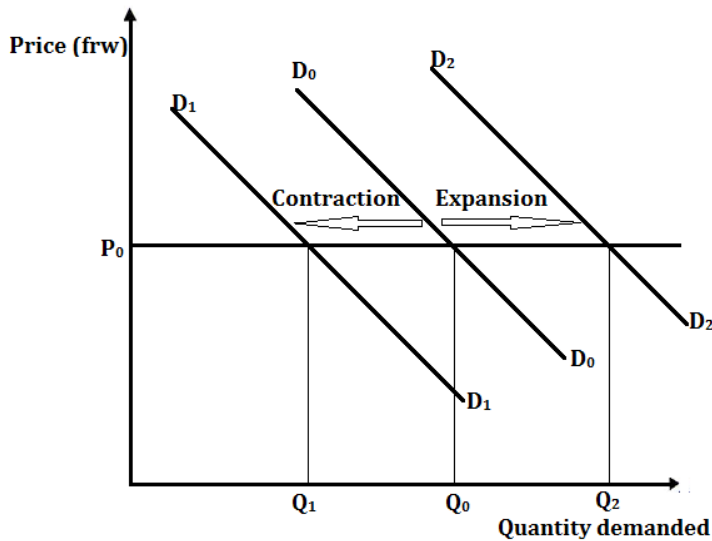


As prices fall from P_1 to P_3 , quantity demanded rises from Q_1 to Q_3 and as prices increase from P_1 to P_2 , quantity demanded falls from Q_1 to Q_2 .

b) Change in demand;

This refers to an increase or decrease in quantity demanded of a commodity due to change in other factors that affect demand holding price of that commodity constant. A change in demand can be illustrated by the shift in the demand curve either to the left (decrease in demand/ contraction) or to

the right (increase to the demand/ expansion) as below;



An extension in demand curve i.e. increase in demand from $0Q_0$ to $0Q_2$ shows a positive change in other determinants of demand holding prices constant. While a contraction i.e. decrease in demand from $0Q_0$ to $0Q_1$ shows a negative change in other determinants of demand holding prices constant.



Application activity 20.3

Explain the reasons why people demand goods in a market.



Skills lab

Undertake a market research inside and outside the school community, form a school- based business club, analyze the factors that determine the demand of some commodities. And then come up with a list of certain commodities that are highly demanded and produced according to the analysis made.



End unit assessment

1. What are the common methods of price determination in markets in Rwanda?
2. Describe the different factors that determine your levels of demand for the commodities you normally purchase.
3. Under what circumstances may
 - a) More of a commodity be demanded at constant prices?
 - b) Less of a commodity be demanded at constant prices?
4. Examine the factors that may affect change in quantity demanded.
5. Explain how the following affect demand for some commodities in markets
 - a) Government policies of taxation and subsidization.
 - b) Change in Price of fuel against the demand for food staffs in markets.
6. Analyse the following statements and answer the questions that follow:
 - a) The price of cameras increased from 10,000frw to 15,000frw leading to a decrease in quantity demanded of camera films from 8 to 5 units.
 - b) The price of Nomi increased from 150 to 200frw leading to an increase in quantity demanded for sunlight from 5kgs to 8kgs.

Required:

- i) How are commodities in each case related?
- ii) Illustrate the information in each case on curves.

UNIT 21:

THEORY OF SUPPLY

Key unit Competence : By the end of the unit you should be able to analyse the determinants of supply in the market.



Introductory Activity 21

Rwanda is among the countries gifted with natural resources; for example, lakes, rivers, mountains, natural forests, soils etc. for various activities. However, they are not equally distributed in all parts of the country. Different regions have different resources that enable them to practice different activities. Some regions are highly endowed with resources and thus have ability to produce and supply much in the market, while some other regions are less endowed with favorable resources which make them unable to access most of their requirements for production and thus, suppliers in such areas take few products in the market.

- a) What, other than inadequate raw materials, can make producers to produce and supply less in markets?
- b) In case you are from such areas that are less endowed with natural resources, what would you do to increase supply of commodities?

In the previous unit, we analyzed the relationship between price and quantity demanded. The two have an inverse relationship. In the supply theory, we are going to analyse the relationship between price and quantity supplied. There is a direct relationship between demand and supply. What is supplied by producers in the market is demanded by consumers.

21.1: Meaning of supply.



Activity 21.1

Analyse the following passage and answer the questions that follow;

Dufatanye, a rice and maize growing cooperative in Gatsibo district, Eastern province, was given the mandate to supply rice and maize flour to boarding secondary schools in Gatsibo district. After sometime, it was later realised that maize flour supplies were not sufficient to all schools as had been agreed in their contract. However, rice supply was sufficient and in excess of what was required for all the schools in contract. Prices for maize flour had to increase while for rice fell.

Required;

- a) From the passage above, what do you understand by the term supply?
- b) Examine factors that might have favoured rice supply and disfavoured maize flour supply.

Supply refers to the willingness and ability of a producer or seller to bring to the market certain amounts of a commodity at a given price in a given period of time. OR Supply refers to the amount of goods and services that are available in the market.

Quantity supplied refers to the amount of a particular commodity that producers/suppliers are able and willing to bring to the market for sale at a certain price in a given period of time. The ability to produce commodities requires resources. The willingness to supply commodities is majorly influenced by price.

21.2: The Law of Supply.

It states that “Ceteris paribus, the higher the price, the higher the quantity supplied and the lower the price, the lower the quantity supplied”. When other factors that may influence supply are held constant, when the price increases, producers produce and supply more and the reverse is true. The law of supply is explained by the supply schedule and supply curve.

21.3: Supply Schedule;

A supply schedule is a table that shows different quantities of a commodity that a producer can supply at different prices per period of time. OR This is a table that shows a list of quantities supplied and their respective prices.

It is drawn based on the law of supply. A supply schedule can be for an individual producer or seller i.e. a table showing quantities supplied by single seller/producer at various prices or it can be for the whole market of same commodity (summation of all individual producers'/sellers' quantities in the market for a given commodity at various prices in a given period of time).

For example;

a) Individual supply schedule.

Price (frw)	Quantity supplied (kgs)
1000	10
2000	20
3000	30
4000	40
5000	50

b) Market supply schedule.

Price (frw)	Firm A	Firm B	Firm C	Market supply
1000	10	5	15	30
2000	20	10	30	60
3000	30	15	45	90
4000	40	20	60	120
5000	50	25	75	150

21.4: The Supply Curve;

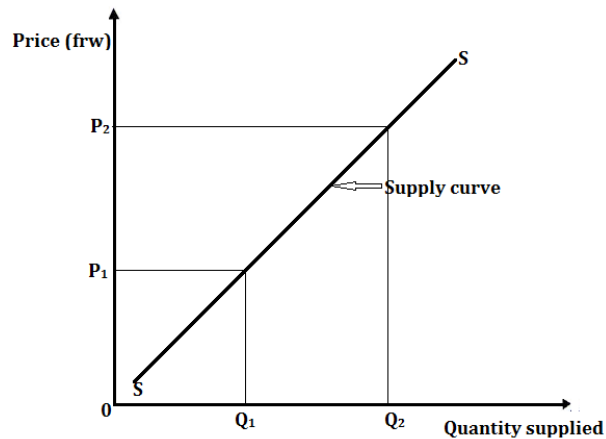


Activity 21.2

Basing on the law of supply and the supply schedules formulated above, illustrate the information on graphs and comment on the shape of the curves drawn.

A supply curve is a graph that shows different quantities of a commodity that suppliers/producers are able and willing to bring to the market at different prices over a given period of time. It is a graphical representation of the law of supply. It is upward sloping from left to right illustrating the law of supply. A supply curve can be for an individual supplier or for the whole market.

Illustration of an individual supply curve;



The supply curve is upward sloping showing that as the price increases from OP_1 to OP_2 , quantity supplied also increases from OQ_1 to OQ_2 . This illustrates what the law of supply states. The supply curve may not pass through the origin because suppliers usually have a minimum price (reserve price) below which they aren't going to supply or sell. .

For example, the minimum price in the above curve is P_1 . The quantity therefore remains at zero until that minimum price is reached.

21.5. Factors that determine quantity supplied of a commodity.



Activity 21.3

Analyse the case study below and answer the questions that follow;

Ishingiro Bakery Ltd, a producer of bread in Rwanda, uses wheat flour and sugar as the main ingredients. From your own understanding, examine what will happen to the price and amount of bread supplied in markets in Rwanda if the following events took place;

- a) Because of the East African Common Market protocol, Tip Top Bakery Ltd from Uganda and Super Loaf Ltd from Kenya enter the Rwandan market.
- b) Pembe Rwanda Ltd, importers of wheat into Rwanda gets access to cheaper sources of wheat.
- c) As a result of environmental degradation like deforestation and silting of water bodies, there are long spells of drought that affect wheat and sugar plantations.
- d) The parliament passes a bill that imposes a very high minimum wage.
- e) There is introduction of new and more efficient machines in the bakery industry.
- f) Taxes on inputs are reduced.
- g) Because of government efforts on encouraging and promoting young entrepreneurs, more youth form their cooperatives and start up their own bakeries.
- h) The number of people who prefer to consume bread to other consumables increase.
- i) The price for cakes, a substitute of bread reduces.

Quantity supplied of a commodity is affected by the following factors:

1. Price of the commodity: Ceteris paribus, the higher the price the higher the quantity supplied and the lower the price the lower quantity supplied

2. Number of firms or producers: The more producers are engaged in production of a given commodity the more of that commodity will be supplied and if producers are few the quantity supplied of that commodity will be low.
3. Goals or objective of a firm: If the aim/objective of the firm is sales maximization more will be supplied and if it is profit maximization less will be supplied.
4. Cost of production: The lower the cost of production, the higher the quantity supplied and the higher the cost of production, the lower the quantity supplied.
5. The level of technology: The more advanced the technology is, the more the quantity supplied and the less advanced technology is, the less the quantity supplied
6. Demand for the commodity: There is a direct relationship between demand for a commodity and its supply. i.e. an increase in demand for a commodity makes it more profitable as this will increase its price. Thus, an increase in demand encourages producers to produce more output to satisfy the available demand. On the other hand, a decline in demand for a commodity discourages its production and supply.
7. Government policy: if government imposes high taxes on producers, production and supply reduce and where the government subsidizes producers, production and supply increase.
8. Seasonal factors: If the season is favourable for a given commodity supply will be high and if the season is not favourable, the quantity supplied will be low. .
9. Degree of freedom of entry of new firms in production: Some industries have entry barriers in form of startup costs, patents, technology, limit pricing by the already existing firm. When there is freedom of entry of new firms into the industry supply increases while restricted entry of new firms keeps supply low.
10. Time: Supply is high in the long run and in short run the supply is low. It is very easy for producers to supply more of a commodity with in long period of time, and they can only produce less of that commodity with in short period of time.
11. Political climate i.e. Peace and stability in the country will encourage investment, production and supply of goods and services while instability and insecurity in the country will discourage investments, production and supply of goods and services.

12. Gestation period: This is the duration between the time when the decision to produce and supply a commodity is taken and the time output is actually produced and supplied. A long gestation period reduces supply in the current period. A short gestation period increases supply in the current period.
13. Level of infrastructural development: Well or highly developed infrastructure promotes investment, production, movement and supply of commodities while poorly developed infrastructures discourages investment, production movement and supply of commodities.
14. Size of the population/market: the bigger the size of the population, the bigger the size of market thus the higher the quantity supplied and vice versa ceteris paribus.

21.6 Types of supply



Activity 21.4

Analyse the following sets of commodities and, answer the questions that follow

Set A

Mutton and wool, Sugar and sugar molasses, beef and hides, banana and banana peels.

Set B

Food crops and cash crops, land for agriculture and land for construction, land for commercial purposes and for residential.

Research from the library or internet and;

State what economic term is given to the sets in each category A and B.

- a) State what economic term is given to the sets in each category A and B.
- b) Explain the relationship between the commodities in each set.
- c) Identify other commodities that belong to each set.

1. **Joint supply:** This is where two commodities are supplied together and an increase in supply of one will cause the supply of the other to increase, e.g. sugar and molasses, mutton and wool, cotton and cotton seeds, beef and hides etc. Where joint supply exists, the supply and demand for each product is linked to the others originating from the same source. For example, if demand increases for wool, and sheep farmers therefore raise more animals for wool, there will be a related increase in sheep meat production. This increased production will lead to greater meat supply and potentially lower prices.
2. **Competitive supply;** This is where commodities are related in such a way that an increase in production of one commodity means a reduction in output of the other e.g. supply of meat and milk, cash crops and food crops, chicken and eggs. Etc. Goods and services in competitive supply are alternative products that a business could make with its factor resources of land, labour and capital.

21.7 Change in supply and change in quantity supplied



Activity 21.5

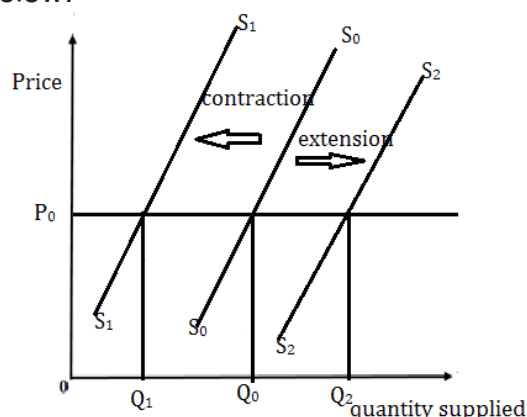
Read the following case study and in groups, answer the questions that follow;

1. Mr. Nkusi a producer of coffee, supplied 200 tones at 1000frw per tone, in period 1. In period 2, he supplied 1000 tones at the same price.
2. Miss Karigirwa, a producer of tea, was able to supply 300 kilograms of tea at 500frw per kilogram, in period 1. In period 2, as prices increased to 700frw per kilogram, she managed to increase her supply to 500kilograms.

Required:

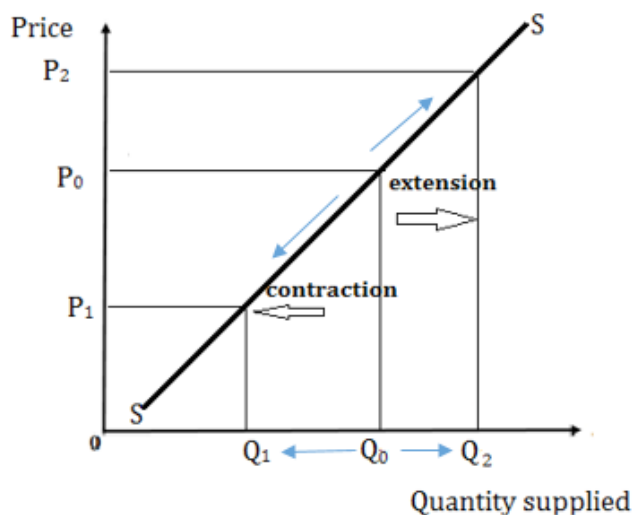
- a) What economic term is given to each scenario '1' and '2'?
- b) Examine the factors that may have led to;
 - i) Mr. Nkusi changing his supplies at constant prices.
 - ii) Miss Karigirwa changing her supplies between period 1 and 2.

Change in supply: refers to increase or decrease in the amount of a commodity supplied in the market at a particular time due to other factors that affect supply holding prices constant. In change in supply, the price of the commodity remains constant, the supply curve shifts either to the right (indicating an increase in supply) or to the left (indicating a decrease in supply) as a result of other factors i.e. quantity supplied changes. This can be illustrated as below:



At a constant price OP_0 , quantity supplied is increasing or reducing as shown by the shifts in the supply curve from S_0 to S_2 and from S_0 to S_1 respectively.

Change in quantity supplied: This refers to increase or decrease in the amount of a commodity supplied to the market as a result of changes in its price holding other factors that determine supply constant. In a change in quantity supplied there is price change which results into a change in the amount supplied. There is movement along the same curve either downwards to the left which indicates a decrease or upwards to the right which shows an increase quantity supplied.



A change in price from OP_0 to OP_2 leads to an increase in quantity supplied from OQ_0 to OQ_2 while a change in price from OP_0 to OP_1 leads to a decrease in quantity supplied from OQ_0 to OQ_1 .



Application activity 21.1

Basing on the law of supply, on your own, formulate an individual and market supply schedules.



Skills lab

Form a business club in your school, analyze the factors that influence the supply of commodities, come up with ideas of how you will maintain a manageable supply so as earn profits and increase the demand of your commodities in the school and outside school.



End unit assessment

End of unit assessment.

1. Analyse the factors that might make someone supply much or less in a market.
2. Other than examples given in the unit, identify more examples in your society, of commodities that are;
 - i) Jointly supplied
 - ii) Competitively supplied.
3. Under what circumstance may;
 - i) More of a commodity be supplied at constant prices?
 - ii) Less of a commodity be supplied at constant prices?
4. How may government regulate supply of commodities to compromise environmental sustainability.

UNIT 22:

EQUILIBRIUM AND PRICE DETERMINATION

Key Unit Competence: Be able to determine the equilibrium position in the market.



Introductory Activity 22

Analyse the following case study and answer the questions that follow:

In period 1, a change in the price of a given commodity created a shortage of it in the market, which meant that consumers wanted to buy a higher quantity than the one offered by producers. In this case, demand exceeded supply and consumers were not satisfied. In contrast, in period 2, a change in the price of the same commodity created its surplus, which meant that consumers wanted to buy less quantity than the one offered by producers. In this case, supply exceeded demand and producers needed to lower the price of the product to avoid excessive inventory. In period 3, change in price of that very commodity, made consumers to purchase all what was brought for sale and the market was cleared, which means there was neither a shortage nor an excess.

Required: Visit the library or internet and research about the following;

- What economic term is given to the price that is in the market at any given time?
- What economic term is given to that price in situation in the market where all what has been brought for sale by sellers has been bought by buyers?

In Unit 20, we looked at how prices are determined in the market by the forces of demand and supply. Buyers meet with sellers in the market and each negotiates to satisfy his or her interest. Buyers want to maximize satisfaction at the lowest possible price. Sellers want to maximize profits by selling at the highest possible price. When the market forces are left to operate freely without any interference, there will be continuous adjustments until a point where stability is attained.

We also looked at demand and supply in units 20 and 21 respectively, and saw how quantity demanded and quantity supplied relate to price. We explained how each of the two changes and what happens to the curves. This unit will explain what the market price is, with reference to demand and supply conditions and also walk you through an example of determining the equilibrium price.

22.1: Meaning of equilibrium price and quantity.

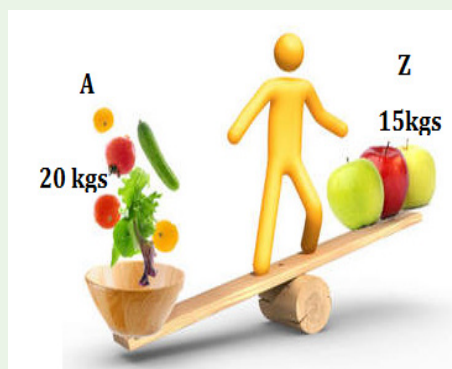


Activity 22.1

Image 1



Image 2



3. Analyse the images above and answer the questions that follow:
4. Distinguish image 1 from image 2?
5. What can be done to bring about a balance between the two objects in image 2?
6. b) Supposing object A represented the number of kilograms brought to market by suppliers and object Z represented the number of kilograms demanded by buyers of a particular commodity in a market, explain what would happen to the price of such a commodity.
7. What economic terms would you give to the situation where
8. The two sides balance.
9. There the two sides don't balance?

Equilibrium is a state of stable conditions in which all significant factors remain more or less constant over a period, and there is little or no inherent tendency for change. For example, a market is said to be in equilibrium if the amount of goods that buyers wish to buy at the current price is matched by the amount the sellers want to sell at that price.

Equilibrium price is the price where the demand for a product or a service is equal to the supply of the product or service. At equilibrium, both consumers and producers are satisfied, thereby keeping the price of the product or the service stable. At equilibrium, there is no shortage or surplus unless a determinant of demand or a determinant of supply changes. At this point, the demand and supply curves in the market intersect. Therefore, to determine the equilibrium price, you have to figure out at what price the demand and supply curves intersect.

Equilibrium quantity is a quantity at which supply of a commodity in the market equals demand for it at a given price. Equilibrium quantity is when there is no shortage or surplus of a product in the market. Supply and demand intersect, meaning the amount of an item that consumers want to buy is equal to the amount being supplied by its producers. In other words, the market has reached a perfect state of balance as prices stabilize to suit all parties.

22.2: Deriving market equilibrium:



Activity 22.2

Study the table below and answer the questions that follow.

Price (frw)	Quantity demanded (kgs)	Quantity supplied (kgs)	Surplus (kgs)	Shortage (kgs)
100	5	50		
90	12	41		
80	18	35		
70	22	28		
60	25	25		
50	34	22		
40	41	18		
30	47	14		
20	50	9		
10	55	5		

Required;

- a) Fill up the columns of shortage and surplus.
- b) Identify;
 - i) What causes a shortage and a surplus.
 - ii) The equilibrium price and quantity.

Market equilibrium occurs when the desires of buyers and sellers align exactly so that neither group has a reason to change its behaviour. This means there is no shortage and no surplus in the market. There are two approaches to determining the market equilibrium that is, using:

- Joint demand and supply schedules.
- Joint demand and supply curves.
- Equilibrium equations.

i) Equilibrium determination using Joint demand and supply schedules.

To determine market equilibrium using joint demand and supply schedules, you have to bring together the demand and supply schedules in the same table. At any price in the market (market price), there is a given quantity of the commodity that is supplied and demanded. However, it doesn't necessarily mean that all what is supplied has to be demanded. That is, a market price is any price ruling in the market irrespective of whether quantity demanded equals quantity supplied or not. **OR** a market price is any price determined by buyers and sellers in the market.

It should be noted that, all prices ruling in the market are market prices but not all market prices are equilibrium prices. An equilibrium price, as noted before, is a price at which quantity supplied is equal to quantity demanded in the market. Where the two forces are not equal, there could be a **disequilibrium state**. A disequilibrium is a situation where forces of demand are not equal to forces of supply. It may be either demand greater than supply leading to a shortage (excess demand) or supply greater than demand leading to a surplus (excess supply). In disequilibrium state there is disequilibrium price.

Joint demand and supply schedules.

Price (frw)	Quantity demanded (kgs)	Quantity supplied (kgs)
35,000	100	700
30,000	200	600
25,000	300	500
20,000	400	400
15,000	500	300
10,000	600	200
5000	700	100

From the table above, there is only one price of 20,000frw at which quantity demanded equals quantity supplied (equilibrium price) and one quantity 400frw at which quantity demanded equals quantity supplied (equilibrium quantity).

At a price less than 20,000frw there is disequilibrium state, that is, there is excess demand and shortage of commodities because quantity demanded exceeds quantity supplied.

At a price greater than 20,000frw, there is a disequilibrium as well, that is, there is excess supply or surplus because quantity demanded is less than quantity supplied.

In cases of excess demand there is rivalry between consumers which leads to high price offered in the market than the prevailing one which causes upward pressure on prices. On the other hand, in case of excess supply sellers are likely to cut their prices to get rid of their supply. Consumers observing the unsold stock of goods will begin to offer lower prices thus leading to downward pressure on prices.

At 20,000frw, producers are willing to sell their goods for example, 400kgs and consumers are willing to purchase the same amount. At this point, there is no tendency to change we therefore achieve equilibrium price i.e. a price at which quantity demanded equals quantity supplied (market clearing price).

ii) Equilibrium determination using joint demand and supply curves.

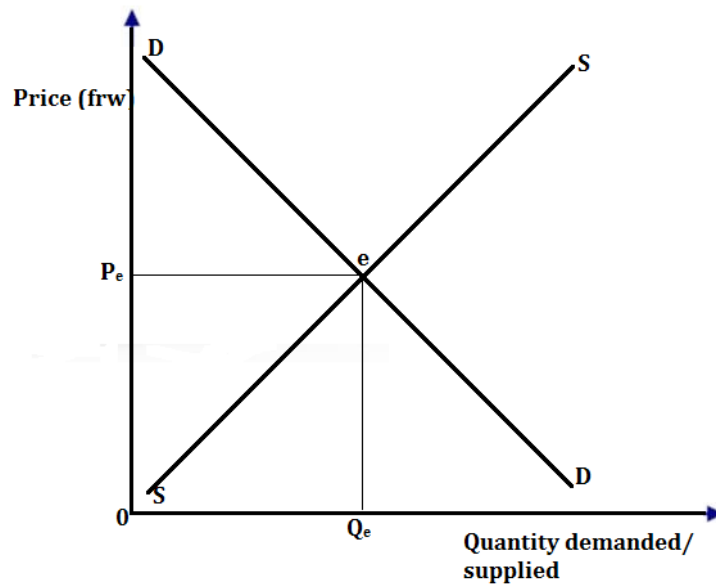


Activity 22.3

Basing on the above demand and supply schedules,

- i) Sketch a curve that shows equilibrium price and quantity.
- ii) Indicate, on the graph, areas of shortage and surplus.

In a graphical representation, equilibrium means the intersection point of the supply and the demand curves. Because the graphs for demand and supply curves both have price on the vertical axis and quantity on the horizontal axis, the demand curve and supply curve for a particular good or service can appear on the same graph. Together, demand and supply determine the price and the quantity that will be bought and sold in a market.



From the above curve, SS is the supply curve and DD is the demand curve, equilibrium is at “e” where the supply and demand curves cross. The equilibrium price is P_e and equilibrium quantity is Q_e . The equilibrium occurs where the quantity demanded is equal to the quantity supplied. If the price is below the equilibrium level, for example, below P_e , then the quantity demanded will exceed the quantity supplied. Excess demand or a shortage will exist. If the price is above the equilibrium level, for example above P_e , then the quantity supplied will exceed the quantity demanded. Excess supply or a surplus will exist. In either case, economic pressures will push the price toward the equilibrium level that is at point “e”.

iii) Equilibrium determination using equations.



Activity 22.4

Analyse the case study below and answer the questions that follow;

In Kayonza market, the relationship between the supply of Irish potatoes was studied against the price per kilogram. The economic researcher came up with a linear relationship between the two variables as $Q_s = 20 - 3P$, where Q_s stands for the quantity of Irish potatoes supplied and P is the price per Irish in Rwanda Francs.

Another study was done in the same market about the quantity demanded of that same commodity relating to its price. The following linear relationship was formed: $Q_d = 5 + 2P$; where Q_d is quantity demanded in kilograms and P is the price per kilogram of Irish potatoes in the market in Rwanda Francs.

Required:

- i) Determine the equilibrium quantity and price.
- ii) Assuming that the equilibrium price changed to 5, describe the market condition with a clear justification.

In unit 20, we tackled simultaneous equations, that is, forming linear equations of quantity demanded and supplied of the commodity and prices of that commodity. Also, having worked out equilibrium using supply and demand schedules and curves, we realised that at equilibrium, there is one price and one quantity that both buyers and sellers agree upon. We are therefore, going to look at the demand and supply equations (algebraic method) using demand and supply functions to determine equilibrium. We set the demand equation against the supply equations to determine at which price demand and supply are equal.

Example;

Suppose that the demand for sugar is given by the following equation,

$Q_d = 16 - 2P$; where Q_d is the amount of sugar that consumers want to buy (i.e., quantity demanded), and P is the price of sugar.

Suppose the supply of sugar is $Q_s = 2 + 5P$; where Q_s is the amount of sugar that producers will supply (i.e., quantity supplied). and P is the price of sugar.

In equilibrium, we assume $Q_d = Q_s = Q_e$. Where Q_e is equilibrium quantity, and at this point we have equilibrium price (P_e).

Let us rewrite the above equations to make a set of linear equations describing the variables equilibrium quantity and equilibrium price as

$$Q_e = 16 - 2P_e$$

$$Q_e = 2 + 5P_e$$

Using the above set of equations, we find the equilibrium quantity and price as follows;

$$\text{At equilibrium, } Q_d = Q_s = Q_e$$

$$\text{thus } 16 - 2p_e = 2 + 5p_e$$

$$16 - 2 = 2p_e + 5p_e$$

$$14 = 7p_e$$

$$\frac{14}{7} = \frac{7P_e}{7}$$

$$P_e = 2$$

Equilibrium price is 2

Now, substitute the value of P_e i.e. 2 in any of the equations

$$Q_e = 16 - p_e$$

$$\text{or } Q_e = 2 + 5P_e$$

$$Q_e = 16 - 2(2)$$

$$Q_e = 2 + 5(2)$$

$$Q_e = 16 - 4$$

$$Q_e = 2 + 10$$

$$Q_e = 12.$$

$$Q_e = 12$$

Equilibrium quantity is 12.

From our demand and supply equations above, equilibrium price is **2** and equilibrium Quantity is **12**.

In case price changes, due to changes in demand and supply, there comes a state of disequilibrium, either a surplus or deficit. From the above worked out example, we can determine whether there's a shortage or surplus as below.

