GEOGRAPHY

TEACHER GUIDE

GRADE 10

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FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
MINISTRY OF EDUCATION

GEOGRAPHY TEACHER GUIDE GRADE 10

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Teacher Guide Grade 10

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FOREWORD

Education and development are closely related endeavors. This is the main reason why it is said that education is the key instrument in Ethiopia's development and social transformation. The fast and globalized world we now live in requires new knowledge, skill and attitude on the part of each individual. It is with this objective in view that the curriculum, which is not only the Blueprint but also a reflection of a country's education system, must be responsive to changing conditions.

It has been almost three decades since Ethiopia launched and implemented new Education and Training Policy. Since the 1994 *Education and Training Policy* our country has recorded remarkable progress in terms of access, equity and relevance. Vigorous efforts also have been made, and continue to be made, to improve the quality of education.

To continue this progress, the Ministry of Education has developed a new General Education Curriculum Framework in 2021. The Framework covers all pre-primary, primary, Middle level and secondary level grades and subjects. It aims to reinforce the basic tenets and principles outlined in the *Education and Training Policy,* and provides guidance on the preparation of all subsequent curriculum materials – including this Teacher Guide and the Student Textbook that come with it – to be based on active-learning methods and a competency-based approach.

In the development of this new curriculum, recommendations of the education Road Map studies conducted in 2018 are used as milestones. The new curriculum materials balance the content with students' age, incorporate indigenous knowledge where necessary, use technology for learning and teaching, integrate vocational contents, incorporate the moral education as a subject and incorporate career and technical education as a subject in order to accommodate the diverse needs of learners.

Publication of a new framework, textbooks and teacher guides are by no means the sole solution to improving the quality of education in any country. Continued improvement calls for the efforts of all stakeholders. The teacher's role must become more flexible ranging from lecturer to motivator, guider and facilitator. To assist this, teachers have been given, and will continue to receive, training on the strategies suggested in the Framework and in this teacher guide.

Teachers are urged to read this Guide carefully and to support their students by putting into action the strategies and activities suggested in it.

For systemic reform and continuous improvement in the quality of curriculum materials, the Ministry of Education welcomes comments and suggestions which will enable us to undertake further review and refinement.

ADDIS ABABA, ETHIOPIA
2023

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1. INTRODUCTION

In the previous grade, the students have studied many important features about our country – Ethiopia. Here in grade ten, they will primarily be studying about our wonderful continent – Africa. Hence, this textbook examines the nature of Africa's landforms, climate, natural resource bases, population, economic and cultural activities. Human environment interactions, geographic issues and public concerns in Africa and geospatial information and data processing are other important issues and skills that you will study in this grade. Therefore, a successful completion of the course at this grade level helps the students to develop an understanding and acquire knowledge of basic geographic concepts, principles, and theories – focusing on Africa.

It is quite essential that the teacher should read and understand the basic assumptions, philosophical underpinnings, and new developments in the field of geography. To that end, details of the new developments in the field of geography are thoroughly discussed below.

1.1. THE FOUNDATIONS AND PHILOSOPHICAL INCLINATIONS OF GEOGRAPHY

Geography is a dynamic subject which makes it necessary to define it time and again. The subject is often understood as a study of spatial variation, of how and why things differ from place to place on the surface of the Earth (Biswas, 2007). One could also consider the subject simply as the study of how observable spatial patterns evolved through time. It is important to note the fact that Geography is one of the oldest disciplines and school subjects, if not the oldest. The Name Geography was coined by the Greek scientist Eratosthenes over 2200 years ago! Eratosthenes coined the name by linking two Greek terms that stand for "the Earth" and "to write". Strabo (c. 64B.C.-A.D. 20), suggested, on his part, that the task of Geography was to describe the several parts of the inhabited world, to write the assessment of the countries of the world, and to treat the differences between countries. It is thus to be seen that Geography focused, from the very beginning, both on the physical structure of the earth and on the nature and activities of people who inhabited the various lands of the known world.

Later in the 16th and 17th centuries, many new lands were discovered and accounts by explorers such as Christopher Columbus, Marco Polo and James Cook, revived a desire for both accurate geographic detail and more solid theoretical foundations (Biswas, 2007). It is also known that Geography got recognition as a discrete academic discipline and became part of a typical university curriculum in Europe in the 18th and 19th centuries. In this regard, the influence of Immanuel Kant, Alexander von Humboldt, Carl Ritter, and Paul de la Blanche contributed to Geography becoming an academic subject.

The second half of the nineteenth and second half of the twentieth centuries were characterized by philosophical dichotomy (environmentalism vis-à-vis possibilism) that hampered the development of geography. This dichotomy was concerned with the influence of natural environment on human beings and their life. Geographers have since long debated the question 'how far man is affected by his physical environment'? Although the dichotomy is almost over, a categorical answer to this age-old question can hardly be found even today (Singh, 2007).

Finally, it is interesting to note that Geography had been included among the school subjects that formed the first official curriculum to be ever designed in Ethiopia (in 1947) (Abebe, 1991). The first curriculum was designed for elementary schools (grades 1-6). Since then the Ethiopian education system included Geography at all levels albeit in different forms and intensities. Nevertheless, a development that threatened the existence of geography in lower grades happened in 1963 (Belachew, 1994). Geography merged history to form a new school subject called social studies. Since then Geography continued as a separate school subject or integrated with other subjects.

1.2. VALUES OF GEOGRAPHY EDUCATION

John Dewey, in this classic book entitled 'Democracy and Education' famously argues that Geography and History are the two great school resources for bringing about the enlargement of the significance of a direct personal experience (Dewey, 1916 republished by Cosmo Classics, 2008, p.242). Philippe Pinchemel, a Professor of Geography at the University of Paris, suggests that the value of geography goes far beyond the enlargement of children's direct personal experience. In fact, Pinchemel (1985, p.14) emphatically declares that "No inhabitant of this earth is truly educated, that is, he has not become an autonomous and responsible citizen

until he has acquired a geographical education".

The International Charter on Geographical Education indicates that geography is "a vital subject and resource for 21st century citizens living in a tightly interconnected world" (IGU, 2019, p.3). Geography education enables students to face questions of what it means to live sustainably in this world. It is further argued that "geographically educated individuals understand human relationships in the world and their responsibilities to both the natural environment and to others". Geographical education also helps young people to learn how to exist harmoniously with all living species.

The importance of Geography has also been underscored by prominent non-geographers. A case in point is Palin who strongly believed that Geography is "one of those richly comprehensive subjects whose relevance is all around us" (Palin, 1991 cited in Kent, 1999, p. 289). He further notes that where we come from, what we do, what we eat, how we move about, and how we shape our future "are all directly the province of the geographer. More than ever we need the geographer's skills and foresight to help us learn about our planet – how we use it and how we abuse it". The following are some of the specific values of geography education (Kent, 1999, p. 287):

- *Enhancing* children's interest in and interaction with people and places – their experience of the social and natural environment.
- *Providing awareness, knowledge and understanding of a changing and interconnected world through the study of physical environments and resources; cultures, economies, and societies; people and places; and global development and citizenship.*
- *Contributing to the understanding of the impact that people have on the environment. Both in the locality and global stage people act upon the environment; and such actions are based not simply on knowledge, understanding, and skills but also on values.*
- *Providing a framework for children, even in their earliest years, for them to explore their own and others' values and the impact of these, particularly in terms of the conflicts of different interests, and to understand the potential outcomes of their actions in the environment as adults.*

- *Informing about where places are. There is a need for children to be able to recognize a globe, to know the locations of places and areas of importance in the world, locally and globally. There is no shame in knowing where places are; the shame lies in an education which denies, or seemingly does not care, that one element of the armory of being well-informed enough to make effective judgements is being able to locate places mentioned on the news or in a report, a discussion, or a photograph, within a mental map of 'the world'.*

Today, it is widely understood and recognized that Geography is no longer simply a listing of the facts and features of the various parts of the earth. It now makes use of facts to study the problems of spatial relations on earth, *problems which are made manifest by overpopulation, underdevelopment, urban sprawl, regional planning, agrarian reform, and land-use policies* (Pinchemel, 1985, p.4). It should also be underlined that, while geography often bridges natural and social sciences, "it is pre-eminently the discipline that deals with spatial variability, i.e. that phenomena, events, and processes vary within and between places and therefore should be regarded as an essential part of the education of all citizens in all societies" (IGU, 2016, p.2).

1.3. RATIONALE AND PRINCIPLES UNDERPINNING GEOGRAPHY EDUCATION

Inclusion of Geography Education in Ethiopian Schools, from preprimary to secondary levels either in an integrated form or as a separate subject, could be justified in terms of its contribution to holistic development of students and their ability to solve some of the key problems facing humanity at local, regional, and global scales. Therefore, Geography Education is not only essential but also indispensable.

There are a few key principles that underpin the aims, the process, and desired outcomes of geography education. The following are such principles extracted from the document prepared by the International Geographic Union (IGU, 2016, p.5-6).

i. Focus on spatial variability to give a practical and useful perspective on everyday life

As location is a key factor in life, especially in an era of globalization and the internet, geography with its focus on spatial variability provides a very practical and useful perspective on everyday life.

ii. Focus on the unique contexts and circumstances in an interconnected world to deepen our understanding of human diversity

Geography is the discipline where knowledge about locations and regions has its base. The appreciation of unique contexts and circumstances in an interconnected world helps deepen our understanding of human diversity. Besides, Geography is concerned with both the local and the global and the interconnections between these scales of human experience.

iii. Building a bridge between natural and social sciences thereby encouraging the 'holistic' study of diverse issues

Geography is concerned with human-environment interactions in the context of specific places and locations and with issues that have a strong geographical dimension like natural hazards, climate change, energy supplies, migration, land use, urbanization, poverty, and identity. Geography is a bridge between natural and social sciences and encourages the 'holistic' study of such issues.

iv. Focus on the patterns and processes that help to understand an ever-changing planet

Geography helps people to think critically about sustainable living locally and globally and how to act accordingly. Geography is much more than learning many facts and concepts. Its focus is on the patterns and processes that help us to understand an ever-changing planet.

v. Aspiring to develop an invaluable 21st century skill set for today and tomorrow, and offer unique opportunities to make sense of the modern world

Geographical knowledge and skills, especially when mediated through geospatial technologies offer unique opportunities to make sense of the modern world. Together they form an invaluable 21st -century skill set for today and tomorrow.

1.4. AIMS OF GEOGRAPHY EDUCATION

Geography education has the following aims which are closely related to the values of the subject:

Analysis of Locations and Distributions

All earthly phenomena, visible or invisible, controlled, or spontaneous, *are localized* (Pinchemel, 1985). This localization is manifested as 'points', as lines, as areas, which result in *spatial differentiation* on the earth's surface. Considered separately and at different scales, each phenomenon makes a characteristic *pattern of distribution,* which is not entirely due to chance but which is related to social and economic processes. Geographical analysis is concerned with the *description and explanation of these patterns,* searching out for the multiple causes which may be found among physical and human factors and whose origins may be recent or ancient. Such distributions are not static but in evolution; consequently, the *geographic analysis must be dynamic.*

Environmental Analysis

Environments result from the co-existence of several phenomena in one area (Pinchemel, 1985). These spatial *association and interdependence of environmental phenomena* contribute to a *spatial differentiation* and give a certain *character* to places. *Human societies* have established *complex relationships with the physical and biotic environment*, largely through the exploitation of natural resources.

The Analysis of Spatial Organization

Individuals, families, villagers, citizens, and nations tend to perceive, build, and divide environments into *regions whose poles of attraction are population centers* which, themselves, are the basis of spatial organization and consequently of spatial differentiation (Pinchemel, 1985).

1.5. THE SUBJECT MATTER OF GEOGRAPHY EDUCATION

Key Geographic Questions

Geographers are united by the *similar questions they ask and the common set of basic concepts they employ to consider their answers* (Getis, Getis and Fellman, 2006, p.8). Of either a physical or cultural phenomenon, they will enquire: What is it? Where is it? How did it come? and where it is? Where is it in relation to other physical or cultural realities that affect it, or are affected by it? How is it part of a functioning whole? How does its location affect people's lives and the content of the area in which it is found?

As indicated earlier, space is at the core of the content of Geography. The word 'spatial' comes from space, and to geographers, it always carries the idea of the way things are distributed, the way movements occur, and the way processes operate over the *whole or part of the surface of the earth* (Getis, Getis and Fellman, 2006, p.8-9). The geographer's space, then, is *earth space, the surface area occupied or available to be occupied by humans*. Spatial phenomena have *locations* on that surface, and spatial *interactions* occur among places, things, and people within the earth area available to them.

The need to understand spatial relationships, interactions and processes help *frame the questions that geographers ask*. Those questions have their starting point in *basic observations* about the location and nature of places and about how places are similar to or different from one another. Such observations, though simply stated, are *profoundly important to our comprehension of the world* we occupy (Getis, Getis and Fellman, 2006, p.8-9).

More specifically, the content of Geography Education is composed of the following concepts:

i. Location, Direction and Distance

Location, direction, and distance are everyday ways of assessing the space around us and identifying our position in relation to other things and places of interest. They are also *essential in understanding the processes of spatial interaction* that are so important in the study of both physical and human geography (Getis, Getis and Fellman, 2006, p.9).

ii. Size and Scale

Geographers are concerned with *scale*. One can, for instance, study a problem such as population or landforms at the local scale or on a global scale. The geographic inquiry may be broad or narrow; it occurs at many different sizescales (Getis, Getis and Fellman, 2006, p.11-12).

iii. Physical and Cultural Attributes

All places have individual physical and cultural attributes distinguishing them from other places and giving them character, potential, and meaning. Geographers are concerned with identifying and analyzing the details of those attributes and, particularly with recognizing the *interrelationship between the physical and cultural components* of an area: the human-environment interface (Getis, Getis and Fellman, 2006, p.13). The *physical characteristics* of a place are such natural aspects as its climate, soil, water supplies, mineral resources, terrain features, and the like. These natural landscape attributes provide the *setting within which human activity occurs*. They help shape – but do not dictate -- how people live. The *resource base, for instance, is physically determined, though how resources are perceived and utilized is culturally conditioned*.

iv. Changing Attributes of a Place

With growing numbers of people, and particularly with industrialization and the spread of exploitative technologies throughout the world, the pace of change in the content of area accelerated. The built landscape – *the product of human effort – increasingly replaced the natural landscape*. Each new settlement or city; each agricultural assault on forests; each new mine, dam, or factory changed the content of regions and altered the temporarily established spatial interconnection between humans and the environment (Getis, Getis and Fellman, 2006, p.14). Characteristics of places today are thus the *result of constantly changing past conditions*. They are the *forerunners of differing human-environmental balances* yet to be struck. *Geographers are concerned with places at given moments*. But to understand fully the nature and development of places, to appreciate the significance of their relative locations, and to understand the interplay of their physical and cultural characteristics, *geographers must view places as the present result of past operation* of distinctive physical and cultural processes (Getis, Getis and Fellman, 2006, p.14).

v. Interrelations between Places

There is interchange *between connected places*. *Spatial diffusion* is the process of dispersion of an idea or a thing from a center of origin to more distant points (Getis, Getis and Fellman, 2006, p.15). The rate and extent of that diffusion are affected by the *distance* separating the origin of the new idea or technology and other places where it is eventually adopted. Diffusion rates are also affected by such factors as *population densities, means of communication, obvious advantages of the innovation, and the importance or prestige of the originating node.* Geographers study the *dynamics of spatial relationships*. *Movement, connection, and interaction* are part of the social and economic processes that give character to places and regions. Geography's study of those relationships recognizes that *spatial interaction is not just an awkward necessity but a fundamental organizing principle* of the physical and social environment.

vi. Place Similarity and Regions

The distinctive characteristics of places – physical, cultural, locational -- immediately suggest two geographically important ideas. The *first* is that *no two places on the surface of the earth can be the same*. Not only do they have different absolute locations, but the precise mix of physical and cultural characteristics of a place is never exactly duplicated. Because geography is a spatial science, the inevitable uniqueness of place would seem to *impose impossible problems of generalizing spatial information*. The *second* important idea is that the natural and cultural characteristics of places show *patterns of similarity in some areas*. Often, such similarities are striking enough for us to conclude *that spatial regularities exist*. They permit us to recognize and define regions, earth areas that display significant elements of internal uniformity and external differences from surrounding territories.

In general, international experience in Geography Education shows that there are eight themes/concepts that *recur in all geographic inquiry and at all levels of instruction: Location* (the relative and absolute position on the earth's surface); *place* (the distinctive and distinguishing physical and human characteristics of locales); *relationships/interdependence within places* (the development and consequences of human-environmental relationships); *movement* (patterns and change in human spatial interaction on the earth); *regions* (how they form and change), cultural understanding and diversity (diversity and richness in the human environment; and scale (the level at which human and natural processes operate).

Box 1: Standards of Geography Education:

The geographically informed person is expected to know and understand (Getis, Getis and Fellman, 2006, p.19):

A. The World in Space Terms:

- *How to use maps and other geographic tools and technologies* to acquire, process, and report information from a spatial perspective.
- *How to use mental maps* to organize information about people, places, and environments in a spatial context.
- *How to analyze the spatial organization* of people, places, and environments on Earth's surface.

B. Places and Regions:

- The physical and human *characteristics of places*.
- That *people create regions* to interpret Earth's complexity.
- How culture and experience influence *people's perceptions of places and regions*.

C. Physical Systems:

- The *physical processes* that shape the patterns of the Earth's surface.
- The *characteristics and spatial distribution of ecosystems* on Earth's surface.

D. Human Systems:

- The *characteristics, distribution, and migration of human populations* on Earth's surface.
- The *characteristics, distribution, and complexity of Earth's cultural mosaics*.
- The patterns and networks of *economic interdependence* on Earth's surface.
- The processes, patterns, and functions of *human settlement*.
- How the forces of cooperation and conflict among people influence *the division and control of Earth's surface*.

E. Environment and Society:

- How human actions *modify the physical environment*.
- How physical systems *affect human systems*.
- The *changes* that occur in the meaning, use, distribution, and importance *of resources*.

F. The Uses of Geography:

- How to apply geography *to interpret the past*.
- How to apply geography to *interpret the present and plan for the future*.

1.6. TEACHING STYLES AND STRATEGIES

Glimpses into geography classrooms might catch (Roberts, 1992, p.232): a teacher giving *a talk* and pupils *taking notes;* pupils *copying notes* from overhead transparencies; pupils *working individually* from worksheets and resources; pupils *working at computers;* pupils working in *small groups* having heated discussions; a whole class taking part in a *mock public inquiry;* and others *preparing questionnaires* for a fieldwork visit.

There are also strategies that attempt to address the values related to Geography Education. In the past, physical geography – even in certain respects human geography, was regarded as an objective scientific study and therefore value-free. Today, it is widely accepted that value judgements affect scientific inquiry simply because *scientists are human* (Brown and Meed, 1992). The *focus on processes* – especially human processes – has automatically *introduced value judgements* of a social, political, and economic character. And the values in themselves are changing. A few wonders that *perception studies* have become a critical feature of the contemporary syllabus.