Suppose price is 4 determine whether there is a shortage or surplus.

Substitute the value of the new price in both equations of demand and supply.

$$Q_d = 16 - 2P; \text{ and } Q_s = 2 + 5P$$

$$\text{i) } Q_d = 16 - 2P$$

$$Q_d = 16 - 2(4)$$

$$Q_d = 16 - 8$$

$$Q_d = 8$$

$$\text{ii) } Q_s = 2 + 5P$$

$$Q_s = 2 + 5(4)$$

$$Q_s = 2 + 10$$

$$Q_s = 12$$

From the above calculations, it is noticed that quantity demanded is less than quantity supplied which indicates that there is a surplus in the market. ($Q_d [8] < Q_s [12]$)



Application activity 22.1

Application activity 22.4:

Analyse the equations below to answer the questions that follow.

$$\text{i) } Q_e = 38 - 6p_e$$

$$Q_e = 18 + 4p_e$$

$$\text{ii) a) } Q_s = 24 - 2p_e$$

$$Q_d = 4 + 3p_e$$

b) In case price changed to 8, describe the condition in the market and support your answer.



End unit assessment

- 1.a) What is the necessary condition for equilibrium state in the market?
- b) Describe the cause of i) excess demand and ii) excess supply in the market.
2. a) Use the schedules below to answer the questions that follow.

Demand schedule

Price (frw)	Quantity demanded. (kgs)
1000	2
800	4
600	6
400	8
200	10

Supply schedule.

Price (frw)	Quantity supplied (kgs)
200	2
400	4
600	6
800	8
1000	10

Required:

- i) Determine equilibrium price and quantity.
- ii) Plot the information on graph to show equilibrium position.
2. a) Given that $Q_s=10$; $Q_d=2 P-6$
Determine i) Equilibrium price ii) Equilibrium quantity.
- b) Suppose equilibrium price is 10, show whether there is shortage or surplus, support your answer.
4. Given the functions that $Q_d+4p=136$ and $Q_s=6p+124$,
 - i) Determine equilibrium price and equilibrium quantity.
 - ii) Illustrate your findings on a curve

Key Unit Competence: Be able to interpret the variations in percentages of quantity demanded and supplied due to changes in their determinants.



Introductory Activity 23

Analyse the case study below and answer the questions that follow;

Mr. Kagambo has been going to kimironko market for several years, but in the last five years, he has realized changes in quantity demanded and as well as supply of commodities he has been buying in the market which is attributed to different factors respectively.

Required;

- a) Carry out research and state which specific name is given to the response of quantity demanded and supply to the different factors as stated in the case study above?
- b) Identify which special name is given to the changes in demand and in supply respectively in response to the factors that affect each.

In Units 20 and 21, we showed that quantity demanded changes when there are changes in price. We also looked at how sellers vary their quantities supplied when market prices change. We showed that quantity demanded and quantity supplied increase or decrease when other factors that influence them change.

Under certain conditions, the consumer may not vary much of a commodity he or she purchases, irrespective of changes in the price or other factors. In other conditions, the supplier may supply almost the same quantity of a commodity irrespective of the increase or decrease in price. In this unit, we shall look at how quantity demanded or supplied responds to change in price or other factors that influence it.

23. 1: Meaning of elasticity:



Activity 23.1

Carry out research from the internet, newspapers, and economics text books and then present to the whole class the following.

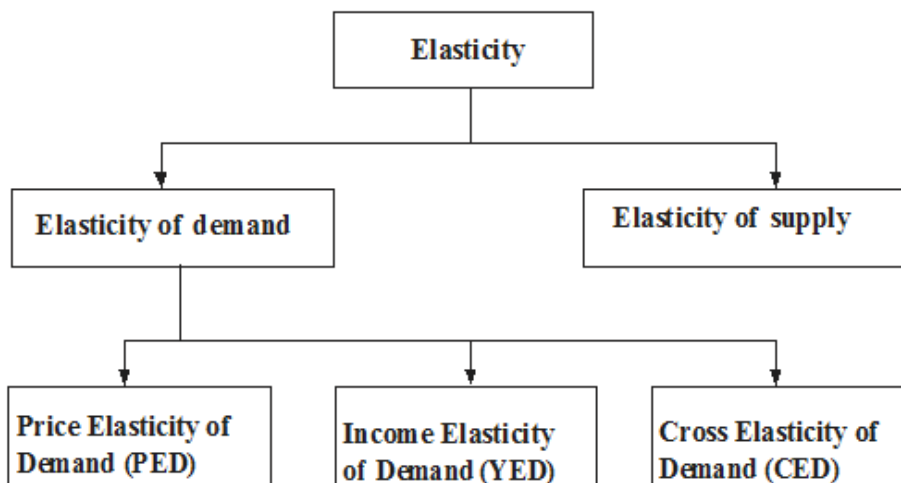
- What is meant by the term elasticity?
- What are the different types of elasticity?
- Describe each type of elasticity.

Elasticity refers to the measure of degree of responsiveness of dependent variables to changes in any of the independent variables. An independent variable is a factor that has an influence on another associated factor (that is called a dependent variable). While a dependent variable is a quantity or value that has different values only in response to an independent variable. Price of a commodity, income of the consumer and price of related commodities are examples of independent variables. These independent variables have a direct influence on dependent variables such as quantity demanded or quantity supplied (dependent variables)

23.2: Types of elasticity

There are majorly two types of elasticity:

- Elasticity of demand
- Elasticity of supply.



Break down of elasticity



Application activity 23.1

Describe how the following affect demand and supply respectively:

- a) Price of the commodity.
- b) Government policy of taxation and subsidization
- c) Price of other commodities.
- d) Income levels

23.2.1 Elasticity of demand



Activity 23.2

From the research you made in activity 23.1;

- a) Explain the meaning of elasticity of demand.
- b) Identify and explain the types of elasticity of demand.

Facts

Elasticity of demand is a measure of the degree of responsiveness of quantity demanded of a commodity to changes in factors that affect demand. When factors that influence quantity demanded such as price of the commodity, income of the consumer, or price of related commodities change, the quantity demanded of a commodity also changes (responds). However, our main concern is the percentage of this response. Elasticity of demand thus measures the percentage of such response.

23.2.2. Types of elasticity of demand:

There are various elasticities of demand but the most common ones are:

- a) Price elasticity of demand (P.E.D)
- b) Income elasticity of demand (Y.E.D)
- c) Cross elasticity of demand. (C.E.D)

Price Elasticity of Demand (PED)



Activity 23.3

With reference to the research you made in Activity 23.1 through discussions;

- Explain the meaning of price elasticity of demand.
- Practice different calculations of elasticity of demand and make interpretations therein.

Price elasticity of demand refers to a measure of the degree of the responsiveness of quantity demanded of a commodity to changes in the price of that commodity. It can also be defined as the ratio of percentage change in demand to the percentage change in price.

When the price of a commodity increases or decreases, its quantity demanded responds to a certain extent. Quantity demanded may reduce, increase or even remain constant. Price elasticity of demand therefore measures the extent of this reaction. Therefore, price elasticity of demand is measured as a percentage change in quantity demanded to the percentage change in price.

Mathematically, this can be illustrated as follows:

$$PED = \left(-\right) \frac{\Delta Q_{dx}}{\Delta P_x} \times \frac{P_x}{Q_{dx}}$$

Where

ΔQ_x is change in demand

ΔP_x is change in price.

P_x = original price

Q_x = original quantity

Or, PED can be expressed as

$$PED = \frac{\text{Percentage change in quantity demanded of the commodity}}{\text{Percentage change in the price of the commodity}}$$

Or

$$PED = \frac{\% \Delta Q}{\% \Delta P}$$

$$PED = \frac{\frac{\text{New quantity} - \text{old quantity}}{\text{old quantity}} \times 100}{\frac{\text{New price} - \text{old price}}{\text{old price}} \times 100}$$

$$PED = \frac{\frac{Q_2 - Q_1}{Q_1} \times 100}{\frac{P_2 - P_1}{P_1} \times 100}$$

$$PED = (-) \frac{\Delta Q_{ty}}{\Delta P} \times \frac{P_1}{Q_1}$$

Where,

PED → Price elasticity of demand,

P is the price

ΔQ → Change in quantity,

Q is quantity,

ΔP → Change in price.

23.2.3: Calculations of Price Elasticity of demand.



Activity 23.4

Use the given formulas in sub unit 23.2.2 and calculate the following questions;

- The Quantity demanded of commodity Y increased from 400kgs to 600kgs as a result of a 30 % decrease in its price. Determine its price elasticity of demand and identify the type of elasticity and then support your answer.
- Given that the price of commodity X reduced from 800 FRW to 750 FRW as a result of increase in its quantity demanded from 240kgs to 420kgs. Determine its price elasticity of demand.
- The price of commodity K increased from 20,000 FRW to 30,000 FRW leading to a decrease in its quantity demanded by 50%. Find the price elasticity of demand.
- The price of a commodity remained constant at 3,000 FRW per unit but its quantity demanded increased from 120 units to 200 units. Determine its price elasticity of demand and also identify the category of price elasticity of demand and support your answer.
- The price of commodity N increased from 1,000 FRW to 1,800 FRW but its quantity demanded remained constant at 50kgs. Find its price elasticity of demand and describe the form of elasticity and the type of commodity N.

Example 1;

Given that the price of a commodity increased from 15000 rwf to 20,000frw per kg and quantity demanded of commodity decreased from 50kgs to 40kgs per day. Calculate the P.E.D and state the category of PED.

Solution

$$\text{P.E.D} = (-) \frac{\Delta Q}{\Delta P} * \frac{P}{Q}$$

$$\Delta Q = Q_2 - Q_1$$

$$\Delta P = P_2 - P_1$$

P= Original price

Q= Original quantity

$$\text{P.E. D} = (-) \frac{\Delta Q}{\Delta P} * \frac{P}{Q}$$

$$\Delta Q = Q_2 - Q_1 = 40 - 50 = -10$$

$$\Delta P = 20,000 - 15,000 = 5,000$$

$$P = 15,000$$

$$Q = 50$$

$$\text{P.E.D} = (-) \frac{-10}{5000} * \frac{15000}{50} = \frac{150,000}{250,000} = \mathbf{0.6}$$

The commodity has an Inelastic demand.

Example 2:

When the price of a given commodity increased from 8000rwf to 9000frw, quantity demanded changed by 20%. Calculate the price elasticity of demand.

$$\text{P.E.D} = \frac{\% \Delta \text{qty dd}}{\% \Delta \text{price}}$$

$$\begin{aligned} &= \frac{\frac{20\%}{9000 - 8000 * 100}}{8000} \quad \frac{9000 - 8000 \times 100}{8000} = \frac{1000 \times 100}{8000} \\ &= \quad = 12.5 \end{aligned}$$

Therefore, = 12.5%

$$\text{P.E.D} = \frac{\% \Delta \text{qty demanded}}{\% \Delta \text{price}} = \frac{20}{12.5} = \mathbf{1.6}$$

$$\text{P.E.D} = \mathbf{1.6}$$

23.2.4: Categories of Price elasticity of demand:



Activity 23.5

Visit the library or the internet and research about the categories of price elasticity of demand; Analyse, interpret and illustrate the different categories therein and share your findings to the rest of the class.

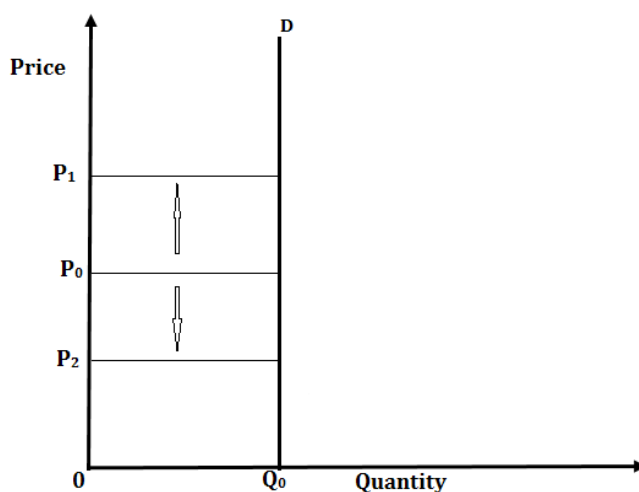
Price elasticity of demand is categorized into:

- Perfectly inelastic demand.
- Inelastic demand.
- Unitary elastic demand.
- Elastic demand.
- Perfectly elastic demand.

a) Perfectly inelastic demand

This is where changes in price bring about absolutely no change in quantity demanded of a commodity. i.e. **PED=0**.

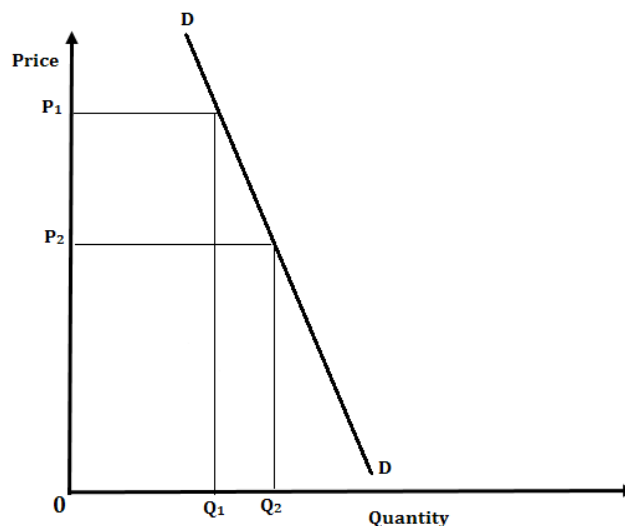
A change in price results into zero change in quantity demanded i.e. consumers do not respond to changes in price. Even if prices increase or reduce, it has no effect on quantity demanded. As the price changes, consumers continue to buy the same amount of a commodity that they have been buying before the price changed. E.g. demand for necessities



As price increases from OP_0 to OP_1 or reduces from OP_0 to OP_2 , quantity demanded remains constant at OQ_0 .

b) Inelastic demand

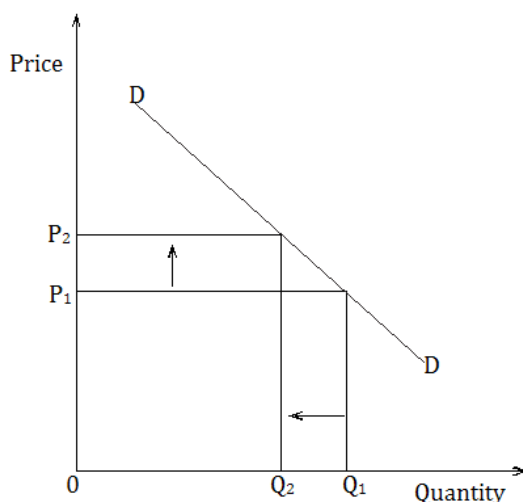
Here, the degree of responsiveness is low i.e. elasticity of demand is greater than 0 but less than one ($0 < PED < 1$). Change in price results into a proportionately smaller change in quantity demanded. Consumers do not strongly respond to changes in price. There is a bigger change in price leading to a smaller change in quantity demanded. As the price changes, consumers continue to buy almost the same amount of a commodity that they have been buying before the price changed. i.e. quantity demanded changes by a smaller percentage than does the price.



As price decreases from OP_1 to OP_2 (**a bigger change**) it leads to a smaller change in quantity demanded OQ_1 to OQ_2 (**a smaller change**).

c) Unitary elastic demand

Here a change in price results into a proportionately equal change in quantity demanded. Elasticity of demand equals to one. i.e. **P.E.D = 1**. Percentage change in quantity demanded, equals percentage change in price. Consumers respond equally to changes in price.



As price increases from OP_1 to OP_2 , quantity demanded responds equally by changing from OQ_1 to OQ_2 . The change in price is almost equal to the change in quantity demanded. Therefore, a given percentage change in price of a commodity leads to the same percentage change in quantity demanded.

d) Elastic demand

Here, the degree of responsiveness is high i.e. elasticity of demand is greater than one but less than infinity. $PED > 1$ & A small change in price leads to a more than proportionate change in quantity demanded. i.e. percentage change in quantity demanded is greater than percentage change in price.

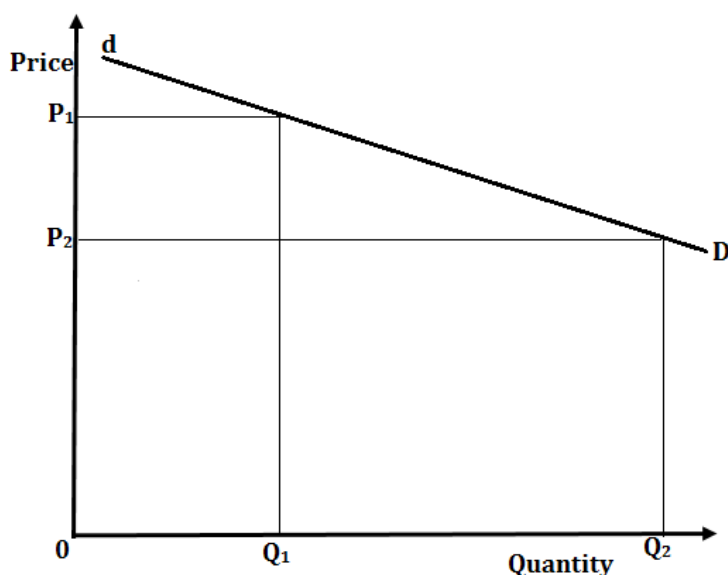


Fig 23.5: Elastic demand

As price decreases from OP_1 to OP_2 (**a smaller change**) and this leads to a bigger change in quantity demanded OQ_1 to OQ_2 .

e) Perfectly elastic demand

Here, elasticity of demand equals to infinity. Price is fixed at all levels of demand. Consumers buy at or below that price. If prices slightly increase, demand falls to zero. (**PED = ∞**).

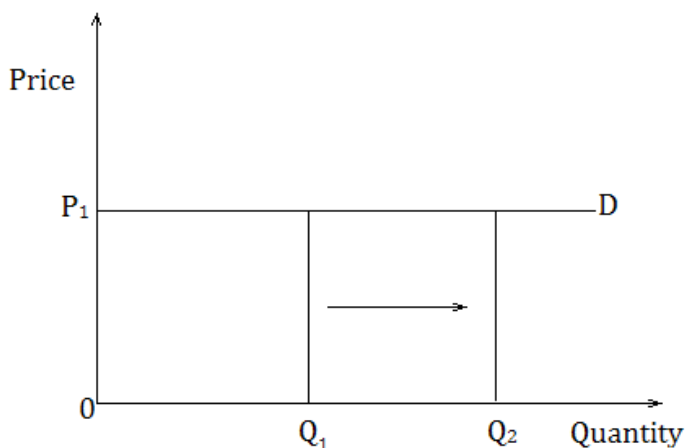


Fig 23.6 Perfectly elastic demand

Price remains constant at OP_1 , but quantity demanded can increase from OQ_1 to OQ_2 . Or can decrease from OQ_2 to OQ_1 .



Application activity 23.2

1. When the price of a given commodity increased from 8000rwf to 9000frw, quantity demanded changed by 20%. Calculate the price elasticity of demand and state the type of commodity and form of elasticity with a reason.
2. Given that the price of a commodity increased from 15000rwf to 20,000frw per kg and quantity demanded of commodity decreased from 50kgs to 40kgs per day. Calculate the P.E.D and state the type of commodity and form of elasticity with a reason.

23.2.5: Determinants of price elasticity of demand



Activity 23.6

Refer to the different categories of price elasticity of demand, analyse the determinants of price elasticity of demand, share your views to the whole class through class presentation.

Facts

The following are the factors that determine price elasticity of demand.

1. **Consumer's income:** Generally, consumers with high incomes have inelastic demand. At any price, they will purchase the commodity they want because their purchasing capacity is high. Low-income earners have elastic demand. When the price increases, their purchasing capacity is affected and so they purchase less of the commodity.
2. **Availability of substitutes:** Commodities with close substitutes have elastic demand. This is because when their prices increase and those of their substitutes remain constant, consumers shift to substitutes. Commodities with no close substitutes have inelastic demand.
3. **Price expectations:** When prices are expected to increase in future, demand for such commodities becomes inelastic. When there is an increase in price in the current period, consumers may not cut on their purchases because they expect prices to increase further in the coming days.
4. **Price of the commodity:** Cheap commodities have inelastic demand. Commodities like matchboxes, razor blades, needles are really cheap. The price of a matchbox is around 50 FRW. Even if there is 100% increase in its price, still it remains cheap and affordable. Its demand thus becomes inelastic. However expensive commodities have elastic demand.
5. **Degree of urgency involved:** Urgently needed commodities have inelastic demand. A sick person will be ready to pay any price for medicine that the doctor has prescribed. Necessities have inelastic demand, such that even if their prices increase or reduce, consumers have to buy almost the same quantities. Luxuries however have elastic demand. If consumption of a commodity can be postponed, its demand becomes elastic.
6. **Consumer's ignorance:** When consumers are ignorant of the market conditions, demand becomes inelastic. For instance, a commodity may have substitutes. But the consumer is not aware. So when its price increases, the consumer will continue to purchase it not knowing that there is a close substitute, which is even cheaper.
7. **Habit forming commodities:** Commodities whose consumption develops habit tend to have inelastic demand. Even if their prices change, consumers consume the same quantities. Drug addicts will

be ready to pay any price to acquire the commodity.

8. **Advertising:** Promotional advertising may make demand inelastic. Consumers may be made to buy a commodity at high price because of persuasive advertising.
9. **Durable commodities:** Highly durable commodities have inelastic demand. A flat iron box for instance, is durable and lasts for over a year. Even if the price of the iron box reduces by a bigger percentage, the customer may not buy another iron box.
10. **Several uses of the commodity:** Commodities that serve many functions have elastic demand. When their prices increase, consumers only buy them for the most important of their uses. Their quantity demanded so reduces. Commodities with single functions have inelastic demand.

23.2.6 Income elasticity of demand (YED)



Activity 23.7

Visit the library or the internet and make research on, calculate and interpret income elasticity of demand based on the following questions;

- a) What is meant by income elasticity of demand.
- b) Given that the income of the consumer increased from 40,000FRW to 50,000FRW, leading to a reduction in the quantity demanded of commodity X from 80 kgs to 60kgs,
 - i) Find the income elasticity of demand.
 - ii) What kind of commodity is X?
- c) The quantity demanded of commodity P increased from 300 litres to 500 litres as a result of a 30% increase in consumer's income. Determine the income elasticity of demand and the type of commodity P.
- d) The income of consumers changed by 40% but the quantity demanded of commodity N remained constant at 50 kgs. Find the income elasticity of demand and state the type of the commodity.

Income elasticity of demand refers to the measure of degree of responsiveness of quantity demand of a commodity to the change in consumer's income. It's given by;

$$YED = \frac{\Delta Q}{\Delta Y} \times \frac{Y}{Q}$$

where;

ΔQ = change in quantity demanded,

ΔY = change in consumer's income,

Y = original income,

Q = original quantity.

OR

$$YED = \frac{\% \Delta Q}{\% \Delta Y}$$

where;

$\% \Delta Q$ = percentage change in quantity demanded and

$\% \Delta Y$ = percentage change in consumer's income.

Interpretation of YED

When YED is **positive** it means that the commodity in question is a **“normal good”** i.e. as the consumers' income increases quantity demanded also increases.

When YED is **negative** it means that the commodity in question is an **“inferior good.”** i.e. as income increases less of commodity is demanded

When **YED** is **0** it means that the commodity in question is a **“necessity good”** i.e. as income increases quantity demanded remains constant (fixed).

Example 1:

Given that a consumer's income increased from 25000rwf to 40,000rwf, leading to a decrease in the quantity demand of commodity X from 5kg to 8kg.

- i) Calculate YED.
- ii) What types of commodity is X and why?

Solutions:

$$YED = \frac{\Delta Q}{\Delta Y} \times \frac{Y}{Q}$$

where

$$\Delta Q = Q_2 - Q_1$$

$$\Delta Y = Y_2 - Y_1,$$

Y = Original/ old income.

Q = Original/ old quantity.

$$\frac{8-5}{40,000-25,000} \times \frac{25,000}{5} = \frac{3}{15000} \times \frac{25000}{5} = \frac{75000}{75000} = 1$$

$$YED = 1$$

- ii) The commodity is a normal good because YED is positive.

Example 2:

Given that a consumer's income increased from 5000rwf to 9,000frw, and as a result his demand for commodity K reduced from 10kgs to 6kgs,

- Calculate YED.
- What types of commodity is X and why?

Solution:

$$i) \frac{\Delta Q}{\Delta Y} \times \frac{Y}{Q} = \frac{6-10}{9000-5000} \times \frac{5000}{10} = \frac{-4}{4000} \times \frac{5000}{10} = 0.5$$

$$YED = -0.5$$

- ii) The commodity is an inferior good because YED is negative



Application activity 23.3

Work out the following;

1. Given that a consumer's income increased from 25000rwf to 40,000rwf and the quantity demand of the commodity X increased from 5kg to 8kg. Calculate YED and interpret your answer.
2. Given that a consumer's income increased from 5000rwf to 9,000frw, and as a result his demand for commodity K reduced from 10kgs to 6kgs,
 - i) Calculate YED.
 - ii) What types of commodity is X and why?
3. Given that a consumer's income increased from 15000rwf to 20,000frw, as a result his/her demand for commodity M remained constant at 9kgs,
 - i) Calculate YED.
 - ii) What types of commodity is X and why?

23.2.7 Cross Elasticity of Demand: (CED)



Activity 23.8

Visit the library or the internet, and with your knowledge from the other examples in the types of elasticity of demand, analyse the information below, calculate and interpret your answers.

- a) Given that the price of commodity Y increased from 2,000 FRW to 3,000 FRW leading to a reduction in the quantity demanded of commodity X from 60 kgs to 40 kgs,
 - i) Find the cross elasticity of demand.
 - ii) State the relationship between commodity Y and X.
- b) The quantity demanded of commodity A increased from 400 litres to 600 litres as a result of a 40% increase in price of commodity B. Determine the cross elasticity of demand and the relationship between commodity A and B
- c) The price of commodity K changed by 50% but the quantity demanded of commodity L remained constant at 2000 litres. Find the cross elasticity of demand and state the relationship between the two commodities.

Cross elasticity of demand refers to the measure of the degree of responsiveness of quantity demanded of one commodity (**A**) to change in price of another commodity (**B**). These commodities **A** and **B** are either related in consumption i.e. Substitutes or compliments or unrelated.

$$CED = \frac{\Delta Q_A}{\Delta P_B} \times \frac{P_B}{Q_A} \quad \text{OR} \quad CED = \frac{\% \Delta \text{Quantity demanded in commodity A}}{\% \Delta \text{Price of commodity B}}$$

Interpretation of CED

- If CED is **positive**, then the 2 goods are **substitutes**. This means that an increase in price of one commodity “A” leads to an increase in quantity demanded of another commodity “B”.
- If CED is **negative**, then the 2 goods are **compliments**. This means that increase in price of “A” will lead to reduction in quantity demanded of commodity “B”.
- If CED is **0**, commodities “A” and “B” are **not related**. Increase or decrease in price of “A” does not affect the quantity demanded of “B”.

Example 1:

Given that price of commodity Z increased from 200frw to 250frw, and as a result, quantity demanded of commodity K increased from 5kgs to 7kgs.

- Calculate CED
- What type of commodities are Z & K and why?

Solutions:

$$i) \quad CED = \frac{\Delta Q_K}{\Delta P_Z} \times \frac{P_Z}{Q_K}$$

$$CED = \frac{7-5}{250-200} \times \frac{200}{5} = \frac{2}{50} \times \frac{200}{5} = \frac{400}{250} = 1.6$$

$$\text{CED} = 1.6$$

- Commodities Z & K are **substitutes** because CED is **positive**.

Example 2:

Given that price of commodity N increased from 900frw to 1200frw, and as a result, quantity demanded of commodity M decreased from 5kgs to 3kgs.

- Calculate CED.
- How are commodities m & n related and why?

Solution:

i) $CED = X$

$$CED = \frac{3-5}{1200-900} X = \frac{-2}{300} X \frac{900}{5} = \frac{-1800}{1500} = -1.2$$

CED = -1.2

ii) Commodities M & N are **complements** because CED is **negative**.



Application activity 22.4

1. Given that price of commodity E increased from 500frw to 550frw, and as a result, quantity demanded of commodity F increased from 5kgs to 10kgs.
 - i) Calculate CED
 - ii) What type of commodities are E & F and why?
2. Given that price of commodity H increased from 1200frw to 1500frw, and as a result, quantity demanded of commodity R decreased from 6kgs to 3kgs.
 - i) Calculate CED.
 - ii) How are commodities R & H related and why?
3. Given that price of commodity C decreased from 1200frw to 1000frw, and as a result, quantity demanded of commodity D remained at 80kgs.
 - i) Calculate CED.
 - ii) How are commodities C & D related and why?

23.3 Elasticity of supply



Activity 23.9

Visit the library or internet, make research and share your findings about the following in class.

- a) Explain meaning of elasticity of supply.
- b) Explain and calculate price elasticity of supply.
- c) Describe different categories of price elasticity of supply.
- d) Examine the factors that determine price elasticity of supply

23.3.1 Meaning of elasticity of supply:

Elasticity of supply refers to a measure of the degree of responsiveness of quantity supplied of a commodity to changes in factors that affect supply. Quantity supplied of a commodity is influenced by a number of factors like price of the commodity, cost and availability of factors of production, goals of the firm, the level of technology, etc. Elasticity of supply measures the extent to which quantity supplied responds to changes in these variables.

a) Price elasticity of supply (PES)

Price elasticity of supply: This refers to the measure of degree of responsiveness of quantity supplied of a commodity to changes in price of that particular commodity.

Examples,

1. Price of a given commodity increased from 1000frw to 1500frw and as a result quantity supplied increased from 20 to 25kgs per week. Calculate the PES for that commodity

$$PES = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q} = \frac{25-20}{1500-1000} \times \frac{1000}{20} = \frac{5}{500} \times \frac{1000}{20}$$

$$\frac{5000}{10000} = 0.5$$

$$PES = 0.5$$

1. Due to an increase in the price of meat, from 1800rwf to 2000rwf, quantity supplied increased from 27000kgs to 30,000kgs.

Calculate PES.

$$PES = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q} = \frac{30000-27000}{1800-2000} \times \frac{1800}{27000} = \frac{3000}{200} \times \frac{1800}{27000}$$

$$\frac{5400000}{5400000} = 1$$

$$PES = 1$$



Application activity 23.5

Basing on the research carried out on elasticity of supply and knowledge gained on elasticity of demand, given the data below, examine the questions, discuss, calculate and share your findings to the rest of the class.

- a) Quantity supplied of commodity X increased from 100kgs to 300kgs as a result of a 20% increase in its price. Determine its price elasticity of supply.
- b) Given that the price of commodity Y reduced from 600 FRW to 450 FRW resulting into a decrease in its quantity supplied from 800kgs to 200kgs. Determine its price elasticity of supply.
- c) The price of commodity Z increased from 1000 FRW to 1,300 FRW leading to an increase in its quantity supplied by 30%. Find the price elasticity of supply.
- d) The price of a commodity remained constant at 2,500 FRW per unit but its quantity supplied increased from 100 litres to 300 litres. Determine its price elasticity of supply.
- e) The price of commodity S increased from 3,000 FRW to 4,500 FRW but its quantity supplied remained constant at 100kgs. Find its price elasticity of supply.

23.3.2 Categories of price elasticity of supply



Activity 23.10

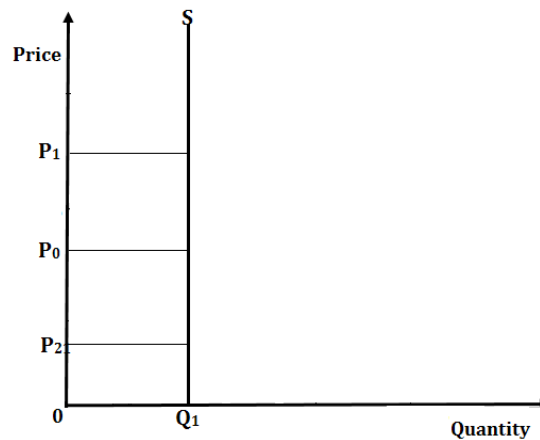
Visit the library or the internet, research and describe the categories of price elasticity of supply. Make presentations thereafter.

Price elasticity of supply may be categorized as follows:

- Perfectly inelastic supply.
- Inelastic supply.
- Unitary elastic supply.
- Elastic supply.
- Perfectly elastic supply.

a) Perfectly inelastic supply.

Here, a change in price results into zero change in quantity supplied. Producers do not respond to changes in price (**PES = 0**). As the price changes, sellers continue to supply the same amount of a commodity that they have been selling before.

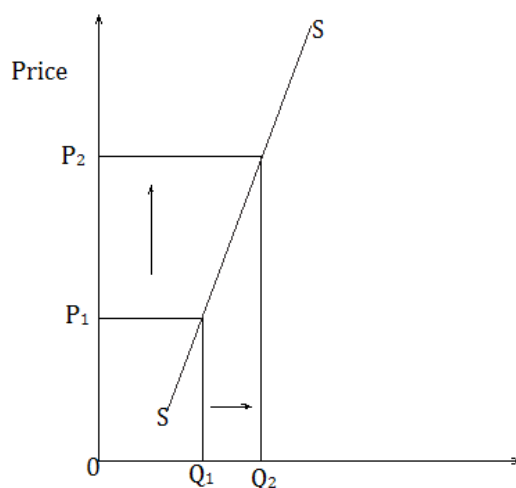


Perfectly inelastic supply.

As price increases from OP_0 to OP_1 or reduces from OP_0 to OP_2 , quantity supplied remains constant at OQ_1 .

b) Inelastic supply:

A change in price results into a proportionately smaller change in quantity supplied. **PES > 0 < 1**. Suppliers do not strongly respond to changes in price. There is a bigger change in price leading to a smaller change in quantity supplied. As the price changes, sellers continue to supply almost the same amount of a commodity that they have been buying before the price changed.

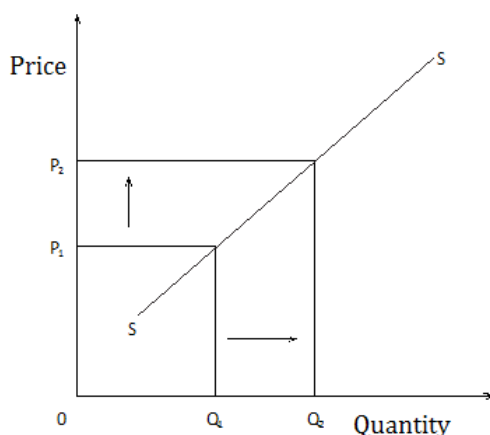


Inelastic supply

As price increases from OP_1 to OP_2 (**a bigger change**), quantity supplied slightly reacts by changing from OQ_1 to OQ_2 (**a smaller change**).

c) Unitary elastic supply

Here, a change in price results into a proportionately equal change in quantity supplied. **PES = 1**. Suppliers respond to changes in price. A change in price leads to a relatively equal change in quantity supplied.

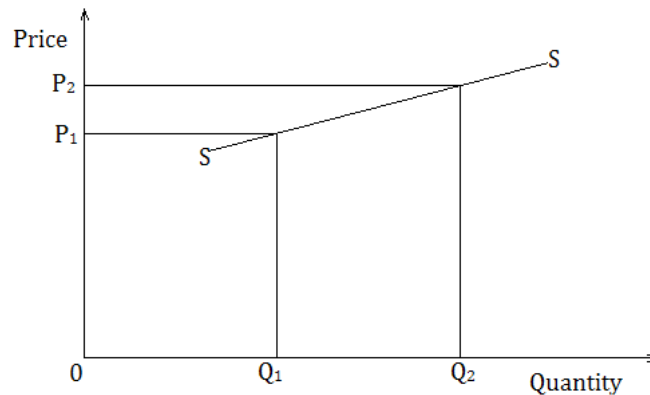


Unitary elastic supply

As price increases from OP_1 to OP_2 , quantity supplied responds by changing from OQ_1 to OQ_2 . The change in price is almost equal to the change in quantity supplied.

d) Elastic supply

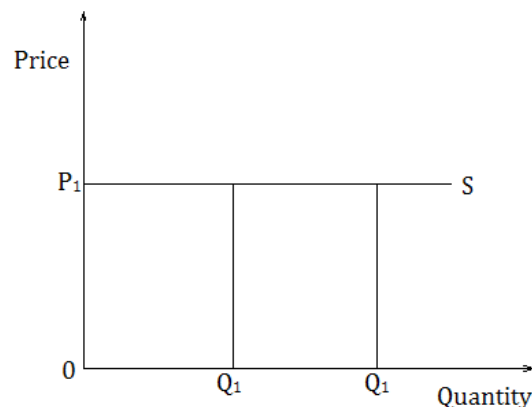
A change in price results into a proportionately bigger change in the quantity supplied. $PES > 1 < \infty$. Suppliers strongly respond to changes in price. There is a smaller change in price leading to a bigger change in quantity supplied. As the price changes, sellers supply more of the commodity.



As price increases from OP_1 to OP_2 or decreases from P_2 to P_1 (a **smaller change**), quantity supplied responds by increases from OQ_1 to OQ_2 or decreases from OQ_2 to OQ_1 respectively (a **bigger change**).

e) Perfectly elastic supply.

Here, there is a constant price but Quantity supplied changes $PES = \infty$. At a constant price, suppliers vary the amounts of a commodity to be supplied. They can increase or decrease their quantities supplied at constant prices.



Perfectly elastic supply

Price remains constant at OP_1 , but quantity supplied changes from OQ_1 to OQ_2 .



Activity 23.11

From the research carried out on categories of price elasticity of supply in activity 23.10 above, discuss the factors that influence price elasticity of supply of a commodity.

23.3.3 Determinants of price elasticity of supply

Facts

Price elasticity of supply is determined by the following factors;

1. Cost and availability of factors of production: When factors of production are scarce and expensive, supply cannot be easily increased even if the price of the commodity rises. Thus, it becomes inelastic. But when they are readily available and cheap, supply becomes elastic.
2. Nature of the commodity: Perishables have inelastic supply such that when prices reduce, almost the same quantity will be supplied. This is because they cannot be stored to be supplied in future when prices are favourable. Durables have elastic supply. As a result, they can be stored and supply varied depending on the price level.
3. Gestation period (maturity period): This is the time lag between when the decision to supply a commodity is taken and when it is actually supplied. Commodities with a short maturity period have elastic supply. Their supply can be increased quickly and easily when prices increase. Those with long gestation periods have inelastic demand.
4. Time: In the short run, supply becomes inelastic because it cannot be increased easily even if prices increase. In the long run, supply becomes elastic since time is enough to allow supply to increase with increase in prices.
5. Method of production used: Advanced methods of production make supply elastic. This is because it is easier and quicker to produce and increase supply. Use of traditional, inefficient and poor methods of production slows down the rate of production, making supply inelastic.
6. Government policy: Rigid, bureaucratic tendencies, unattractive policies or high tax rates backslides production, making supply inelastic. Subsidization of producers reduces costs of production and makes it easy to increase supply and so make it elastic.

7. Freedom of entry of new firms into the industry: Freedom of entry of new firms into the industry makes supply elastic. Restricted entry makes supply inelastic.
8. **Mobility of factors of production:** Mobility of factors of production both occupational and geographical quickens and simplifies production. This makes supply elastic. Immobility of factors makes supply inelastic.



Application activity 23.6

Referring to unit 21 about the determinants of supply, categorize the following points under elastic supply or inelastic supply.

Developed technology, small market size, political insecurity, undeveloped infrastructure, government subsidization, Short gestation period, immobility of factors of production, freedom of entry of new firms.



Skills lab

Invite a resource person from district/ sector especially the one in charge of welfare, interview them on the wellbeing of people in the district / sector. Group people as consumers and producers, let the resource person give his or speech basing on those 2 groups. Write down their main points from the speech. Ask for chance to talk by suggesting how to improve the wellbeing of people based on the factors that affect elasticity of demand and elasticity of supply.



End unit assessment

1. Study the table below and answer the questions that follow;

Price of commodity Z (frw)	Quantity demanded of commodity Z
5,000	25
7500	20

- i) Calculate the price elasticity of demand for commodity Z.
 - ii) What category of price elasticity of demand does commodity Z have?
2. The quantity demanded of commodity M reduced from 70kgs to 65kgs as a result of a 20% increase in the price of another commodity Z from 2,000 FRW to 4,000 FRW.
 - a) Determine the cross elasticity of demand between commodities
 - b) M and Z
 - c) State the relationship between commodities M and Z.
 - d) Give two examples of such commodities.
3. The income of the consumer increased by 60% leading to a decrease in the quantity demanded of commodity S from 100 units to 70 units. Find the income elasticity of commodity S and its type.
4. Given that the price of a commodity reduced from 3,000 FRW to 1,500 FRW leading to a decrease in its quantity supplied from 100kgs to 50kgs, determine the elasticity of supply for this commodity and give its category of elasticity.
5. What is measured by the following?
 - i) Elasticity of supply.
 - ii) Cross elasticity of demand.
 - iii) Price elasticity of demand.
 - iv) Income elasticity of demand.
 - v) Elasticity of demand.

UNIT 24:

CONSUMER THEORY

Key unit Competence: Be able to discuss the concept of utility and how it influences consumer's choice in the allocation of their spending.



Introductory Activity 24

Kalisa has only 20,000frw (his budget constraint), he must choose how to allocate his funds between buying school shoes and buying hens (the bundle of goods). If, each pair of school shoes cost 1000frw and a hen costs 2000frw, Kalisa can purchase any combination of school shoes and hens that costs no more than 20,000. He could decide to buy only school shoes, or buy only hens, or a combination of both shoes and hens, or he could keep all 20,000frw in his pocket. Kalisa is able to choose different bundles of goods and services; logically, he chooses those that bring the greatest benefit (or maximizes utility).

Required:

- What economic term is given to Kalisa's act of purchasing school shoes and hens?
- What is the aim of Kalisa, as he tries to purchase the two items?
- If Kalisa decided to use all his income to purchase either school shoes or hens, how many units would he purchase?
- Given alternatives to choose from, why may you buy more of one commodity than the other?

Consumer theory is the study of how people decide to spend their money, given their preferences and budget constraints. A branch of microeconomics, consumer theory shows how individuals make choices, given restraints, such as their income and the prices of goods and services. Through consumer theory, we are better able to understand how individuals' tastes and incomes influence the demand curve. These choices are among the most critical factors, shaping the overall economy.

24.1. Meaning of consumer and utility.



Activity 24.1

- Shyaka: How much does bread cost?
- Ishimwe: I have small size and big size, which one do you want?
- Shyaka: I want both sizes and in large numbers.
- Ishimwe: As you buy in bulk, small size is 400frw each and big one is 900frw each.
- Ntare: May I have a small loaf if it is 400frw?
- Ishimwe: If you are taking only one, a small one is 600frw while a big one is 1200.
- Shyaka: Pack for me in different boxes, 40 and 30 loaves small and big ones respectively.
- Ntare: Pack for me one small loaf in an envelope.

Required:

- Describe, with justification, each person's position in the conversation.
- Who of the three is the final user of bread? Justify your answer.
- Why do people consume?

A market has several groups or parties. We have those who come to sell commodities or offer services, those who buy, those who offer transport, those who offer security services, government representatives, potential investors, potential buyers and the commodities being exchanged. Hence a market is a diverse place. It should be noted that the most important party however is the buyer. All other parties work towards serving or fulfilling the needs of the buyer. This buyer is also called a **customer or a consumer**.

A consumer is the final user of a commodity. i.e. a person or household that buys a final product for use. The main aim of a consumer is utility maximization (satisfy his/her wants) by buying from the cheapest source possible.

The consumer demand for a product is based on the utility derived from it. From product point of view, utility refers to the power of a commodity to satisfy consumer wants. From consumer's point of view, it is a psychological

feeling of satisfaction or pleasure, which varies from individual to individual, derived by the consumer on consumption of the good or service. Utility, therefore, is the satisfaction that is derived from consuming a product. It is measured in imaginary units called **UTILIS**.

As one continues to consume more units of a given commodity, he/she reaches maximum satisfaction. The maximum point of satisfaction is known as **saturation point / bliss point/ point of satiety of a consumer**. Extra units consumed after this point of satiety cease to provide satisfaction but instead provide dissatisfaction or negative satisfaction. This is what is called **disutility**. This means that total utility starts declining.

24.2: Forms of utility:

We have already seen that utility is the satisfaction that is derived from consuming a product. Different people have different needs. These needs have to be satisfied. Consumers do not buy commodities for the sake of buying them. They purchase commodities to use them to satisfy their needs. Two quantitative concepts related to the utility are total utility and marginal utility.

a) Total utility (TU);

When you consume a certain amount of a commodity, you derive a certain amount of satisfaction. This satisfaction is also called utility. Each unit of a commodity consumed gives you a certain amount of utility thus adding up to the prior utility leading to total utility.

Total utility (TU), therefore, is the overall satisfaction derived by a consumer from consumption of various units of a good or service, at a certain point or over a period. For instance, if one person takes one cup of tea and another takes two cups, the two may not get the same utility.

As one continues to consume more units of a given commodity, he/she reaches maximum satisfaction or **saturation point / bliss point/ point of satiety of a consumer**. Extra units consumed after this point of satiety cease to provide satisfaction but instead provide dissatisfaction or negative satisfaction. This means that total utility starts declining.

Total Utility can be expressed as:

$$TU_n = U_x + U_y + U_z \text{ or } TU = \sum MU$$

Where TU = Total Utility

n = Number of commodities

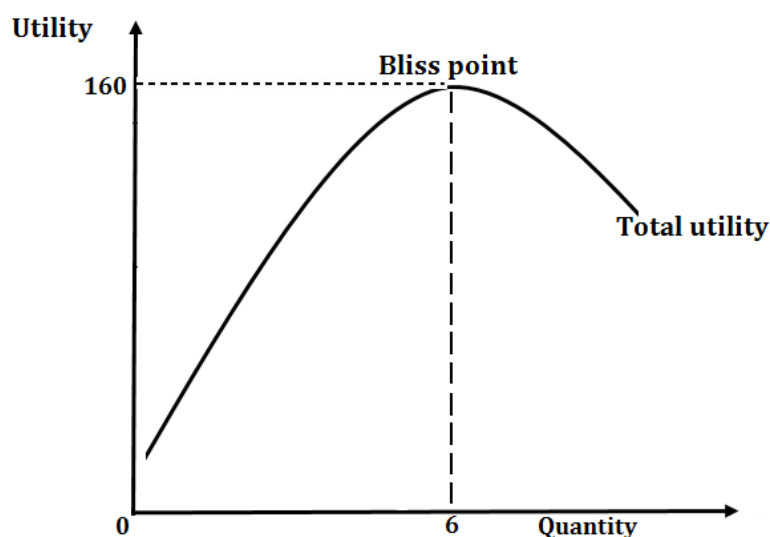
U_x, U_y, U_z = Total respective utilities of consumption of goods

MU = Marginal Utility.

For example,

Units	Total utility.
1	60
2	100
3	130
4	150
5	160
6	160
7	150
8	130

From the above table, we plot total utility as below;



In the above illustration, total utility increases up to 6th unit. At this point, the consumer has reached his or her point of saturation (maximum point of satisfaction). As consumption goes beyond 6th unit, total utility starts to reduce. The consumer gains no more utility for consuming a given product. Consumption of the commodity beyond total satisfaction (point of saturation) leads to disutility or negative satisfaction.

b) Marginal utility (MU);

The term 'marginal' refers to small change, and utility means satisfaction. So, as its name suggests **marginal utility** is the additional/extra satisfaction

received by a consumer, on the consumption of an extra unit of a commodity. It implies the addition to the total utility, due to the consumption of one more unit of a good or service. Marginal Utility is also known as “marginal satiety”. As more units of a commodity are consumed total utility increases because each new unit consumed adds to the total. This means that as one adds more units of a commodity, there is extra or additional satisfaction to him/her thus Marginal utility (MU).

It is given by:

$$\text{MU} = \frac{\Delta TU}{\Delta Q}$$

Where

MU =Marginal utility.

ΔTU = Change = in Total utility.

ΔQ = Change in units consumed.

When more and more units of a commodity are consumed, the additional utility from each extra unit consumed keeps reducing and even goes into a negative. This means that at times marginal utility is negative.

For example, let's say that you are hungry and are buying food to eat for supper. Let's also say that one plate of food costs 2500frw. If you're so hungry that you would pay 3000frw for the plate of food, the food is said to provide 3000frw worth of utility. In other words, you're willing to pay 3000frw to get the satisfaction from the plate of food no matter what it actually costs.

Total utility is just the concept of utility applied to more than one good. If consuming one good gives you a certain amount of utility, consuming more than one of the same good will give you an amount that is higher, lower, or the same.

For example, let's say that you plan to eat two plates of food. However, after eating the first plate, you're not quite as hungry as before. Now, you would only pay lower price e.g. 2000frw for the extra satisfaction of the second plate of food. It's not worth as much to you now that you're somewhat full. This means the two plates of food provide 2000frw (2nd plate of food) + 3000frw (first plate of food) = 5000frw of “total utility” together. A consumer wouldn't actually end up buying the extra plate of food because its marginal utility (2000frw) is less than its marginal cost (2500frw). Basically, one is losing utility on this transaction, so it's not in his/her favor.

Example:

Units	Total utility.	MU ($\Delta MU/\Delta Q$)
1	60	60
2	100	40
3	130	30
4	150	20
5	160	10
6	160	0
7	150	-10
8	130	-20
9	100	-30
10	60	-40

To get MU of ninth unit we can as well use $MU = \frac{TU_n - TU_{n-1}}{Q_n - Q_{n-1}}$

Where n is the quantity consumed.

When you haven't had any commodity consumed, the MU of the first unit is 60 (60 of total utility - the 0 you had before/change of 1 unit). Therefore, MU for the first unit is the same as its total utility thus = 60

$$\text{Mu for the 2}^{\text{nd}} \text{ unit} = \frac{100-60}{2-1} = \frac{40}{1} = 40$$

$$\text{Mu for the 3}^{\text{rd}} \text{ unit} = \frac{130-100}{3-2} = \frac{30}{1} = 30$$

$$\text{Mu for the 4}^{\text{th}} \text{ unit} = \frac{150-130}{4-3} = \frac{20}{1} = 20$$

$$\text{Mu for the 5}^{\text{th}} \text{ unit} = \frac{160-150}{5-4} = \frac{10}{1} = 10$$

$$\text{Mu for the 6}^{\text{th}} \text{ unit} = \frac{160-160}{6-5} = \frac{0}{1} = 0$$

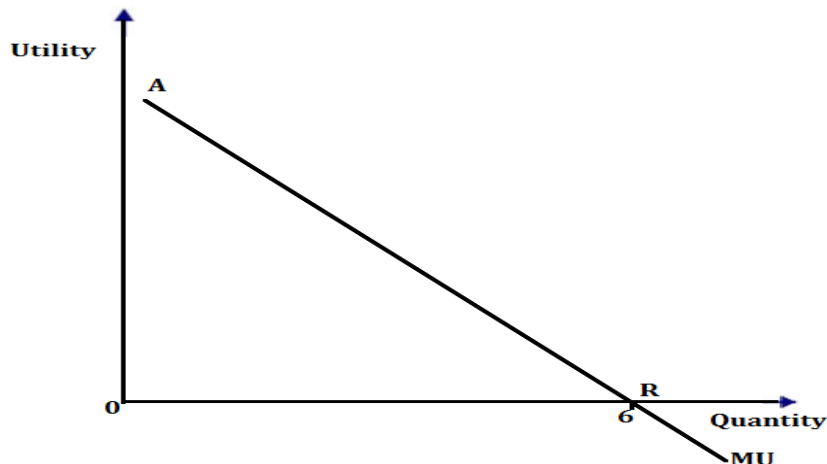
$$\text{Mu for the 7}^{\text{th}} \text{ unit} = \frac{150-160}{7-6} = \frac{-10}{1} = -10$$

$$\text{Mu for the 8}^{\text{th}} \text{ unit} = \frac{130-150}{8-7} = \frac{-20}{1} = -20$$

$$\text{Mu for the 9}^{\text{th}} \text{ unit} = \frac{100-130}{9-8} = \frac{-30}{1} = -30$$

$$\text{Mu for the 10}^{\text{th}} \text{ unit} = \frac{60-100}{10-9} = \frac{-40}{1} = -40$$

From the above worked out example, we can plot the MU curve on a graph as below;



From point A to point R, MU is still positive. At point R MU is zero (0) and after that point, MU becomes negative (disutility). If the additional consumption of a commodity generates less satisfaction than the previous one, the consumer is willing to pay less for any additional unit to be consumed. This makes the consumers demand decrease as he/she consumes more units of a commodity, thus explaining the shape of the marginal utility curve.

c) Relationship between TU & MU

- i) When TU is increasing, MU is decreasing.
- ii) When TU is at maximum, MU is zero.
- iii) When TU is decreasing, MU is negative (disutility).

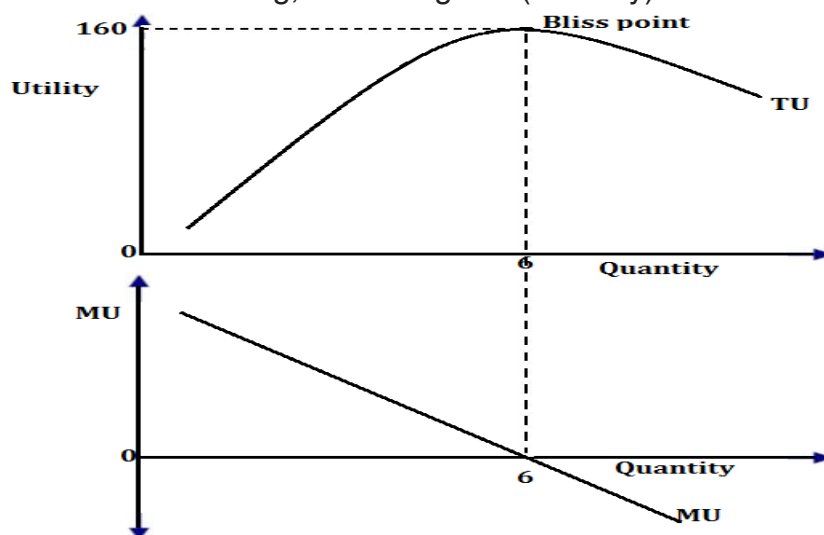


Illustration of relationship between TU & MU:

MU, from the 1st unit isn't known because the TU before the 1st unit isn't indicated. After the first unit TU is increasing but at a decreasing rate. After the 6th unit, TU declines because MU becomes negative due to disutility or negative satisfaction (utility) which sets in. For example, one can start vomiting after the 6th unit, a situation that reduces TU he/she had gained.

The 1st units of a commodity give a higher satisfaction than the subsequent units. This is because the need that the commodity covers is gradually satisfied. The quantity consumed and MU vary inversely.

d) Key differences between Total and Marginal Utility

The significant differences between total and marginal utility are explained in the points given below:

1. Total Utility means overall benefit obtained by a person from consumption of goods and services. Marginal Utility means the amount of utility a person gets from the consumption of each successive unit of a commodity.
2. In general, the total utility increases as more of a commodity is consumed. As against this, the marginal utility decreases with each additional unit of a commodity consumed.
3. There is a certain saturation point of satisfaction, where the consumer no longer gains satisfaction with the consumption of the commodity, once that point has reached. This shows that total utility suffers from decreasing returns unlike marginal utility, which declines with each additional unit of the commodity consumed.

24.3. The law of diminishing marginal utility



Activity 24.2

Use the table below to answer the questions that follow assuming that a consumer took successive glasses of water as shown below,

Units (glasses of water drunk)	Total utility	Marginal utility
1 st glass	20	20
2 nd glass	32	12
3 rd glass	40	8
4 th glass	42	2
5 th glass	42	0
6 th glass	39	-3

Required:

- Which glass took less time to finish and why?
- Which glass was enjoyed most?
- Which glass do you think was highly or less paid for and why?

The law of diminishing marginal utility describes a familiar and fundamental tendency of human behavior. The law of diminishing marginal utility states that:

“As a consumer consumes more and more units of a specific commodity, the utility from the successive units goes on diminishing”.

a) Assumptions of the law of Diminishing Marginal Utility.

- Consumer is rational and aims at utility maximization.
- Commodity is taken in suitable and reasonable units. If the units are too small then the MU instead of falling, may increase up to a few units.
- Constant tastes of a consumer. i.e. the law holds true if there is no change in tastes of a consumer. E.g. if a consumer develops a taste for wine, the additional units of wine may increase the MU.
- Consumption must be continuous without abnormal and prolonged interval between the consumption of different units. For example, if you take one plate of food in the morning, and the second in the afternoon, the MU of the second plate of food may increase.

This law can be explained by taking a very simple example.

Suppose someone is very thirsty. He/she goes to the market and buys one glass of water. The glass of water gives him or her immense pleasure or we say the first glass of water has great utility for him/her. If he/she takes second glass of water after that, the utility will be less than that of the first one. It is because the edge of his/her thirst has been reduced to a great extent. If he/she drinks a third glass of water, the utility of the third glass will be less than that of second and so on.