Values clarification is an approach that encourages students to *analyze their thoughts and feeling* about an issue, while *values analysis* encourages students to think about and analyze a range of people's viewpoints in relation to their own (Gough, 2011). Value clarification as a method of teaching is aimed at helping

students to (Coppens, 2006):

- become aware of and identify their values and those of others;
- communicate openly and honestly with others about their values; and
- use both rational thinking and emotional awareness to examine their personal feelings, values, and behavior patterns.

Value exercises are meant to make students conscious of their opinions on a range of issues. The exercises are constructed in such a way that *everyone thinks for himself, everyone listens*, and everyone can *express a personal* standpoint (Brunner, *et al.*, 1994). The exercises are based on *questions, which have no simple answers*. Right or wrong does not apply. Value exercises create questions and *force students to ask themselves*: Where do I stand? They must also *accept responsibility for their opinions* and *defend them in subsequent discussions*: why do I think like this?

Problem-Based Learning (PBL)

The essential purpose of PBL is enabling students to generate a body of knowledge intentionally geared towards the solution of a real problem. Students would be guided to develop a vision of alternative actions and potential solutions to the problem, which they use to devise a plan of action (Cotton and Winter, 2010). The action may then be carried out, followed by a period of reflection and evaluation. PBL is believed to enhance students' confidence in their problem-solving skills and help them to be self-directed learners (CTL, 2001). While such confidence does not come immediately, it can be fostered by good instruction whereby teachers give students a sense of ownership over their learning; develop relevant and meaningful problems and learning methods, and empower students with valuable skills that will enhance their motivation to learn and ability to achieve.

Steps in Problem Based Learning (PBL)

1. All learning experiences with PBL begin with an essential question or problem. The question may be the one that does not have a right answer and needs deep understanding of contents to be answered.
2. Learning is self-directed, meaning students are responsible for finding a solution to the problem.
3. Students work in cooperative groups to find a solution.

4. The team of students presents their findings to a class.

- The teacher must be active in Problem Based Learning. Selects the appropriate topics for PBL, guiding students throughout the process and providing support.

1.7. FUNCTIONS OF TEACHING AIDS

In Geography Education, as is often the case in many subjects, teaching aids are expected to evoke *interest and motivation*; create *imagination* and convey *information*; help them *develop skills* and *generate thinking* on the part of teachers, and arouse the *feeling and emotions* of pupils. Maps are often considered as the key tool of a geography teacher with a potential for stirring *imagination*; giving *accuracy* to ideas and impressions; and providing *certain types of information* (e.g. distribution pattern, spatial relationships, etc.) *better than any other medium*.

Geography textbooks are the other tools with an indispensable contribution. Textbooks may be used effectively in schools in *three main ways* (Lidstone, 1992, p.191): They may be used by pupils *'as is';* they may be *analyzed critically* by students and teachers and they may be used *by teachers as aids* to the teaching-learning process. On the other hand, effective use of textbooks is said to *require* (Lidstone, 1992, p.191): *helping pupils* to interpret the textbooks with which they are expected to work; *collaboration* between pupils and teachers as they analyze textbooks critically; and *confidence* on the part of teachers themselves as geographers as well as teachers.

1.8. ASSESSMENT IN GEOGRAPHY EDUCATION

A need for setting minimum requirements

The International Geographic Union urges national and local education policy makers to set minimum requirements for geography teaching and the geographical literacy of those who teach geography. This requirement is based on the convictions that (IGU, 2016, p.6):

- ✓ All children at all levels in primary and secondary school need access to high quality geographical education as an important part of their curriculum.

- ✓ As teachers are the key to innovation and quality in education, highly qualified geography teachers should be present in all schools to ensure effective curriculum leadership and implementation (Initial teacher training regulations should specify a minimum requirement for teachers of geography at both primary and secondary schools).
- ✓ Geography teachers should be qualified in both physical and human aspects of geography so that they may integrate both aspects of the discipline as appropriate for primary and secondary levels.

Assessment of classroom learning is expected to allow learners to *reflect on learning over time;* be used to find out where students are *before, during and after* a unit or course; help *teachers reflect on their pedagogy;* help teachers to *develop a better understanding of the student* as a learner; help to identify learning issues to support the *planning of strategic interventions and* provide a *basis for a meaningful dialogue* with students, parents and other stakeholders, such as school leaders, governors about students' progress.

Students should be *given regular opportunities to write analyses of* graphs, *explanations* of processes and *evaluations* of options to develop these skills. It is also important to use *peer and self-assessment* to encourage students to identify phrases that demonstrate *explanation* ("because" or "this means that…") or *evaluation* ("on one hand" or "more importantly…"). Besides, o*pen-ended tasks are found to* allow students to demonstrate their skills and understanding better than closed questions. Students should be given plenty of opportunities to explain their reasoning as this allows misconceptions to be identified and corrected, as well as developing important skills of analysis and communication of ideas.

Tests can be used diagnostically to show what students cannot do. Students can investigate specific areas for homework and, by making small changes, they make progress and realize they can improve. Allowing time for students to correct and improve their work is key. *Decision-making Exercises (DMEs)* are excellent assessment tasks that encourage students to develop and demonstrate higher- level skills, especially evaluation, whilst also improving students' place knowledge. Listening to students' discussions during tasks and asking open-ended questions is useful for teachers and students alike and written work can be used as evidence for more formal tracking of progress. *'Exit tickets'* are an effective way of assessing knowledge at the end of a lesson – students may be asked to hand a "ticket" filled out with an answer to a question, a solution to a

problem, or a response to what they've learned. Exit tickets can be simple tests of knowledge, perhaps in the form of a hinge-question or multiple choice, or longer open-ended questions that require explanation or evaluation.

2. VALUES AND SIGNIFICANCE OF GEOGRAPHY EDUCATION IN ETHIOPIA

The knowledge and skills students acquire in geography education in Ethiopian schools help them to develop a rational judgement based on objective investigation of issues from a geographical perspective. This in turn enables students to:

- develop a sense of wonder, enjoyment and curiosity about peoples, places, and environments;
- recognize environmental problems and take appropriate actions to promote sustainable development of Ethiopia;
- cultivate a sense of belongingness to society and the country thereby becoming active and responsible citizens; and
- appreciate the increasing global interdependence between and among nations and the need for international solidarity and cooperation.

All these are meant to enable students to appreciate Ethiopia as physically, culturally, socially diverse nation thereby motivating them to play a positive role in achieving the overarching goal of nation-building.

3. GOALS AND OBJECTIVES OF GEOGRAPHY EDUCATION

Goals

Geography education for Ethiopian schools enables students to be equipped with geographic knowledge, understanding, skills, values, and attitudes about important questions and issues of the natural and human environment, and their interaction and interdependence, diversity and change at local, regional, and global scale, develop the competencies for analyzing spatial distribution to engage in the community as informed and active citizens.

Objectives

Upon successful completion of geography education, the students will be able to:

- distinguish key geographic concepts of place, space, scale, environment, interdependence, diversity and change, the complex nature of people's relationships and interactions with the environment;
- describe the areal differentiation and distribution of phenomena, the physical and human characteristics of the environment, and the two-way relationships between human beings and the natural environment, and their impacts;
- critically assess the patterns and processes involved in economic, social, and environmental changes;
- develop geographic skills and abilities including enquiry, research / action research and problem- solving through critical and creative thinking, communication, collaboration, and social participation to solve socioeconomic and environmental problems;
- develop skill to read, analyze and interpret geospatial information and data presented in various forms such as graphs, photographs, maps, diagrams, and charts;
- develop abilities to use a wide range of tools and technologies like ICT, GIS, and RS to address geographic issues;
- develop positive attitude towards the natural and human environment interaction, interdependence, and diversity (both cultural and natural) as manifested through pro-environmental action and social engagement;
- value the importance of indigenous knowledge and practices for wise use of natural resources and sustainable development;
- gain insights into the contemporary geographic issues and public concerns (climate change, natural disasters, resource- related conflicts, pollution, rapid population growth, migration, HIV/AIDS) and act accordingly; and
- engage in natural resource conservation, preservation, and management policy at local, national, and global levels.

4. CONTENTS OF GEOGRAPHY EDUCATION

From the standpoint of the well-established geographic tradition set forward by William Pattison (Pattison, 1964) suggests modern geography comprises

four important traditions (spatial, area studies, human – land, and earth science traditions). In the meantime, additional dimensions have been included in the aforementioned traditions. In line with this, the position paper presented here adopts the following six key contents of geography education for Ethiopia.

i. Physical environment
ii. Human environment
iii. Human – natural environment interaction and interdependences
iv. Geographic skills and techniques (Mapping, spatial analysis, graphicacy, GIS and RS)
v. Contemporary geographic issues and public concerns
vi. Diversity and change

These contents in the geography education set the scope of the study and teaching of geography in Ethiopian schools, cover contents in expanding horizons (progression) and spatial horizons, and give due attention to the cultural diversity of Ethiopia, indigenous knowledge and practices, resource management and crosscutting issues. What follows is a brief description of each of the content areas that geography education is supposed to cover in the Ethiopian context.

i. Physical Environment

The physical environment refers to scientific study of the natural features of the earth, especially in its current aspects and geological past including land formation, climate, currents, and distribution of flora and fauna. It includes land, air, water, plants, and animals, and all the natural resources that provide our basic needs and opportunities for social and economic development. The focus here is to identify and analyze how natural systems work in the environment.

ii. Human Environment

Human environment is one of the main areas of concern of geography because it is the area that humans live. Often the study of geography begins with one's home community and expands as a person gains greater experience. This experience could include population, culture economy, infrastructure, politics, etc. at a different scale. Hence, the study of human- environment provides a conceptual link for children between home, school, and the world beyond. In addition to this, such a study offers an opportunity to study how people interact with the

environment and with each other from place to place. This enables students to understand the complex interplay between the human and natural environment as discussed below.

iii. Human – Natural Environment Interaction and Interdependences

The relation between human beings and the natural world is known as human-environment interaction. Studying environment is very important to us because it is where we live and share resources with other species. Almost all human activities directly or indirectly depend on natural components like land, water, air, and living things. Human made components like buildings, parks, bridges, roads, industries, etc. may affect the natural environment. Humans - individuals, family, community, and their institutions – religion, politics and education have a great influence on the environment. On the other hand, the natural environment also hampers or greatly affects human activities.

The interaction and interdependence between the human social systems and (the rest of) the ecosystem is one of the main areas of concerns of geography education. Human social systems and ecosystems are complex adaptive systems because they have feedback structures that promote survival in a constantly changing environment. Examples of different kinds of human – environment interactions include: the use of natural resources; energy resources; water resources; land use of different activities; oil and gas drilling; environmental pollution; waste management and littering; deforestation; conflict on resource use, etc. The study of human – natural environment interactions and interdependence is expected to help students to make informed decisions and take part in various issues.

iv. Geographic Skills and Techniques

Geography education heavily relies on different tools and techniques which in turn requires the development of various skills. Such skills include the following, among others: mapwork skills; fieldwork skills; geographic research skills; communication skills; social skills; use of ICT; and GIS, and spatial data management and analysis skills.

Geographic skills, techniques, and tools help students to locate important events and use geographical knowledge to make informed decisions regarding the best use of resources.

v. Contemporary Geographic Issues and Public Concerns

Contemporary issues that are currently affecting Ethiopia in particular, and the African continent, and the entire world population or places in general, which thus far unresolved and relevant to geography, should get the attention of geography education in schools of Ethiopia. Therefore, topics, concerns, problems, debates, or controversies related to natural and cultural environments can be included in geography contents at different grade levels. The contemporary geographic issues comprise, among others: global warming; climatic change; globalization; unemployment, etc.

Similarly, geography lessons in schools of Ethiopia need to cover issues related to public concerns which demand popular awareness, behavioral change, and policy interventions. Some of the socioeconomic and environmental issues that can be treated in geography lessons include, but are not limited to: deforestation; pollution; poverty; loss of biodiversity; rapid population growth; waste disposals; HIV /AIDS, etc.

Finally, failure of treating these issues will exacerbate the problems by rapidly spreading them across the globe. Therefore, the study of contemporary geographic issues and public concerns is expected to enable students to have a deeper understanding of current geographic issues and contribution towards a critical debate as to how to address the issues.

vi. Diversity and Change in Geography

One of geography's unique contributions to education, in general, is its intentional emphasis on spatiotemporal diversity and change. In other words, different parts of the world greatly differ, and on a process of continuous change over space and time. The variation could be in the natural environment, cultural and religious landscape, level of socioeconomic and political development, etc. It is important to remember that within the same region there can be significant variations caused by local conditions and processes. Thus, the study of diversity and change in geography enables students to understand and value the implications of diversities both in the natural and human environments thereby supporting their conceptualization of geography as a discipline which is dynamic in nature frequently adapting to new knowledge, skill, and attitudes.

5. APPROACHES AND METHODS IN GEOGRAPHY EDUCATION

Approaches in geography education are meant to achieve the stated goals and objectives and the key contents identified for effective teaching of geography in Ethiopian schools. Furthermore, the methods used in teaching geography are supposed to strengthen students' understanding, creativity, critical thinking, problem solving and aesthetic values which enable them to draw relationships between past and current phenomena. A maximum effort is made to promote active learning (i.e., learning that is engaging, interactive, and problem- oriented) through the utilization of both **thematic** and **regional** approaches in geography.

Consequently, geography education assumes effective use of the following teaching methods.

- Problem- based learning
- Demonstration
- Collaborative learning
- Case study
- Field trip
- Project work
- Concept mapping
- Debate
- Dialogue
- Discussion
- Jigsaw
- Role play
- Guest speaker
- Value analysis and clarification
- Inquiry, and
- Microteaching, etc.

6. MATERIALS AND RESOURCES IN GEOGRAPHY EDUCATION

It is also important to note that effective use of teaching approaches and methods, to enrich students learning experiences and lifelong learning, presupposes utilization of relevant resources of audio-visual materials including maps, globe, atlases, photographs, charts, locally available specimen, replicas of archeological and material culture, curriculum materials, computers, etc.

7. ASSESSMENT METHODS AND TOOLS OF GEOGRAPHY EDUCATION

Assessment is a critical component of the teaching and learning process. It involves a continuous collection of information about students learning through formal and informal methods. It helps to obtain valid information about students' performance on the intended learning competencies and learning objectives to improve students learning quality. It is embedded in Education and Training Policy (ETP) of Ethiopia and the recent Education Roadmap of Ethiopia as well. Accordingly, Geography Education teaching needs to be aligned with the formative continuous assessment or on assessment of learning outcomes and instructional effectiveness. Therefore, students' understanding of geographical concepts, processes, skills, and values and dispositions development need to be assessed for their attainment at different grade levels. Moreover, students need to get constructive and timely **feedback** on their learning progress for further and improved learning. In doing so, assessment should be done through oral, written, and practical assessments continuously.

Furthermore, in the teaching and learning process of geography, a teacher should use a wide range of diversified assessment mechanisms. This encompasses:

- Observation,
- Presentation,
- Pair and group discussion,
- Debating,
- Interview,
- Demonstration,
- Questioning and answering,
- Tests and exams, and quizzes, etc.

Moreover, self and peer assessment should be encouraged. Those various assessment methods offer important evidence about student's wide range of understanding, skills, and attitude of learning. Consequently, assessment evidence would be used to shape and improve the quality of teaching and learning process.

8. GEOGRAPHY STUDENTS FIELD TRIP SAFETY GUIDE

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1. Definition of Field Trip

Field trips are essential outside-of-the-classroom learning experiences which get students away from traditional classroom settings and into new environments. Field trips should be correlated with the goals of the educational program requesting the trip.

Field trips can take many forms. The simplest form is an on-campus trip during class time. For example, walking one's students to hear an on-campus speaker talk about a classroom topic in the school auditorium requires minimal planning and little or no paperwork. Off campus and/or longer duration experiences require progressively more planning, paperwork, and permissions as their complexity increases.

2. Supervision

In many situations fieldwork and other outdoor activities cannot be supervised in the same manner as laboratory or classroom activities. The Head of Discipline is ultimately responsible for ensuring adequate supervision is in place at all times and the Fieldwork Leader should adhere to the supervision requirements and organize this accordingly when in the field. The supervision of people undertaking

activities must be adequate. A staff to student ratio of around 1:20, dependent on environment and experience is recommended. Complete head counts throughout the trip and ensure all participants stay together.

If, during the course of the fieldwork, sub-groups are formed, there should be a nominated leader for each sub-group. This applies for groups of two or more. When there are both male and female students on a trip, there should always be male and female leaders. Sub-group leaders will remain under the general supervision of the Fieldwork Leader. It should be clearly understood by all fieldworkers that they are in a work situation under supervision.

3. Responsibility of the Individual Student

Fieldwork is an activity involving inherent risks and hazards - e.g. coastal exposure, quarries, river sections, power stations, farms, and some urban areas. Severe and potentially dangerous weather conditions may be encountered, and it is the responsibility of each student to be equipped with suitable clothing and to take appropriate action to reduce the risk of accidents. Students are asked to observe sensible standards of behavior and to conduct themselves with good manners and consideration for others. For certain work, students may be required to identify themselves and their place of study. They should bring no disrepute to the College. Any student not conforming to the standards required may be dismissed from the field course.

4. Participation of Students with Disabilities

No student should be automatically excluded from participating due to his or her disability. If a student with a disability needs an accommodation or related aids and services to participate in a field trip, those services must be provided.

5. Consideration for the Environment

All students should make themselves familiar with the Country Code. They should protect the natural and human environment - e.g. by avoiding littering fields or roads in areas of high fire risk such as forested areas. Students must avoid unjustifiable disturbance to wildlife. Plants and animals may inadvertently be displaced or destroyed by careless actions.

6. Permissions for Access to Study Areas

Permission should be sought to carry out fieldwork on private land, including National Parks, and Commons, etc. Students must agree to abide by the regulations imposed by the landowner.

7. Expectations for Excursions

Students should stay with the party, except by clear arrangement with the leaders. Students must report any personal injury or illness.

8. Avoid Danger

Students should avoid, where possible, confrontations with dogs, snakes, livestock and wild animals. Students must be especially careful when working near machinery, farm implements and in the vicinity of firing ranges. They should avoid touching metal objects discovered in the field. They should not consume water from dubious sources, and they should not walk barefoot where glass or other objects could inflict damage (e.g. in streams and on beaches). Do not go into the water more than knee deep.

9. Mountainous Areas

Certain parts will more properly be defined as dangerous, notably areas where there is steep or loose rock, or a layer of ice and/or snow. Furthermore, mountainous areas can be subject to dramatic changes in weather conditions. Students should be equipped with safety rucksacks containing first aid kit, compass, whistle, torch, survival bags and extra food. Participants should move carefully over rough, rocky or vegetation-covered ground, avoiding loose boulders: they should never run down steep hills or screes. They should never attempt to cross a bog of any type unless it is unavoidable. Students should note that carrying a map and compass is not in itself sufficient. They must also be able to use them. Consider carrying a GPS unit, especially if poor visibility is a possibility; the combination of mobile phone and GPS will greatly aid recovery of lost and injured fieldworkers.