The utility goes on diminishing with the consumption of every successive glass of water till it drops down to zero. This is the point of satiety. It is the position of consumer's equilibrium or maximum satisfaction. If the consumer is forced further to take a glass of water, it leads to disutility causing total utility to decline. The marginal utility will become negative. A rational consumer will stop taking water at the point at which marginal utility becomes zero even if the good is free. In short, the more we have of a thing, *ceteris paribus*, the less we want still more of that, or to be more precise,

“In given span of time, the more of a specific product a consumer obtains, the less anxious he is to get more units of that product” or we can say that as more units of a good are consumed, additional units will provide less additional satisfaction than previous units.

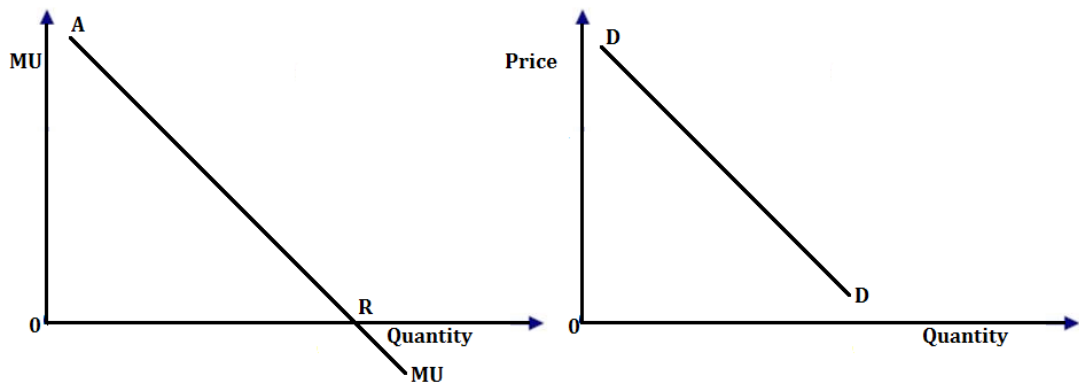
The law of diminishing marginal utility is based upon three facts.

- First, total wants of a man are unlimited but each single want can be satisfied. As man gets more and more units of a commodity, the desire of his or hers for that good goes on falling. A point is reached when the consumer no longer wants any more units of that good.
- Secondly, different goods are not perfect substitutes for each other in the satisfaction of various particular wants. As such the marginal utility will decline as the consumer gets additional units of a specific good.
- Thirdly, the marginal utility of money is constant given the consumer's wealth.

b) Relationship between MU and demand curves.

This law explains why the demand curve slopes downwards from left to right. When a consumer derives high marginal utility from a unit of a commodity, he will be willing to pay a high price for it. As quantity consumed increases and marginal utility reduces, the consumer will be ready to pay a lower price.

The demand curve is equal to the positive part of MU curve only. The demand curve doesn't cross the x-axis since we cannot have negative price though we have negative MU. This can be illustrated as below.

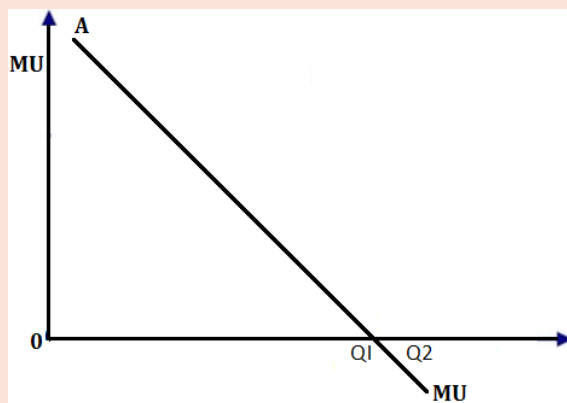


As MU declines, the consumer is willing to pay less for the commodity. This indicates that price of a commodity depends on the MU. The higher the MU, the higher the price and vice versa. As MU is high, price is high but demand is less as MU falls one is willing to pay less for the commodity thus high demand.



Application activity 24.1

Analyze the graph below and answer the following questions



- Which point shows total utility when it is at maximum and support your answer.
- Explain where the total utility would be at point Q2 and why

24.4. Consumer's and producer's surplus:

24.4.1: Consumer's surplus:



Activity 24.3

Analyse the case study below and answer the questions that follow:

Mukamana went to a shop to buy a dress. She was ready to pay 10,000frw for it. When she reached, she was told that it costs less and paid 8000frw.

Required:

- In relation to your knowledge of utility, discuss the difference in the price she was willing to pay and what she actually paid.
- How much did Mukamana enjoy as her extra utility?
- What economic term is given to Mukamana's extra utility after purchasing the dress at a lower price than she expected.

In the earlier unit, we stated that the price for a unit of a commodity depends on its marginal utility (MU). When marginal utility is high, the consumer is willing to pay a high price for the unit of the commodity. Consumer surplus is an economic measurement of consumer benefits. Consumer surplus happens when the price that consumers pay for a product or service is less than the price they're willing to pay. It's a measure of the additional benefit that consumers receive because they're paying less for something than what they were willing to pay. When there is a difference between the price that you pay in the market and the value that you place on the product, then the concept of consumer surplus becomes a useful one to look at.

Consumer surplus is therefore, defined as the difference between the total amount that consumers are willing and able to pay for a good or service and the total amount that they actually do pay (i.e. the market price). Consumer surplus is shown by the area under the demand curve and above the price. Consumer surplus is a measure of the welfare that people gain from consuming goods and services. For example, the consumer is willing to pay 600frw but the market price is 400frw, therefore, consumer's surplus is 200frw. i.e. $600 - 400 = 200$.

As MU diminishes, the consumer is willing to pay less for the successive units of the commodity. Thus, MU diminishes as the consumer's surplus also diminishes. Consumer surplus always increases as the price of a good falls and decreases as the price of a good rises.

Consumer's surplus = Price consumer is willing to pay – market price.

Or Consumer's surplus = total utility – consumer's expenditure. $T.U - T.E$

Where

TU = summation of price the consumer is willing to pay; and

TE = market price x units bought.

Example:

Assuming that market price is 200, and given the demand schedule for the consumer below, we can calculate the consumer's surplus as;

Units consumed	Price a consumer is willing to pay.
1	1200
2	1000
3	800
4	600
5	400
6	200

To calculate consumer's surplus,

C.S= price a consumer is willing to pay – what he/she actually pays (market price), thus;

For the first unit $C. S = 1200 - 200 = 1000$

2nd unit = $1000 - 200 = 800$

3rd unit = $800 - 200 = 600$

4th unit = $600 - 200 = 400$.

5th = $400 - 200 = 200$

6th = $200 - 200 = 0$

We add up all the consumer's surplus for the all the units consumed to get total consumer's surplus. Therefore, $C.S = 1000 + 800 + 600 + 400 + 200 + 0 = 3000$

Therefore, $CS = 3000$ FRW.

Or $CS = TU - TE$;

where TU= total of what he/she was willing to pay;

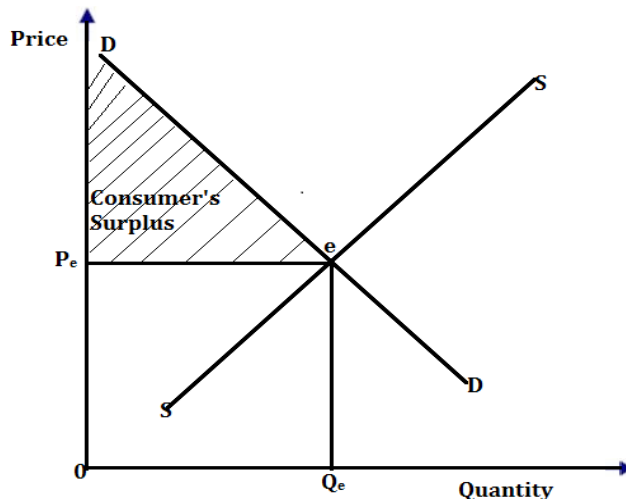
TE= total of what he actually paid.

$$TU = 1200 + 1000 + 800 + 600 + 400 + 200 = 4200$$

$$TE = 200 + 200 + 200 + 200 + 200 + 200 = 1200:$$

$$TU - TE = 4200 - 1200 = 3000 \quad \square \quad CS = 3000$$

By illustration, the consumer's surplus is the area below the demand curve and above the equilibrium price as seen below;



From the above curve, a consumer's surplus is that shaded part below the demand curve but above the equilibrium.

24.4.2: Producer's surplus



Activity 24.4

Analyse the case study below and work out the following questions.

Manzi took his goat to the market expecting to earn 15000frw, but in the market, he found that demand was high and, he actually received 18,000frw.

- What was Manzi's surplus from his sales?
- Why do you think Manzi was able to earn more than he expected?
- What is the main aim of any producer taking his/ her product for sale?
- What was Manzi's reserve price?

Producer surplus is defined as the difference between the amount the producer is willing to supply goods for and the actual amount received by him when he makes the trade. Or it is the difference between the minimum possible price a producer is willing to accept for his/ her commodity and what he/she actually earns from the sale of a commodity. It is also the excess to the producer's receipts over the minimum that would have to be paid to persuade them to produce a given commodity. The producer usually has a particular price at which he/she is ready to offer his/her product for sale (reserve price).

Producer surplus is a measure of producer welfare. It is measured as the difference between what producers are willing and able to supply a good for and the price they actually receive.

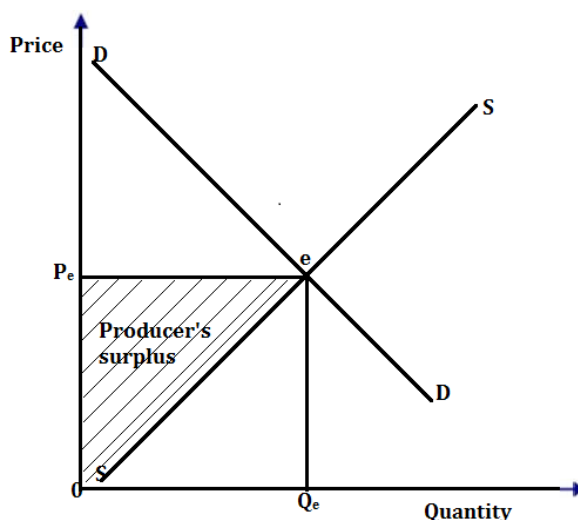
Producer's surplus is given by;

Producer's surplus = total of what a producer receives – total of what he/she was willing to charge (receive).

Or Producer's Surplus = actual earning – expected earnings.

Graphically, a producer's surplus is that area below the equilibrium but above the supply curve.

This can be illustrated as below.



From the above curve, **SS** is the supply curve which represents what the producer is willing and able to supply over a given period of time at different prices. '**e**' is the equilibrium point matching to the market price while **Q_e** is the quantity that corresponds to the market price. The producer's surplus is determined by the market price (**P_e**). i.e. the higher the market price, the bigger the producer's surplus and vice versa.

Producer's surplus= total of what a producer receives – total of what he/she was willing to charge (receive).

Or PS = actual earning – expected earnings.

Example:

Assuming the market price is 100, the producer's surplus is;

Units supplied	Price producer is willing to charge
1	10
2	20
3	30
4	40
5	50
6	60
7	70
8	80
9	90
10	100

Producer's surplus= total of what a producer receives – total of what he/she was willing to charge (receive).

Total of what was received = 100 +100+ 100+100 +100 +100 +100 + 100 +100 +100 =1000

Total of what one was willing to charge =10 + 20+30 +40+50 +60 +70 +80 +90 +100 =550

Thus PS = 1000 – 550 = 450

Or PS = actual earning – expected earning

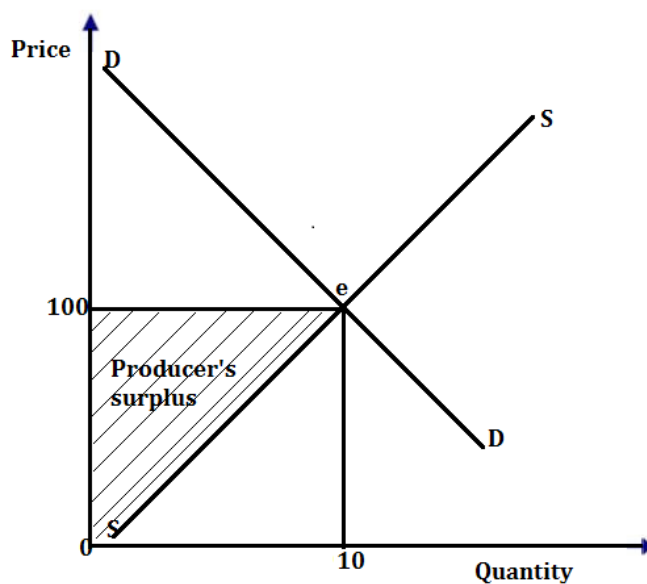
Actual earning = 100 +100+ 100+100 +100 +100 +100 + 100 +100 +100 =1000

Expected earning =10 + 20+30 +40+50 +60 +70 +80 +90 +100 =550

PS = 1000 – 550 =450

Thus PS= 450frw

From the above example, the producer's surplus can be plotted as below.



Here the producer surplus is shown in shaded area as shown by the area above the supply curve and below the equilibrium price (100). As the price increases, the incentive for producing more goods increases, thereby increasing the producer surplus.



Application activity 24.2

Under what circumstances may consumers' surplus or producers' surplus occur.

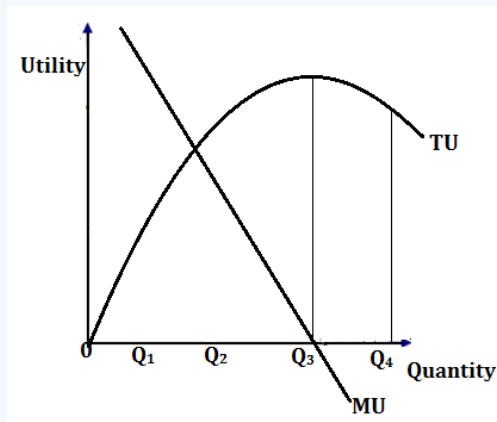


End unit assessment

1. a) Use the table below to calculate MU and illustrate the relationship between TU and MU.

Quantity	1	2	3	4	5	6	7
TU	300	350	380	390	390	380	350

2. use the graph below to answer the questions that follow;



Explain the state of TU

- i) Between Q_1 and Q_2
- ii) Between Q_3 and Q_4 .
- iii) At Q_3

UNIT 25:

PRICE MECHANISM

Key unit Competence: Be able to analyse the role of price mechanism in the allocation of resources



Introductory Activity 25

Mutoni and Gihozo are both strong business ladies dealing in women clothes in Gicumbi market. The profits of their businesses depend on the demand of commodities in the market in a given season. When the demand for their commodities is high, they are able to supply much and charge high prices, but when the demand changes to another fashion, they make less sales because of lack of enough customers. They, therefore, normally have to change their supplies depending on the changes in the demand by their customers. The two are in stiff competition for customers in a bid to reap much from their sales, therefore they have to be efficient in their service delivery. At times, Gihozo shifts her supplies to other districts outside Gicumbi looking for customers who are able to pay a high price for her commodities:

Required:

- i) What general name is given to the situation where prices determine the direction of Mutoni and Gihozo's business?
- ii) Examine the role of prices in determining the levels of profits of both Mutoni and Gihozo's business.

In Unit 22, we looked at how the forces of demand and supply operate freely to determine equilibrium in the market. This happens when there is no interference from other forces like government interference. In this unit we shall continue to analyse how the system works, and its outcomes. We shall also look at the means the government can use to improve the operation of the market forces in allocation of resources.

25.1 Price mechanism.

25.1.1. Meaning of price mechanism



Activity 25.1

Carry out research from the library or internet sources, on Price mechanism and then in a general class discussion;

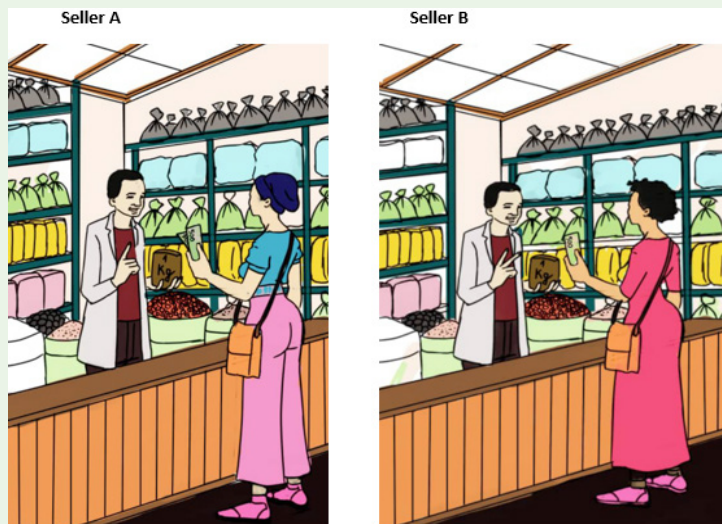
- Explain the meaning of price mechanism
- Describe the operation of price mechanism.

Price mechanism is a system in a free enterprise economy in which resource allocation and prices are determined by forces of demand and supply with little or no government interference. This depends on the forces of demand and supply. It can also be called the **price system**. It's a system of economic organization where each individual as a consumer or producer or resource owner is engaged in any piece of economic activity where exchange of goods transpires or takes place freely without government influence.

25.1.2: Operation of price mechanism.



Activity 25.2



Study the pictures above negotiations between the seller and buyers (ladies). In A the buyer is offering 500rwf for a kilogram of sugar while in B the lady is willing to pay 1000 for a kilogram of sugar but the seller is requesting her to double the price.

- i) What technical term can you use to refer to a situation where prices and resource allocation are determined by market forces?
- ii) Why do you think in A the seller is likely to accept a lower price (500rwf) for a kilogram while in B he is wants the buyer to double the price from 1000rwf to 2000 rwf for the same kilogram?
- iii) Describe the likely dangers that may arise when prices are freely determined by the market forces of demand and supply.

- Prices are determined by the forces of demand and supply. This means there is no government interference.
- High demand will give rise to high prices. i.e. as demand increases, prices will also increase and as demand falls, prices fall as well. Thus, more and more resources will join the line of production where prices are high due to the profit drive.
- As demand falls, prices also fall and as prices fall, profits will also lower. This will cause some producers to abandon that line of production so resources will move away from it.
- High prices create high incomes and profits for producers and this will attract resources to the production of those commodities whose prices are so high and extra resources which are or were formerly redundant will also be attracted.
- In addition, profits will be highest in that line of production where costs are minimized. Low cost and efficient firms will attract more resources while high cost and inefficient firms will be out competed from the line of production.
- Changes in tastes and preferences of the consumer will be reflected in what he is willing buy. Resources will move away from the production of those commodities which the consumer is not willing to buy. Therefore, through prices and profits the consumer will determine how resources are going to be allocated using price mechanism.

25.1.3: Advantages and disadvantages of price mechanism



Activity 25.3

With the knowledge gained from unit 16 on free enterprise economy, present arguments for and against operation of an economy where resource allocation is determined by forces of demand and supply with little or no government interference.

a) Advantages of price mechanism:

1. Price mechanism promotes efficient allocation and use of resources. Due to competition and desire to maximize profits, resource owners allocate them more efficiently to avoid wastages.
2. Under price mechanism, producers aim at maximizing profits. The desire to maximize profits encourages research, invention and innovation. This leads to an increase in production and improvement in technology, resulting into economic growth
3. There is competition between producers. Competition leads to efficiency in production. Producers will cut on origination or costs so as to compete favourably in the market.
4. There is speculation underprice mechanism. Speculators ensure steady supply of commodities. Consumers are offered a chance to access commodities all the time throughout.
5. Price mechanism encourages acquisition and distribution of commodities from areas where supply is high to areas where there is little or no supply. This also ensures a ready supply of commodities to the consumers. This is what is called arbitrage.
6. Price mechanism answers the economic questions i.e. What to produce, how to produce, for whom to produce, when to produce and where to produce; for profit maximisation as the major goal
7. It encourages effective distribution and redistribution of resources. Resources are distributed to areas where they are rewarded favourably depending on their demand and prices. Land is used in areas where rent is high, labour goes to where wages are high and capital where interest is maximum.
8. Price mechanism works automatically. It therefore does not require the government to put in a lot of resources for implementation. This makes it cheap to operate. It is the responsibility of the government and gives it a chance to concentrate on other areas.

b) Disadvantages of price mechanism

1. The system creates economic instability due to fluctuations in price. Incomes, revenues and exchange rates. As the economy becomes unstable, economic planning becomes difficult.
2. It promotes income inequality because resource owners and business owners become richer while other economic agents become poorer.
3. Unemployment may arise especially when inefficient firms are outcompeted from the industry.

4. Disappearance of some vital or important commodities which are cheap and therefore not so profitable. . This causes misallocation of resources.
5. Emergency of monopoly firms that make a lot of profits through exploiting consumers by charging high prices especially after out pushing out other firms from the industry.
6. Exploitation of consumers due to their ignorance about market conditions in the market. this makes them to be charged high prices in the market.
7. Under this system private economic interests override public interests and as a result economic public interests are not catered for. Resources are not allocated to public utilities.
8. It leads to over exploitation and exhaustion of resources because producers only aim at profit maximization.
9. It doesn't respond to rapid structural changes in the economy e.g. when there is a rapid change in demand resources may not shift accordingly as quickly as possible.
10. It ignores the poor and disadvantaged groups in the society e.g. the lame, the blind, the elderly, orphans etc. who cannot compete favourably with others in the market.

25.1.4: Reasons for government intervention in the operation of the price mechanism.



Activity 25.4

In your own opinion, why do you think government needs to interfere in the operation of price mechanism?

Government interferes in price mechanism due to the following reasons:

- To bring about economic stability, by regulating price changes through price controls (maximum and minimum prices).
- To provide for the poor and disadvantaged groups in the society e.g. the lame, the blind, the elderly, orphans etc. who cannot compete favourably with others in the society. This can be done through rationing.
- To regulate resource utilization by fighting over exploitation and exhaustion of resources due to high profit motive by the producers. This is done through short-term and long-term economic policy and planning. It helps to bring about quick structural changes that price mechanism cannot enforce.

- To provide public utilities which cannot be provided by private producers. Such utilities are not profit making.
- To protect consumers against exploitation by the profit motivated private producers through encouraging formation of consumer associations.
- To control exploitation of either consumers or producers by either parties through setting either maximum or minimum prices respectively.
- To control the emergency of monopoly firms that may arise due to stiff competition. This can be done through anti-monopoly laws or taxing highly monopoly firms to reduce their abnormal profits and nationalizing such firms which provide essential but cheap commodities.
- To provide cheap and essential commodities that cannot be produced by the producers since they are not profit making.
- To redistribute income and resources, since due to stiff competition, incomes and resources go to those who are in production and pay for them respectively.
- To curb down unemployment especially where the inefficient firms which are unable to compete favourably in the market are kicked out of the line of production. This can be done through Government support by subsidizing weak firms. This helps the upcoming or weak firms to grow, expand and compete with other firms in the market. This creates employment and improves efficiency as well



Application activity 25.1

Describe how government controls the effects of price mechanism.

25.2. Price fluctuation



Activity 25.5

Case study:

According to the new times newspaper published January 23, 2014, "Farmers in the Northern and Western provinces appealed to the government to help them get ready market for their expected maize bumper harvest in February. The farmers expected increased maize production due to reliable rains, but were worried about price changes. Hagumimana, planted maize on three hectares and was expecting to harvest at least seven tones. He was however, worried about the market where he will sell his produce.

Required:

Use the case study above to make research and;

- a) Identify the general name of what was worrying the farmers.
- b) Discuss the causes of the above scenario that was worrying farmers of Northern and Western province in 2014.
- c) Discuss the effects of the above scenario to the farmers from both provinces
- d) Assuming, after farmers appealing to the government for help; the government responded positively and helped them in any way, In your own opinions, explain some of the measures which the government took to help the farmers in the two provinces

25.2.1. Meaning of price Fluctuations.

Price fluctuations are changes in price in form of ups and downs (rise and fall) over a period of time because of changes in demand and supply. Prices of some commodities are more stable and remain the same for a long period of time e.g. manufactured products while prices for others e.g. agricultural products tend to fluctuate a lot. This scenario is common without government intervention in regulation of supply and demand of commodities and the prices in the market.

25. 2. 2: Causes of price fluctuations of agricultural products

Price fluctuation is the continuous alternating rise and fall in prices of commodities. This is mostly common in the agricultural sector. Usually during the planting seasons, prices for agricultural products are high. After harvest, prices reduce. Without government interventions, in periods when supply for agricultural products is high, prices are low. When supply reduces, prices increase. Therefore, the differences between supply and demand in the agricultural sector and failure to regulate supply basically explain the constant price fluctuations. These differences can be as a result of:

- a) **Perishability of agriculture products:** Most agricultural products are perishable. They cannot be kept for long. Before harvest, supply is down since they cannot be stored to wait for high prices in the next period. At this time, demand is greater than supply forcing prices to rise., due to high supply, commodities are sold immediately often at low prices to avoid them going bad before being sold.

- b) Long gestation periods:** There is usually a longtime lag between planting season and harvesting period. Immediately after planting, supply remains very low. Because of low supply, prices are high. When harvesting season sets in, supply increases. As supply keeps increasing, prices of agricultural products keep on reducing.
- c) Difference between planned output and actual output.** Agricultural production mostly in developing economies largely depends on natural conditions or factors. These include the amount of rainfall received, effects of pests and diseases, and changes in weather conditions. These factors affect agricultural output either positively or negatively. As a result, farmers' expected output may vary from what is actually harvested, depending on how favorable or unfavorable these natural conditions were. When the natural factors are favourable, agricultural harvest may be higher than what was planned. This may lead to a decrease in the price, as there is more supply. On the other hand, when natural conditions become unfavourable, agricultural harvest reduces. Consequently, prices will rise due low supply in the market.
- d) Agriculture in developing economies is practiced by many, small-scale producers.** Most producers use old methods of production. Regulating output to equate it with demand is difficult. This causes fluctuations in prices.
- e) Agricultural producers in developing countries produce similar products.** They compete for the available market. Thus, in case of surplus output, it may not be absorbed by the market which in turn forces selling prices to go down.
- f) Absence of effective commodity programs.** Most developing economies lack programs that can be used to regulate supply and then stabilize prices.
- g) Agricultural products have low market in industrial production.** This reduces the market for surplus output in developing countries. Discovery of new technologies in developed countries reduced the demand for agricultural products. Thus, excess agricultural output cannot be easily disposed off. This forces prices down.
- h) Agricultural products have inelastic demand.** This is because most of them are food stuffs. For instance, even if the price for food reduces, the amount of food eaten by an individual almost remains constant. When there is excess supply, disposing it off becomes difficult and this

price forces the price down. On the other hand, food is a necessity, irrespective of the price, people have to consume food. Thus, a reduction in supply forces the price to go up.

- i) **Regulating supply of agricultural products through arbitrage is difficult.** This is because agricultural products are bulky. Transporting them from areas of excess supply to areas of scarcity is costly. In most developing countries, infrastructures connecting production areas to areas of scarcity are poor. Therefore, marketing surplus output becomes expensive.

25.2.3 Effects of price fluctuation

1. Fluctuation of farmers' incomes and therefore causing uncertainty and makes future planning difficult for them.
2. Less savings of the producer. During time of plenty, when prices fall, the producer may be forced to use his/her past savings to continue production.
3. Producers will be discouraged to produce more after making losses in the season of low prices leading to less production in the economy.
4. It will lead to fluctuation of revenues of the government from agriculture products thus making government planning and budgeting difficult.
5. Price fluctuation may result into fluctuation in **foreign exchange earnings** from agricultural exports. This may lead to Balance of Payment (**BOP**) deficits when prices of exports reduce.
6. Employment levels will tend to fluctuate due to instabilities in price since agriculture employs many.
7. Widens income inequality between the peasant farmers whose prices fluctuate and those in other sectors whose prices are stable.
8. Modernization of agriculture becomes difficult because it becomes difficult to rely on agricultural revenue to improve agriculture.

25.2.4 Measures to control price fluctuation

The following can be done to reduce price fluctuations in agricultural sector:

1. **Price control** in form of minimum and maximum prices to protect producer from being exploited by consumers and consumers from being exploited by producers respectively
2. **Improving storage systems:** Stable prices in the agricultural sector can be ensured by improving storage systems. This will help

to regulate supply by storing the excess output during periods of bumper harvests. The excess will be used to stabilise prices in periods of scarcity.

3. **Improve transport systems:** This facilitates the movement of commodities from areas of plenty to areas of scarcity, quickly and cheaply. This also helps to regulate supply.
4. **Diversification of the agricultural sector:** This creates a variety of commodities supplied to the market. It also reduces competition among sellers especially in foreign markets.
5. **Improvement in technology:** Technology reduces dependence on natural conditions. This increases the quality of output which makes it competitive.
6. **Processing agricultural products:** This adds value to agricultural products and makes them competitive.
7. **International commodity agreements:** These agreements can be used to stabilise prices on the international market. These help to stabilise prices of agricultural products by regulating production in the member countries.
8. **Stabilization process:** Prices can be stabilized through establishment of farmers' associations to regulate supply. These associations may help to fix quotas and regulate supply. Farmers would produce according to the fixed quotas.
9. **Establishing of agro-processing industries** to absorb the surplus output and add value so as to make the final product more competitive on the world market which in turn makes prices stable.



Application activity 25.2

1. Identify the causes of price fluctuations especially in agricultural in Rwanda
2. In your own opinions, how do you think price fluctuations has affected economy?
3. How has the government of Rwanda controlled price fluctuations in an economy?

25.3. Price control



Activity 25.6

- a) Visit the library or the internet and through discussions, present your arguments for and against the motion that “It is important for the government to fix low prices to favor consumers and high prices to favor producers”.
- b) What specific name is given to the prices fixed in favor of consumers and producers respectively.
- c) Why do you think government may set either low or high prices?
- d) Other than government setting prices to control price fluctuations, in what other ways can prices be controlled?

25.3.1: Meaning of price control:

Price control refers to the methods that can be used to interfere with the forces of demand and supply in determining prices. Price mechanism is not allowed to influence prices in the market. It can also be called price administration.

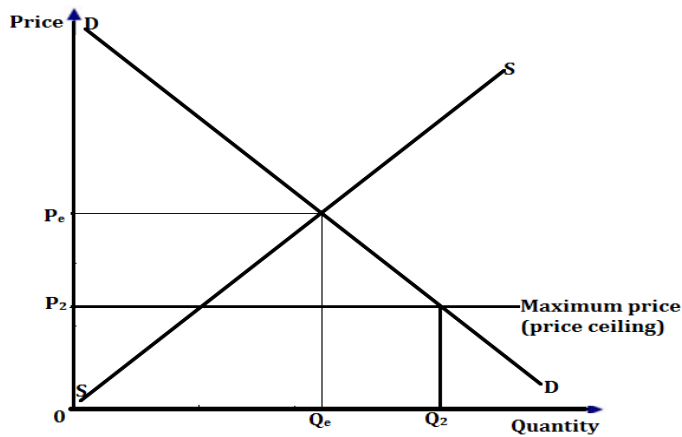
25.3.2: Forms of price control:

Various forms of price control include among others the following;

a) Maximum price legislation (price ceiling)

This is the highest price fixed by the government below the equilibrium point above which it is illegal to buy or sell the commodity. Sellers and buyers are required by law not to buy or sell above the fixed price. As it is fixed below the equilibrium, consumers are willing and ready to buy more commodities since the prices are affordable. On the other hand, however, sellers are discouraged by the low price. Quantity supplied reduces.

Illustration of maximum price (price ceiling)



Maximum price.

P_e is the equilibrium price.

P_2 is the maximum price (price ceiling)

Fig 25.1: Maximum price

Merits of maximum price.

- It reduces consumers' exploitation by producers.
- It reduces inflationary tendencies by maintaining price stability.
- It gives chance to low income earners to get access to essential commodities at the low prices fixed by the government.
- It reduces monopoly powers by when the government fixes the prices to be charged by all firms.
- Improves standards of living of people because they will be able to purchase various commodities at a low price.

Demerits of maximum price (price ceiling)

- It leads to hoarding of commodities or artificial shortages by hiding away commodities from the market because of low prices fixed by the government.

- There is production at excess capacity because of low prices. I.e. resources may be underutilized because low prices fixed by the government.
- It leads to unemployment because many firms may be discouraged to expand their businesses because of the low prices fixed by the government.
- There is black marketing, i.e. commodities may be sold illegally/unlawfully at high prices behind curtains (not openly).
- It leads to scarcity inflation due to shortages in supply yet there is increased demand.
- It reduces incentives for private enterprises or entrepreneurs to expand their businesses and this slows down economic growth.

b) Minimum price legislation (Price floor)

This is the lowest price fixed by the government above the equilibrium point below which it is illegal to buy or sell commodities. For instance, a minimum wage for workers or minimum price set by the government for agricultural products to protect farmers from being cheated by the profit-oriented traders/middlemen.

Illustration of a minimum price (price floor):

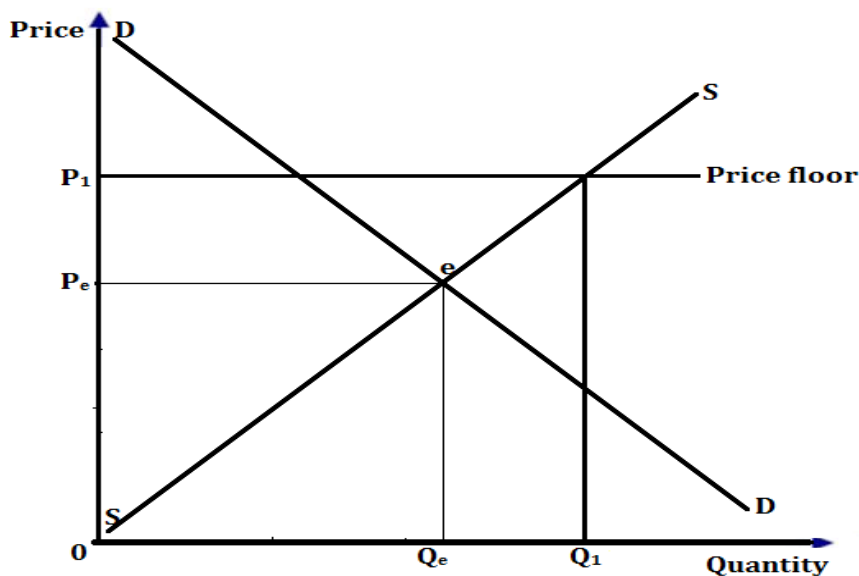


Fig 26.2 Maximum price

P_e – equilibrium price.

Q_e – equilibrium quantity

P_f – minimum price

Q_f – quantity sold and bought at minimum price.

Merits of minimum legislation.

- Protects producers from being under paid by the buyers who always want to pay low prices.
- It leads to increased production and creation of employment opportunities because it encourages producers to produce more outputs due to high prices fixed by the government.
- It enables the producers to receive stable incomes when the government fixes the prices for their products.
- It discourages consumption of unwanted or undesired commodities because when the government fixes high prices for such commodities, many customers will be discouraged from buying such commodities.
- It may help the economy come out of a depression or recession because when the government fixes high prices this encourages more investments, increase in levels of income and demand which in turn offsets a depression or recession.
- It reduces strikes by workers who complain of low wages because when high prices are fixed even wage levels increase.
- It increases the purchasing power especially for producers hence increased aggregate demand.
- It increases the levels of profits for producers because of charging high prices fixed by the government.
- It reduces wage differentials and the gap between the rich and the poor.

Demerits of minimum price legislation (price floor)

1. It can easily cause inflation in the economy because the government set high prices for commodities.
2. It increases the cost of production because when government sets higher wages for workers this increases the costs of production.
3. It reduces people's standards of living especially consumers when government fixes high prices in the economy.

4. It may also lead to malpractices in the market like black markets, hoarding of goods, smuggling etc. especially when price control cause shortages in the market.
5. It also increases government expenditures because it becomes costly for the government to implement such policies. It may lead to over production because producers are encouraged by high prices set by the government.

c) Resale price maintenance

This is a price fixed by the producer/manufacturer of a given commodity to the consumer. The price paid by the consumer is the same at different retail outlets and therefore no price fluctuations. It is set to protect the producer or seller in order to cover costs of production. Examples include the price of newspapers, price of airline etc.

d) Rent control

This is where the government intervenes to fix prices of housing facilities especially in urban areas where their demand is always high as a way of protecting consumers (tenants).

e) Rationing

This is where the government takes control of the supply channel of a scarce commodity and distributes it to consumers equally at a constant price. It is aimed at ensuring supply of the scarce commodity to all consumers. People line up and will be served on the basis of “first come first served”.

f) Buffer stock and stabilization fund policies.

The government may come in to stabilise producer's revenue by operating a buffer stock or a stabilization fund. A stabilization fund is a mechanism set up by a government to protect the domestic economy from large influxes of revenue as from commodities. Buffer stock is a system where the government buys up a surplus (excess output) from producers, stores it and sells/supplies it to the market during the shortage period.

g) International Commodity Agreement (ICA);

These are treaties or agreements set up either by producers or by the producers and consumers mainly to control prices and supply of their commodities. Examples include International Coffee Organisation (ICA), International Cocoa Agreement (ICA), and International Tea Agreement (ITA), International Wheat Agreement (IWA).

25.3.3: Effects of Price Controls:



Activity 25.7

Price controls have been effective in controlling the effects of price fluctuations, discuss.

Price controls have both positive and negative effects which include among others the following:

a) Positive effects of price controls:

- Resale price maintenance stabilizes producer's incomes i.e. whether demand is greater or less than supply, producer prices and incomes remain the same.
- Maximum price controls monopoly power. Monopolists usually cheat buyers by charging high prices. Thus, maximum price legislation will control price increases by monopolists.
- Price controls maintain price stability. Prices are kept constant and this favours consumers. It keeps the real value of their incomes stable. Price control protects consumers from being exploited by profit motivated producers. In periods of scarcity, consumers are protected from
 - high prices.
- Minimum wage increases purchasing power of workers. This improves their general standard of living, aggregate demand and production in general.
- The minimum wage protects workers from exploitation by employers by paying them low wages. Producers usually aim at increasing their profits by reducing total costs.
- Price control protects producers from being under paid by profit motivated middlemen. Traders buy from producers like rural farmers at very low prices.
- Minimum wage maintains industrial peace. It avoids the occurrence of strikes by trade unions when demanding wage increments.

b) Negative effects of price controls

- Maximum prices lead to black markets. Commodities are sold to willing buyers at higher prices behind counters. This is because of shortages in the markets.

- Minimum wage legislation may increase the supply of labour by reducing voluntary unemployment and so creates unemployment.
- Maximum prices increase demand creating shortages. When the price is fixed below the equilibrium, supply is discouraged but quantity demanded widens.
- Minimum prices like minimum wages increase the cost of production. This reduces the volume of production. Production becomes expensive through a high wage bill.
- Rent control reduces the supply of housing facilities. It discourages landlords from expanding housing facilities.
- A minimum price creates storage problems of the surplus output produced. Supply increases with a minimum price but quantity demanded reduces.
- Maximum prices reduce the incentives of private producers. This is because their power to determine prices of their products depending on their costs is reduced.



Application activity 25.3

Discuss the likely consequences of the government setting high prices on food staffs in markets in Rwanda.



Skills lab

Pay visit to any nearby farmers especially market those dealing with commercial agriculture. Inquire from them about their annual prices for their products, at least for 2 years back, inclusive this year. And come up with ideas on how best you can advise them of how to control fluctuations in the prices of their commodities.



End unit assessment

1. What are the assumptions underlying Price mechanism?
2. Examine the benefits and costs associated with price mechanism.
3. It is always assumed that underprice mechanism, there is consumer and producer freedom in resource allocation, why then does government come in to interfere in the long run?
4. Why do you think agricultural product prices fluctuate more than those of industrial ones?
5. How does fluctuation of prices affect the growth and development of the economy at large?
6. Describe how the following measure help in controlling price fluctuations:
 - i) International commodity agreement
 - ii) Buffer stock and stabilization fund policies.
 - iii) Resale maintenance.
7. Examine the role of price controls towards economic growth.

UNIT 26:

INTRODUCTION TO THE THEORY OF PRODUCTION:

Key unit Competence: Be able to assess the role of the factors of production in the economy.



Introductory Activity 26

Read the following passage to answer the questions that follow;

A business firm, in its daily operations, decides how much of each commodity that it sells, it will produce, and how much of each kind of labour, raw materials, capital goods, land size etc., that it employs and will use. All these relate to prices of commodities and of the productive factors used to produce them; and also, on the other hand, the quantities of these commodities and productive factors that are produced or used and the organizational capacity of the firm itself. These various decisions a business enterprise makes about its productive activities, can be short term or long term.

Required:

- What economic name is given to the process of daily business operations named above?
- From the passage, identify the major components of production process.
- What are rewards of each resource used in the production process of the firm?
- Which resource is more important than the other? Justify your answer.

The theory of production, in economics, takes an effort to explain the principles by which business firms decide on their “output” or “products” they will produce in relation to their “inputs” or “factors of production” they will use. The theory involves some of the most fundamental principles of economics which include the relationship between the quantities and prices of commodities and of the productive factors used to produce them respectively, for cost minimization and profit maximization. Therefore, the theory of Production relates to the mix of the factors of production and how to utilize these factors to maximum effect.

26.1. Production

26.1.1: Meaning and purpose:

Production is the organized activity of transforming resources into finished products in form of goods and services. It can as well be defined as a process of combining various inputs to produce an output for consumption. Or it is the act of creating output in the form of a commodity or a service which contributes to the utility of individuals. In other words, it is a process in which the inputs are converted into output.

26.1.2: Purpose of production:

According to Adam Smith and a number of other people, the purpose of production is consumption. i.e. to satisfy human wants and needs. If something is not going to be used (consumed), then, there is no need to bother produce it. This is because production is any activity directed to the satisfaction of other people's wants through exchange. While according to Keynes, the main purpose of production is to create wealth and improve the economic wellbeing of people.

26.1.3: Types of production:



Activity 26.1

Analyse the following case study and thereafter, visit the library and search about the following;

Muhizi, a farmer in Nyagatare, rears cows for milk and purposely for his home consumption. He only sells some few litres when he wants to buy some basic items at home like, salt, soap etc.

Mwiza poultry farmer in Kamonyi, raises chicken purposely for selling to markets and rarely eats them at home.

Required:

- What economic name is given to Muhizi's and Mwiza's act of production respectively?
- Describe the characteristics of each person's activities named above.

There are basically two types of production. These include;

1. **Direct production:** This is the production of goods and services by an individual for personal use (one's own consumption). It is at times referred to as **subsistence production**. However, a small surplus, if any, may be exchanged for one's other requirements. For example, if Mr. Mugisha grows maize, rice and rears cows for milk, chicken for eggs, builds his own residential house etc, all this is direct production.
2. **Indirect production:** This is production of goods and services for sale/exchange/market. It is at times called commercial production. With this type of production, the money got from the sale of items is used to acquire other items one requires, which he/she cannot produce him/herself.



Application activity 26.1

Producer A



Producer B



Study photograph A and B above. Identify the activity taking place in each of them and answer the questions that follow.

- i) What technical terms can you use to refer to the kind of production identified in photographs A and B. Support your answer with two reasons.
- ii) Give the differences between the two types of production given in (i) above.
- iii) Give suitable examples of producers from who suit in the types of production identified above.
- iv) What can be done to change from the type of production in A to that in B?
- v) If you were to participate in production, which of the two types identified above would you select? Give reasons to support your answer.

26.1.4: Levels of production.



Activity 26.2

Analyse the following information in the table below and thereafter, using the questions that follow, visit the library to research about what is required to answer;

Person	Occupation
Rwagasana	Agriculturalist, Fisherman
Akacu	Processes yoghurt, Tailor
Butera	Driver, local defence officer.

Required.

- Categorize each person's occupations into levels of production.
- What characterizes each person's occupation activities?

For general purposes, it is necessary to classify production into three main groups / levels:

a) Primary Production:

This refers to the extraction of commodities in their raw form as provided by nature. This is the first stage of production. Primary production is carried out by 'extractive' industries which are engaged in such activities as extracting the gifts of nature from the earth's surface, beneath the earth's surface and from the water bodies like agriculture. It includes activities like forestry, fishing, mining, oil extraction, hunting, quarrying etc.

b) Secondary Production:

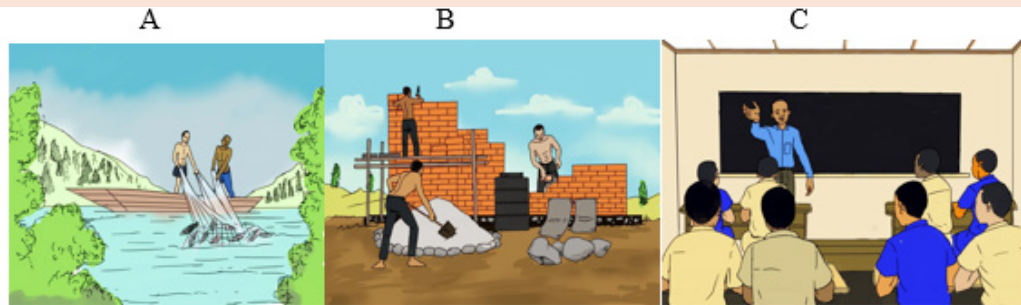
This is the transformation of raw materials and intermediate goods into semi-finished and finished products. Generally, the output of primary production is used as input for the secondary production. For instance, production of sugarcane is the primary production used to produce sugar. At times, primary products are converted into semi-finished products and then used by other manufacturing units to produce final goods. Examples of such industries include; Construction, manufacturing e.g. cars, furnishing, textiles, engineering, processing (fruits into juice, milk into butter, ghee, yoghurt, sugarcane into sugar), oil refining (petroleum into diesel, petrol, paraffin), leather tanning. Etc.

c) Tertiary Production:

This is the provision of services only. It includes the processes which increase the value or utility of commodities. Tertiary production starts after producing the final product. Industries in the tertiary sector produce all those services which enable the finished goods to be put in the hands of consumers. In fact, these services are supplied to the firms in all types of industry and directly to consumers. Examples include banking, insurance, transport and communications, government services, such as law, administration, education, health and defence etc.



Application activity 26.2



Study the pictures above.

- Identify the economic activities taking place in each of the above pictures, A, B and C.
- Under what level of production would you categorise the activities taking place in above pictures, A, B and C.
- Give at least two more examples of economic activities that fall under the three levels of production mentioned in (ii) above.

26.2. Factors of production:



Activity 26.3

Analyse the statement below and share your views together. Thereafter present your views to the whole class.

Your friend comes to you seeking advice about his proposal to start up a given business, describe what you would advise him to have before the start of the business.

Production of a good or service requires the use of certain resources or factors or agents of production. Since most of the resources necessary to carry on production are scarce relative to demand for them, they are called economic resources. Therefore, factors of production are the resources or inputs required in the production of a commodity. Production is made possible by combining certain resources in various ways, by firms or enterprises, to produce an annual flow of goods and services. They include land (natural resource), labor (human resource), capital (man-made resource), and entrepreneurship (organizational and risk-taking resources).



Application activity 26.3

Assesse the role of indirect production towards economic growth in an economy.

26.2.1: Land as a Factor of production.



Activity 26.4

Discuss and share your views about the following and thereafter make presentation in a whole class discussion.

- What do you think is land?
- Describe anything you think is land.
- How is land important in production and in the economy in general?

In economics the term land is used in a broad sense to refer to all natural resources or gifts of nature on, beneath or above the earth's surface. It includes farming and building land, forests, and mineral deposits, soil, fisheries, rivers, lakes, oceans, the sun, rain etc. all those natural resources (or gifts of nature) which help us (the members of the society) to produce useful goods and services. The reward to land for its contribution in the production process is rent. .

a) Characteristics of land:

- Land has fixed supply: The total land area of earth (in the sense of the surface area available to men) is fixed. Therefore, the supply of land is strictly limited.
- Land is a free gift of nature: it is not a produced or man-made agent: though man tries to improve or modify nature, he cannot completely master it.

- Alternative uses: Although the total supply of land is fixed, land has alternative uses.
- No cost of production: Since land is a gift of nature, it has no cost of production (zero supply price). i.e. Since land is already in existence, no costs are to be incurred in creating it just like training labour or creating capital.
- Operation of the law of diminishing return: This simply means that as more and more workers are employed on the same plot of land, output per worker will gradually fall.
- Land is permanent: it is not easy to destroy it. Even when destroyed, it can be restored after sometime.
- Land is a primary factor of production: Any production process starts with land.
- Land is geographically immobile but can be occupationally mobile since it can have alternative uses.
- Land has inelastic supply: The supply of land cannot be adjusted according to its demand.
- Land is differentiated: Land is not homogeneous i.e. it differs in fertility and thus productivity which results into different prices of land.
- Demand for land is derived: land is demanded not for its own sake but for the production of goods and services.

b) Importance of land:

Land as a factor of production is of immense importance. This includes;

- It is the original source of raw-materials for industries, thus promotes industrialisation.
- It includes soils and climate which are vital for agriculture.
- It is a source of fuel like oil, coal, firewood etc.
- It is a source of fish which is used for food or exchange locally or externally.
- It provides scenery for tourism e.g. waterfalls, wild animals, natural forests, mountains etc. all which earns a country revenue in form of forex.
- It provides a site on which all developments stand.
- It is a source of minerals like gold, copper etc. which can be exchanged to provide revenue.
- Land is taxed to earn government revenue.

- It is a source of water for home use, using in industries and generation of electricity.
- It is a source of medicine like herbs which help promote health standards of nationals of a given country.
- It helps in transport systems like road network, railways, air transport which aids production directly and or indirectly.



Application activity 26.4

Discuss the reasons as to why land as a factor of production differs from all other factors of production.

26.2.2: Labour as a Factor of production:



Activity 26.5

Analyse and share your views about the following;

- By writing “T” for true statement and “F” for false statement and thereafter make presentation to the whole class.

The following are examples of labour provision;

- A construction worker at a hotel site.
 - A waiter who serves guests in a hotel.
 - A student in class
 - A baby at home.
 - A housemaid washing clothes.
 - An artist involved in making art.
 - A taxi driver transporting passengers.
 - Teacher in class teaching.
 - A doctor treating patients.
 - A farmer in his garden digging.
- Using the above information, where statements are true, categorize labour into their skill levels.

Labour refers to any human effort, mental and or physical, that contributes towards the production of goods and service. Labour can be productive labour or unproductive labour. Productive labour is the labour

that is engaged in producing goods and services, and it is paid a wage/ salary. Unproductive labour is the labour that does not produce goods or services and therefore it receives no wage.

a) Categories of labour:

Labour can be categorized into;

- a) Skilled labour: This is labour which is highly trained and experienced and can engage in productive activities without any supervision e.g. teachers, doctors, lawyers, engineers and veterinary officers.
- b) Semi-skilled: This is labour which is partly trained and has some degree of experience but requires some supervision to complete certain tasks e.g. drivers, tailors, hair dressers, carpenters, mechanics, plumbers and artisans etc.
- c) Unskilled labour: This is labour which lacks training and experience in any particular job. E.g. house maids, wheel barrow pushers, cleaners , car washers, herds boys, and farm workers. .

b) Specialisation and Division of labour.



Activity 26.6

Study the case study below and answer the questions that follow;

Tuyishime is a sister to Kwizera. Tuyishime is a gynecologist in one of the hospitals in Rwanda. Kwizera is a Peasant farmer and at the same time a saloon operator in their home area.

Required:

- a) Who of the two is a specialist and who isn't? Justify your answer.
- b) What is specialisation?
- c) What are the arguments for and against specialisation?

Specialisation refers to an economic situation where labour concentrates in the production of one or very few commodities in a more effective and efficient way. In this case, resources are concentrated in production of relatively few commodities. Specialisation at individual level refers to the allocation of tasks among workers so that each worker concentrates on the task he or she is most effective and efficient. Example, the specialisation of teachers in different subjects in TTCs. Specialisation by individual tasks is called 'division of labour'. **Division of labour** refers to the separation of a

work process into a number of simple and separate tasks, with each task being performed by a separate person or a group of people. Each worker is responsible for a particular task where he or she can perform better.

c) Advantages of specialisation and division of labour:

- There is increase in levels of outputs produced because work is done by specialized people which leads to reduction in the price levels in the country.
- There is production of high quality products which in turn leads to improvement in people's standards of living.
- Consumers' choice increases because through specialization and division of labour a variety of goods and services are produced.
- Specialisation and international trade increases the size of the market, offering opportunities for large-scale production for a larger market
- There is increased competition for domestic producers which acts as an incentive to minimize costs and to be innovative to remain competitive. Competition will help to keep the prices lower in the economy.
- Workers become very skillful and effective into their single allocated task because they have a lot of time and occasion to practice their selected job.
- Time is saved because workers are able to concentrate on only tasks they perform better and this eliminates the constant need to move from one operation to the next by the workers.
- Use of specialised machinery may arise from the division of the general manufacturing process into small, separate and simple tasks. This in turn may greatly speed up the individual jobs which are automated.
- It is also generally considered that, because of the cost of training, workers to perform simple tasks is far less than training each worker to complete the whole production process, division of labour can lower average cost of production.

d) Disadvantages of specialisation and division of labour:

Although division of labour can lead to considerable gains in the productivity and quality of production, division of labour can also have negative effects on the production for the following reasons.

- Division of labour increases industrial interdependence which results into delays in production, inefficiency and losses in case of a breakdown in the process of production or an absence of a worker can halt the

whole production process. For example, a strike in one part of the factory can halt the whole production process.

- Very high degree of division of labour can create demand for very specific, narrow skills, which creates the possibility of increased unemployment among the labour force of the country. In the long-term, this may lead to structural unemployment where the worker is replaced by a machine, and because the worker's skill is no longer required, the worker has trouble finding employment, because he is not trained in anything else.
- Division of labour leads to boredom and hostility (disaffection), which people may experience because of doing the same task continuously. This may have a negative effect on the labour force and labour relations and eventually the productivity of the workers.
- There is a possibility of overproduction. Due to specialisation, there is large scale production which creates excess supply. This leads to losses to the producers.
- Specialisation leads to loss of craftsmanship (skills) because it results into increased use of machines. As a result, labour becomes machine attendant hence low skill utilisation.
- It reduces mobility of labour because a worker is trained to handle only part of the whole task. This makes it hard for the worker to find a similar job in another place.
- It can result into the rise of monopoly as a worker specializes in performance of a given task he or she may become a monopolist in that field and may end up cheating customers.



Application activity 26.5

Explain specialization as an instrument for achieving economic objectives of the country.

27.2.3: Capital as a Factor of production:



Activity 26.7

Discuss and share your views about the following and thereafter make presentation to the whole class.

- a) What do you understand by the term capital? Identify examples of capital in your locality.
- b) Describe anything you think is capital.
- c) How is capital important in production and in the economy in general?
- d) What can be done in an economy to increase capital stock in an economy?

Capital refers to all manmade resources used in the production process of goods and services. Or it is any physical asset capable of creating further goods and services. It is also used to refer to wealth used to produce more wealth. Capital is that part of wealth which is not used for the purpose of consumption but is utilized in the process of production. Capital has also been defined as “produced means of production”. Thus, all those items produced by man to help in the production of further goods and services are examples of capital e.g. Tools and machinery, factories, dams, canals, transport equipment, stocks of raw-materials, seeds and fertilizers, etc. are examples of capital. Capital is rewarded with **interest** in the market of factors of production.

a) Forms of capital:

- a) Real/physical/fixed capital is the stock of physical assets capable of producing goods and services. It is not for satisfying wants directly but is used in production. Real capital increases the volume of goods and services. Examples are roads, railways, machines, factories, buildings, etc.
- b) Money /nominal /liquid capital: This is capital which is in monetary form or near liquid assets. It is the paper notes and coins, and it is used as a method of payment for capital goods. It is not directly productive. To a lay person, it is money capital that matters while to an economist, it is real capital that matters.
- c) Human capital: This is productive qualities found in human beings that are used in production of goods and services. Such qualities are acquired through training and education.

- d) Floating capital: This is capital that can be used for a number of purposes in a number of ways e.g. Money and raw materials.
- e) Private capital: This is capital owned exclusively by an individual and it yields him/her income.
- f) Social overhead capital or public capital: This is capital which is in most cases owned by the state on behalf of the people e.g. roads schools, hospitals defense etc.
- g) g) Sunk capital: This capital which is specialised and cannot be easily adopted to an alternative use e.g. railways.

b) Role of Capital in development:

Capital plays a vital role in the modern productive system:

1. It creates employment opportunities in the country when it is invested. When the capital is produced, some workers have to be employed to make capital goods like machinery, factories, dams and irrigation works. And at the same time, more labourforce has to be employed when capital has to be used for producing further goods.
2. It increases the levels of outputs produced when it is invested. Capital adds greatly to the production of more outputs in the economy due to growth of technology and specialization associated with capital which in turn leads to economic growth.
3. It also leads to infrastructural developments when it is invested. Capital facilitates construction of dams, roads, irrigation works, railway lines, air ports bridges and many others which all contribute towards economic growth and development.
4. Capital enables the country to improve her balance of payment (BOP) position through establishing import substitution industrial strategy where a country invests so much in establishing industries to produce goods which were previously imported into the country and this in turn reduces the amount of goods imported and then improves on the country balance of payment.
5. It also leads to the exploitation of idle resources in the country for example idle land, minerals and other resources which later leads to economic growth.
6. The use of capital enables a country to achieve a self-sustaining economic growth and thus helps to break through vicious cycle of poverty.