10. In and Near Water

Safety lines must be used by students engaged in fieldwork activity in fast flowing water or in the surf zone when conditions demand. Fast flowing water is hazardous and students should minimize risks. Also sometimes, in exceptional weather conditions normally dry rivers may become dangerous because of flash

floods. Do not attempt to cross such streams in spate.

11. Woods and Forests

The main safety hazards in woods and forests are associated with the difficulty of movement and limited visibility. It is easy to become lost so if you do have an accident; it may be difficult for you to be found or for you to find the way out. Consider carrying a GPS unit; the combination of mobile phone and GPS will greatly aid recovery of lost and injured fieldworkers.

12. Bogs and Swamps

Of the several types of wet unstable ground likely to be encountered, those in which a raft of vegetation overlies water are perhaps the most dangerous. These can usually be distinguished by their swaying movement when walked on. Any continuous carpets of sphagnum or peat mud should also be avoided. Reed-swamps are difficult to traverse on foot and extra care should be taken. Probe ahead with a pole.

13. Excavations

With excavations think about what type of soil you are working in, a sand section is a lot less stable than clay sided one, a rubble section has the added danger of falling debris. Always assess the safety of the trench before going in and decide if any shoring is required. Some trenches may need shoring at shallower depths dependent on the local conditions. The situation of a trench may change depending on weather, size of spoil heap, heavy machinery passing by. Spoil heaps should not be allowed to creep ever closer to the edge of your trench, the weight pressing down on can cause a collapse. Debris and stones will also roll off the spoil heap and into the trench - a hard hat only protects your head so wear protective footwear as well. Make sure the spoil heap is secure. Great care should be taken to avoid injury to passers-by, especially when the site is unattended overnight. When visiting sites all local rules must be complied with.

14. Lakes, Rivers and Other Inland Waterways

Except for very shallow ponds and ditches, all work in water should be regarded as hazardous, because of currents, submerged objects and slippery or muddy bottoms. Lone working in water should be avoided, and lone working using boats is not permitted.

15. Biological Hazards – General

There are many species of plant and animal that presents a health hazard to humans. An ability to recognize the dangerous/poisonous species indigenous to the particular fieldwork environment is therefore desirable.

16. Plan Questionnaires

When planning an interview, survey, or similar fieldwork, students should be guided by their tutor in the preparation of questionnaires and interview schedules to minimize potential disturbance to interviewees. All questionnaires employed by students, either during led fieldwork or in self-guided work, MUST be reviewed by their Tutor before surveying begins.

17. Interview Procedure

In all types of social survey, students must carry a letter of introduction from the School which will confirm that they are members of the School engaged on work for their geography course. In making contact with potential respondents, it is important that they are informed of the student's name and their status as a student at given school. Purposes of the study must be explained, avoiding extravagant claims of its value. It may be necessary to offer reassurance about the confidentiality of a respondent's answers - a pledge which must be honored. If appointments for return visits are made, it is imperative that they are kept. Dress inconspicuously taking account of cultural norms and avoid clothing that could be considered provocative. Equipment and valuable items should be kept out of sight.

18. First Aid Kits

A comprehensive first-aid kit must be taken on every field trip. If the group breaks into smaller groups, a basic kit should be carried by every sub-group working away from the main fieldwork control point. A basic first-aid kit should be carried by individuals undertaking fieldwork. The nature of the location and the type of work being undertaken should be considered when determining the contents of first-aid kits

UNIT ONE

1. LANDFORMS OF AFRICA

Periods Allotted: 5

1. Unit Introduction

Landforms are physical features on the Earth's surface that form terrain of an area. **Mountains**, **plateaus**, and **plains** are the three major types of landforms. Minor landforms include hills, gorges, valleys, and basins. Tectonic plate movement and volcanic activities (internal processes) under the Earth can create landforms by pushing up mountains and hills. Erosion by water and wind (external processes) can erode land and create minor landforms like gullies, river valleys and gorges. Both processes happen over a long period of time, sometimes millions of years. The major landforms, mentioned above, are widely distributed on the earth's surface. The surface of the Earth is covered by **land** and **water**. The land forms make up **continents** and the water forms **oceans**. Continents are any one of the largest landmasses in the world. The Earth is divided into seven continents, from largest to smallest they are; **Asia**, **Africa**, **North America**, **South America**, **Antarctica**, **Europe,** and **Oceania** (**Australia).**

2. Learning Outcomes

By the end of this unit, students will be able to:

- *develop general idea on the major landforms of the world;*
- *identify the major landforms and their spatial distribution in Africa;*
- *describe the major landscape features of Africa; and*
- *recognize the spatial variations in the distribution of the major landforms in Africa*

3. Main Contents

- Introduction
- Overview of the World's Major Landforms
- Location and Related Features of Africa
- Major Landforms of Africa

1.1. OVERVIEW OF THE WORLD'S MAJOR LANDFORMS

Periods Allotted 2

1. Competencies

At the end of this lesson, the students will be able to:

- *locate the major landform in Africa; and*
- *explain the spatial variations in the distribution of the major landforms in Africa*

2. Contents

- Types of Landforms

3. Overview

In this lesson, the students will learn that landforms are divided into two categories: major and minor landforms. Major landforms include: **Mountains**, **plateaus**, and **plains, whereas** minor landforms include hills, gorges, valleys, and basins. The major landforms, mentioned above, are widely distributed on the earth's surface. The surface of the Earth is covered by land and water.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- A photograph that shows a typical landform (e.g., you may use Figure1.1 and show the students that different landforms are depicted in the Figure.)
- Map of the world for exercises (Figure 1.21)

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Pair or group discussion
- Demonstration
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Sketch Figure 1.1 on a flip chart, or A4 size paper so that students answer Activity 1.2.
- Print out map for exercises (Figure 1.21) for activities and questions you may raise in the class.
- Prepare notes, activities, and exercises

4.4. Presentation of the Lesson

a) Introduction to the Lesson

Ask the following questions to start the lesson:

- what is landform?
- list down the landforms you can identify in the surrounding.
- how are landforms formed?
- how many continents are there? Ask them to list them down.
- how many oceans are there? Ask them to list them down.

b) Body of the Lesson

- Explain the types of landforms that can be found in any part of the world.
- Discuss the importance of internal and external processes in creating and reshaping landforms, respectively.
- Describe how different landforms make up continents; and

- Explain the number, size, and nature of oceans, as well as the role of oceans in forming coastal land features.

c) Stabilization

Review the main ideas and concepts of the lesson. Mention the following points:

- Landforms are physical features on the Earth's surface that form terrain.
- Landforms are formed by internal and external processes.
- *The surface of the Earth is covered by land and water. These features make up continents and oceans respectively.*
- Using the world map for exercises (Figure 1.21) ask them to indicate the distribution, size, and position of continents and oceans.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout the period.

Check the students' understanding of the lesson by asking them questions such as:

1. What are the common major landform types we find in the world?
2. How many percent of the Earth's surface is covered by oceans?
3. Give them an assignment to list island countries in the Caribbean.

b) Follow up

Form a group consisting of five students and order them to use a printed-out Map for exercises (Figure 1.21) or let them sketch it. Then give them the following task:

- mark mountainous areas of the world;
- mark plain areas of the world;
- the oceans; and
- peninsulas and isthmuses

4.6. Answer Key for Activities

Activity 1.1

How do the major and minor landforms occur?

- Landforms are the results of two important processes. The processes are internal and external processes. Internal processes involve **tectonic and volcanic activities**. Tectonic activity is the result of the large-scale motion of the plates. Such movements create disturbances on the land surface and could form mountains, valleys, and plateaus. Whereas, volcanic activities result from the eruption of magma (molten rock) pours out to the Earth's surface. These activities form cone-shaped hills or mountains and conic depressions such as craters or calderas.

Activity 1.2

What important (specific) landform features can you indicate from Figure 1.1 above?

➥ *Important landform features the Figure (Figure 1.1) indicate include:*

- saddle;
- hill;
- ridge; and
- river bank deposition.

Activity 1.3

In which of the continents is our country – Ethiopia found?

Can you indicate Ethiopia on the map in Figure 1.2 above?

Can you indicate Japan on the map in Figure 1.2 above?

Answers: Help the students to locate Ethiopia and Japan in Figure 1.2. or Figure 1.21

Activity 1.4

- Sovereign island countries of the world within their respective continents.

Africa	Asia	Europe	North America	Oceania
▪ *Mauritius* ▪ *Comoros* ▪ *Cape Verde* ▪ *São Tomé and Príncipe* ▪ *Seychelles*	▪ Indonesia ▪ Japan ▪ Philippines ▪ Sri Lanka ▪ Singapore ▪ Jamaica ▪ Bahrain ▪ Brunei ▪ Maldives	▪ Cyprus ▪ Malta ▪ Iceland ▪ Republic of Ireland	None	▪ New Zealand ▪ Papua New Guinea ▪ Fiji ▪ Solomon Islands ▪ Vanuatu

Activity 1.5

- **What are the three major landforms of the world?**
- **Mountains**, **plateaus**, and **plains** are the three major types of landforms in the world.
- **Why is it important to study about them?**

The importance of studying landforms:

Studying landforms helps people to understand their economic potentials and values hence to determine the economic potentials of an area (for example, agriculture, pastoralism, etc.). Also, studying landforms helps people to understand the occurrences of disasters, its causes, and mechanisms to withstand damages. Then it helps people to take precautions in case of a possible disaster. It also helps people to understand the weather patterns of the landforms.

Activity 1.6

- Help the students to sketch Himalayas, plain areas, and Mariana trench in *Figure 1.3 or 1.21.*

1.2. LOCATION AND RELATED FEATURES OF AFRICA

Periods Allotted 1

1. Competencies

At the end of this lesson, the students will be able to:

- *Locate Africa on a map*

2. Contents

- Location of Africa

3. Overview

In this lesson, the students will identify the location of Africa. They will also learn the relative location of Africa as compared to other continents and major natural features. Other important concept this portion includes are; the size the continent in terms of area and population, the number of sovereign countries that Africa has and how the Equator divides the continent into almost half parts.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Map of the world (e.g., you may use Figure 1.3 and show the students the distribution of the continents. Focusing on Africa you can explain the concepts related to location of Africa.)
- Map of the world for exercises (Figure 1.21) can also be used for different activities.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use Figure 1.2 to locate Africa and explain its relative location with respect to other continents.
- Print out map for exercises (Figure 1.21) for activities and questions you may raise in the class.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lesson

Ask the following questions to start the lesson:

- where is Africa located?
- list continents and other major water bodies bordering Africa.
- what is the size of Africa?
- how many countries are there in Africa?

b) Body of the Lesson

- Explain the relative location of Africa.
- Discuss the important Figures related to Africa – its size, population, and proportion of the Earth's land surface.

c) Stabilization

Review the main ideas and concepts of the lesson. Mention the following points:

- *The continent of Africa is bounded by the Mediterranean Sea, the Red Sea, the Indian Ocean, and the Atlantic Ocean.*
- *Africa is the second largest and second most populous continent on earth after Asia in both cases. Africa's areal size is 30.37 million Km².*
- *Africa covers 6% of the Earth's total surface area and 20% of its land area.*

- *Africa's total population was estimated at 1.3 billion people in 2020. Therefore, Africa accounts for about 17% of the world's population.*

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout the period.

Check the students' understanding of the lesson by asking them questions such as:

1. what is the areal size of Africa?
2. how many sovereign states are there in Africa?
3. what is the significance of the Equator in dividing Africa into different parts?

b) Follow up

Form a group consisting of five students and order them to use a printed-out Map for exercises (Figure 1.4). Then give them the following task:

- mark five big countries in Africa;
- mark five small countries in Africa;
- identify countries north of Tropic of Cancer; and
- identify countries north of Tropic of Capricorn.

1.3. MAJOR LANDFORMS OF AFRICA

Periods Allotted 2

1. Competencies

- *Explain the spatial variations and the distribution of the major landforms in Africa*

2. Contents

- The Landforms of Africa

3. Overview

In this lesson, the students will study landforms. They will identify how landforms are formed, the importance of studying landforms, and major landform regions in Africa.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Maps related to Africa (e.g., you may use Figures 1.5, 1.7, 1.10, 1.13, 1.16, 1.18, 1.19, and 1.20 to show the students the distribution of different landforms in Africa).

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion (Pair or Group Discussion)
- Demonstration
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps to explain the various landform regions of Africa.
- Print out map for exercises (Figure 1.21) for activities and questions

you may raise in the class.

- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- what is a landform?
- what is the importance of studying landforms?
- how many land forming regions are found in Africa?
- list the physical regions of the landforms in Africa.
- ask the location, and main features of each of the physical regions.

b) Body of the Lesson

- Explain how landforms are formed, and significance of studying about them.
- Discuss how Africa is divided into four major landform regions and eight physical regions.
- Locate and describe the main features of each physical region:
    - *Atlas Mountains;*
    - *The Sahara;*
    - *The Sahel;*
    - *The Savanna;*
    - *The Tropical rainforest;*
    - *The Rift Valley and African Great Lakes;*
    - *The Ethiopian and Eritrean Highlands; and*
    - *Mountains and desert systems of Southern Africa.*

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- Landforms are the results of volcanic and tectonic processes.
- Understanding landforms is very important because as part of a landscape, landforms greatly affect human perception and interactions with environment.
- Landforms are ecologically important elements because **ecosystems** (which consists of all the organisms and the physical environment with which they interact) develop within landform regions, and material and energy flows occur within the landform system.
- Landforms also affect, modify, and influence climate. The effect can be recognized on both large area as **macroclimate** or small area as **microclimate**.
- Effects of landforms on ecosystem pattern and processes (lists included).
- *In Africa there are four significant land forming regions. Each of this region contains eight major physical regions listed above.*

Since each physical region must be discussed, for each lesson locate and describe the main features of the physical regions. For example, while discussing the Atlas Mountains, use Figure 1.5 to indicate its location. Also indicate the local name – *Maghrib* and its topographic features. You may also use supportive Figures (pictures) which depict typical landform of the regions.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. what are the processes involved in landform formation?
2. what are effects of landforms on ecosystem pattern and processes?
3. how many major landform regions are there in Africa?
4. in which part of Africa is the Atlas Mountain found?
5. what are some basic features of the Sahara Desert?
6. what are some countries found in the Sahel region?
7. what are some basic features of the Sahel region?
8. what are some basic features of the Savanna region?
9. what is the effect of climate change and desertification on the Savanna region?
10. what are some basic features of the Tropical Rainforest region?
11. why do plants in the Tropical Rainforest region grow tall and faster?
12. how was the Rift Valley formed?
13. how can you describe the Ethiopian and Eritrean Highlands?
14. how can you describe the mountains and Desert Systems of Southern Africa?

b) Follow up

- Order students to be in pairs, and give them the questions listed above (one question for each pair).

4.6. Answer Key for Activities

Activity 1.7

- The Atlas covers the largest proportion in Morocco, and followed by Algeria and Tunisia.

Activity 1.8

- *Erg* is a large mass of sand dunes, specifically those in the Sahara. The dunes are fixed to a certain place, even though winds often sweep over its surface. Unlike an *Erg*, the *Reg* is a stony and rocky desert. It forms large, seemingly endless plains that look like a lunar landscape.

Activity 1.9

- Desertification is the process by which fertile land becomes desert, typically because of drought, deforestation, or inappropriate agriculture.
- The Sahel is the ecoclimatic and biogeographic realm of **transition** in Africa between the Sahara to the north and the Savanna to the south. Having a semi-arid climate, it stretches across the south-central latitudes of Northern Africa between the Atlantic Ocean and the Red Sea. Thus, due to its semi-arid condition and being a transition zone, it is very susceptible to desertification and the climate change.

Activity 1.10

Why do we find many parks in the Savanna region in Africa?

The savanna is characterized by grasses and small or dispersed trees that do not form a closed canopy, allowing sunlight to reach the ground. Hence, there is abundant growth of grasses on which many game animals depend. The animals in turn become prey for other carnivores. Therefore, the wide diversities of the animals found in the Savanna helped governments to establish national parks.

Activity 1.11

In hot, steamy rainforests, the tightly packed trees grow rapidly and to great heights. This is because they are all competing for sunlight. The taller the tree, the more lights its leaves will receive.

Activity 1.12

What is the role of Rift Valley in the classification of Ethiopia into different physiographic regions?

The Rift Valley divides Ethiopia into two big parts – Western and Eastern parts. Then it helps create three physiographic regions; the Western Highlands and Associated Lowlands, the Southeastern Highlands and Associated Lowlands, and the Rift Valley Region.

4.7. Answers for Review questions (Unit One)

Part I. True or false

1. True 2. False 3. True

Part II. Matching

4. E 5. A 6. B 7. F 8. D 9. C

Part III. Multiple choice

10. B 11. C 12. D

Part IV. Fill in the blank spaces

12. Kalahari and Namib Deserts

13. Reg

Part V. Short answer type

14. The teacher should use the figure (Figure 1.21) to mark the continents and oceans of the world.

15. The major landforms of the world are mountains, plateaus and plains

which are widely distributed on the earth's surface.

16. The significance of the study of landforms are very diverse. The key significance of landforms is to have a basic understanding of the general configuration of landforms and of the surface processes. It also helps us to improve and maintain the sustainability of our environment and predict and reduce the impact of contemporary earth surface processes that lead to natural hazards (such as land degradation).

17. Most of African national parks are found in plain and mountains where eendemic and other game animals are found.

18. The Rift Valley is the most important landform that divides Ethiopia into different physiographic regions.

UNIT TWO

2. CLIMATE OF AFRICA

Periods Allotted: 9

1. Introduction

In unit one, the students have learnt about landforms of Africa. In this unit they will study about the climate of Africa. The first section of the unit presents about the climate types or zones and regions of the world. In the second section, you will study about the features of the climate of Africa.

Climate is an average of weather conditions in a place over a long period of time – 30 years or more. It represents the sum of all interacting atmospheric processes over a given period of time. Weather, on the other hand, refers to a short-term atmospheric condition such as the temperature and precipitation on a certain day, the state of the atmosphere with respect to heat or cold, wetness or dryness, calm or storm, clearness, or cloudiness.

Climatic zones are spacious areas with a climatic similarity. The climate zones roughly spread in an east-west direction around the Earth and can be classified using different climatic parameters. Climatic region refers to a continuous geographic area in which similar climate characteristics are observed. Average temperature is the most important factor in determining climate regions of the world, although other weather aspects like precipitation play roles.