7. Capital enables the use of monetary exchange thus reduces the subsistence sector and its negative effects.
8. As finance, capital increases the level of savings which stimulates investments in the economy.
9. Capital breaks the state of technological backwardness by enabling the country to acquire modern technology thus promotes technological development:
10. Capital increases occupational and geographical mobility of other factors of production which results into efficient distribution of resources and increase in quantity of resources available.
11. Capital facilitates production of high-quality goods and services because with it producers are in position to use high levels of technology in production.
12. Capital facilitates research which helps the producers to increase on the quality and quantity of outputs. Capital makes it possible for producers to undertake research which improves their operations thus becoming more innovative and more competitive in the markets
13. Capital can be exported in form of loans, grants, foreign investments which can create more income to the country and employment.
14. Capital enables labour to specialise in operating different tasks which enables them acquire more skills thus increasing their efficiency and production of more goods and services.

c) Capital accumulation/ formation:

People use capital goods like machines, equipment, etc. because they (capital goods) are the creators of other goods and services. Capital also helps to produce goods and services with less effort and lower costs than would be the case if labour were not assisted by capital. But in order to use capital goods people must first produce them. This calls for a sacrifice of current consumption to increase on capital goods. Thus, the opportunity cost of the capital goods is the potential output of consumer goods which has to be foregone in order to produce that capital. This means that the production of capital demands abstinence from current consumption. . This is what we call capital accumulation or formation. Therefore, capital accumulation/ formation refers to the process of increasing a country's stock of real capital/ assets over a given period of time. Or it is the increase in the stock of capital goods.

Factors that affect capital accumulation (formation).

The creation of capital depends on the following factors;

- The level of savings. Whenever one's levels of saving increase, his/her levels capital accumulated increase, but when levels of saving reduce even the levels of capital accumulated reduce.
- Culture of the society. If the culture of the society is favourable for example favouring people to save, invest and to be good entrepreneurs, the levels of capital formation will be higher than when culture is not favourable.
- Extended family system. In most cases, people with small families are always able to save more money because of having low expenditures leading to higher levels of capital accumulation than extended families with high level of expenditures and low saving levels.
- Level of financial sector development. If the economy has a well-developed financial sector e.g. enough good commercial banks; this will encourage most people to save their money in banks which in turn increases capital accumulation, but if it not well-developed, most people will keep their money in cash form which reduces levels of saving and capital accumulation.
- Government and security. Capital formation is a function of good governance and management of the country's resources. A politically stable environment ensures investors' confidence in the economy, which in turn favours the capital formation process than a politically unstable one which scares away potential investors both local and foreign.
- The profit levels. When profit levels are high, producers will be encouraged to re- invest their capital leading to higher levels of capital accumulation but when profit levels are low they will be discouraged from re- investing leading low levels of capital accumulation.
- Labour productivity. Well trained and skilled workers always produce more and high quality products which increases capital accumulation but when workers are not well trained and skilled their productivity will be low leading to low capital accumulation
- Technology levels. If the levels of technology are high a country will be able to produce more and high quality output which leads to higher capital accumulation than when the levels of technology are low.
- Level of entrepreneurship: The higher the level of entrepreneurial skills in a country the greater the level of investments and capital accumulation, and the lower the level of entrepreneurial skills, the lower the level of investments and capital accumulation.

- Capital stock. The existing levels of capital stock are vital in explaining the levels of investment and capital accumulation in an economy. If the existing stock of capital is big the level of investment and capital accumulation will be higher than when the existing capital is small. .
- The wage rate and remuneration. If the payments for workers are high they will be motivated and this will increase their productivity, and the profits of the firms leading to higher capitals accumulation than when their wages and remunerations are low. Low payments always discourage workers from their hard work which in turn affects the profit levels of the firms. What a worker earns is important in explaining a firm's output levels and subsequently the profit levels. Similarly, capital formation is highly linked to a firm's profitability. This implies that when wages rate is high, it motivates them to produce more which increases output, profitability and more investments hence capital formation. But when labour is poorly remunerated, it becomes less productive and efficient which discourages capital formation.
- Number of active workers. If a country has a big number of active labour force this will increase the level of production leading to higher capital accumulation than when the number of active workers small. With large active labour participation, it is possible to increase the productive capacity of a country hence its stock of capital assets and vice versa.
- Rate of capital flows: High levels of capital inflows lead to an increase in capital accumulation while high levels of capital outflows lead to a decrease in capital accumulation.
- The size of market: existence of well-organized and expanding market encourages production of goods and services and generates more incomes. This leads to more savings for re-investment leading to increased capital accumulation. When the size of the market is small, it discourages production leading to low incomes, low savings. Low investment and less capital accumulation.
- Population structure: A high population growth rate with more dependants, increase expenditures and reduce savings leading to low capital accumulation while a low population growth rate with a big size of the working class encourages savings, investment, more output hence increased capital accumulation.
- Government policy of Taxation or subsidization. Favourable government policy on taxes and subsidies encourage savings and investment and production hence increasing the formation of capital. Unfavourable policies on taxes and subsidies discourage savings, investment and production and thus reduce the process of capital accumulation.

- Level of infrastructure development. A country that has well developed and equally distributed socio-economic infrastructures attracts more investments leading to higher capital accumulation than when socio-economic infrastructures are undeveloped and unevenly distributed.



Application activity 26.6

- Discuss the reasons as to why USA may have higher levels of capital accumulation than Rwanda.
- Explain the measures taken by the government of Rwanda to increase the capital accumulation in the country

26.2.4: Entrepreneurship as a factor of production:



Activity 26.8

Reflect back in your communities, identify people who have successfully started businesses and are still running them.

- List down the types of businesses they run.
 - Identify the characteristics that they have that enable them manage their businesses.
 - Analyse the role they have played in the development process of the areas where they operate from and the entire economy.
- An entrepreneur is a person who organises and co-ordinates other factors of production to produce goods and services. An entrepreneur hires labour and land and looks for capital. The entrepreneur then combines these factors in appropriate proportions to produce goods and services. The entrepreneur is the pivot around which all the activities of the firm revolve. He/she is the one who gives direction to the business firms & ensures its effective operation. The entrepreneur is rewarded profit for his contribution in the production process.
- a) Characteristics of an entrepreneur:**
- Risk taker and bearer i.e. an entrepreneur has the ‘willingness to assume risk’ arising out of the creation and implementation of new ideas. New ideas are always uncertain and their results may not be immediate/prompt and positive. Therefore, he/she always finds out ways and techniques of reducing or minimizing risks for his/her benefit.

- Passion and motivation i.e. an entrepreneur should be able to work over and over again without getting bored, keep awake at night because he/she hasn't finished a certain task yet, have to build something and want to continue to improve upon it.
- Self-belief, hard work and disciplined dedication i.e. entrepreneurs believe in themselves and are confident and dedicated to their project. Their intense focus on and faith in their idea may be misunderstood as stubbornness, but it is this willingness to work hard and defy the odds that make them successful.
- Adaptable and flexible i.e. successful entrepreneurs welcome all suggestions for optimization or customization that may enhance their offering and satisfy client and market needs.
- Product and market knowledge. Entrepreneurs know their product inside and out i.e. successful entrepreneurs create something that didn't already exist or significantly improves an existing product after experiencing frustration with the way it worked.
- Strong financial management i.e. successful entrepreneurs plan for present and future financial obligations and set aside an emergency fund. Even after securing funding or going fully operational, a successful businessperson keeps a complete handle on cash flow, as it is the most important aspect of any business.
- Effective planning skills i.e. successful entrepreneurs have a business plan in place, but remain capable of dealing with unforeseen possibilities.
- Make the right connections i.e. successful entrepreneurs reach out to mentors with more experience and extensive networks to seek valuable advice. If they don't have the necessary technical or marketing skills, they find someone who does and delegate these tasks so they can focus on growing the business.
- Exit preparedness since entrepreneurs aren't always successful at the first time around, but they have to know when to cut their losses. Therefore, sometimes the best solution is to call it quits and try something new instead of continuing to dump money into a failing business.
- Ability to question him/herself intimidating questions like; "can I do this? Do I want to do this?" etc.
- Committed to outcome i.e. an entrepreneur rebukes and disciplines self for failing to perform.

b) Functions of an entrepreneur:

- The entrepreneur in modern business performs the following useful functions:
- Organizes other factors of production.
- Undertakes risks and bears the burden of uncertainties of the business.
- Co-ordinates other factors of production. An entrepreneur sets goals and co-ordinates other factors of production to produce goods and services.
- Is a decision maker. The entrepreneur undertakes all the decisions of the business.
- Directs the development of the enterprise. An entrepreneur develops concrete plans for the development of the enterprise
- Is an initiator. The start of any business enterprise is as the result of the initiative of the entrepreneur.
- Is an innovator. An entrepreneur introduces new methods of production to improve the quality and quantity of output



Application activity 26.7

Discuss the role played the government in the development of entrepreneurship in the country.



Skills lab

Based on the benefits of direct production, as economics students, extend the benefits to the school community, by starting up a school garden. Make a report of the benefits of what you plan to do and a request form to the school administration, asking them to provide resources which might not be in your reach.



End unit assessment

1. a) Why do people engage in production?
b) Basing on the characteristics of an entrepreneur, analyse the factors that hinder development of entrepreneurs in Rwanda.
2. a) Among the four factors of production covered in the unit, which do you think is most important?
3. b) How can Rwanda improve capital development?
a) Match the following.

Resource	Reward
Land	Profits
Labour	Interest
Capital	Rent
Entrepreneurship	Wages or salaries

b)

Resource	Category
Land	Organizational skills
Labour	Manmade
Capital	Human resource
Entrepreneurship	Natural

4. Examine the benefits and dangers of direct and indirect production respectively.
5. Identify different activities in your localities that are categorized according to levels of production.

UNIT 27:

INPUT-OUTPUT RELATIONSHIP/ PRODUCTION FUNCTION.

Key unit competence: By the end of this unit, you should be able to describe and illustrate the production function.



Introductory Activity 27

To teach students, there is need of teachers, classrooms, teaching and learning materials. To have a healthy population, there is need of medical personnel and facilities. To produce food, there is need for land and capital.

- From the statements above, categories different things mentioned as output and inputs.
- How are the two categories related?

Input- output relationship expresses a functional relationship between quantities of inputs and output. It shows how and to what extent output changes with variations in inputs during a specified period of time.

27.1 Meaning of production function



Activity 27.1

Select an enterprise of your choice and find out its input used in a given period of time to produce a given level of output. Show their production function by use of an illustration or a graph and interpret your outcomes to the class in discussion.

Production function is an expression of the relationship between physical quantities of inputs and output. It shows the maximum output that can be obtained from a given quantity of physical inputs.

In a mathematical form, the production function can be expressed as;

$Q = f(K, L_1, L_2, E)$ where;

Q=quantity,

f= function

K = capital,

L_1 = labour,

L_2 = land or raw materials,

E = entrepreneurship or Organisation.

The production function can also be represented using a graph, as below.

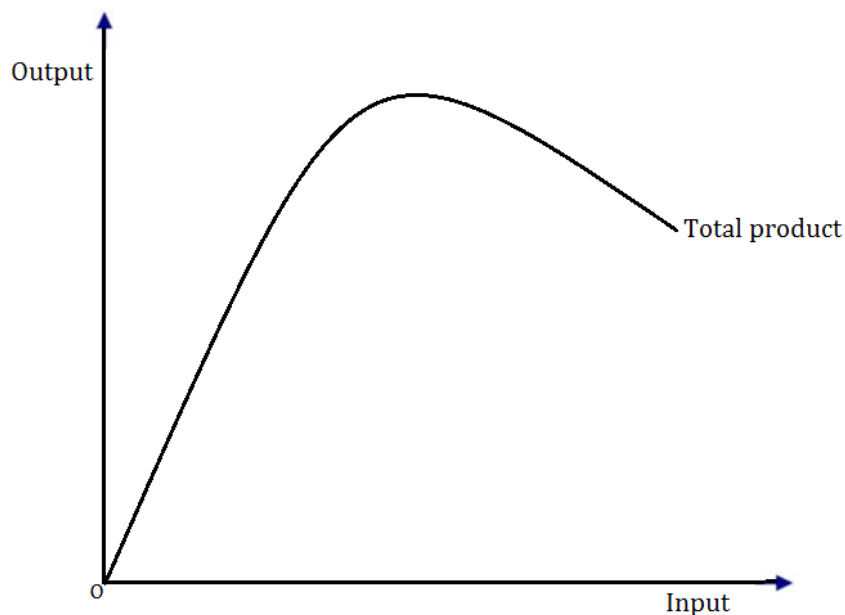


Fig 27.1: The relationship between inputs and outputs

27.2: Planning periods



Learning Activity 27.2

Case study:

Analyse the following statement and answer the questions that follow;

To produce shoes, Mucyo took 1 year to release his final product for sale. While Mugabo, producing shoes also, took 3 months to release his final product for sale.

Required:

- a) Why do think Mucyo took much time, while Mugabe took less time, yet they all produce shoes?
- b) In your own perspective, how much time do you think any production process should take? Justify your answer.

Planning periods are reference periods by any production unit when making production decisions. To study the relationship between a firm's output decision and its costs, we distinguish the two primary time periods or decision time frames /reference periods (i.e. short-run, long-run). Any production unit shows its performance for short run or long run or very long run. These periods do not show specific period of time e.g. a week, month or year, but it depends on the production unit making decision and what it is able to do with in that time. These periods are actually relative for different production units. For example, short run period for one firm, may be long run period for another.

Short run period.

It is a time-period so short that the firm is unable to vary all its resources. It is a time horizon over which some factors of production are fixed while others are variable limiting entry or exit from an industry. It is normally assumed that land, buildings, technology and services of top management are fixed. In this period, production units are only able to influence prices through adjustments made to production levels. Output will be increased by adding more units of a variable factor of production e.g. labour to a fixed factor e.g. land or capital and there is no change in technology.

Long run period.

This refers to the time horizon over which all factor inputs under the control of the firm and costs are variable (no fixed factors of production) so that there are no constraints preventing changing the output level by changing the capital stock or by entering or leaving the industry. Production units are able to adjust all costs and variables. In this period, a producer or manufacturer is flexible in his/her production decisions. E.g. the amount of labour, size of the factory, and production process, level of technology etc. can be altered if need be, depending on the state of the economy. This period is a planning and implementation stage in which a production.

27.3: Product of the firm.



Activity 27.3

Given the following information, carry out research from the library or the internet and answer the questions that follow;

Fixed factor	Variable factor.	TP	AP (TP/L)	MP ($\Delta TP/\Delta L$)
7	1	4	?	?
7	2	14	?	?
7	3	27	?	?
7	4	40	?	?
7	5	60	?	?
7	6	72	?	?
7	7	77	?	?
7	8	80	?	?
7	9	81	?	?
7	10	81	?	?
7	11	77	?	?

- Using the above case of input-output ratio, Calculate AP and MP and
- Illustrate the relationship between TP, AP and MP and make presentations.

Product of the firm refers to output (goods and or services) of a given production unit (firm) or what has been produced by a given production unit (firm) at a given period of time.

27.3.1: Forms of product of the firm

There are basically 3 major forms.

i) Total product (TP).

This is the overall amounts of products or output that have been produced by a given ratio of factors combinations in a particular period of time. Or it is the total output resulting from the employment of all factors of production. TP is always considered or measured in physical units e.g. kilograms, tons, grams, litres etc. but not in prices.

ii) Average product (AP).

This is output per unit of a variable factor employed (holding other factor inputs constant). Or it is how much each unit of a variable factor has produced. It is given by the total product divided by the variable inputs employed i.e.

$$AP = \frac{\text{Total Product}}{\text{units of variable factor (Labour)}}$$

Or

$$AP = \frac{TP}{L}$$

Example.

If TP of 6 units of labour is 72 kilograms, calculate output per worker.

Total output = 72. (TP)

Units of labour (number of workers) = 6 (L)

$$\text{Output per worker (AP)} = \frac{72}{6} = 12$$

iii) Marginal product (MP).

This refers to the additional output resulting from employment of an extra unit of variable factor when all other units are held constant. It is the change in output as a result of change in the variable factor.

$$MP = \frac{\text{Change in total product}}{\text{Change in units of a variable factor (labour)}}$$

$$\text{OR } MP = \frac{\Delta TP}{\Delta L}$$

Example;

If TP of 6 units of labour is 72 kilograms, and as a result of employing the 8th worker, total product increased to 120, calculate the marginal product.

$$TP_1 = 72$$

$$TP_2 = 120$$

$$\Delta TP = TP_2 - TP_1$$

$$120 - 72 = 48$$

$$L_1 = 6$$

$$L_2 = 8$$

$$\Delta L = L_2 - L_1$$

$$8 - 6 = 2$$

$$MP = \frac{\Delta TP}{\Delta L} = \frac{48}{2} = 24$$

27.3.2: Relationship between TP, AP & MP:

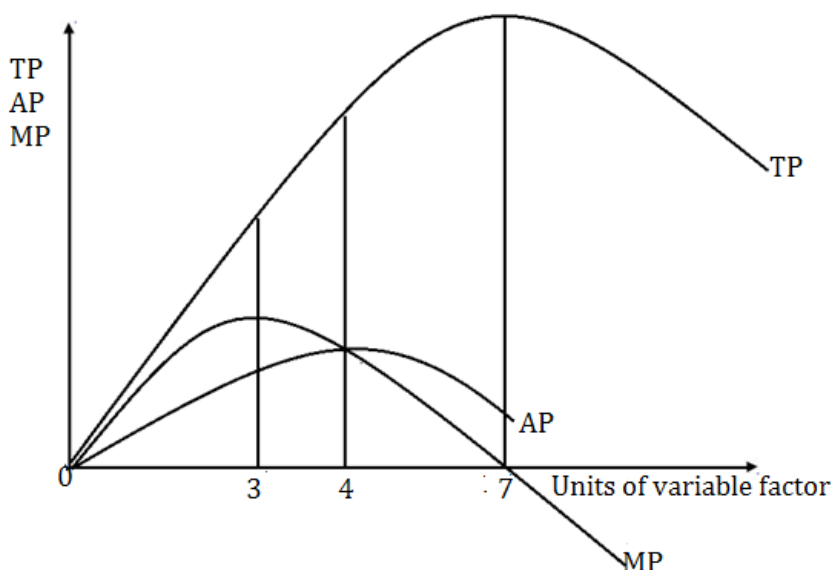
This can be explained by a production schedule or curves as below

Production function schedule:

Labour (L)	Total product (Q)	Average product AP= TP/L	Marginal product MP= $\Delta TP / \Delta L$
1	10	10	10
2	22	11	12
3	36	12	14
4	48	12	12
5	55	11	7
6	60	10	5
7	60	8.6	0
8	56	7	-4

The analysis of the table shows that the total, average and marginal product increase at first, reach a maximum and then start declining. The TP reaches its maximum when 7 units of labour are employed and it declines. The AP continues to rise till the 4th unit while the MP reaches its maximum at the 3rd unit of labour, then they also fall. This can be illustrated on curves as below;

TP, AP & MP curves



From the curves above, it is seen that;

- TP, AP and MP first increase, reach their maximum and begin to decline.
- The point of maximum and of falling are not the same for TP, AP and MP. i.e., MP reaches its maximum first, followed by AP and later on TP.
- When TP is at maximum, MP equals to zero. After this point, TP falls and MP becomes negative.
- The AP is at its maximum when it is equal to MP. The AP starts falling after meeting MP curve but MP is below AP after that point.
- The TP curve first rises at an increasing rate, reaches the highest point at a decreasing rate and then starts falling.

27.4.1: The law of diminishing returns.



Activity 27.4

Visit the library or the internet and carry out more research on the production function, in there,

State and explain the law of diminishing returns and its assumptions

The law of diminishing returns states that, given a short run situation with 2 factors of production, one variable and another fixed, **“As more and more units of a variable input are applied to the fixed factor in a given state of technology, the marginal product of the variable factor will eventually diminish.”** This law is also called the **law of variable proportions**.

b) Assumptions of the law of diminishing returns

1. Existence of a variable factor of production and other factors are constant.
2. All units of the variable factor are homogeneous.
3. The price of the product is given and constant.
4. It assumes a short run period.
5. It assumes that technology is constant.
6. It is possible to change the proportions in which various inputs are combined.

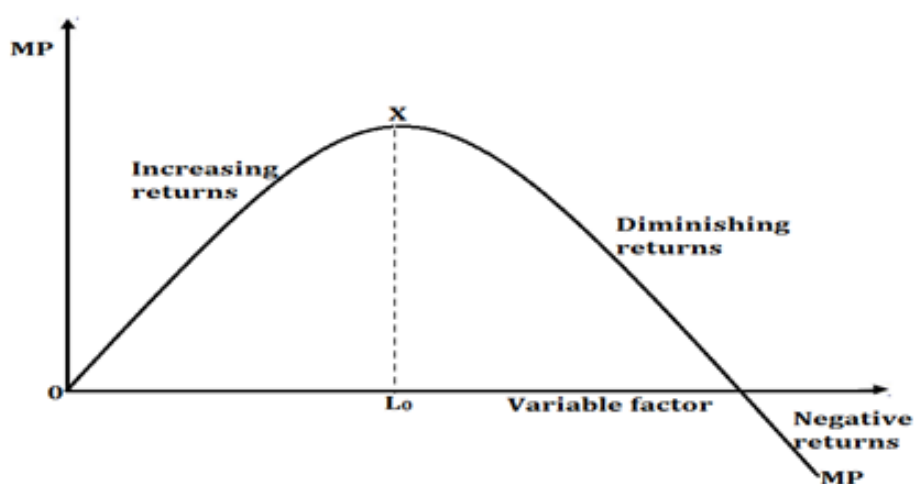


Fig 27.3: The law of diminishing returns to scale



Application activity 17.1

Use the table below to answer the questions that follow.

Capital units	Labour units	TP	AP	MP
1	1	8		
1	2	20		
1	3	36		
1	4	48		
1	5	58		
1	6	60		
1	7	60		
1	8	56		
1	9	50		

Required:

- Calculate AP & MP
- Illustrate the relationship between TP, AP & MP on graphs



End unit assessment

- Describe the different forms in which the production function can be expressed
- Explain the relationship between total product, average product and marginal product.
- When is the law of diminishing returns applicable and why?
- Use the table below to calculate AP & MP and illustrate TP, AP and MP thereafter.

Capital units	Labour units	TP	AP	MP
1	0	0		
1	1	6		
1	2	16		
1	3	27		
1	4	36		
1	5	40		
1	6	42		
1	7	42		
1	8	40		

UNIT 28:

THEORY OF THE FIRM

Key unit competence : Be able to assess the impact of location and localization of firms in an area



Introductory Activity 28

In Rwanda, there are many entrepreneurs dealing in different activities. Each entrepreneur, has his or her own business activity in areas and size of their choice. However, some have been directed by the government to settle in one place.

Required:

Visit the library or the internet and research on the location and localization of firms to discover the following,

- What economic name is given to single production units by different entrepreneurs?
- What name is given to setting up a business activity in any given place?
- What economic name is given by the act of the government directing production units in one place.
- Where, in Rwanda , do you know where production units have been put together?
- Why would government direct location of firms in a single area?

28.1: Meaning of a firm, industry and plant.



Activity 28.1

Visit the library or internet and make research on the difference between a firm, an industry and a plant. Thereafter, make presentation in class discussions.

a) A firm

A firm refers to a single production unit or enterprise under one ownership, management and control. . It may be small thus controlled by one man or through partnership, or a large-scale production unit e.g. public corporation. It may be private businessmen or joint stock companies or owned by the government or both government and private individuals.

b) A plant

A plant refers to a place or establishment where goods are produced. For example, Coca-Cola, Inyange factory etc. So plant means a factory, shopping center, or any other establishment. . Different firms have different plants. A plant includes not only the building and machinery, but also the workers employed therein.

c) An industry

An industry is made up of several firms that compete in the production of the related product or service. It can also be defined as combination of different firms producing related products. E.g. sugar industry, Textile Industry, Cement Industry, Mining Industry, Entertainment industry, transport industry, soft drinks industry. An industry is normally known by the name of the commodity produced by the various firms in it.

28.2: Location of firms.



Activity 28.2

In your own view,

- a) What do you understand by the term location of firms?
- b) What would you base on to establish your business activity in a given place?

28.2.1: Meaning of location of firms:

Location of firms refers to establishment of a firm or industry in a particular geographical area. Or it is a site or place where a firm or industry is established or set up. The place might be convenient or economic to the entrepreneur irrespective of whether there are others or not. The basic principle behind location of a firm is cost minimization. The producer selects the location of a firm, where costs of production are at minimum.

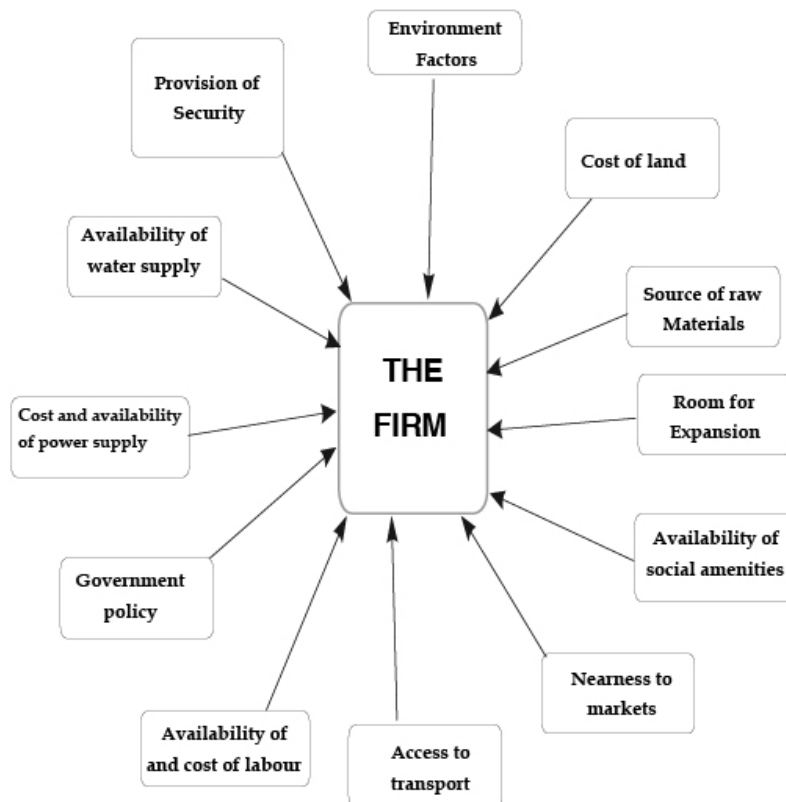
28.2.2: Factors influencing location of a firm and an industry.

There are several factors that determine location of firms or industry. These factors may be geographical, economic or political. They may be having a bearing on costs of production or not depending on what circumstances are compelling a firm's set up. Some, among others include the following;

- i) **Availability of raw materials:** A firm can be located in an area where raw materials are, especially when the raw materials are heavy and it would be costly transport them from distant places. Such firms are called rooted firms/industries e.g cement firms.
- ii) **Availability of the market:** Firms can be located in areas where the market for its finished products is available as this reduces the firm's expenditure to market its products and hence an increase in firm sales and profits. Such firms are called tied firms/industries.
- iii) **Government policy:** The policy of the government concerning industrialisation influences location of firms. For example, government may have the goal of regional balance in development and therefore may dictate where to locate certain firms in order to realize this goal.
- iv) **Transport and communication network:** Firms can be located in areas where the transport and communication infrastructure is developed. This eases transportation of the firm's products to market and the raw materials to the firm as well as keeping in touch with its partners through efficient communication network.
- v) **Availability of power:** Firms can be located in an area where power is available and less costly. This is because every firms need power in the production process and therefore its absence implies that the firm cannot undertake production.
- vi) **Availability of labour or Skill base in the area:** A firm can be located in an area where there is availability of abundant labour, with the required skills that the firm can employ to facility its production process.
- vii) **Availability of land:** Availability of enough land which the firm can acquire at a low cost and also where it can expand its scale of operations in future influences the location the firm.
- viii) **Political stability/security:** Firms can be located in an area where there is political stability since it will be sure of the security of its investments.
- ix) **Commercial institutions:** Presence of developed commercial institutions such as banks, insurance companies and advertising companies. They facilitate the firm to acquire credit and promote

its products in case of advertising companies influence location of firms.

- x) Industrial inertia: Industries tend to develop at the place of their original establishment, though the original cause may have disappeared. This phenomenon is referred to as inertia, sometimes as geographical inertia and sometimes industrial inertia. Industrial inertia refers to the tendency for an industry to remain in a location or keep attracted there even when the factors that attracted them before there no longer exist.
- xi) Climate: Harsh climate is not much suitable for the establishment of industries. There can be no industrial development in extremely hot, humid, dry or cold climate. For example, Cotton textile industry requires humid climate because thread breaks in dry climate.
- xii) Water is another important requirement for industries. Many industries are established near rivers, canals and lakes, because of this reason. Iron and steel industry, textile industries and chemical industries require large quantities of water, for their proper functioning.