2. Learning Outcomes

By the end of this unit, the students will be able to:

- *assess the climatic regions and climate types of the world;*
- *compare climatic regions within Africa;*
- *examine how climate provides substantial benefits for the life of people in Africa; and*
- *analyze the challenges posed by climate change on development of Africa.*

3. Main Contents

- Overview of world climatic regions and types
- Climate types and regions of Africa
- Benefits of climate for life of people in Africa
- Climate change and its challenges to Africa's development vision

2.1. OVERVIEW OF WORLD CLIMATIC REGIONS AND TYPES

2.1.1. Climate Classifications

Periods Allotted 1

1. Competencies

- *Identify the climate types and regions of the world*

2. Contents

- Overview of World Climatic Regions and Types

3. Overview

Global climate is a description of the climate of a planet, with all the regional differences averaged. The world has several climatic zones. Geographers and climatologists defined climatic region based on different climatic elements. In fact, the Earth's climate is driven by energy from the sun which arrives in the form of heat.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Maps related to Africa (e.g., you may use Figures 2.1, 2.2, 2.3 and 2.4 to show the students the concepts related to the climate of Africa).
- Sketch a circle on a blackboard or white board which shows the classification of the world into three climatic regions.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Field work/trip
- Problem based learning

- Problem based learning

  Give an assignment on the climatic regions and types of the world, and tell the students to work in groups. Let them prepare a sketch of the regions and types of climates of the continents in their groups on a **flip chart** or A4 size paper.

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps to explain the various climatic regions of Africa.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- what is a climate?
- what is weather?
- what is climate classification?
- what is the function of climate classification?

b) Body of the Lesson

- Define climate, and its elements.
- Discuss the difference between climate and weather.

- Discuss the purpose of climate classification and why the classification is important.
- Locate and describe the main climatic regions of the world (the first attempt of the Greeks):
  - *torrid – or tropical;*
  - *temperate; and*
  - *frigid.*
- Locate and describe the main climatic regions of the world according to Koppen:
  - *A (humid tropical),*
  - *B (dry),*
  - *C (humid middle-latitude, mild winters),*
  - *D (humid middle-latitude, severe winters), and*
  - *E (polar).*

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- Climate is an average of weather conditions in a place over a long period of time – 30 years or more. Weather, on the other hand, refers to a short-term atmospheric condition such as the temperature and precipitation on a certain day, the state of the atmosphere with respect to heat or cold, wetness or dryness, calm or storm, clearness, or cloudiness.
- Climatic zones are spacious areas with a climatic similarity.
- The study of climate mostly uses averages or mean values of recorded data.
- Climate classifications help people know what types of conditions a region usually experiences throughout the year.
- Different functions of knowing a regions climate - useful when choosing building materials for protection and durability, or when considering what crops are likely (or unlikely) to thrive in a region.

For tourists, knowing a location's climate classification can help them select and pack appropriate clothing.

- The various classification schemes used by climate scientists for categorizing world's climate into different regions such as; ancient Greeks, and Koppen's classification. Also, mention that the latter is the widely used.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. what is climate classification?
2. how do scientists classify world climates into different types?
3. list the main climate types according to the ancient Greeks.
4. list the main climate types according to Koppen.
5. what criteria had Koppen used in climate classification?

b) Follow up

- Order students to be in pairs, and give them the questions listed above (one question for each pair).
- Let the students draw a circle and divide it into three climatic regions. Let them indicate on the Figure the latitudinal values of the equator, Tropic of Cancer, and Tropic of Capricorn.
- Let them identify the climatic types of Ethiopia based on Koppen's classification.

4.6. Answer Key for Activities

Activity 2.1

How many world climate regions and types do you know? How do climate scientists and geographers classify world climates into different types and regions?

For the first question, encourage the students to figure out the number of climatic regions they know. The answer for the second question is that scientists and geographers use different criteria to classify climate into different types and regions. The criterion could be temperature, precipitation, humidity, or location. More than one criterion could be used to classify climate of an area.

2.1.2. World Climate Zones and Regions

Periods Allotted 1

1. Competencies

- *describe the major climate of the world.*

2. Contents

- World Climate and Climatic Regions

3. Overview

Climate zones are areas with distinct climates, which occur in the east-west direction around the Earth, and they can be classified using different climatic parameters. Generally, climate zones are belt-shaped and circular around the poles (see Figure 2.3). In some areas, climate zones can be interrupted by mountains or oceans. The world's climate pattern reflects a regular and dependable operation of the major climate controls.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Maps related to Africa (e.g., you may use Figures 2.3 and 2.4 to show the students the concepts related to the climate classification).

- Use Figure 1.21 (Map for Exercises) to concentrate on the climate of Africa or parts of Africa.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Filed visit (like visiting meteorology station)
- Project work

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps to explain the various climatic regions of Africa.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- what the role of solar radiation on seasonal climate variations of an area?
- what are the four broad climatic zones of the world?

b) Body of the Lesson

- Define climate zone.
- Discuss the role of solar radiation and the position of the Sun on seasonal changes of climate.
- Locate and describe the four climate zones of the world:
  - *Tropical Zone;*
  - *Subtropics Zone;*

- *Temperate Zone; and*
- *Cold Zone.*

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- Climate zones are areas with distinct climates, which occur in the east-west direction around the Earth, and they can be classified using different climatic parameters.
- In some areas, climate zones can be interrupted by mountains or oceans. The world's climate pattern reflects a regular and dependable operation of the major climate controls.
- The solar radiation reaches the ground on different parts of the Earth at different angles. On the equator, the sunlight reaches the ground almost perpendicularly, whilst at the poles the angle of the Sun is lower or even under the horizon during the polar night.
- **Tropical Zone** is characterized by; high angle of the Sun, high temperature, and high humidity.
- **Subtropics Zone** is characterized by; receiving high radiation in summer, thin cloud cover, has less moisture, and has cool and moist winter.
- **Temperate Zone** is characterized by; low angle of the Sun, low temperature, seasonal variation of lengths of day and night, regular distribution of precipitation, and less frequent extremes of climate.
- **Cold Zone** is characterized by; receiving less heat through solar radiation, low angle of the Sun, significant variation in length of days, and low level of vegetation growth.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. why is the Tropical Zone very warm?
2. why do most deserts of the World found in the Subtropics?
3. what is extreme climate?
4. why do polar areas very cold?

b) Follow up

- Order students to be in groups, and give them the questions listed above (one question for each pair). Let them draw and discuss the main characteristics of the four climatic regions.

4.6. Answer Key for Activities

Activity 2.2

Be in a group of five and discuss the characteristics of each one of the climate types in Koppen's classification scheme. What other classification schemes do you know?

For the first question, encourage the students to figure out the characteristics of each of Koppen's climatic types. The answer for the second question is that encourage the student' to search the internet and identify other climatic classifications made by other scientists such as by:

i. **Classification by C. W. Thornthwaite**

Thornthwaite, an American climatologist, presented his first scheme of classification of climates of North America in 1931 when he published the climatic map of North America. Later he extended his scheme of climatic classification for world climates and presented his full scheme in 1933. He further modified his scheme and presented the revised second scheme of classification of world climates in 1948. His scheme is complex and empirical in nature.

ii. **Classification by G.T. Trewartha**

Trewartha, an American climatologist, made several revisions and modifications in the scheme of climatic classification of Koppen since

1930s and ultimately presented his simple scheme of climatic classification having a blending of both empirical and genetic schemes of classification of world climates.

2.2. CLIMATE TYPES AND ZONES OF AFRICA

2.2.1. Types and Characteristics of Climate Zones in Africa

Periods Allotted 2

1. Competencies

- *describe the major climate types and regions of Africa.*

2. Contents

- Types and Characteristics of Climate Zones in Africa

3. Overview

The climate of Africa is characterized by a range of climates such as the **equatorial** climate, the **tropical wet** and **dry** climate, the **tropical** monsoon climate, the semi-arid climate (semi-desert and steppe), the desert climate (hyper-arid and arid), and the subtropical highland climate. Temperate climates are rare across the continent except at very high elevations and along the fringes. In fact, the climate of Africa is more variable in rainfall amount than in temperatures, which are consistently high. African deserts are the sunniest and the driest parts of the continent, owing to the prevailing presence of the subtropical ridge with subsiding, hot, dry air masses. Africa holds many heat-related records: the hottest extended region year-round, the areas with the hottest summer climate, the highest sunshine duration, and more.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Maps related to Africa (e.g., you may use Figure 2.4 to show the students the concepts related to the climatic zones of Africa).

- Use Figure 1.21 (Map for Exercises) to concentrate on Africa or parts of Africa.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion (group discussion)
- Demonstration
- Jigsaw
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps to explain the various climatic regions of Africa.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- which factors determine the types of climates in Africa?
- what are the factors that control climate of Africa?

b) Body of the Lesson

- Explain the characteristics of the climate of Africa.
- Discuss the role of the position of Africa, especially its location along the Equator, in determining its climate.
- Explain the apparent movement of the Sun – north and south of the Equator, in determining the variations in climate of Africa.
- Locate and describe the eight climate zones of Africa:

  ➲ *The Equatorial Climate;*

- *The Tropical Wet-And-Dry Region;*
- *Semi-arid Climatic Region;*
- *The Hot Desert Climatic Region;*
- *Mediterranean Climate;*
- *The Warm Temperate East Coast climate;*
- *Warm Temperate Continental climate and*
- *The Mountain Climatic Region.*

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- Africa has very diversified climates.
- Africa's position across equatorial and subtropical latitudes in both the northern and southern hemispheres, different climate types can be found within it.
- Africa is the most tropical of all the continents.
- The climate of Africa is regulated by the apparent movement of the Sun between the two tropics (Tropic of Cancer and Tropic of Capricorn) and the associated movement of winds.
- **The Equatorial Climate** is characterized by; very high temperatures, and low diurnal range of temperature.
- **The Tropical Wet-and-Dry Region** is characterized by; covering very large area, has seasonal rainfall, and has double passage of the ITCZ, hence has double peaks of rainfall.
- **Semi-arid Climatic Region** is characterized by; being found at the fringe of tropical deserts, as hot as the deserts, but relatively wetter than the deserts.
- **The Hot Desert Climatic Region** is characterized by; little or no rainfall, found under the influence of dry continental tropical air masses, and having extremely high temperatures.
- **Mediterranean Climate** is characterized by; being found at the western coast of the continent, dry summer, and wet winter.
- **The Warm Temperate East Coast climate** is characterized by;

being found at the eastern coast of the continent, under the influence of warm ocean current (Mozambique), high summer temperature and low winter temperature.

- **Warm Temperate Continental climate** is characterized by; experienced in the interior of the continent, blown away by dry winds, and limited to South Africa.
- **The Mountain Climatic Region** is characterized by; climate modified by altitude, receives relief rainfall, windward part of the mountains receives high rainfall, leeward parts receive no rainfall or referred to as 'rain shadow' slopes.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. how many climatic zones can we find in Africa?
2. from the two climatic elements of rainfall and temperature, which one is more variable in Africa?
3. why is the diurnal range of temperature very small in the Equatorial climate?
4. which of the climatic zones referred to as 'Savanna'?
5. which of the climatic zones has the highest temperature?

b) Follow up

- Order students to be in groups, and give them a task on each climatic zones of Africa and describe the climatic zones).

4.6. Answer Key for Activities

Activity 2.3

What are the major types and zones of climate in Africa? Which factors determine the types of climates in Africa?

For the first question, let the students list the eight climate types found in Africa.

The answer for the second question the answer is given below.

Factors influencing the climate of Africa

Altitude: Climate changes with height above sea level. Areas near mountains receive heavy rainfall and low temperature, especially on the windward side.

Latitude: Climate changes as one moves away from the equator, north or south. The equator influences the occurrence of the Inter-Tropical Convergence Zone (ITCZ). This is in relation to the apparent movement of the overhead sun. Areas around the equator receive double maxima of rainfall and hot temperature between February and May and between September and November.

Relief: Highland areas act as barriers to prevailing winds. In such areas, there are differences between the conditions on the leeward side and the windward side. The leeward side receives little or no rainfall because it is in the rain shadow.

Vegetation: Areas with tropical rainforests receive heavy rainfall due to abundant moisture release through evapotranspiration. Hence, receive convectional rainfall.

Influence of human being: Due to human activities such as bush burning, swamp reclamation and deforestation, activities that lead to deforestation, hence such areas receive low rainfall and experience high temperature.

Activity 2.4

Explain the relationship between position of Africa and its climate types.

The position of Africa, especially its position across equatorial and subtropical latitudes in both the northern and southern hemisphere, is the main reason for the occurrence of several climatic types.

The continent mainly lies within the intertropical zone between the Tropic of Cancer and the Tropic of Capricorn, hence its interesting density of humidity. Precipitation intensity is always high, and it is a hot continent. Warm and hot climates prevail all over Africa, but mostly the northern part is marked by aridity and high temperatures. Only the northernmost and the southernmost fringes of the continent have a Mediterranean climate (see Figure 2.4).

The equator runs through the middle of Africa, as do the Tropic of Cancer and the Tropic of Capricorn, making Africa the most tropical of all the continents. Africa's position is relatively unique in the sense that it almost has a mirror image of climate zones to the north and south of the Equator regarding latitude. When considered in detail, the movement of air masses and their effects provide the basis for a division of the continent into eight climatic regions.

2.2.2. Factors Controlling Climate of Africa

Periods Allotted 2

1. Competencies

- *identify the factors that control climate of Africa*

2. Contents

- Factors Controlling Climate of Africa

3. Overview

There are several factors that influence the climate of Africa. These include angle of the sun, latitude, air pressure, wind system and the Intertropical convergence zone (ITCZ), major ocean currents, land, and water (maritime versus continental) influence, and altitude. These factors determine the amount of temperature and precipitation. Below is the description of each one of the factors.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Maps related to Africa (e.g., you may use Figure 2.2 to show the students the concepts related to the controls of climate).
- Use Figure 1.21 (Map for Exercises) to concentrate on Africa or parts of Africa.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Project work
- Problem based learning

- Problem based learning

  One of the factors controlling the climate of Africa is **angle of the sun**. Ask the students as how they experience the seasonal differences in angle of the sun in their local areas.

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps to explain the various climatic regions of Africa.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- what are the factors that control climate?
- how do the factors control climates?

b) Body of the Lesson

- Explain the factors that control climate of Africa.
- Discuss how each factor operates.

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

1. Latitude and its influence on Solar Radiation received influences climate

through the variations in the receipt of solar energy and temperature differences that it creates at different latitudes. Particularly, area near the equator receive high angle of the Sun hence have warm climate all the year-round.

2. Pressure Systems, Winds, and the Intertropical Convergence Zone (ITCZ)
   Located on about Latitude 30° North and South of the Equator are Sub-tropical High-Pressure Belts that dictate surface wind patterns and influence rainfall and temperature regimes on the continent. The Subtropical High-Pressure Systems on both sides of the Equator generate two wind systems that converge on the equator in a zone termed as Inter-Tropical Converge Zone (ITCZ).
3. Major Ocean Currents
   When ocean currents blow from low latitudes (near to the equator) towards higher latitudes (towards the pole) the currents carry warm ocean water into relatively cool regions. Such an ocean current is called Warm Ocean Current. Warm ocean currents have cooling effect on the bordering areas. Whereas, cool ocean currents have drying effect.
4. Distribution of Land and Water
   Large water bodies such as the Ocean and huge lakes modify climates in adjacent lands. In the continental interior, where there are no large bodies of water, temperatures get **very warm** in summer or during the day.

5. Altitude
   Since energy from the sun is transformed into heat on the surface of the earth, air temperature decreases with altitude at an average rate of 3.5 o F per 1,000 feet (6.4 ° C per 1000 meters) called the Lapse Rate. Because of this decrease in temperature with height, mountainous regions such as the Ethiopian highlands have very cool temperatures. Very high peaks such as Mountain Kilimanjaro located along the equator even have permanent snow cover.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. how does latitude affect the climate of Africa?
2. how does altitude affect the climate of Africa?
3. what is the effect of warm and cool ocean currents on the climate of adjacent areas?
4. is the ITCZ a high-pressure or low-pressure cell area?

b) Follow up

- Order students to be in groups, and give them a task on each factor which control the climate of Africa.

4.6. Answer Key for Activities

Activity 2.5

List down the factors that control climate of Africa. How do these factors control the continent's climate?

For the first question, let the students list the five controls of climate of Africa.

The answer for the second question the answer is given below.

1. **Latitude and its influence on Solar Radiation received influences climate through the** variations in the receipt of solar energy and temperature differences that it creates at different latitudes. Particularly, area near the equator receive high angle of the Sun hence have warm climate all the year-round.

2. **Pressure Systems, Winds, and the Intertropical Convergence Zone (ITCZ)**

   Located on about Latitude 30° North and South of the Equator are Sub-tropical High-Pressure Belts that dictate surface wind patterns and influence rainfall and temperature regimes on the continent. The Subtropical High-Pressure Systems on both sides of the Equator generate two wind systems that converge on the equator in a zone termed as Inter-Tropical Converge Zone (ITCZ).

3. **Major Ocean Currents**

When ocean currents blow from low latitudes (near to the equator) towards higher latitudes (towards the pole) the currents carry warm ocean water into relatively cool regions. Such an ocean current is called Warm Ocean Current. Warm ocean currents have cooling effect on the bordering areas. Whereas, cool ocean currents have drying effect.

4. Distribution of Land and Water

Large water bodies such as the Ocean and huge lakes modify climates in adjacent lands. In the continental interior, where there are no large bodies of water, temperatures get **very warm** in summer or during the day.

5. Altitude

Since energy from the sun is transformed into heat on the surface of the earth, air temperature decreases with altitude at an average rate of 3.5 ^{o} F per 1,000 feet (6.4 ^{o} C per 1000 meters) called the Lapse Rate. Because of this decrease in temperature with height, mountainous regions such as the Ethiopian highlands have very cool temperatures. Very high peaks such as Mountain Kilimanjaro located along the equator even have permanent snow cover.

2.3. BENEFITS OF CLIMATE FOR LIFE OF PEOPLE IN AFRICA

2.3.1. Climate and Agriculture in Africa

2.3.2. Climate and Health in Africa

2.3.3. Climate and Water Resources in Africa

Periods Allotted 2

1. Competencies

- *explain benefits of climate for life of people in Africa*

2. Contents

- Benefits of Climate for Life of People in Africa

3. Overview

Climate affects nearly every aspect of our lives from our food sources to our transport infrastructure; from what clothes we wear, to where we go for recreation. It has a huge effect on our livelihood, our health, and our future. People's settlement and living are hugely associated with climate types. For instance, some places are overpopulated due to the better climate and associated factors. On the other hand, regions of extreme climatic conditions like the deserts, rainforests, and the polar regions have fewer people. Climate plays significant role in people's lives by sustaining agriculture, creating healthy environment, and providing vital water resources.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Atlas related to Africa or Ethiopia to explain the significant roles of climate.
- Use Figure 1.21 (Map for Exercises) to concentrate on Africa or parts of Africa.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Debating
- Case study

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps to explain the various climatic regions of Africa.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- what is the benefit of climate for life of people?

b) Body of the Lesson

- Explain the role of climate on the lives of people.
- Discuss how climate fosters agriculture, creates a healthy environment, and sustains water resources.

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- Climate affects nearly every aspect of our lives from our food sources to our transport infrastructure; from what clothes we wear, to where we go for recreation.
- It has a huge effect on our livelihood, our health, and our future.

- Agriculture is the backbone of Africa's economy and it is the bases of livelihoods across the continent.
- Agriculture has always been deeply dependent on the weather, with farmers needing a steady mixture of sun, warmth, and rains to reliably produce the crops they need.
- Humans have understood the importance of climate to human health since ancient times.
- Africa is commonly described as a "climate-vulnerable" continent in which rainfall variability, hydrological extremes, and anthropogenic climate change have the potential to inflict significant harm on a large population.
- The level of streams, flow of streams/rivers, volume of underground water and the like all depend on types of climates and water availability.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period. Check the students' understanding of the lesson by asking them questions such as:

1. how does climate affect your life?
2. what is livelihood?
3. what is the contribution of agriculture to the economies of developing countries like Ethiopia?
4. why is Africa referred as 'climate vulnerable continent'?

b) Follow up

- Order students to be in groups, and give them a task on the effect of climate in their environments (their lived experiences).

4.6. Answer Key for Activities

Activity 2.6

Form a group of two, each group consisting of three students. Let the first group discusses on the benefits of climate to the life of the people of Africa while the second group discusses on the impacts of climate on the life of the people of Africa. Then, debate on the issue.

For the first part of the activity, organize the students into groups and let them come up with a debatable idea. Then facilitate the debate. Make sure that they have identified both the effects and impacts of climate in the lives of African people.

Activity 2.7

What are the benefits of climate to other physical and socio-economic aspects of Africa? Mention the role of climate in determining lifestyle, tourism development, fishing, and natural vegetation in the continent?

Climate, especially temperature and rainfall, affect the distribution and health of ecosystems. Hence, people largely depend on ecosystem services for making of agricultural tools, building houses, hunting, etc.

In many places in Africa, one can expect that climate may readily produce droughts or floods as an almost annual event, however, people might view the coming of the autumn as a very significant event. Thus, we might expect to see this reflected as a cultural veneration and desire to give thanks to God. Here you can mention several cultural events in Ethiopia after the big rainy season (e.g., *Irreecha, Enkutatash, Chembelala*, etc.).

Meanwhile, large number of tourists flow from northern Europe to mid latitude areas during harsh northern hemisphere winter seeking sunshine. Furthermore, in areas where desert climate prevails, there is less of a cultural tendency towards establishing permanent homes, farming the land and, accumulating lots of possessions. Here, the climate does not support that sort of fixed location or sedentary lifestyle. Hence, in such cultures you may find a more pastoralist lifestyle prevailing.

2.4. CLIMATE CHANGE AND ITS CHALLENGES TO AFRICA'S DEVELOPMENT VISION

Periods Allotted 1

1. Competencies

- *explain the major challenges of climate change on African development vision*

2. Contents

- Climate Change and its Challenges to Africa's Development Vision

3. Overview

Climate variability and climate change are interchangeably used in many cases. However, there is a clear demarcation between the two. Variability may be due to natural internal processes within the climate system or to variations in anthropogenic (caused by human) external forcing. In other words, climate variations occur with or without our actions. It is critical to assess precisely which human actions affect climate and those that do not. Climate change, on the other hand, is a change in the state of the climate system, identified by changes in the average conditions and the variability of its properties, that persists for an extended period, typically decades or longer, due to natural and/or anthropogenic processes and forcings.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Atlas related to Africa or Ethiopia to explain the significant roles of climate.
- Use Figure 1.21 (Map for Exercises) to concentrate on Africa or parts of Africa.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration

- Project work
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps to explain the various climatic regions of Africa.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- what is climate change?
- what is climate variability?

b) Body of the Lesson

- Explain the similarities and differences between climate change and climate variability.
- Describe the impact of climate change on people and environment of Africa.
- Discuss how climate change poses threat to the economic growth of Africa.

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- Climate change and climate variability are not similar and have different underlying causes.
- Variability may be due to natural internal processes within the climate system or to variations in anthropogenic (caused by human) external forcing.
- Climate change is a change in the state of the climate system

identified by changes in the average conditions and the variability of its properties that persists for an extended period typically decades or longer due to natural and/or anthropogenic processes and forcings.

- Africa is among the most vulnerable continents to climate change. The vulnerability of Africa results from the fact that it has:

  - ✓ weak adaptive capacity;
  - ✓ high dependence on ecosystem goods for livelihoods; and
  - ✓ less developed agricultural production systems.

- Climate change is already happening and represents one of the greatest environmental, social, and economic threats facing Africa.
- Climate change will have very strong impact on Africa's ability to achieve the Millennium Development Goals (MDGs) and the Africa Agenda 2063 goals. It will also have an increased impact on agriculture, water supply and demand, health, and political stability of Africa.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. how does climate change affect people's lives in Africa?
2. does climate change have socioeconomic impact?
3. what are some very vulnerable sectors to climate change?
4. why is Africa considered as 'the hardest hit' by the impacts of climate change?

b) Follow up

- Order students to be in groups, and give them a task on the impacts of climate change and the challenges of climate change to Africa's development.

4.6. Answer Key for Activities

Activity 2.8

What is climate change? How does climate change affect Africa's development vision?

Climate change is a change in the usual weather found in a place. This could be a change in how much rain a place usually gets in a year. Or it could be a change in a place's usual temperature for a month or season.

Climate change has severe impact on the African continent. It is now clear that climate change hits the most vulnerable hardest, hence, it contributes to food insecurity, population displacement and stress on water resources of the continent.

4.7. Answer Key for Review Questions

Part I. True or false

1. True 2. False 3. True

Part II. Multiple choice

4. E 5. C 6. D 7. B 8. B

Part III. Fill in the blank spaces

9. Warm Temperate East Coast climate region
10. The Equatorial climate region
11. Equator
12. The westerlies
13. Altitude/elevation
14. Convectional
15. Southwestern and northwestern tips

Part IV. Short Answer

16. The characteristics (parameters) we use to differentiate climate zones include:

- Temperature,
- The amount of rainfall,

- Latitude,
- Elevation (altitude),
- The presence of nearby mountains or major water bodies.

17. The equator runs through the middle of Africa as do the Tropic of Cancer and Capricorn making Africa the most tropical of all the continents. Africa's is relatively unique in that it almost has a mirror of climate zones to the north and south of the equator with regard to latitude.

18. The two major ocean currents that shape the coastal local climates of Africa are the warm (Mozambique current and Guinea current) and the cool (Benguela current and Canary current). These currents control local climate systems by dictating the temperature and moisture characteristics of wind of the coastal regions over which the winds below.

    Note to the teacher, please show the warm and cool ocean currents on a map (you can use figure 2.5).

19. The inter tropical convergence zone (ITCZ) is a low pressure belt where the trade wind of the northern and southern hemispheres converge (meet) forming a low pressure area around the equator. The ITCZ shifts with the seasonal movement of the sun across the tropics creating different climate types and zones.

20. Note to the teacher, please help the students to show the distribution of each climate zones on the map of Africa (you can use figure 2.4).

UNIT THREE

3. NATURAL RESOURCE BASE OF AFRICA

Periods Allotted: 12

1. Introduction

this unit deals on the natural resource base of Africa. Therefore, in the unit we examine Africa's natural resources endowment. Natural resources are parts of the environment that people can extract and exploit. The natural resources provide fundamental life support, in the form of both consumptive use and public-good services. However, the sustainable and wise use of natural resources is more important than the existence of the resources.

2. Learning Outcomes

By the end of this unit, students will be able to:

- *identify key natural resources of the world;*
- *describe the main drainage systems and water resources of Africa;*
- *identify the major soil types and mineral resources of the continent of Africa; and*
- *assess the main vegetation and wildlife of Africa.*

3. Main Contents

- Introduction
- Overview of Major Natural Resources of the World
- Major Drainage and Water Resources in Africa
- Main Types of Soils and Mineral Resources in Africa
- Major Vegetation and Wildlife of Africa

3.1. OVERVIEW OF MAJOR NATURAL RESOURCES OF THE WORLD

3.1.1. The Major Natural Resources of the World

Periods Allotted 2

1. Competencies

- *identify major natural resources of the world.*

2. Contents

- The Major Natural Resources of the world

3. Overview

The Earth is blessed with different natural resources. However, there are a select few that we rely on more than others. Natural resources provide fundamental life support, in the form of both **consumptive use** and **public good** services. Consumptive use is the use of resources in ways that reduce supply. Examples include mining and logging in a forest. Public good is a good that benefits many people whether they have paid for it or not.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Maps related to Africa (e.g., you may use Figures 1.21, to show the students the concepts related to the natural resources).
- Atlases showing resource distribution in the world can also be used as a reference in several topics in this unit.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Field trip or field work

- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps and tables to explain the resource bases of Africa or other resources in the world.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- what is natural resource?
- what are the types of natural resources?
- what is sustainability?
- why is it important to use the natural resources sustainably?
- what are some common natural resources of the world?

b) Body of the Lesson

- Define natural resource.
- Discuss the types of natural resources.
- Discuss the importance of sustainability and sustainable utilization of natural resources.
- Describe the importance, and distribution of major natural resources of the world:
  - *water;*
  - *air;*
  - *soil;*
  - *forest;*
  - *minerals; and*
  - *oil.*

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- Natural resources are parts of the environment that people **can (here it indicates that the utilization of natural resources requires ability)** extract and exploit (use or manipulate to one's advantage).
- Natural resources are categorized into two – **renewable** and **nonrenewable** resources.
- Our quality of life and survival depends on our ability to use, rather than abuse the environment.
- Sustainable use of resources is very important. Sustainable use refers to the use of resources in a *way* and at a *rate* that does not lead to the long-term degradation of the environment, thereby maintaining its **potential** to meet the needs and aspirations of present and future generations.
- Sustainable management of resources involves an effective utilization of the following key strategies.
    - *Sustainable management of land resources;*
    - *Maintaining and enhancing water resources;*
    - *Conserving and recovering biodiversity;*
    - *Enhancing skills, capacity, and engagement of people;*
    - *Protecting and enhancing the marine and coastal environment*
    - *Delivering high-quality planning that leads to effective action.*
- Natural resources provide fundamental life support, in the form of both consumptive use and public good services. Here is the list and basic features of the key natural resources that are extremely important to the existence of life on Earth.
- **Water**: although water is technically a renewable resource, the amount of fresh or drinkable water in the world is very small in amount. It is only about 2.5% of the total water available in the Earth (see Table 3.1). Most of the freshwater cannot easily be accessed since it is found underground or in a form of ice and snow in remote areas. In addition, water in seas and oceans is saline hence, it cannot

be directly used for household use and drinking purposes. In addition, **climate change** is affecting freshwater by reducing its availability for humans.

- **Air:** Air is more than oxygen. It holds moisture, forms the atmosphere, and regulates winds.
- **Soil:** Soil allows plants to grow. It is important for the growth of plants and trees. Soil is another natural resource that is threatened by pollution.
- **Forest:** Trees in forests produce oxygen and absorb carbon dioxide in the atmosphere, allow people to heat their homes, and source of wide varieties of medicinal plants. Moreover, forests are also home to incredible amounts of biodiversity, especially tropical rainforests.
- **Minerals:** Minerals are nonrenewable resources. They are either **metallic –** that can be melted to gain new products, or **nonmetallic** – a combination of minerals that do not produce new products by melting them.
- **Oil:** oil is very scarce natural resource. It is being depleted, that is, the remaining reserves of oil will last probably the next few decades.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. what is natural resource?
2. what are the types of natural resources?
3. How scarce is water?
4. why is it important to use the natural resources sustainably?
5. what are some common natural resources of the world?

b) Follow up

- Order students to be in pairs, and give them to debate on the idea that; "water is very scarce" and "water is abundant"
- Let the students discuss in groups the importance of sustainable use of natural resources.

4.6. Answer Key for Activities

Activity 3.1

Categorize the following resources into renewable and nonrenewable?

Wood, water, iron, oil, hydroelectricity, uranium and, the energy of the wind and sun

Renewable	Nonrenewable
Wood	Iron
Water	Oil
Hydroelectricity	Uranium
Wind energy	
Sun energy	

Activity 3.2

Why is water so important? Think about how many things in your daily life require water and list them below.

To answer these questions, encourage students to mention the importance of water in their daily lives.

Activity 3.3

From the table above, extract freshwater sources of the world and discuss how scarce the resource is and what need to be done to effectively utilize the existing freshwater.

Freshwater sources	Measures for effective utilization
✔ Glaciers and permanent snow (1.739%) ✔ Predominantly fresh groundwater (0.76%) ✔ Freshwater lakes (0.007) ✔ Rivers (0.0002%)	✔ Wise use of available water resources. ✔ purify non-drinkable water into water safe for consumption through filtration methods.

Activity 3.4

Give some examples by which you can reduce air pollution.

Encourage the students to mention the things or actions they can take to reduce air pollution.

Activity 3.5

The teacher should facilitate for the students to discuss their roles in sustainable use of natural resources, and how they can minimize wastage and unwise use of resources.

3.2. MAJOR DRAINAGE AND WATER RESOURCES IN AFRICA

Periods Allotted 2

1. Competencies

- *Describe the locations of major natural resources of Africa.*

2. Contents

- Major Drainage and Water Resources in Africa

3. Overview

A drainage basin or watershed is an area of land where surface water from rain converges to a single point at a lower elevation. This usually appears

at the exit of the basin, where the main river joins another water body such as a river, lake, reservoir, estuary, wetland, sea, or ocean. Other terms which are alternatively used to describe a **drainage basin,** are catchment, catchment area, catchment basin, drainage area, river basin and water basin.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Map of drainage basin (Figure 3.1 and Figure 3.2).
- Use Figure 1.21 (Map for Exercises) for students to practice drawing drainage basins of Africa.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Debate

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps to explain the various climatic regions of Africa.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- what is a drainage basin?
- what are the major drainage basins of Africa?

b) Body of the Lesson

- Define drainage basin.
- Locate and describe the features of the six drainage basins of Africa:
  - *The Nile Basin;*
  - *The Congo Basin;*
  - *The Niger Basin;*
  - *The Zambezi Basin;*
  - *The Orange Basin; and*
  - *The Chad Basin*

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- A drainage basin or watershed is an area of land where surface water from rain converges to a single point at a lower elevation.
- **The Nile Basin:** is the longest river in the world, has sources of water from the leftwing and right wing from White Nile and Blue Nile, respectively. Eighty-six (86%) of Nile water comes from Ethiopia. If the Nile water is equitably shared among the countries in the basin, it has huge economic potential for every country in the basin. It comprises eleven basin countries.
- **The Congo Basin:** The Congo is the Earth's second largest river by volume in the world (next to the Amazon in South America). It is the second-longest river in Africa. The Congo is an important navigational system in Africa. Unlike other rivers of Africa, the Congo is accessible at all seasons due to its high volume of water content. The Congo River's hydroelectric potential is estimated at 100,000 MW, out of which 44,000 MW may come from the Inga site alone at the Inga Falls, in the Democratic Republic of Congo.
- **The Niger Basin:** The Niger basin is the largest river basin in western Africa. It is the third longest river in Africa. Irrigation is largely practiced inz the Niger valley.
- **The Zambezi Basin:** The Zambezi River experienced a headward

erosion. That is, the valley of the lower section eroded toward the headwaters until it captured the waters of the upper section. At the mouth of the main river, the Zambezi has a delta which is about 60 km wide. The Zambezi has a little importance for navigation because of natural barriers.

- **The Orange Basin:** The Orange River is the longest in South Africa. Its major tributary, the Vaal River, is one of its northern headwaters. Navigation is impossible throughout the river's course because of its irregular flow, its constant interruption by falls and rapids, and the silting that occurs in its channels and at the river mouth.
- **The Chad Basin:** The Chad basin constitutes the largest inland drainage area in Africa. The basin's main water body is Lake Chad. Its size varies seasonally from about 10,360 sq km to about 25,900 sq km. Lake Chad sits within the Sahel, a semiarid strip of land dividing the Sahara Desert from the humid savannas. Hence, it is being affected by high temperature of the region which leads to very high seasonal evaporation.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. can you list the countries in the Nile basin?
2. which region of Africa is devoid of drainage basin?
3. what the major drainage basins of Africa?
4. what are the unique features of the Congo River basin?
5. what problems do African drainage systems face?
6. what are some possible solutions to the problems?

b) Follow up

- Order students to be in groups, and give them the questions listed above (one question for each pair). Let them draw and discuss the main characteristics of the four climatic regions.

4.6. Answer Key for Activities

Activity 3.6

What do you think the Nile Basin countries should do to equitably share Nile water?

The Nile Basin countries must first believe that all basin countries have equal right of using the water resources in the basin. Then based on the principles of inalienable right of water use, and equitable use of water resources, as well as through negotiation in good faith the basin countries can equitably use the water resources.

Activity 3.7

What unique similarities and differences can you identify between Congo Basin and Nile Basin?

Both the Congo and Nile basins consist long rivers, and drain large areas. The river basins have large potential for hydroelectric power. In the contrary, the basins have differences such as, the fact that the Nile pass through dry region in northern Sudan and Egypt whereas, the Congo predominantly drain in the wettest part along the Equator.

Activity 3.8

What unique differences can you identify between Nile Basin and Niger Basin?

The Nile, with its 6,650kilometer length, is the longest river in Africa and the world. Whereas, the Niger is just the third longest river in Africa. Meanwhile, the Niger has more than three-fourths of its total length, is used by commercial shipping. Whereas, the Nile has limited function for commercial shipping.

Activity 3.9

What unique similarities and differences can you identify between Zambezi Basin and Congo Basin?

Both the Zambezi and Congo basins cover and drain very large areas. The river basins have large potential for hydroelectric power. In the contrary, the basins have differences such as, the Congo basin is more than twice as large as the Zambezi basin. Compared to Congo basin, the Zambezi has limited importance for navigation.

Activity 3.10

What important use of other river basins of Africa is absent in the Chad Basin?

Most river basins of Africa have huge hydroelectric power potential that is absent in Chad basin.

3.3. MAIN TYPES OF SOILS AND MINERAL RESOURCES IN AFRICA

3.3.1. Soils of Africa

Periods Allotted 3

1. Competencies

- *identify the main soils types in Africa*

2. Contents

- Soils of Africa

3. Overview

Soil is a complex mixture of weathered minerals, organic and inorganic compounds, living organisms, air, and water. Soil is a product of their interactions. Soil forming processes are dependent on these interactions. Processes are generally significant up to 1-2 m below the ground surface. The material below this depth is known as the soil parent material.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Maps related to Africa (e.g., you may use Figure 2.4 to show the students the concepts related to the soils of Africa).
- Use Figure 1.21 (Map for Exercises) to concentrate on Africa or parts of Africa.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Field work / field visit
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps to explain the various soil types of Africa.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- what is soil?
- what is soil parent material?

b) Body of the Lesson

- Explain the characteristics of soil.
- Discuss the role of soil forming processes.