Factors influencing location of a firm

28.3: Localization of firms



Activity 28.3

Analyse the photo below and answer the questions that follow:



Source: *Newtimes.co.rw* (7/09/2009): Fig 28.2 Concentration of firms at Masoro

Required: Visit the library or internet and research about the following;

- State some of the industries located at Masoro.
- Why do you think the Government of Rwanda decided to concentrate firms at masoor?
- Present argument for and against government's decision to concentrate firms at Masoro.

28.3.1: Meaning of Localisation of firms:

In today's economy, firms depend on one another. One firm's waste material may be used by another firm as a raw material. Due to this interdependency among firms, most entrepreneurs decide to construct their firms near the ones that may provide raw materials. Or it may be due to government policy. This helps in cutting down the transportation and disposal of waste costs for the firms.

Localization of firms refers to the concentration of many firms in an area. Localisation is related to the territorial division of labour, that is, specialisation by areas or regions. A certain town or region tends to specialise in the production of a particular commodity. And a situation of transferring firms from the area of high concentration to areas of low concentration is known

as **delocalization**. Localization can also lead to establishment of forward linkage and backward linkage. Localisation promotes linkages between or among firms in a localized area.

Forward linkage happens where the products of one industry are used as the raw material of another industry. For example, the development of forest resources for the export trade in raw timber leads to the development of a saw-milling industry using the same basic resource inputs. **Backward linkage** happens where an existing industry encourages investment in the earlier stage of production. For instance the development of sugar industry creates demand for sugarcane growing to provide sugar canes as inputs in the sugar industry.

28.3.2: Merits and demerits of Localisation of firms:

Merits of Localisation of firms.

Localisation of firms has the following merits to the localized area or the entire economy as below.

- i) **Creation of employment:** Localization leads to creation of more employment opportunities because as many firms are established in a given area more jobs are created.
- ii) **Development of infrastructure:** Localisation results into improvement of infrastructure by the government such as roads and telecommunications to cater for the firm's needs.
- iii) **Urbanization:** Concentration of firms in a particular area results into urbanization with its advantages like improvement of cultures and attitudes, encouraging hard work hence promotion of economic development.
- iv) **Improved quality:** Concentration of firms in area results into production of high quality products due to competition among many firms.
- v) **Improved reputation:** Localisation enables the area to gain reputation and the same will apply to the goods produced from that area which creates wider markets for its products.
- vi) **Supply of skilled labour:** Concentration of firms in an area attracts skilled labour to that area which in the long run promotes specialization and division of labour in the production process with its associated advantages.
- vii) **External economies:** Concentration of firms in an area results into generation of various external economies like transport economies, marketing economies, labour economies, research economies and

many others which reduce the production costs of the different firms.

- viii) Industrial expansion:** Localization of firms results into growth of subsidiary industries to supply raw materials, machine tools, component parts etc. hence expansion of the industrial sector.

Demerits of localization of firms:

Localisation of firms has the following demerits to the localized area or the entire economy as below.

- i) Regional imbalances:** As a result of localization, the localized region grows faster than others leading to regional imbalances in development.
- ii) Development of slums:** Localization results into development of slums and its negative effects due to lack of adequate housing facilities to house the large number of people in the localized area.



Houses in a slum

- iii) Social problems:** Concentration of firms in an area results into social problems like congestion, overpopulation, traffic jam and accidents which reduce labour efficiency and industrial production.
- iv) Rural-urban migration:** Due to Localisation, many people move to urban centers in search of employment. This results into high crime rates and other social problems in urban areas.
- v) Over-straining infrastructure:** As a result of Localisation, infrastructures like roads are excessively used which increases wear and tear, costs of replacement hence constraining the government budget.
- vi) Diseconomies:** Due to concentration of many firms in an area, diseconomies of scale arise such as high cost of labour, transport problems, failure to secure credit, competition for raw materials resulting into high costs of production.

vii) Increased cost of living: Concentration of firms in an area results into shortage of essential commodities in the area due to increased demand for those products, hence resulting into increased cost of living.

viii) Increased dependence: Localization results into overdependence on a particular area for a particular product which is dangerous in case of war, natural disasters or in an economic crisis.

ix) Exhaustion of resources: Concentration of firms in an area leads of over exploitation of resources in the area resulting into quick exhaustion of the resources which deprives the future of access to those resources



Application activity 28.1

Visit any localized area in Rwanda and analyse the benefits and dangers of localization to the firms and areas around. Make report and present in class.



Skills lab

Mobilise the youth in the nearby school community, ask them to give their views on what it requires to start a business venture, and what one has to have in mind before they start their businesses. Thereafter, provide long lasting ideas that they should base on to start their business for better results.



End unit assessment

1. Distinguish with examples the following terms
 - a) A firm
 - b) An industry
 - c) A Plants
2. Describe the objectives of the firm
3. Distinguish between localization and delocalization
4. "Masoro industrial area is one of the industrialized areas in the country".
Discuss factors that contributed to its localization.
5. Explain the costs and benefits of localization of firms.

UNIT 29: THEORY OF THE COSTS

Key unit Competency: Be able to describe production costs of the firm in the short run and long run.



Introductory Activity 29

Read the following passage and answer the questions that follow:

In any business enterprise, there is need for resources to produce a given level of good and services. However, these resources are not easily accessed by every entrepreneur as a business owner, therefore, one has to hire or buy such resources to enable production take place and achieve the stated objectives. Some resources are needed and acquired on a daily basis while others are acquired once and for all unless they depreciate after a long time.

Required:

- What economic term is given to expenses on resources in production?
- What do you think needs to be spent on as a resource in production?
- Why do you think it is important to calculate expenses in production?

29.1. Costs of production.



Activity 29.1

Visit the library or internet to explain the following;

- What do you understand by the term costs of production?
- Describe the different types of costs of production a firm can experience.
- When are costs of production incurred?

Theory of Cost explores the cost concepts, costs in the short and long run and economies of scale. Costs are very important in business decision-making; they provide the floor to pricing. It helps managers to take correct decisions, such as what price to quote, whether to place a particular order for inputs or not whether to abandon or add a product to the existing product line and so on. There are many forces behind the process of price determination for a good. One such force is supply, which is directly determined by the costs of the company.

29.1.1: Meaning and types of costs of production.

Costs of production are expenses a firm incurs during production process of goods and services. Or a cost is any alternative that is given up in production as a result of decision taken. In production, firms must incur costs in order to produce a given level of output. Costs consist of payments to factors of production and therefore closely linked to the theory of production. Costs are derived from the production function.

29.1.2: Types of production costs:

- 1. Indirect costs / implicit costs:** These are costs that cannot be computed in monetary terms and cannot be included in the calculations of the costs of the firms. E.g. pollution (noise, air and water pollution), time, opportunity cost, producers own labour, rent for one's own building etc.
- 2. Direct costs / explicit costs:** These are actual expenditures of a firm included in the computation of the firms' costs. They are included directly in production. They are costs on items for which the firm can make specific payments on. They are actual expenditures of a firm incurred when purchasing input factors. They are computed in monetary terms. For example, costs of raw materials, labour, transport, energy, fuel, taxes, payment on phone calls etc.

29.1.3: Short run costs of the firm;



Activity 29.2

Use the formula below and Analyse Uwamahoro Bakery's short run cost schedule and answer the questions that follow;

$$TC = TFC + TVC$$

Out put	TC	TFC	TVC
0	50	?	?
1	80	?	?
2	90	?	?
3	95	?	?
4	105	?	?
5	125	?	?
6	170	?	?

Required:

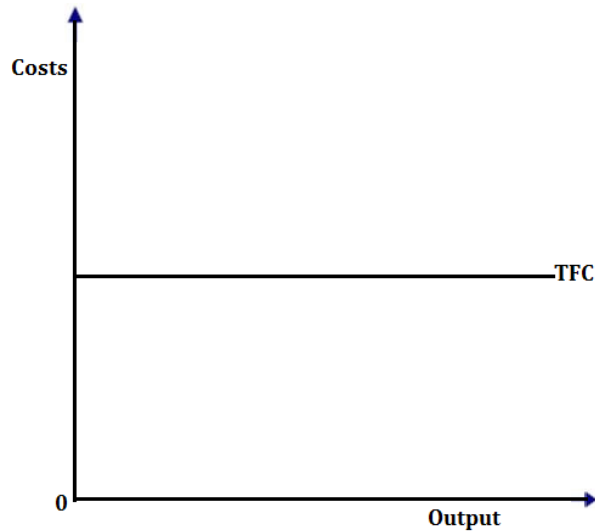
- Fill up the TFC & TVC gaps.
- Illustrate all the information in the above table on graphs.
- Describe the relationship between TC, TVC & TFC

Short run is a period in which the firm cannot change its plant, equipment and the scale of operations. To meet increased demand, it can only raise output by hiring more labour and raw materials or asking the existing labour force to work overtime. The short- run total costs are divided into:

- Total Fixed costs (FC).
- Total Variable costs (VC).

a) Total Fixed costs (TFC) – These are costs that do not change as production is increased or decreased. They have to be paid in advance of production. They exist even if output is zero. It is expressed as; **TFC = TC – TVC**.

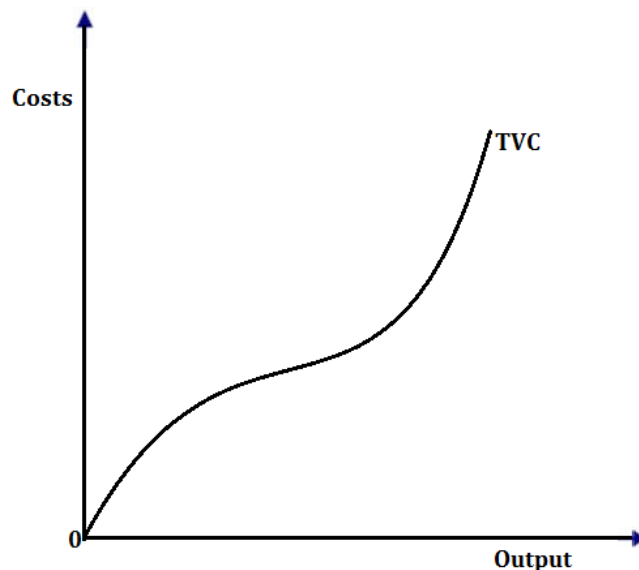
Examples include payment for rent, interest on loans, Insurance charges, depreciation allowance, wages and salaries of permanent staff and maintenance expenditure. They are also called overhead costs, supplementary costs and indirect costs. The total fixed cost curve is therefore horizontal and parallel to the X- axis. Fixed costs can be represented graphically and this would appear as follows:



b) Total Variable costs (TVC) these are costs which vary directly with the level of output. Varying directly means that the total variable cost will be dependent on the level of output. They are also known as direct costs, prime costs or operating costs. Common examples of variable costs include the following: Direct labour costs, packaging costs, costs of raw materials, transport costs, energy costs, fuel costs, taxes, payment on phone calls etc.

TVC is expressed as $TVC = TC - TFC$

Fixed costs can be represented graphically and this would appear as follows:



c) The total cost (TC)

This is the total sum of the total fixed costs and the total variable costs in the business.

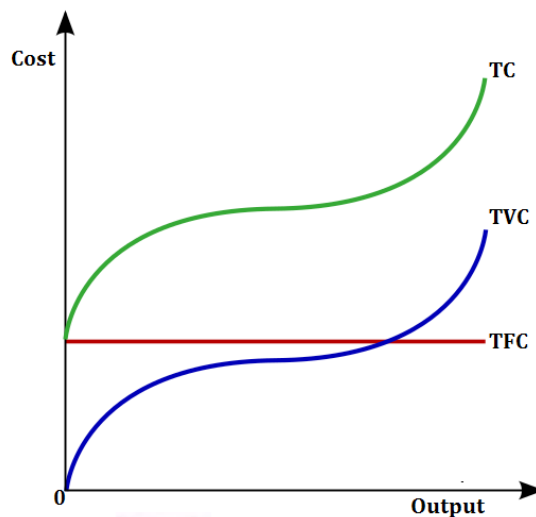
$$TC = TFC + TVC$$

When output is equal to zero, total cost will equal fixed costs since variable costs will be zero. When production begins to increase, total costs will continue to rise as variable costs increase since variable costs must increase as output expands.

Hypothetical Total Cost (TC), Variable Cost (VC) and Fixed Cost (FC) Schedule

Output	Fixed cost	Variable cost	Total cost
0	40	0	40
1	40	20	60
2	40	30	70
3	40	32	72
4	40	34	74
5	40	36	76
6	40	38	78
7	40	40	80
8	40	46	86

Relationship between TC, TVC and TFC: (Typical TC, TVC and TFC curves:)



The TC curve cuts the vertical axis at a point above the origin and rises continuously from left to right because even when no output is produced the firm has to incur fixed costs.

- The TVC curve starts from the origin (0) because when output is zero, the variable costs are also zero because they increase as output increases
- TFC is a straight line parallel to the output axis indicating that TFC is constant at all levels of output.
- TVC and TC are both upward sloping indicating that as output increases TVC increases as well as TC.
- TVC and TC are parallel to one another and never will meet because TFC can never be zero ($TC = TVC + TFC$)

a) Variation of costs in the short run.



Activity 29.3

Using the formulas below, analyse the information in the table below to answer the questions that follow:

$$TC = TFC + TVC; AFC = \frac{TFC}{Q}; AVC = \frac{TVC}{Q}; AC = \frac{TC}{Q}; MC = \frac{\Delta TC}{\Delta Q}$$

Output	TFC	TVC	TC	AFC	AVC	AC	MC
0	50	0	?	?	?	?	?
1	50	40	?	?	?	?	?
2	50	50	?	?	?	?	?
3	50	57	?	?	?	?	?
4	50	64	?	?	?	?	?
5	50	85	?	?	?	?	?
6	50	126	?	?	?	?	?
7	50	189	?	?	?	?	?
8	50	400	?	?	?	?	?

Required:

- Calculate TC, AFC, AVC, AC, and MC.
- With the aid of illustrations, show the relationship between
 - TFC, TVC & TC;
 - AFC, AVC, AC & MC.
 - MC & AC

While the total cost of production helps firms understand the overall expenses incurred, the average costs help identify the expenditures involved in manufacturing a single unit. In this case, we will look at the short run average costs and marginal costs of production. In the short run analysis average costs are more important than total costs. The units of output that a firm produces do not cost the same amount to the firm, but they must be sold at the same price. Therefore, the firm must know per unit cost or the average cost.

The short run average costs of a firm are the average variable cost (AVC), the average fixed cost (AFC) and the average total cost (ATC).

i) Average fixed cost (AFC)

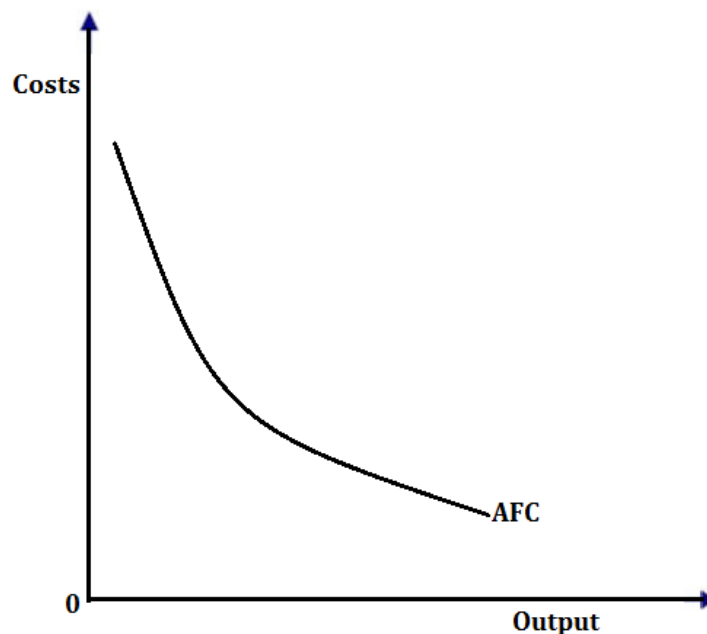
These are total fixed costs per unit of output. This can be expressed as;

$$\text{AFC} = \frac{\text{TFC}}{Q} \text{ where TFC is total fixed cost Q is output.}$$

Or

$$\text{AFC} = \text{AC} - \text{AVC}$$

Graphically, AFC can be illustrated as below;



The average fixed cost diminishes continuously as output increases. This is because when a constant figure such as the TFC is divided by a continuously increasing unit of output, the result is a continuously diminishing average fixed cost. Thus the AFC curve is down ward slopping but does not cross the quantity or output axis because if it did then, AFC would be zero in which case TFC would be zero which cannot be the case.

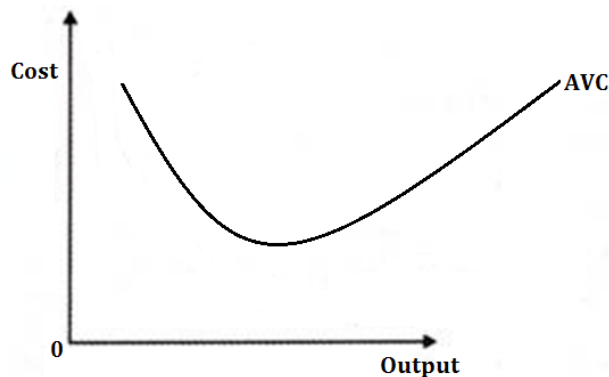
ii) Average Variable Cost (AVC):

These are total variable costs per unit of output. This can be expressed as;

$$AVC = \frac{TVC}{Q}, \text{ where } TVC \text{ is total variable cost } Q \text{ is output or}$$

$$AVC = AC - AFC.$$

Graphically, AVC can be illustrated as below;



The curve is U- shaped because of the law of diminishing marginal returns. The AVC first declines with the rise of output as larger quantities of variable factors are applied to fixed factors but eventually, it begins to rise due to the law of diminishing marginal returns.

iii) Average total costs (ATC / AC):

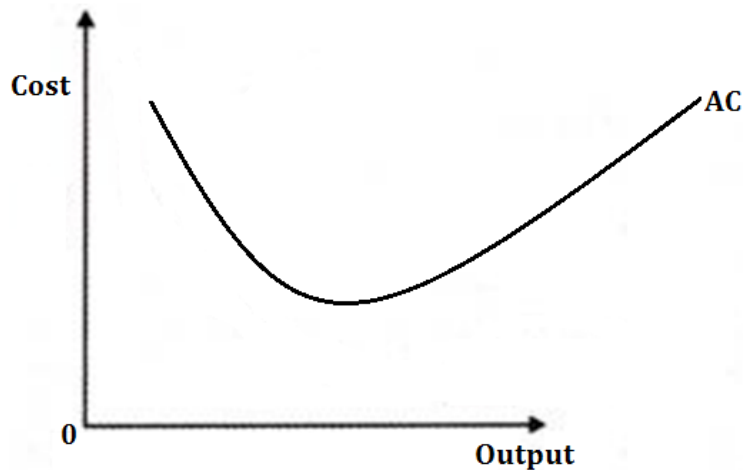
These are total costs per unit of output produced. This can be expressed as

$$ATC/ AC = \frac{TC}{Q}, \text{ where } TC = \text{total cost } Q = \text{output}$$

$$ATC = \frac{TFC}{Q} + \frac{TVC}{Q} = \frac{TFC+TVC}{Q} = \frac{TC}{Q}, \text{ Or}$$

$$ATC = AFC + AVC.$$

Graphically, AC can be illustrated as below;

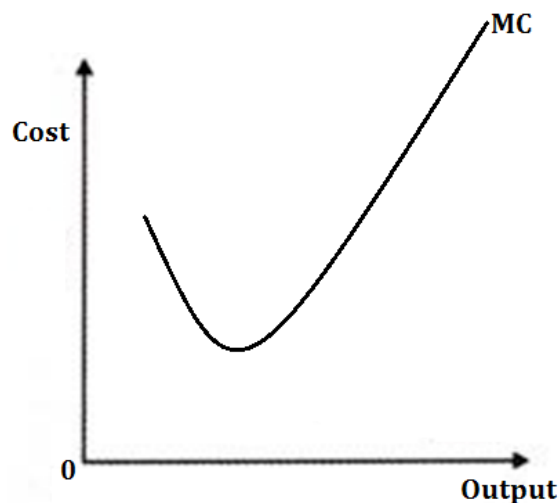


iv) Marginal Cost (MC):

These are additional costs incurred in producing an extra unit of output. Or it refers to the addition to the total cost for producing an additional unit of the product.

$$MC = \frac{\Delta TC}{\Delta Q}, \text{ where } \Delta TC \text{ is change in total cost and } \Delta Q \text{ is change in output.}$$

Graphically MC can be illustrated as below;

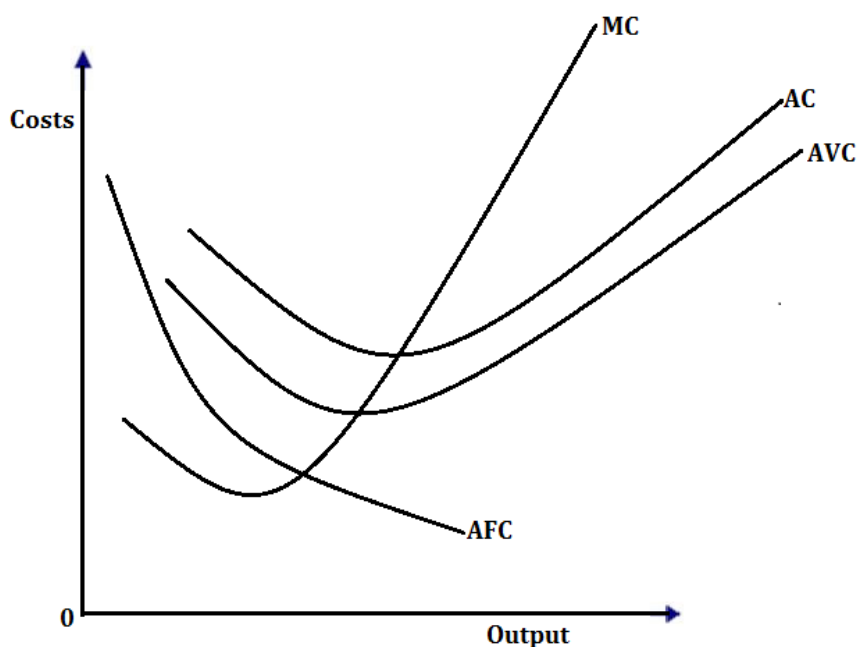


MC curve is a U-shaped curve as marginal cost initially decreases as output increases and afterwards, rises as output increases. This is because TC increases at decreasing rate and then increases at increasing rate.

Hypothetical Total Cost (TC), Variable Cost (VC) and Fixed Cost (FC) Schedule

Output	TFC	TVC	TC	AFC	AVC	AC	MC
0	60	0	60	-	-	-	-
1	60	30	90	60	30	90	30
2	60	40	100	30	20	50	10
3	60	45	105	20	15	35	5
4	60	55	115	15	13.75	28.75	10
5	60	75	135	12	15	27	20
6	60	120	180	10	20	30	45
7	60	180	240	8.57	25.7	34.3	60
8	60	260	320	7.5	32.5	40	80

Typical AFC, AVC, AC, MC curves / Relationship between AC, AVC, AFC & MC.

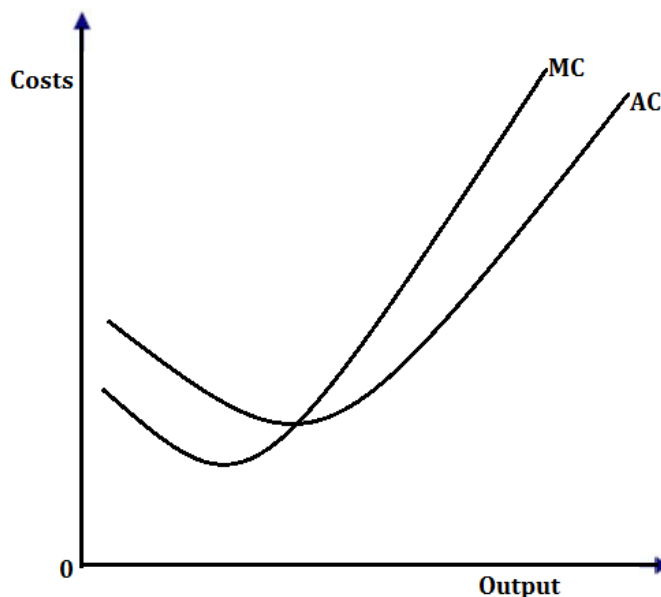


- At zero level of output, AC, AVC, AFC, and MC are unknown, thus they cannot start from zero or any of the axes.
- As long as AC and AVC curves are falling, MC is less than them. However, MC falls more rapidly and reaches its minimum point earlier than AC and AVC. When MC begins to rise, it meets/intersects the average total cost (AC) and average variable cost curves (AVC) at their minimum points/ lowest points.
- After AVC and AC curves meeting MC curve at their minimum points, immediately the two curves begin to rise, and they tend to approach each other, but both curves can never meet because AFC cannot be Zero. If $AC = AFC + AVC$, and AFC cannot be Zero this means that AC and AVC cannot be equal.
- The average fixed cost (AFC) curve declines continuously because as output increase, the fixed cost is continuously divided by the increasing levels of output.
- MC curve, AVC curve and AC curve are all **U-shaped due to the operation of the law of variable proportions (law of diminishing returns)**.
- AC curve is above AFC and AVC curves. This is because AC is the summation of both AFC and AVC. If $AC = AFC + AVC$ this means that the figure of AC will be bigger than AFC and AVC figures.
- AC's minimum point comes at a later range of output than AVC's minimum point. As a high level of output is produced the influence of a rise in AVC becomes stronger than the fall in AFC, so AC starts rising.
- At the level of optimum output, (**Optimum/ full capacity**) average cost (**AC**) is minimum (lowest point possible) and constant. Here, $MC = AC$. The firm produces the highest level of output at lowest average costs. Before the optimum point, the firm is operating below its capacity, i.e. **excess capacity (underutilization of resources)**; and after the optimum point, the firm operates at overcapacity. Beyond this point, it is a signal to the producer that there should be increase even in the fixed costs and therefore start operating in the long run.

29.1.4: Relationship between Average Cost and Marginal Cost

- If the average cost falls due to an increase in the output, the marginal cost is less than the average cost.
- If the average cost rises due to an increase in the output, the marginal cost is more than the average cost.
- Marginal cost is equal to the average cost when the average cost is at minimum level i.e. the MC curve cuts the ATC curve at its minimum or optimum point.

Illustration of the relationship between the MC and the AC curves.



29.1.5: Long run costs of the firm (LAC)



Activity 29.4

Visit the library or internet and research about long run cost curves to answer the following questions?

- Describe the nature of costs in the long run.
- Why the long run average cost curve is called an envelope curve?
- Why is long run average cost curve U-shaped?
- Describe how a long run cost curve is derived.

The long run refers to that time period for a firm where it can vary all the factors of production. Therefore, in the long run, all inputs (factors of production) are variable and firms can enter or exit any industry or market. Consequently, a firm's output and costs are unconstrained in the sense that the firm can produce any output level it chooses by employing the needed quantities of inputs (such as labour and capital) and incurring the total costs of producing that output level. While the SAC curves correspond to a particular plant since the plant is fixed in the short-run, the LAC curve depicts the scope for expansion of plant by minimizing cost. In the long run, the law of diminishing marginal returns does not operate and do not guide production and cost. Instead long run average cost is affected by increasing and decreasing

returns to scale, which translates into economies of scale and diseconomies of scale.

Derivation of the LAC Curve

To increase output, the firm will use more of both variable and what was fixed in the short run. By doing so, the firm will expand its size or scale of production. Each scale of production has its own short run unit cost curves thus long run is going to consist of short run average cost curves (SAC) at different levels of production. Each SAC curve corresponds to a particular plant size. This size is fixed but what can vary is the variable input in the short-run. In the long run, the firm will select that plant size which can minimize costs for a given level of output. The choice, in the long run, is to produce at that plant size that can minimize costs.

Graphically, this gives us a long run curve (LAC) that joins the minimum points of all possible SAC curves. Thus, the LAC curve is also called an **envelope curve or planning curve** because it 'envelopes' or covers all the SAC curves faced by the firm. The curve first falls, reaches a minimum and then rises, giving it a U-shape. Therefore, the AC curve in the long run is U-shaped because of the economies and diseconomies of scale.