- Explain the functions of soil.
- Describe the major soil types of Africa.

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- Soil is a product of the interactions of minerals, organic and inorganic compounds, living organisms air and water.
- The processes of soil formation are significant up to 1-2 m below the ground surface.
- Soil has also several key environmental, social, and economic functions that are vital to life on Earth. Functions of soil are:
  - *supplies water and nutrients to plants;*
  - *protects water supplies by storing; and*
  - *buffering and transforming pollutants.*
- The major soils types of Africa, based on the areas they cover, are:
  - *arenosols,*
  - *leptosols,*
  - *cambisols,*
  - *ferralsols, and*
  - *calcisols*

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. what mixtures make soils?
2. what do we call materials below 2m?
3. what are the functions of soil?
4. what are some limitations of soils to grow crops?
5. what are the traditional methods African farmers use to maintain soil fertility?

b) Follow up

- Order students to be in groups, and give them a task to draw or sketch the major soils of Africa on the map of Africa.

4.6. Answer Key for Activities

Activity 3.11

From the figures above (Figure 3.10), which soil types are largely found in Ethiopia?

- Leptosols, and cambisols are found in large areas of Ethiopia.

From the figures above (Figure 3.10), which of the soil types cover few areas in Ethiopia?

- Ferralsols cover few areas in Ethiopia.

By searching the internet, identify other soil types largely found in Ethiopia?

- Encourage students to search the internet to come up with the other soil types largely found in Ethiopia.

3.3.2. Mineral Resources of Africa

Periods Allotted 2

1. Competencies

- *identify the main soils types in Africa*

2. Contents

- Mineral Resources of Africa

3. Overview

Africa has huge mineral wealth because of its long geological history. The activities of mountains, rivers, volcanoes, lakes, and forests further consolidate the appearance of minerals. Ancient woodlands have been transformed over millions of years into fossil fuels such as petroleum, natural gas, and coal. The

courses of rivers and the disturbances of landforms have exposed to the surface deposits of metals such as uranium, iron, copper, zinc, and tin, as well as rock minerals such as phosphates. Africa's rocks, soil, and volcanic activities are the source of some of the world's greatest treasures – for example, platinum and cobalt.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Maps related to Africa (e.g., you may use Atlases that show mineral distribution in Africa).
- Table 3.2 Africa's leading mineral production and reserves.
- Use Figure 1.21 (Map for Exercises) to concentrate on Africa or parts of Africa.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps, charts, and atlases to explain the distribution of mineral resources in Africa.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- how are minerals formed?
- can minerals be exposed to the surface of the Earth?

b) Body of the Lesson

- Explain the processes involved in the formation of minerals.
- Discuss the mineral wealth of Africa.
- Explain the problems African countries faced to utilize mineral resources.

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- Africa has huge mineral wealth.
- Africa has both metallic and nonmetallic mineral resources.
- Many African countries are very rich in mineral resources. South Africa and D.R. Congo are highly endowed with many minerals. They rank either first or second in the production of some of the most important minerals in the world, and have large reserves.
- Africa has not effectively utilized its potential of mineral resources; hence, it could not benefit the peoples of the continent.
- The sector suffered from poor management, lack of investment money, low selling prices, political turmoil, outdated machinery, and general neglect of the sector.
- Exporting raw minerals and lack of interindustry linkage greatly affects the mining sector in Africa.
- Grassroots and small companies engaged in the mining sector could hardly compete with big companies operating in the sector in Africa today.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. how resourceful is Africa in minerals?
2. what are some minerals Africa is the leading producer in the world?
3. which African countries are known for their mineral wealth?
4. why Africa could not benefit from its mineral wealth?

b) Follow up

- Order students to be in groups, and give them a task to debate on the ideas that "mineral resources are the sources of problems for Africa, and the contrasting ideas that the mineral resources are sources of economic growth of Africa."

4.6. Answer Key for Activities

Activity 3.12

List the problems Africa faced in the utilization of its mineral resources	Provide possible solutions to effectively use the mineral resources
✔ poor management, ✔ lack of investment in the sector, ✔ low commodity prices in the world market, ✔ political turmoil, ✔ outdated machinery, and ✔ general neglect to the sector.	✔ proper management of resources, ✔ building governments' capacity to manage resources ✔ sovereign exercise of contract and negotiation in mining licenses ✔ Improved infrastructure (transport and power) and a legal business environment ✔ Informed decision, well-informed governments perform well in negotiations

3.4. MAJOR VEGETATION AND WILDLIFE OF AFRICA

Periods Allotted 3

1. Competencies

- *demonstrate the major vegetation and wild life distribution areas of Africa.*

2. Contents

- Major Vegetation and Wildlife of Africa

3. Overview

Vegetation is the general term we use to refer to living plants – the trees and grasses that cover the earth's surface. Biologically, vegetation is known as flora. The plant communities such as forests, shrubs and grasses are distributed across the surface of the earth. The plant communities contain different plant associations such as deciduous broadleaves, and evergreen broadleaves. They are usually found in similar environments.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Map of Africa showing the distribution of vegetation and wildlife (Figure 3.12)
- Atlas related to Africa show vegetation distribution in the continent.
- Use Figure 1.21 (Map for Exercises) to concentrate on Africa or parts of Africa.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Field work
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps to the distribution of Africa vegetation in Africa.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- what is the similarity between the map of climate of Africa and its vegetation?
- how diverse is Africa possession of wildlife?
- what are some endemic animals to Africa?
- where are the major national parks concentrated in Africa?

b) Body of the Lesson

- Explain the role of climate on vegetation distribution.
- Discuss the different categories and types of vegetation in Africa.
- Discuss the diversity and wealth of wildlife in Africa.
- Show the pictures of some endemic animals of Africa.
- Explain why most of the national parks in Africa are found in the Savanna region.

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- African has diverse wildlife than any other continent.
- The diversity and wealth of wildlife found in Africa is the result of diverse climate of the continent – that ranges from intense heat to bitter cold.
- Its varied vegetation has given rise to a wide range of animals, including mammals, birds, reptiles, fish, and insects.
- Africa is inhabited by the world's fastest land animal **cheetah**, the biggest bird **ostrich,** and the largest land animal **elephant**.
- Africa is home to an astonishing variety of **mammals**.
- Some of the mammals that live in Africa are endemic to Africa. That include *Walia ibex*, Nyala, giraffes, hippopotamuses, jumping

hares, and the long-snouted, insect-eating tenrecs of Madagascar, and aardvark.

- Nearly 2,000 species of birds spend at least part of each year in Africa. Most of the birds are migratory.
- A great many **reptiles** and amphibians creep, slither, or hop along Africa's varied terrain.
- There are countless of species of **insects** in Africa.
- A wide variety of **marine life** exists off the coasts of Africa, and the continent has more kinds of freshwater fish than any other – about 2,000 species.
- Many African governments have established national parks to protect the wildlife from human impact, and other purposes such as for scientific study, and educational and recreational opportunities for both local people and visitors.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. why does Africa possess large diversity of wildlife?
2. what are some unique mammals found in Africa?
3. what are some endemic mammals found in Ethiopia?
4. many bird species spend part of a year in Africa, where do they spend the rest of the time?
5. why do insects referred to as 'pests'?
6. what is the largest national park in Africa?

b) Follow up

Order students to be in groups, and give them a task on:

- Debate on why Africa has large diversity of wildlife.
- List unique mammals found in Africa.
- List the endemic mammals found in Ethiopia.
- Debate on the migration of birds – where and why the birds move away from Africa seasonally.
- Discuss why the Savanna region has many national parks.

4.6. Answer Key for Activities

Activity 3.13

Which of the mammals mentioned in the text and Figures above are found in Ethiopia?

- Nyala and Walia ibex are endemic to Ethiopia.

4.7. Answers for Review Questions

Part I. Matching

1. C 2. B 3. A 4. D 5. E

Part II. Multiple choice

6. D 7. C 8. C 9. D 10. B

Part III. Short answer type

11. Natural resources are parts of the environment that people can extract and exploit;

    i. Based on the above statement, does natural resources utilization require ability?

Answer

Natural resources are often viewed as key assets driving development and wealth

creation. Over time and with progressive industrialization, resource use increased. In some cases, exploitation levels came to exceed resources' natural regeneration rates. Such overexploitation ultimately threatens the livelihoods and wellbeing of people who depend on these resources, and jeopardizes the health of ecosystems. Hence, people have come to the point of over exploitation of natural resources from a very low level of utilization (e.g., hunting and gathering, or use of archaic tools made from stones, etc.) through the advancement of their capabilities or abilities to use the resources.

12. Note to the teacher, ask the students (possibly in groups) to identify natural resources found in the local areas (e.g., Kebele, or Woreda).

13. As indicated in Table 3.1 freshwater is very scarce resource. The vast percentage of water found on the earth is saline (salty), and it constitutes 96.5%. This means it cannot be directly utilized, and the desalination process requires huge capital and advanced technology. Meanwhile, the freshwater found on the earth is 2.5% and most of it (98.8%) is inaccessible for human immediate use. It is found in a form of snow or underground away from the reach of the world's major population settlement areas, or requires technology for digging.

14. Major uses of the rivers of Africa include:

    i. river water is used for both industrial and domestic purpose. Water supply to many urban areas is pumped from rivers;

    ii. water from rivers are suitable for irrigation since they are fresh water;

    iii. rivers can be used to transport people and goods (navigation). Navigable rivers or their section are used as transportation routes. In Africa the rivers Congo and the Nile are navigable;

    iv. some rivers provide port facilities, especially in their rias (a long, narrow inlet formed by the partial submergence of a river valley) and estuaries. These drowned river mouths are deep and sheltered and therefore suitable for port development. Port Gentil on river Ogoye in Gabon and port Harcourt on Niger are examples of ports that have been developed on river mouth in Africa;

    v. Some rivers can be used as fishing ground. Fishing is also carried

rivers such as Niger and Nile in Africa; and

vi. waterfalls gorges, meanders, and those made by people like dams and water reservoir are a tourist attraction.

15. Note to the teacher, organize the debate on the issue, “why Africa is the poorest continent while having abundant water and natural resources”.

UNIT FOUR

4. POPULATION OF AFRICA

Periods Allotted: 12

1. Introduction

In the previous unit, you have learned about the natural resource base of Africa, such as drainage systems, soils, natural vegetation, wildlife, and mineral resources. This unit deals with population and demographic characteristics of Africa. The major topics to be covered include the trends of population growth in Africa, population characteristics such as birth rates and death rates, population composition and methods of presenting sex and age distribution using population pyramids, population density, and settlement patterns of Africa's population

2. Learning Outcomes

By the end of this unit, students will be able to:

- *analyze the demographic structure of the population of Africa;*
- *examine the population characteristics of the African continent; and*
- *describe the population distribution and settlement patterns in Africa.*

3. Main Contents

- Overview of World Population Growth and Size
- Africa's Major Demographic Trends
- Population Structure
- Distribution and Density of Africa's Population
- Urban and Rural Settlement Patterns in Africa

4.1. OVERVIEW OF WORLD POPULATION GROWTH AND SIZE

4.1.1. Global Population Trends

Periods Allotted 3

1. Competencies

- *describe the demographic characteristics of the world population*

2. Contents

- Global Population Trends

3. Overview

The Meaning of Population: The term population, in population studies, refers to the total number of human inhabitants of a specified area such as a city, country, or continent at a given time. Population Geography is concerned with the **spatial** analysis of the human population. It focuses on population-space relationships. It also emphasizes the interaction and interdependence between the human population and the physical environment.

World population growth accelerated after World War II when the population of less developed countries began to increase dramatically. Population growth and distribution differ significantly among the major regions. Asia, Africa, Latin America and the Caribbean all increased their share of the world population between 1970 and 2021. Asia's share of the world population rose from 58% to 61%, Africa from 10 to 13%, the Caribbean and Latin America from 8 to 9%. During the same period, the share of Northern America declined from 6% in 1950 to 5% in 1998, and Europe from 18% to 12%.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Map of the world to show world population distribution.
- Almanacs and atlases to show world population size.
- Graphs showing population distribution.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Debating
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps, almanacs, and atlases to describe the situation of world population size, and distribution.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- What is a population?
- Why do we study human population?
- Since when has the world's population rapidly increased?
- what is the most populous continent in the world?
- What the underlying factors for the rapid growth of Africa's population?
- What challenges does the rapid population growth pose on Africa?
- What are the components of population change?

b) Body of the Lesson

- Define human population.
- Discuss the importance of studying human population.
- Discuss the population size, distribution, and changes in Africa over different times.

- Discuss the underlying factors of population growth, and change.
- Explain the effects of rapid population growth in Africa.
- Describe the components of population change.

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- Population is the total number of human inhabitants of a specified area such as a city, country, or continent at a given time.
- Population is studied in different academic disciplines.
- Population studies yield knowledge that is important for planning particularly by governments, in fields such as health, education, housing, social security, employment, and environment conservation.
- Population growth and distribution differ significantly among the major regions.
- Africa has one of the world's largest populations. The continent is the world's second most populous next to Asia.
- Africa has one of the world's fastest-growing population.
- Africa's massive population growth in such a short period has also come with many interrelated challenges and opportunities.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. what is population?
2. what is the importance of studying about population?
3. why does the world's population rapidly increasing in the period since WWII?
4. what is the current Africa's percentage share of the world's population?
5. what were some historical factors which affected Africa and stagnated its population growth?

b) Follow up

- Order students to be in groups and debate on the advantage and challenges of large population size.
- Let the students discuss in pairs contrasting issues such as birth rates and death rates; fertility rates and mortality rates; and life expectancy and prevalence of diseases. Let them identify the impacts of each factors on population growth of decline.

4.6. Answer Key for Activities

Activity 4.1

1. Do you remember what you learnt about population change in your previous grades?

- Encourage students to respond to the question, write their ideas on the board, and remove the wrong ones.

2. Which demographic variables are responsible to bring population change in a given region or country?

- Demographic variables are responsible to bring population change are:

  - **Birth**
  - **Death**
  - **Migration** (out of a country or into a country)
    - Emigrate (leave one's own country to settle permanently in another country.
    - Immigrate (movement of people to a new destination in a country of which they are not natives or where they do not possess citizenship to settle as permanent residents).

Activity 4.2

1. Which continent has a very short period of population doubling?

- Now Africa has the shortest doubling time of its population since the continent is experiencing rapid population growth rate which is higher than 3% per annum.

2. Rapid population growth rate has adverse effects on the quality of life of the people. Explain briefly.

- Rapid population growth rate has the following adverse effects:
  - *Leads to uncontrolled urbanization, which produces overcrowding, destitution, crime, pollution, and political turmoil.*
  - *Rapid growth also outstrip increases in food production, and*
  - *Population pressure leads to the overuse of arable land and its destruction. Therefore, it adversely affects the quality of life of people.*

3. Clarify the relationship between growth rate and period of population doubling in a given country.

- Population growth rate is the rate at which population of an area increase in a year. Whereas population doubling time means the time it takes for a population of an area to increase by its current population size.

4.2. AFRICA'S MAJOR DEMOGRAPHIC TRENDS

Periods Allotted 3

1. Competencies

- *explain why the population of Africa has the structure it has now*

2. Contents

- Africa's Major Demographic Trends

3. Overview

Fertility Patterns: Fertility refers to the occurrence of birth in the human population. It is a natural positive factor that tends to increase the human population size. Demographers use different measures to analyze human fertility. In this section, the fertility patterns of Africa are discussed using measures of fertility like Total Fertility Rate and Crude Birth Rates.

Total Fertility Rate (TFR): is the average number of children a woman would give birth to during her lifetime if she were to pass through her childbearing years (15-49 years) experiencing the present-day age-specific fertility rates.

Crude Birth Rate (CBR): is the number of live births occurring among the population of a given geographical area in a given year, per 1,000 mid-year total population during the same year.

Future Fertility and Mortality Trends: In projections to 2030, the African population is expected to peak at 1.6 billion from 1.0 billion in 2030 (Figure 4.3), which would represent 19% of the world's population. Asia and Latin America will account for 58% and 8%, of the world population, respectively. These projections rely upon assumptions about vital fertility and mortality rates. The fertility rate is assumed to decline at a varying pace by country and follow a trajectory similar to the one in other major global areas.

Meanwhile, the mortality trend of Africa is also showing a declining trend. Africa's death rate is declining since World War II. This happened due to development in medical technology, and sanitary practices, and the discovery of medicines and vaccines for tropical diseases. Moreover, mortality rates are generally poised to improve over the coming decades as communicable diseases in Africa continue to be addressed, although malaria remains endemic in most African countries and continues to represent a major cause of morbidity and mortality.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Map of the world to show world population distribution.
- Almanacs and atlases to show world population size.
- Graphs

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps, almanacs, and atlases to describe the trends in fertility, mortality, and life expectancy.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- What is a fertility?
- What will happen to fertility in Africa in the future? Will it increase, decrease, or remain constant in the future?
- What will happen to mortality in Africa in the future? Will it increase, decrease, or remain constant in the future?
- Will people of Africa live longer, as do the people of Europe and North America?

b) Body of the Lesson

- Define each demographic trend – fertility, mortality, and life expectancy.
- Give formulas for computing:
  - *Crude Birth Rate (CBR)*
  - *Crude Death Rate (CDR)*
  - *Infant Mortality Rate (IMR)*
  - *Maternal Mortality Ratio (MMR)*
- Explain the means of analyzing the fertility pattern, i.e., how total fertility rate, and crude birth rates are used in the analyses of fertility pattern.
- Discuss why future trends of fertility and mortality keep declining. In the meantime, explain why Africa has still have relatively high death rate.

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- Fertility refers to the occurrence of birth in the human population. It is the main factor for the increase of population size. The following are measures of fertility.
  - **Total Fertility Rate (TFR)***: is the average number of children a woman would give birth to during her lifetime.*
  - **Crude Birth Rate (CBR):** is the number of live births occurring among the population of a given geographical area in a given year, per 1,000 mid-year total population during the same year.
- There is still relatively high birth rate in Africa compared with other regions of the world due to:
  - *low standard of living;*
  - *low access to health facilities;*
  - *poor sanitary practices;*

- *civil war and political instability;*
- *widespread famine caused by recurrent drought;*
- *poor nutrition; and*
- *high incidence of disease and infections.*

- Hence, Africa's population is expected to grow, and reach 1.6 billion by 2030.
- Mortality refers to the occurrence of death in the human population. It is a natural negative factor that tends to decrease the human population size. The following are measures of mortality.

  - **Crude Death Rate (CDR)** is the number of deaths occurring among the population of a given geographical area during a given year, per 1,000 mid-year total population of the given geographical area during the same year.
  - **Infant Mortality Rate (IMR)** is the death of an infant before his or her first birthday. It is measured as an annual number of infant deaths for every 1,000 live births during the same year.

- **Life Expectancy** refers to the number of years a person can expect to live. Life expectancy is based on an estimate of the average age that members of a population group will be when they die.
- **Life expectancy at birth** is the average number of years a newborn infant can be expected to live under current mortality levels.
- The relatively high death rate, even though it is decreasing, in Africa is attributed to:
  - *low standard of living;*
  - *low access to health facilities;*
  - *poor sanitary practices;*
  - *civil war and political instability;*
  - *widespread famine caused by recurrent drought;*
  - *poor nutrition; and*
  - *high incidence of disease and infections.*
  - *The current birth and death rates of Africa reflect a very young (and economically dependent) population with relatively low life expectancy.*

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. what is total fertility rate?
2. What is the pattern of fertility in Africa? Is it increasing or decreasing across time?
3. What major factors are affecting the level of fertility in Africa?
4. why do African countries experience high fertility?
5. what are the main factor for the high birth rate in Africa?

b) Follow up

- Order students to be in groups and debate on the advantage and disadvantages of high fertility level of the continent.
- Let the students discuss in pairs why it is important to reduce both the fertility and mortality levels in Africa.

4.6. Answer Key for Activities

Activity 4.4

1. Africa's population growth rate is the highest in the world. What will happen if Africa's population growth rate continues in such a manner?

The continued high population growth rate will put high pressure on the resources. The available resources will be consumed by the current generation and the future generation lacks the means to sustain. Furthermore, high population may lead to environmental degradation, and to the acceleration of climate change.

2. Some developed countries' population growth rate is stagnant. The old-age population number is growing from time to time. What sort of implication will this bring upon the socio-economic condition of these countries?

Very large old age population of most developed countries will have significant socioeconomic impacts on the economies of the countries. It forces governments to invest large sum of money on healthcare as well as paying pension to the old age population.

4.3. POPULATION STRUCTURE

Periods Allotted 3

1. Competencies

- *demonstrate distribution patterns of African population using graphs, pie charts, line and map.*

2. Contents

- Population Structure

3. Overview

The age structure of the given population can be expressed by the distribution of population into young, working, and old age groups. Thus, Africa is characterized by young age population. The age structure of the population can also be expressed from the median age perspective. If the median age is low, it implies that the population is young. For example, Africa's median age is 19.7 years by the mid of 2020. In contrast, if the median age is high, the population is considered as dominantly adult and old age group. For example, the median age for Europe is 42.5 years by the mid of 2020. Low median age reflects high fertility and high population growth rates whereas high median age prevails in a population where the growth rate is low and slow. Another variable that expresses population structure is sex ratio. It refers to the proportion of males to females in the overall population of an area. Population structure is also graphically shown using population pyramid.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Map of the world to show world population distribution.
- Almanacs and atlases to show world population size.
- Graphs showing population pyramids of different countries.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Debating
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps, almanacs, and graphs to describe population structure of different countries.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- How can population structure be expressed?
- How can age structure be expressed?
- Which age structure has large working age population?
- What is age dependency ratio?
- What is sex ratio?
- What are types of pyramid?

b) Body of the Lesson

- Define population structure.
- Explain age structure, specially its impact on working age population.
- Discuss the impacts of young population on the economy of African countries.
- Explain the impact of sex ratio on other demographic variables, such as its impact on marriage, fertility, occupational structure, etc.
- Describe the types and importance of population pyramid.

c) Stabilization

Review the main ideas and concepts of the lesson. Mention the following points:

- Population structure can be expressed using age structure, sex structure and population pyramid.
- The age structure of a population can be expressed by the distribution of population into young, working, and old age groups.
- Africa is characterized by young age population.
- The age structure of a population can also be expressed from the **median age** perspective.
- Low median age implies young population, whereas, high median age reflects adult and old age population.
- Africa has high young population, and very low old age population. High level of fertility and rapid population growth resulted in a youthful age structure in Africa.
- The age structure of Africa puts pressure on resources, hence, the demand for food, education, health facilities, employment opportunities, and other services increases. This in turn greatly affects economic development of the respective countries of the continent.
- Sex ratio is the proportion of males to females in the overall population of a given area. The sex ratio is expressed in terms of the number of males for every 100 females.

$$Sex\ ratio = \left(\frac{number\ of\ male\ population}{number\ of\ female\ population} \right) x100$$

- It has impact on demographic elements such as marriage rate, fertility, occupational structure, growth, etc.
- A population pSseyramid is designed to give a detailed picture of the age-sex structure of a population, indicating either single age or 5-year groups, or other age combinations.
- Types of Population Pyramids are:
  - **Stationary Pyramid** – *shows an unchanging pattern of fertility and mortality.*
  - **Expansive Pyramid** – *broad base and tapering apex and common to developing countries.*
  - **Constructive Pyramid** - *shows lower numbers or percentages of younger people and growing population.*

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. how can population structure be expressed?
2. which age structure is common to Africa?
3. why does Africa have high fertility and low old age population?
4. what challenges does the age structure of Africa have on the economy of the continent?
5. what is the importance of population pyramid?

b) Follow up

- Order students to be in groups and debate on the advantage and disadvantages young age population structure.
- Let the students discuss in pairs why it is importance of population pyramid.

4.6. Answer Key for Activities

Activity 4.5

1. Which continent is characterized by the highest percentage of the young population? Why?

   Africa is characterized by having the highest percentage of young population. This is because of the rapid rate of population growth. This in turn is the result of high fertility rate of the people of the continent.

2. Explain briefly the impact of having a high percentage of the young population on socio- economic changes.

   High proportion of young population in a country or continent has huge socioeconomic impacts. Governments in those countries spend on few sectors of the economy, like education and agriculture, instead of balanced investment in every sector of the economy. Therefore, other sectors will greatly be hurt.

3. Why is a large elderly dependent population generally viewed as a problem?

   Large old age population or the elderly are generally viewed as a problem because the cares they need such as healthcare, social security and protection incurs governments large amount of money. Meanwhile, they are currently unproductive.

4.4. DISTRIBUTION AND DENSITY OF AFRICA'S POPULATION
4.5. URBAN AND RURAL SETTLEMENT PATTERNS IN AFRICA

Periods Allotted 3

1. Competencies

- *demonstrate distribution patterns of urban and rural settlement in Africa.*

2. Contents

- Urban and Rural Settlement Patterns in Africa

3. Overview

Population distribution refers to the way people inhabit and occupy the earth's surface. As elsewhere in the world, Africa's population distribution is **uneven**. As a result, there are areas of high and low population density. Some parts of the continent, particularly the vast Sahara, have few permanent residents. While others rank among the world's most densely populated areas. The Nile Valley of Egypt, Mauritius, Rwanda, and Burundi are among the most densely populated areas in the continent. In Africa there is huge spatial variation in population distribution. Factors such as climate, relief, availability of water, fertility of the soil, and distribution of minerals greatly affect population distribution in Africa.

Africa has quite a contrasting urban and rural settlements. Many east African countries are predominantly rural, whereas, some western and northern African countries have large proportion of urban population.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Map of Africa showing population distribution and density.
- Map of the world to show the world's urban and rural population.
- Almanacs and atlases to show urban and rural population.
- Graphs showing urban and rural population.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Debating
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps, almanacs, and graphs to describe population distribution, density and urban and rural population of different countries or regions of Africa.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- Why is population unevenly distributed across Africa?
- Where are some high population density areas in Africa?
- Where are some sparsely settled areas in Africa?
- What are some underlying factors of the spatial variation of population distribution in Africa?
- What is the most densely settled region in Africa?
- What is the most urbanized region in Africa?
- What is the least urbanized region in Africa?

b) Body of the Lesson

- Explain population distribution.
- Show on a map area of dense, and sparse settlement in Africa.
- Discuss why those areas have high population density, or low

population density.

- Show on a map areas or regions most urbanized and lest urbanized in Africa.

c) Stabilization

Review the main ideas and concepts of the lesson. Mention the following points:

- Population distribution refers to the way people inhabit and occupy part of the earth's surface.
- Africa's population distribution is uneven.
- Some parts of the continent have very sparse population density (e.g., the Sahara Desert).
- Some parts of the continent have very dense population density (e.g., Nile Valley of Egypt).
- Africa still has low population density of 44 persons per square kilometer.
- Both physical and socioeconomic factors determine the spatial distribution of population in Africa. These factors are; climate, relief, the availability of water, and economic opportunities and political stability, respectively.
- Small countries such as Mauritius, Rwanda, Burundi, Comoros, and Seychelles are among the most densely populated countries in Africa.
- Africa has quite great contrast of urban rural settlement in the world. Some areas have large proportion of urban population, whereas, large part of the continent is predominantly rural.
- Gabon is the most urbanized country (with 90% of urban population) and Burundi is the least urbanized (with 12% of urban population) in Africa.
- Regionally, Southern Africa is the most urbanized whereas, Eastern Africa is the least urbanized region with 62% and 26% of urban population respectively.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. why is the population of Africa unevenly distributed?
2. how much is current population density of Africa?
3. are the most populous countries of Africa also the most densely populated ones?
4. which region of Africa has the lowest population density?
5. what country has the least percentage of urban population in Africa?

b) Follow up

- Order students to be in groups and discuss the level of economic development and urbanization.
- Let the students discuss in pairs why Africa has very wide contrast in population distribution.

4.6. Answers to Review Questions (Unit Four)

Part I. True or false

1. False 2.True 3. True 4. False 5. True 6. False

Part II. Multiple choice

7. D 8. D 9. B 10. D

UNIT FIVE

5. MAJOR ECONOMIC AND CULTURAL ACTIVITIES OF AFRICA

Periods Allotted: 12

1. Introduction

In this unit, the students will learn about the way of life of the peoples of Africa. These include economic activities, social and cultural diversities in the continent. Africa is very resourceful region in the world. Nevertheless, the continent faces huge economic problems. Its economy is not as diversified as other diversities we find in the continent. Therefore, its people are largely engaged in primary economic activity.

Africa needs a very strong commitment to come out of the cycles of poverty, high unemployment, and economic problems. Specially, it must seek solutions to the problem of unemployment. Therefore, the leaders of Africa have come together and set goals called Agenda 2063. The agenda aims to foster economic development, political integration, improvements in democracy and justice, establishment of security and peace on the entire African continent.

Culture is a manifestation of socio-religious and economic condition, the standard of living, level of technology and people's environmental perception. It is abstract or intangible; however, it can be defined by elements like language, religion, ethnicity, rituals, customs, traditions, and tools. The society has the maximum bearing of **religion**. It is the religion which compels people to adopt certain kinds of economies, dresses, food habits, and beliefs. It also commands people to learn certain languages, and provides some restrictions at the time of cultural mingling. All other variables are directly or indirectly controlled by religion.

2. Learning Outcome

By the end of this unit, the students will be able to;

- *summarize the employment structure in the world;*
- *identify the major economic activities in Africa;*
- *identify the major cultural landscapes in Africa;*
- *describe linguistic and religious diversity of Africa;*
- *assess the pillars of Africa's Agenda 2063 and their implication for the socio-economic transformation of the continent; and*
- *compare and contrast the indicators of Agenda 2063 with those of Sustainable Development Goals (SDGs).*

3. Main Contents

- Introduction
- Overview of Employment Structure in the World
- Major economic activities in Africa
- Possible Solutions to the Problem of Unemployment
- Africa's Agenda 2063 and Its Implications
- Africa's Agenda 2063 Vis-À-Vis Sustainable Development Goals (SDGs)
- Linguistic and Religious Diversity in Africa

5.1. OVERVIEW OF EMPLOYMENT STRUCTURE IN THE WORLD

Periods Allotted 2

1. Overview

The employment structure of a country, a region or the whole world shows how the labor force is divided between primary, secondary, and tertiary economic activities. These three types are commonly used classification systems; while, quaternary is a newly emerging system, hence it is not included in the assessment of economies of countries. Different countries have different employment structures. Therefore, the employment structure of a given country can reflect many things about the country's economy.

2. Teaching Learning Process

2.1. Suggested Teaching Aids

- Map of the world showing the world's economic structure.
- Almanacs and atlases showing the world's economic data.
- Graphs showing the economic activities of different countries.

2.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Pair and group discussion
- Demonstration
- Problem based learning

2.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps, almanacs, and graphs to describe the economic activities of different countries.
- Prepare notes, activities, and exercises.

2.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- What is economic activity?
- How is the economic structure of countries classified?
- What is the different between primary and secondary economic activities?
- In which of the economic activities do most of the labor force of developing countries engage?
- Which economic activities characterize developing countries?

b) Body of the Lesson

- Define economic activity.
- Explain the economic structure of different countries.
- Discuss the impacts of young population on the economy of African countries.
- Explain the main features of the types of economic activities.
- Describe the economic bases of developing countries.

c) Stabilization

Review the main ideas and concepts of the lesson. Mention the following points:

- The employment structure of a country, a region or the whole world shows how the labor force is divided between **primary**, **secondary,** and **tertiary** economic activities.
- **Quaternary** is a newly emerging system, in most occasions it is included under **tertiary** activities.
    - **Primary** *sector involves extracting raw materials, rearing animals, and growing crops.*
    - **Secondary** *sector involves changing of raw materials into new products (finished products). Hence, it is called 'manufacturing'.*
    - **Tertiary** *sector involves activities of people in the service sector, such as education, health, tourism, and banking.*
    - **Quaternary** *sector is based on knowledge. It includes activities such as information and communication technology (ICT), research & development, education, financial planning, etc.*
- *Note that all countries of the world do not have the same economic structure, or share of these economic activities.*
- *Developed countries have more people who work in the tertiary sector, whereas, developing countries have more people engaged in the primary sector, particularly in agriculture.*

2.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. which economic activity dominates the economy of Ethiopia?
2. which economic activity is related to manufacturing?
3. in which income category do most sub Saharan African countries classified?
4. can countries in low income category ever move out of it and achieve the status if high income?

b) Follow up

- Order students to be in groups and debate on the obstacles and challenges developing countries face to move out of it and achieve other levels (lower middle, upper middle, or high-income levels)
- Let the students discuss in pairs the problems of high dependence on the primary sector.

2.6. Answer Key for Activities

Activity 5.1

1. The answer is "C"

   Both Slave Trade and Colonialism had an effect on Africa's economy in the historical past.

5.2. MAJOR ECONOMIC ACTIVITIES IN AFRICA

5.2.1. Economic Activities in Africa

Periods Allotted 2

1. Competencies

- *describe the major economic activities of Africa.*

2. Contents

- Economic Activities in Africa

3. Overview

Africa is home to about 1.3 billion people. Hence, it has large working age population. It is also a diverse continent offering human and natural resources which have the potential to yield inclusive growth and eradicate poverty in the region. Therefore, Africa has very good opportunities for economic growth and development. At present time, Africa is composed of low, lower-middle, upper-middle, and high-income countries. However, Africa faces huge economic hurdles created largely by its historical past, widespread conflicts and bad economic policies pursued by its inexperienced leaders. Nevertheless, economic growth should focus on enabling Africans to live healthier and prosperous lives by harnessing the potential of its resources and people.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Map of the world showing the world's economic structure.
- Almanacs and atlases showing the world's economic data.
- Graphs showing the economic activities of different countries.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration

- Debating
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps, almanacs, and graphs to describe the economic activities of different countries.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- How much is the current total population of Africa?
- Can Africa eradicate poverty?
- What are some of the historical past of Africa which affected its economy or development?
- What opportunities does Africa have for economic development?
- What are the challenges of relying on primary sector?
- What is the contribution of agriculture to the GDP of Africa?

b) Body of the Lesson

- Explain why Africa faces economic problems and why poverty is rampant in the continent.
- List the major economic activities in Africa.
- Discuss the challenges of primary sector.
- Explain the role of agriculture, mining, and forestry to the economy of Africa.
- Describe the potential Africa has in relation to secondary sector.
- Explain the linkage between the tertiary sector, and primary and secondary sectors.

c) Stabilization

Review the main ideas and concepts of the lesson. Mention the following points:

- Africa has large population size that can be an advantage for economic growth and development of the continent.
- In addition to large population size, Africa has huge mineral resources that can be an engine for growth of the economy of the continent.
- Africa largely depends on the primary sector or the extraction of basic materials from the natural environment.
- When an economy highly relies on the extraction of basic natural resources through mining, fishing, agriculture, and forestry it faces several challenges.
    - *Productivity and reliability in these industries* **vary** *because they depend on weather and natural elements (fertile soil, rain, no droughts, etc.).*
    - *Products of the natural environment are also dependent upon exchange rates and other industries to set their prices because the manufactures have more economic power than the producer of raw materials.*
    - *Primary sector workers often work for extremely low wages.*
    - *Moving out of the primary sector into the secondary sector is the hardest of all moves, as governments may not have enough money for investment in the manufacturing sector.*
- *Agriculture is by far the single most important economic activity in Africa. It is important as a source of employment and income.*
- *Mining is one of the major economic activities in Africa. Africa's huge mineral resources attracts investors to the sector.*
- *Africa is rich in forests and woodlands. Forests cover 20.6 percent of the continent's land area and 15.6 percent of the world's forest cover. Hence, forestry plays important role in the economies of many African countries.*
- *The secondary sector is made up of activities that process basic*

materials obtained by the primary sector, and turn them into new goods and products.

- *In Africa the secondary sector is growing at a rapid pace in recent decades, but Africa is not keeping up with worldwide improvements in the manufacturing industry.*
- *The tertiary sector consists of a range of service activities. Services related to transport, storage, communication, and real estate have shown significant improvement in Africa in recent decades.*

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. what is the advantage of large population size for economic growth?
2. how can mineral resources be an engine of economic growth?
3. why is reliance on the primary sector be a challenge?
4. what is the contribution of agriculture to the working population of Africa?
5. should forestry banned in Africa, can there be a problem to the people of the continent?
6. since secondary sector involves conversion of materials obtained from primary sector, why Africa does the economy of many African countries is dominated by the primary sector?

b) Follow up

- Order students to be in groups and debate on the idea of banning forestry and preservation of forests for future use.
- Let the students discuss in pairs the challenges of high reliance on the primary sector.

4.6. Answer Key for Activities

Activity 5.2

The answer is "E"

Tannery, as an economic activity tannery involves processing of hides and skins, hence, it is part of secondary activity.

Activity 5.3

Note to the teacher, please facilitate a debate group so that the students will argue for or against the importance of foreign aid for Africa. The teacher should assign students ahead of class so that they get prepared on either of the two topics. In class organize the students to debate on the two contrasting ideas.

1. Prepare a debate note on one of the following issues:

   i. Foreign aid is good for Africa.
   ii. Foreign aid is bad for Africa.

5.2.2. Major Factors Hindering Growth of Economy of Africa

Periods Allotted 2

1. Competencies

- *describe the major factors that hinder the economic growth of Africa.*

2. Contents

- Major Factors Hindering Growth of Economy of Africa

3. Overview

Several factors hinder the growth of African economy. Some of the problems include limitations in technological capabilities, overdependence on aids, poor economic structure, and poor education, among others.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Map of the world showing the world's economic structure.
- Almanacs and atlases showing the world's economic data.
- Graphs showing the economic activities of different countries.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps, almanacs, and graphs to describe the status of economy of Africa.
- Prepare notes, activities, and exercises.