As the scale of production expands, the minimum AC at each scale of production will continue to fall because the firm is enjoying advantages of large-scale production (economies of scale). These advantages will not be enjoyed indefinitely because after sometime, the firm becomes too large and further expansion in scale results into increased average cost of production. This is as a result of disadvantages of large scale production (diseconomies of scale).

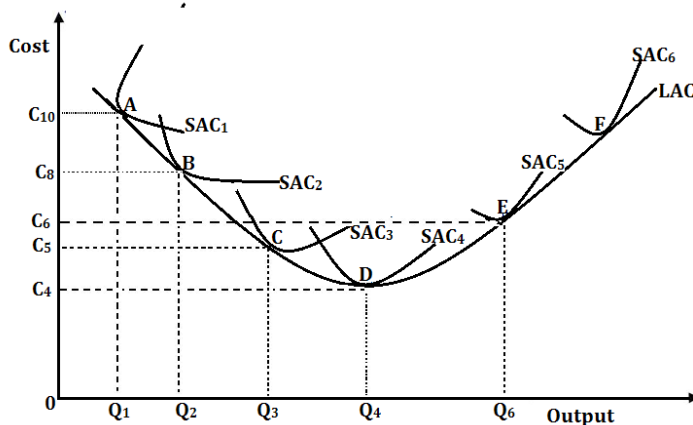


Figure: Large scale ac curves.

The minimum point of AC in the long run represents that size of the firm where it produces the highest level of output at the lowest AC, e.g. at point D in the above curve/ diagram. It is also known as the optimum size of the firm. Till the level of output Q4 it is logical for the firm to operate at the plant size represented by SAC4. If the firm operates at the cost beyond optimum, e.g. SAC5 and SAC6 when producing an output level Q6 and above, the cost would be more.

The long run AC curve has a flatter U-shaped curve as it is derived from several short run AC curves. The LAC is also called a planning curve of the firm because it shows how the firm is producing over a long period of time. Thus, the long run may be regarded as the planning horizon.

Before the optimum point, the firm is still too small and the AC can be reduced further by increasing the scale of production. After that point the firm becomes too large and further expansion in size causes the AC to rise, this gives rise to U-shaped L long run average cost curve which is due to economies and diseconomies of scale

29.2: Scale of production:



Activity 29.5

Visit the library or the internet and research about different firms in Rwanda, compare their sizes and how they are managed to be the way they are; from there, hold a general class discussion on

- How do firms grow?
- Describe each form of growth by firms.
- Why would you not allow your firm to grow beyond a certain level?

The steady physical increase in a firm's productive capacity which is identifiable by a sustained increase in a firm's real output of goods and services over time is what is called growth of the firm. Firms grow so that they can realize their goals and objectives such as increasing sales, profit maximisation, expanding the market share. This growth may either be natural growth or internal expansion and external growth or mergers.

29.2.1: Natural growth:

Natural growth is related to the increase in output which leads to the increase in profits and later expansion or increase in size of the firm.

29.2.2: External growth/merging/ amalgamation/ integration:

Another way in which a firm can grow is by the acquisition of another company. In this case, firms expand when two or more firms come together to form one large firm through **mergers**. A merger refers to an agreement in which two or more companies join together to form one company. In other words, a merger is the combination of two or more companies into a single legal entity.

a) Mergers are of the following types:

1. **Horizontal mergers:** This is where firms at the same stage of production and producing the similar products decide to integrate. For example, two hair dressers, two bread bakeries etc join together. The main objectives of horizontal mergers are to benefit from economies of scale, reduce competition, achieve monopoly status and control the market.
2. **Vertical merger:** This refers to a type of merger where firms at different stages of production integrate. A vertical merger can either be forward merger or backward merger.
 - a) **Backward vertical merger:** This is where a firm at a higher stage of production decides to merge with a firm at a lower stage of production.
 - b) **Forward vertical merger:** This is where a firm at a lower stage of production decides to merge with a firm at a higher stage of production. For example, a business making furniture merge with a retail outlet selling the furniture.
3. **Conglomerate merger:** It refers to the combination of firms operating in industries unrelated to each other i.e. firms that merge are totally in unrelated business activities. In this case, the business of the target company is entirely different from those of the acquiring company. Such a merger is also known as a diversifying merger. The major reason for such integration is insurance against risks in case a firm anticipates a decline in future.
4. **Concentric merger:** It refers to combination of two or more firms which are related to each other in terms of customer groups, functions or technology. For instance the combination of a computer system manufacturer with a UPS manufacturer is a concentric merger.
5. **Lateral merger:** This is where a business merges with another business that makes related goods but which are not in competition with each other, for example when a sugar manufacturing company merges with a sweet manufacturing company.



Application activity 29.1

Describe the relationship between the components of Social Studie

A



B



C



Analyse pictures A,B and C above and answer the questions below.

- What economic term can you use to refer to what happened between the firms in the pictures above?
- For what reasons do you think the firms decided to take the decisions they took as shown in the pictures above?
- Identify other firms that you know which may have taken similar steps like the ones in the picture above.

b): Advantages and disadvantages of merging:



Activity 29.6

Discuss the arguments for and against merging of firms.

Advantages of merging of firms:

There are some benefits that firms cannot enjoy when operating alone. These can only be enjoyed when they come up together and work as one in their production activities. These benefits include:

- International competition: Mergers can help firms become more competitive and able to face the threat of multinational companies and compete on an international level.
- Economies of scale: Mergers enjoy economies of scale since it increases their capacity. The merged firms are able to enjoy marketing economies. They can purchase in large quantities and enjoy discounts among others.
- Research and development: Mergers are able to invest in research and development and therefore improve on the methods of production, thereby leading to development of new products.
- Increased efficiency: When firms merge, they are able to combine their capabilities in terms of expertise, technical knowhow all of which result into increase efficiency.
- Rationalisation: Merging results into rationalisation in those parts of a business that are inefficient or unprofitable are eliminated after merging.
- Diversification: Conglomerate mergers in which firms producing unrelated products integrate results into diversification of their production activities increasing their scope of business activities and therefore hedging against risks.

Disadvantages of merging:

When two or more firms come together to produce a given product, there are different problems that they may experience. These problems sometimes are not experienced by the firms that operate alone. These problems may include:

- Diseconomies of scale: Merging results into diseconomies of scale where after merging the firm experiences problems of coordination and control resulting into increase in the costs of production and reduction in profits.
- Limited variety to consumers: As a result of merging firms which were competing become one and this limits consumer's choice since consumers will be exposed to products of one firm as opposed to the situation before merging.

- Higher prices: After merging the firm is likely to sell its products at high prices since there is reduced competition hence leading to exploitation of consumers.
- Monopoly: Merged firms may have more monopoly power which may allow them to dictate terms to suppliers and customers such as offering low prices to the suppliers.
- Low output: Mergers may result into a reduction in output leading to shortage of goods on the market which is a disadvantage to the consumer.
- Layoffs: Merging of two businesses often leads to lay off of some workers leading to leading to unemployment.
- Leadership issues: Merging may lead to a discontent over leadership of the newly formed company. One may have a feeling that their company has been taken over rather than merged as an equal partner. This can lead to corporate infighting and talent drain as people leave the company.



Application activity 29.2

Qn. Why do firms merge?

29.2.3: Economies and diseconomies of scale:

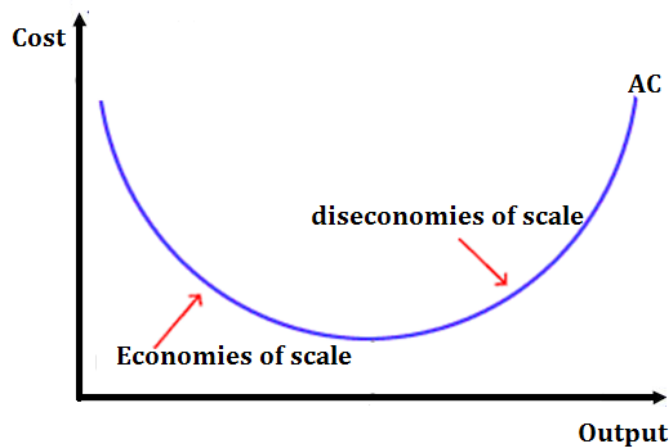


Activity 29.7

Use economics textbooks or the internet to research more about scales of production. Discuss the following

1. What economic terms are given to advantages and disadvantages of large-scale production respectively?
2. Describe how those advantages and disadvantages mentioned above can be enjoyed / face by firms.

Growth brings both advantages and disadvantages to a business. These interact, and depending on the nature of the business and the way it is managed, decide the optimum or most efficient size for the business. This results into the area of **economies and diseconomies of scale**. It should be noted that average cost falls as output increases, with the result that large firms may enjoy lower costs than smaller competitors. This competitive cost advantage allows large firms to have larger profit margins and have more options in pricing policy.



a) Economies of scale:

These are advantages that a firm enjoys in form of reduced average costs as the firm expands its scale of production. The most common reason for economies of scale is that some production costs are fixed (as production increases these costs stay constant) e.g. managerial, marketing and technical costs are paid for as a fixed amount. Therefore, since costs per unit (Average Costs) are calculated by dividing the cost by the number of units of

output; $AC = \frac{TC}{Q}$. Then any average involving Fixed Costs (Numerator) must decrease as Q quantity produced (Denominator) increases. Economies of scale can be categorized into internal and external economies.

i) Internal economies of scale:

These are benefits enjoyed by a single firm as a result of increasing its scale of production. Or they are the unit cost advantages from expanding the scale of production in the long run. Internal economies of scale come from the long-term growth of the firm. Examples of internal economies of scale include;

- Technical economies: The large-scale firms can use modern machinery and get many advantages.
- Financial economies: The Large-scale firms get financial assistance easily in the form of borrowings, loans, credits at a low rate of interest.
- Marketing economies: The large-scale firms get raw materials at a cheaper rate because they purchase raw materials or factor inputs in bulk or a large quantity at discounted prices.

- Managerial economies: The Large-scale firms can manage their business more efficiently because they use division of labour and can use various strategies to manage their workforce effectively.
- Risk bearing economies: Large-scale firms have the greater ability to manage the business risks. If there are losses in one market, they can withstand because of the wider markets which the company has.
- Research and development economies: When a firm expands, it can raise funds to undertake research, develop new designs, invest new products and undertake trade missions which cannot be afforded by small scale firm.
- Social and welfare economies: As a firm expands its scale of production, it is in position to provide fringe benefits to its workers like better housing facilities, medical insurance and recreation which improve the efficiency of labour.
- Storage economies: A big firm is capable of hiring large stores that can store large stock, storage costs per unit of output decrease when commodities are stored in bulk.

External economies

- External economies of scale occur outside of a firm but within an industry. For example, investment in a better transportation network servicing an industry resulting in a decrease in costs for a company working within that industry. Examples of external economies of scale include:
- Transportation and Communication economies. Concentration of firms provides better communication system for all. Rail, road facilities become available to all, the transport system reduces costs.
- Economies of skilled labor: With the concentration of firms skilled labour is available to all the firms because people living in the nearby areas get technical training.
- Facility of workshop economies. Concentration of firms provides incentive for the technical persons to establish their workshops and hence, all the firms benefit from these, because they need not to incur costs in establishing the workshops.
- Economies of helping Industry: In local industry it becomes possible to split up some of the processes which are taken over by specialist firms. For example, in an area where there is a textile firm, textile mills dyeing factories, designing centers, ginning factories and calendaring plants have been established.

- Research and experiment economies: An industry is in a better position to establish research centers and disseminate the research findings in form of new inventions to the member firms through scientific journals thereby increasing the production efficiency of individual firms and a reduction of cost production.
- Banking facility economies: In a localized industry or business centers bank opens their branches and all the firms benefit from banking and credit facility. The banking system helps in promoting trade and business.
- Economies of cooperation: Due to expansion of an industry there is more cooperation between firms which enables them to establish common services like research centers, organisation of trade fairs among others.
- Economies of specialisation: Due to the expansion of the industry, individual firms start specialising in different processes and in the end the industry benefits as a whole.
- Transport Economies: When the industry expands, individual firms may benefit from the infrastructure networks set up by other firms or by the state.
- Economies of security: The firm enjoys joint security service.

b) Diseconomies of scale:

When a firm continues to expand beyond the optimum capacity, economies of scale will disappear and will give place to diseconomies. A given percentage increase in all the factors will be followed by less than a proportionate increase in the total output. Average and marginal product will diminish as a result. Thus, **diseconomies are the disadvantages which a firm faces by expanding the scale of production beyond the point of optimal capacity.** Like economies, diseconomies are also of two types i.e. internal and external diseconomies.

i) Internal diseconomies

- These are the disadvantages or problems faced by a firm which has increased its scale of production beyond the optimal capacity. These problems are only experienced by a single firm and they are not shared by other firms in the industry. They include:
- Managerial diseconomies: When a firm expands it faces the problem of supervision, coordination, control and communication of decisions, bureaucracy increases, time wastage and rigidity also increases which results into higher costs per unit of output.

- Technical diseconomies: A large firm realizes disadvantages of specialisation and incurs high costs of maintaining complicated machines and buying raw materials hence higher average costs of production.
- Financial diseconomies: A large firm may face financial disadvantages especially if funds are not secured in time which delays production and limits expansion of the firm.
- Risk bearing diseconomies: Due to expansion a firm faces more disadvantages in case of uninsurable risks like a war since it loses on a very large scale.
- Marketing diseconomies: A large firm faces the problem of scarcity of raw materials, changes in tastes and preferences of consumers, declining demand for its products etc. which may result into higher costs and more losses.
- Limited availability of natural and human resources: With expansion in the scale of production, workers may have to be recruited from other regions by offering them higher wages. Limited availability of natural resources also causes diminishing returns to scale.
- Advertising diseconomies: To get rid of extra output, large firms incur high costs of advertising.
- Storage diseconomies: Due to large scale production, output increases so the firm may lack adequate stores and the available may tend to be expensive hence increasing costs of production.

ii) External Diseconomies:

These are disadvantages realised by a firm from outside due to expansion of the industry. These problems are shared by the firms operating within the industry. These diseconomies arise due to much concentration and localization of industries beyond a certain stage. Localization leads to increased demand for transport and, therefore, transport costs rise. External diseconomies of scale occur when an industry growing in size causes negative externalities and rising long-run average costs. Examples of external economies include:

- Congestion diseconomies: If an industry grows rapidly in size, it may cause traffic congestion.
- Labour diseconomies: As an industry expands it becomes more difficult to secure labour with the appropriate skills resulting into higher wages for labour and higher costs of production.
- Marketing diseconomies: As a result of expansion of an industry, competition for markets increases resulting into higher marketing costs and lower profits.

- High demand for raw-materials: The expansion of an industry results into higher demand for raw materials hence higher costs of production.
- Scarcity of land: Expansion of an industry creates scarcity of land for expansion for individual firms which increase rent, congestion and transport costs hence higher average costs of production.
- Competition diseconomies: When an industry expands, firms will be challenged by the shortage of infrastructure facilities and social amenities. This will mean that the cost of transport and communication will be very high hence leading to high cost of production.
- Pollution diseconomies: The localization of industries in a particular place or region pollutes environment. The polluted environment acts as a health hazard for the laboratories.



Application activity 29.3



In Photographs A and B above, different producers operating at different production scales are seen delivering their output to the market. Use the photographs to answer the questions that follow.

- Which of the two scales of production is desirable to you and why?
- In your opinion, how does the scale of production in photograph B benefit the producers involved?
- In your view, should producers in A keep in their scale of production or they should change to B? If they are to change, what steps can they take to reach the scale in B?



End unit assessment

1. a) Describe the different costs incurred by firms in production process.
b) Why is the average cost curve U-shaped both in the short run and long run?
2. a) How do firms grow?
b) Why do you think firms merge?
c) Identify different examples of firms in Rwanda that have grown out of merging.
3. Present arguments for and against natural growth.
4. Analyse the tables below and answer the questions that follow.

Output	Total cost	Fixed cost	Variable cost	AFC	AVC	AC	MC
0	40						
1	60						
2	70						
3	72						
4	74						
5	76						
6	78						
7	80						
8	96						
9	120						
10	180						

Required:

- a) Calculate and fill up the blank spaces.
- b) Illustrate AFC, AVC, AC, MC on a graph.

UNIT 30:

REVENUES AND PROFITS OF A FIRM.

Key unit competence: Be able to discuss a firm's revenues and profit maximization process.



Introductory Activity 30

Nzaramba has a piggery firm in Rulindo district. Last month, he sold off 20 piglets at 50,000frw. This month, he got an order to sell more 15 piglets to Ishimwe who wants to start up a piggery firm in Nyagatare district, which he did and his income totaled up to 87500frw.

Required:

- What economic term is given to Nzaramba's income after selling his piglets?
- How much francs did each piglet cost?
- What was Nzaramba's income in the first month and second month?
- How much extra income did Nzaramba earn as a result of selling extra 15 piglets?

30.1: Meaning of revenue.



Activity 30.1

Use the case study below and answer the questions that follow.

Musa, sold his 12 trays of eggs to Amahoro restaurant and got income worth 36000frw. After some few minutes, Tuyizere came and bought 3 trays for her Alimentation, making Musa's total amount to increase to 45000frw.

Required: Using the case study above, visit the library or internet to answer the following questions;

- What do you understand by the term revenue?
- What was Musa's total income after selling his eggs? What economic term is given to the total income after sales by Musa?
- What was the price per tray of eggs? What economic term is given to price per unit of eggs sold?
- How much was his additional revenues after selling 3 extra trays of eggs? What economic term is given to extra revenue after selling extra eggs by Musa?

Revenue of the firm refers to sum of money received from the sale of various quantities of output by the firm at a given price at a given time.

30.2: Forms of revenue

In economics, there are different forms of revenue and can be classified into three categories such as:

a) Total revenue (TR)

This is the total sum of money received from all unit output sold by the firm at a given price in a given period of time.

Total revenue = price × quantity (TR = P × Q)

b) Average revenue (AR)

This refers to the revenue per unit of output sold. It is obtained by dividing total revenue by output.

$$\text{Average revenue} = \frac{\text{Total revenue}}{\text{Total output}}$$

Since Total revenue is ($P \times Q$),

$$\text{Then } AR = \frac{PQ}{Q}$$

This implies that the average revenue equals the price. ($AR = P$)

c) Marginal revenue (MR)

This refers to the additional revenue from an extra unit of output sold. Or it refers to a measure of the instantaneous rate of change of total revenue with respect to change in output (Q) sold. It is obtained by dividing the change in total revenue by the change in total product.

$$\text{Marginal revenue} = \frac{\text{Change in total revenue}}{\text{Change in total product (output)}}$$

$$\text{Marginal revenue} = \frac{\Delta TR}{\Delta Q}$$

30.3: Relationship between AR and MR.

The relationship between AR and MR can be seen through calculations and illustrations as below;

a) Calculations of revenues.



Activity 30.2

Study the table below and basing on the formulas above, answer the questions that follow.

Output (Q)	Total Revenue (TR)	Average Revenue (AR)	Marginal Revenue (MR)
0	-	?	?
1	100	?	?
2	200	?	?
3	300	?	?
4	400	?	?
5	500	?	?

Required:

- Calculate the columns for AR and MR
- Illustrate the whole information in the table on graphs.
- Basing on the calculations and the curves obtained, describe the relationship between TR, AR and MR.

Table 30.1: The revenue position of a perfectly competitive firm.

Price (P) (FRW)	Quantity (Q)	Total Revenue (TR)	Average Revenue (AR)	Marginal Revenue (MR)
30	1	30	30	30
30	2	60	30	30
30	3	90	30	30
30	4	120	30	30
30	5	150	30	30
30	6	180	30	30
30	7	210	30	30

In the above table total revenue (TR) is obtained by multiplying output (Q) and price (P). Average revenue (AR) is obtained by dividing total revenue (TR) by quantity (Q) while marginal revenue (MR) is obtained by dividing changes in total revenue by changes in quantities sold. The table above represents perfect competition market where average revenue is equal to marginal revenue. (AR=MR)

a) Relationship between average revenue (AR) and marginal revenue (MR) using curves.

From the above table (table 30.1) we can represent the relationship between AR and MR as below.

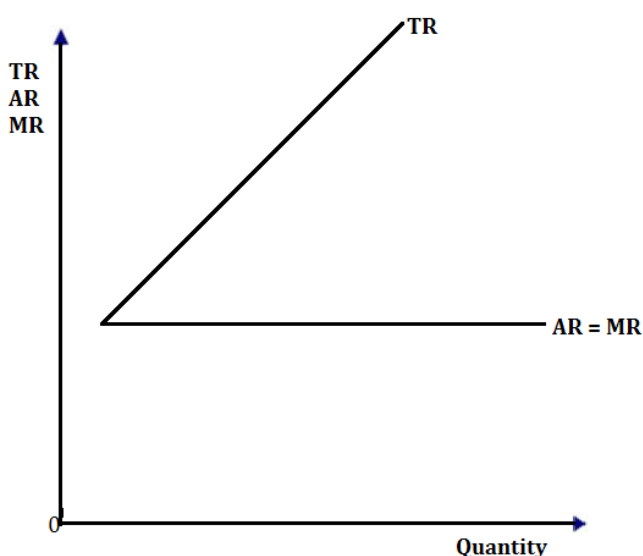


Figure 30.1: Total revenue, Average revenue and marginal revenue curves in a perfectly competitive firm

From the above figure, it can be concluded that, there was only one price that prevailed in the market. Each firm had to take the market price as given and sell its quantity at the ruling market price. The firm's demand curve is infinitely elastic. Therefore, the relationship is in such a way that, as the firm sells more and more at the given price, its total revenue will increase but the rate of increase in the total revenue will be constant, making $AR = MR$.

Table 30.2: The revenue position of a firm operating under imperfect competition.

Price (P) (FRW)	Quantity (Q)	Total Revenue (TR)	Average Revenue (AR)	Marginal Revenue (MR)
20	1	20	20	20
18	2	36	18	16
16	3	48	16	12
14	4	56	14	8
12	5	60	12	4
10	6	60	10	0
8	7	56	8	-4
6	8	48	6	-2

In the table above, Total revenue first increases reaches maximum and then start to fall. Average and marginal revenues start off as equal but thereafter as the firm sells a higher level of output, marginal revenue falls further below the average revenue. Both the average revenue and marginal revenue decrease as more is sold. The MR reaches a point and becomes negative, but AR will never be negative. This relationship can be represented in a graph as below

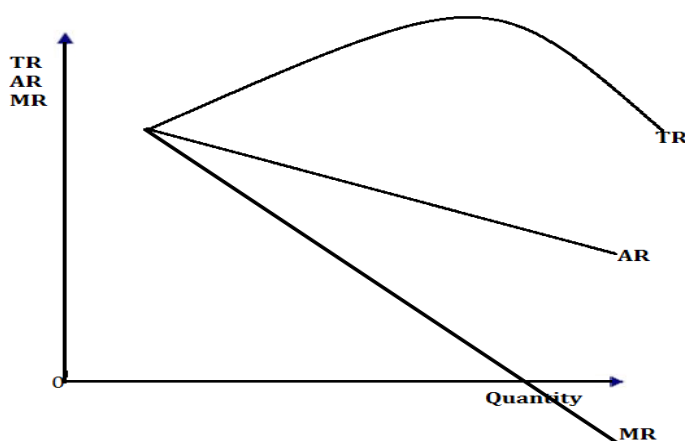


Figure 30.2: Total revenue, Average revenue and marginal revenue curves in an imperfect market.

Under imperfect competition, average revenue is not the same as marginal revenue. It is always greater than marginal revenue at all levels of output. This is because the business persons want to sell more, they must reduce price, not only on the extra units sold, but also on the earlier units. This can be seen in the schedule 30.2 and curve above.



Application activity 30.1

Analyse the tables below to answer the questions that follow.

a)

Output	Average revenue (AR)	Total Revenue (TR)	Marginal Revenue)
1	10		
2	10		
3	10		
4	10		
5	10		
6	10		
7	10		

b)

Output	Average revenue (AR)	Total Revenue (TR)	Marginal Revenue)
1	10		
2	9		
3	8		
4	7		
5	6		
6	5		
7	4		
8	3		

- In both tables a) and b), calculate TR & MR
- Illustrate the information in both tables about TR, AR & MR on curves.

30.4: Profits of a firm:



Activity 30.3

Use the internet and economics books from the library and carry out research on the concept of profits.

- Basing on your research findings, explain what is meant by profits and describe its forms.
- What is the necessary condition for profit maximisation?

30.4.1: Meaning of profits

Profit refers to the earnings to an entrepreneur as a factor of production. It can also be taken as the difference between total revenue received by the firm and the total costs incurred by the same firm.

30.4.2: Forms of profit:

a) Normal profit

This refers to the minimum level of profits which can maintain a firm in business. It is realised when average cost is equal to average revenue that is **AC = AR**. Normal profits are also known as the **transfer earning** or **supply price** of the firm. It is also called **zero economic profits**.

b) Abnormal/supernormal profit.

This refers to profits which are more and above the normal profits. They are earned if average revenue is greater than average cost. They are also known as **monopoly rent** if earned in the long run.

c) Subnormal profit

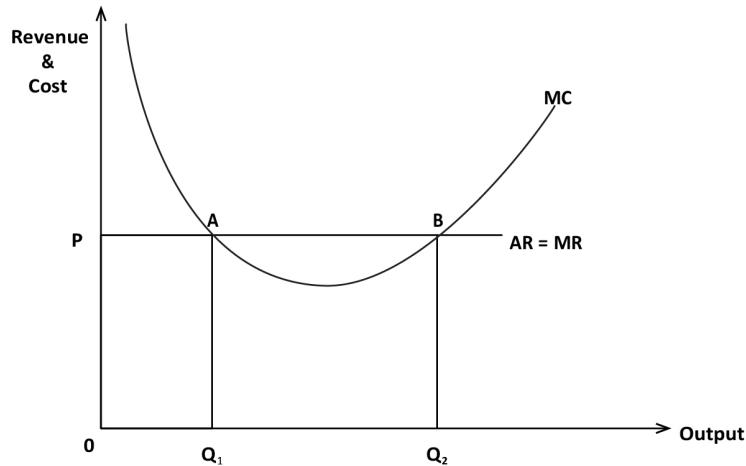
This refers to the profits which are lower than normal profits obtained where average cost is greater than average revenue but average revenue is greater than average variable cost that is

$$AC > AR > AVC.$$

30.4.3: Condition for profit maximisation:

The necessary and sufficient condition for maximum profit states that if the firm is to obtain maximum profit, it would have to equate its MR and MC ($MR=MC$), or, it would have to remain at the point of intersection between its MR and MC curves but the slope of the MR curve, should be less than

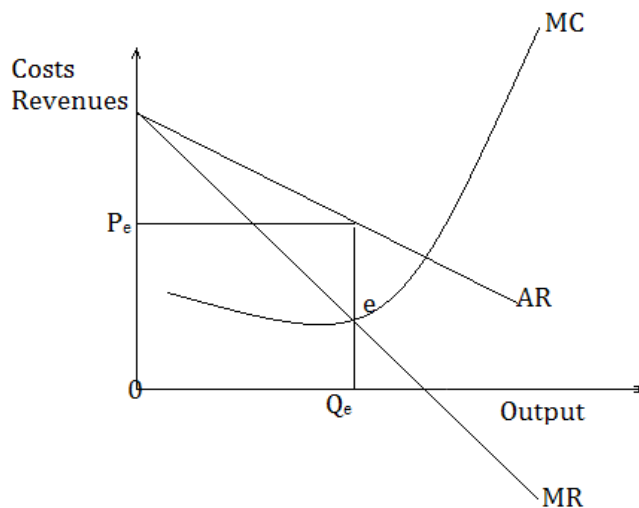
the slope of the MC curve. At that point, the firm is said to be in equilibrium. Basing on our revenue schedules in 30.1 and 30.2 and curves fig.30.1 and 30.2 above respectively, we can illustrate the condition for profit maximisation as below.



a) Condition for profit maximisation under perfect markets.

From the above illustration the firm maximizes profits at point B where $MC=MR$ but the slope of MC is greater than the slope of MR. The profit maximizing output is output OQ_2 because it is greater than output OQ_1 . The equilibrium price is P_e which is equal to average revenue (AR) and as well equal to marginal revenue (MR). i.e. ($P=AR=MR$).

b) Condition for profit maximisation under imperfect markets.



From the above illustration the firm maximizes profits at point "e" where $MC=MR$ but the slope of MC curve is greater than the slope of MR curve;

the profit maximizing output Q_e (equilibrium output) is produced and sold at price P_e (Equilibrium price).



Application activity 30.2

1. Examine the benefits of making profits by the firm



End unit assessment

1. (a) Distinguish between total revenue and marginal revenue.
(b) Explain the relationship between average revenue and marginal revenue curves under perfect and imperfect markets respectively.
Use illustrations.
2. (a) Differentiate between normal profit and abnormal profit.
(b) How does a firm maximize profit under perfect markets?
3. Evaluate the role of profit in an economy.

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