4.4. 4.4 Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- Why is technology important for economic development?
- Is foreign aid good or bad thing for Africa?
- Why is it important to change the economic structure of Africa?
- What type of relationship does education have with economic development?
- What is poverty trap?

b) Body of the Lesson

Explain the factors that hinder Africa from economic development. Focus on:

- How technological limitations affect economic development.
- How over dependence on foreign aids affect economic development.
- How the poor structure of the economy is a problem for development.
- How poor education affects economic development.

c) Stabilization

Review the main ideas and concepts of the lesson. Mention the following points:

- Africa is on low level of economic development. Its economic growth has been hindered by; limitations in technological capabilities, overdependence on aids, poor economic structure, and poor education, among others.
- Technological capability, and innovation in science and technology brings significant changes in different sectors of economies of countries. The major difference between the developed and developing countries in the world is based on their difference in technological capabilities.
- Over-relying on foreign aid leads to the stagnation of the economy of a country. The main problem such as dependence on aid is that instead of engaging in activities that facilitate economic growth, the countries wait for aids to enhance their education and infrastructure.
- Since most African countries could not adopt improved science and technology, they have not changed their economic structures back from the time of independence. They are still exporting raw materials, without adding value to the primary products.
- Education promotes entrepreneurship by producing a skilled workforce. Therefore, it is very important for the development of a country.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. why is Africa at very low level of economic development?
2. why is the technological capability of Africa at low level?
3. why is over reliance on foreign aid bad thing?
4. why is it important for Africa to change its economic structure?
5. what is the advantage of education in economic development?
6. what should African countries do to come out of the poverty trap?

b) Follow up

- Order students to be in groups and debate on the advantages and disadvantages of **foreign aids**?
- Let the students discuss in pairs on how African countries can come out of the **poverty trap**.

4.6. Answer Key for Activities

Activity 5.4

1. "Unemployment rate serves as one of the indicators of a country's economic status". What can you infer from this statement about the economic status of Africa?

If we calculate unemployment rate for Africa, we would get large number. This is because there are large number of unemployed people and in the meantime, Africa has large number of people in the workforce. Therefore, we can conclude that the economic status of Africa is at low level of hiring the work force and there is serious problem of unemployment.

5.3. POSSIBLE SOLUTIONS TO THE PROBLEM OF UNEMPLOYMENT

Periods Allotted 1

1. Competencies

- *suggest possible solutions to the problems of unemployment in Africa.*

2. Contents

- Possible Solutions to the Problem of Unemployment

3. Overview

Employment is tied to wages or money that is paid regularly for doing work. If someone is employed, he/she has to be willing to work for the prevailing wage being offered to do the job. If someone is unemployed, he/she is unable to work or unwilling to do that same job. There are two ways of being unemployed.

- **Voluntary unemployment** occurs when a person is jobless by choice, rather than due to a lack of employment opportunities. Quitting a job because someone has just started his/her own small business is one example of voluntary unemployment.
- **Involuntary unemployment** occurs when a person is willing and able to work for a given wage but cannot find a job. When university graduates could not get a job, as the economy fails to hire, is an example of involuntary unemployment.

Unemployment affects both the workers and the economy of a country or region. It causes workers to suffer financial hardship. Then, it affects families, relationships, and communities. Therefore, problem of unemployment must be solved by the efforts of governments and the private sector.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Map of the world showing the world's employment status.
- Almanacs and atlases showing the world's economic data.
- Graphs showing the employment status of different countries.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Project work
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps, almanacs, and graphs to describe the status of employment in Africa and the world.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- Why does Africa have large unemployed population?
- What are the types of unemployment?
- Can someone voluntarily become unemployed?
- What is the effect of unemployment?
- What are the solutions for unemployment?

b) Body of the Lesson

Explain the features of unemployment. Focus on:

- People can voluntarily or involuntarily become unemployed.
- It refers to persons who are employable and actively seeking a job.
- Unemployment is measured by the formula of unemployment rate.
- Unemployment rate serves as one of the indicators of a country's economic status.

- **The effects of unemployment** – both the workers and the economy of a country can be greatly affected by unemployment.
- **Solutions for unemployment** – creation of more jobs, diversification of field of choice of individuals, and pursuing sustainable development.

c) Stabilization

Review the main ideas and concepts of the lesson. Mention the following points:

- Very large labor force is unemployed in Africa.
- Employment can earn individuals wages or means of living.
- Employed individuals are those willing to work a job by the prevailing wage.
- Unemployed individuals are those who are unable to work or unwilling to work for different reasons.
- There are two type of unemployment; voluntary and involuntary unemployment.
- Unemployment affects both the workers and the economy of a country or region.
- Solutions for unemployment include:
    - *The Creation of more Job Opportunities;*
    - *Encouraging individuals to enter to diverse fields; and*
    - *Pursing sustainable development.*

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. why is unemployment very high in Africa?
2. what is voluntary unemployment?
3. what is involuntary unemployment?
4. what is the effect of unemployment on an individual?

5. what is the effect of unemployment on a country?
6. what are the solutions for unemployment?

b) Follow up

- Order students to be in groups and discuss on types of unemployment.
- Let the students discuss in pairs on the solutions for unemployment.

4.6. Answer Key for Activities

Activity 5.5

Note to the teacher: ask the students their future ambitions.

5.4. AFRICA'S AGENDA 2063 AND ITS IMPLICATIONS

Periods Allotted 2

1. Competencies

- *describe Africa's Agenda 2063 and its implications.*

2. Contents

- Africa's Agenda 2063 and Its Implications

3. Overview

Africa has multiple socio-economic problems that need urgent solutions. To that end, African leaders have launched Agenda 2063. It is Africa's blueprint and masterplan for transforming Africa into the global powerhouse of the future. It is the continent's strategic framework that aims to deliver on its goal for inclusive and sustainable development and is a concrete manifestation of the pan-African drive for **unity**, **self-determination**, **freedom**, **progress,** and **collective prosperity** pursued under Pan-Africanism and African Renaissance.

The main aim of Agenda 2063 was to refocus and reprioritize Africa's agenda from the struggle against apartheid and the attainment of political independence for the continent (which had been the focus of the Organization of African Unity

(OAU), the predecessor of the African Union (AU)) and instead to prioritize on:

- inclusive social and economic development;
- continental and regional integration;
- democratic governance; and
- peace and security.

Agenda 2063 is the concrete manifestation of how the continent intends to achieve this vision within a 50 year from 2013 to 2063.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Almanacs and atlases showing the Africa's economic data.
- Graphs showing the Agenda 2063 of Africa.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Pair and group discussion
- Demonstration
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different almanacs, and graphs to describe the Agenda 2063 of Africa.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- What are some economic problems of Africa?
- Why did African leader launch Agenda 2063?
- What are the priorities of Agenda 2063 for the continent?
- What are the flagship programs of Agenda 2063?

b) Body of the Lesson

Explain the features and implications of Agenda 2063. Focus on:

- Agenda 2063 is Africa's blueprint and masterplan for transforming Africa into the global powerhouse of the future.
- It is the continent's strategic framework that aims to deliver on its goal for inclusive and sustainable development and is a concrete manifestation of the pan-African drive for **unity**, **self-determination**, **freedom**, **progress,** and **collective prosperity** pursued under Pan-Africanism and African Renaissance.
- The main aim of Agenda 2063 was to put priority on:
  - *inclusive social and economic development;*
  - *continental and regional integration;*
  - *democratic governance; and*
  - *peace and security.*
- The agenda has the following initiatives:
  - *renewed economic growth and social progress;*
  - *the need for people - centered development;*
  - *gender equality and youth empowerment; and*
  - *changing global contexts such as increased globalization and the ICT revolution.*
- The agenda has the following Flagship Programs:

1. Integrated high-speed train network
2. Formulation of an African commodities strategy
3. Establishment of the African continental free trade area (AfCFTA)
4. The African passport and free movement of people
5. Silencing the guns by 2020
6. Implementation of the Grand Inga Dam project

7. Establishment of a single African air transport market (SAATM)
8. Establishment of an annual African economic forum
9. Establishment of the African financial institutions
10. The pan-African e-network
11. Africa outer space strategy
12. An African virtual and e-university
13. Cyber security
14. Great African Museum
15. Encyclopedia Africana

c) Stabilization

Review the main ideas and concepts of the lesson. Mention the following points:

- Africa has multiple socio-economic problems that need urgent solutions. In order to solve the problems, African leaders have launched Agenda 2063.
- Its goal is to bring inclusive and sustainable development in Africa as well as to strengthen the **unity**, **self-determination**, **freedom**, **progress,** and **collective prosperity** of the continent.
- Agenda 2063 is the concrete manifestation of how the continent intends to achieve this vision within a 50 year from 2013 to 2063.
- It intends to boost the economic growth and development that leads to rapid transformation of the continent.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. why is Agenda 2063 important for Africa?
2. what are some basic principles of Agenda 2063?
3. what are some basic problems that Africans were collectively struggling against?

4. what are the key flagship programs planned African leaders in Agenda 2063?

b) Follow up

- Order students to be in groups and discuss on the aims, strategies, and programs of Agenda 2063 in Africa.

4.6. Answer Key for Activities

Activity 5.6

1. The headquarter of the African Union is in Addis Ababa, Ethiopia. The current (2021) chairperson of the union is the president of Congo Democratic Republic. Note that the presidency changes every year towards another member state.

Activity 5.7

1. Which of the Flagship Programs has already missed a target year?

Program 5. Silencing the guns by 2020, has already missed a target year. This is because there are so many unresolved armed conflicts in Africa today in 2021. Hence, the African leaders need to revise their plan in the future, that plan must be attainable.

2. Do you think that all the intended projects can finally be realized?

Obviously, some of the programs require strong political will and commitment of individual countries. But so many changing circumstances and international influences may hamper the attainment of all the intended programs.

5.5. AFRICA'S AGENDA 2063 VIS-À-VIS SUSTAINABLE DEVELOPMENT GOALS (SDGS)

Periods Allotted 2

1. Competencies

- *Compare and contrast Africa's Agenda 2063 and Sustainable Development Goals.*

2. Contents

- Africa's Agenda 2063 VIS-À-Vis Sustainable Development Goals (SDGs)

3. Overview

The goals of the Agenda 2063 are economic development, political integration, improvements in democracy and justice, the establishment of security and peace on the entire African continent. It aspires to the strengthening of cultural identity through an "African renaissance" and pan-African ideals. It also gives priority to gender equality and political independence from foreign powers.

The Sustainable Development Goals (SDG) or Global Goals are a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all". These goals provide a shared blueprint for peace and prosperity for people and the planet, now and into the future. SDGs recognize that ending poverty and other deprivations must go together with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.

The SDGs were set up in 2015 by the United Nations General Assembly and are intended to be achieved by the year 2030. They are included in a UN Resolution called the Agenda 2030 or what is simply known as Agenda 2030. The SDGs were developed in the Post-2015 Development Agenda as the future global development framework to succeed the Millennium Development Goals (MDG) which ended in 2015.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Almanacs and atlases showing the Africa's Agenda 2063 and Sustainable Development Goal data.
- Graphs showing the Agenda 2063 of Africa and Sustainable Development Goal.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Pair and group discussion
- Demonstration
- Project work
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different almanacs, and graphs to describe the Agenda 2063 of Africa and Sustainable Development Goals.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- What are the goals of Agenda 2063 of Africa?
- What are the goals of Sustainable Development Goals?
- What are the purposes of Sustainable Development Goals?
- What are the similarities and differences between Agenda 2063 and Sustainable Development Goals?

b) Body of the Lesson

- Explain the features and implications of Agenda 2063. Focus on:
- The goals of the Agenda 2063 are economic development, political integration, improvements in democracy and justice, the establishment of security and peace on the entire African continent.
- The Agenda 2063 tries to promote strong cultural identity of Africa through "African renaissance" and pan-African ideals.
- The Sustainable Development Goals (SDG) or Global Goals are a collection of 17 interlinked global goals designed to be a "*blueprint to achieve a better and more sustainable future for all*".
- SDGs recognize that ending poverty and other deprivations must go together with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.
- The SDGs are:

    - *Goal 1 No poverty: Eradicating poverty in all its forms and dimensions by 2030.*
    - *Goal 2 Zero Hunger: End all forms of hunger and malnutrition by 2030.*
    - *Goal 3 Good health and well-being: Connects health issues to sustainable development.*
    - *Goal 4 Quality education: Tries to ensure that all girls and boys complete free primary and secondary schooling by 2030.*
    - *Goal 5 Gender Equality: Ending all discrimination against women and girls.*
    - *Goal 6 Clean water and sanitation: Safe and affordable drinking water for all by 2030.*
    - *Goal 7 Affordable and clean energy: tries to ensure energy for all by 2030.*
    - *Goal 8 Decent work and economic growth: full and productive employment, and decent work for all women and men by 2030.*
    - *Goal 9 Industry, innovation, and infrastructure: tries to promote*

sustainable industries, and investing in scientific research and innovation.

- *Goal 10 Reduced inequalities: tries to improve the regulation and monitoring of financial markets and institutions, encouraging development assistance, and foreign direct investment to regions where the need is greatest.*
- *Goal 11 Sustainable cities and communities: tries to transform the way cities are built and managed.*
- *Goal 12 Responsible consumption and production: urges reduction in ecological footprint of individuals and companies by changing the way resources are produced and goods are consumed.*
- *Goal 13 Climate action: aims at supporting vulnerable regions, and integrating disaster risk measures, sustainable natural resource management, and human security into national development strategies.*
- *Goal 14 Life Below Water: aims to sustainably manage and protect marine and coastal ecosystems from pollution.*
- *Goal 15 Life on land: strives to take action to reduce the loss of natural habitats and biodiversity.*
- *Goal 16 Peace, justice, and strong institutions: tries to address the problem of lack of peace and security in countries and regions under sustained conflict.*
- *Goal 17 Partnerships for the goals: tries to promote strong global partnerships and cooperation.*

c) Stabilization

Review the main ideas and concepts of the lesson. Mention the following points:

- The goals of the Agenda 2063 are economic development, political integration, improvements in democracy and justice, the establishment of security and peace on the entire African continent.
- The Sustainable Development Goals (SDG) or Global Goals are a collection of 17 interlinked global goals designed to be a "*blueprint to achieve a better and more sustainable future for all*"

- These goals provide a shared blueprint for **peace** and **prosperity** for people and the planet, now and into the future.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. what is the aim of Agenda 2063 of Africa?
2. what are the goals of SDGs?
3. when was the SDGs set up?
4. which of the SDGs are similar with Agenda 2063 of Africa?

b) Follow up

- Order students to be in groups and discuss on the aims, strategies, and programs of SDGs.
- Order students to be in pairs and identify the similarities and differences of Agenda 2063 of Africa and Agenda 2030.

4.6. Answer Key for Activities

Activity 5.8

1. What are some of the basic similarities and differences between Africa's Agenda 2063 and Agenda 2030 of the SDG?

Both Agenda 2063 of Africa and the SDG intend to bring sustainable development, and they both are the result of common measures of countries or regions of the world. So, in that sense they are similar. The main difference between the two is that in Agenda 2030 the goals are more specific and measurable, whereas, in the case of Agenda 2063 the goals are broad and not measurable.

5.6. LINGUISTIC AND RELIGIOUS DIVERSITY IN AFRICA

5.6.1. Language Diversity in Africa

Periods Allotted 1

1. Competencies

- *identify the major cultural landscapes, and linguistic and religious diversity of Africa*

2. Contents

- Language Diversity in Africa

3. Overview

Africa has a long history of human habitation; hence, it is home to numerous cultural and linguistic groups. The African continent is home to one-third of the world's 6,000 languages, but less than one seventh of the world's population. Hence, Africa is the most linguistically diverse continent.

Many African countries are highly multilingual. There are more than 2000 living languages in Africa. A living language is simply a language that is still spoken in the current time. It is sometimes referred to as a modern language and is currently in use. A living language must have at least one speaker whose first language is the language in question.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Maps showing the Africa's religion and language distribution.
- Almanacs and atlases showing the Africa's religion and language distribution.
- Graphs showing the distribution of religions and languages.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Case study
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different almanacs, and graphs to describe the distribution of different religions and languages in Africa.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- How many languages are spoken in Africa?
- What does multilingual means?
- How many languages are spoken in Ethiopia?
- Which of the major religions of the world we do not find in Africa?
- Which African countries have high (very high and high) scores of religious diversity index?
- What is the religious diversity index of Ethiopia?
- Is religious diversity unique to Africa?

b) Body of the Lesson

Explain the main features of religious and language diversities in Africa. Focus on:

- Africa has a long history of human habitation; hence, it is home to numerous cultural and linguistic groups.

- Religions of the world vary in; organization, belief system, nature of belief in super natural power, the history of how the world and the religion began, and the use of sacred texts and objects.
- Religion has largely influenced the art, philosophy, and culture of Africa.
- *Long cultural contact, in degrees ranging from trade to conquest, has mixed some fundamental principles of the religions through generalizations, with indigenous religions of Africa.*
- *Many African countries have high scores of religious diversity index (RDI). Guinea Bissau and Togo with RDI 7.5 each and Ivory Coast (7.4), Benin (7.2) and Mozambique (7.0) are high religious diverse countries.*

c) Stabilization

Review the main ideas and concepts of the lesson. Mention the following points:

- Africa is the most linguistically diverse continent. Many African countries are highly multilingual.
- Nigeria has the largest number of languages in Africa.
- Africa is home to many religions and beliefs. It contains a mixture of both local beliefs and global beliefs.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.
Check the students' understanding of the lesson by asking them questions such as:

1. how many languages are spoken in Africa?
2. what is modern language?
3. how many languages are spoken in Ethiopia?
4. how do religions differ from each other?
5. do all religions have sacred texts?

b) Follow up

- Order students to be in groups and discuss on the linguistic diversities in Africa.
- Order students to be in pairs and identify countries with high (more) and less religious diversities in Africa based on Figure 5.3 (Map of Religious Diversity in the World).

4.6. Answer Key for Activities

Activity 5.9

Based on Figure 5.2 above, categorize the countries into three RDI score levels.

very high	high	moderate
Benin	Cameroon	Botswana
Guinea Bissau	Eritrea	Gabon
Ivory Coast	Nigeria	Ghana
Togo	South Sudan	Sierra Leone
	Mauritius	
	Tanzania	

4.7. Answers to Review Questions (Unit Five)

Part I. True or false

1. False 2. False 3. True 4. True 5. True 6. True

Part II. Multiple choice

7. D 8. C 9. A 10. C

UNIT SIX

6. HUMAN NATURAL ENVIRONMENT INTERACTIONS

Periods Allotted: 8

1. Introduction

In unit five the students have studied major economic and cultural activities in Africa. Hence, they learned that people use resources obtained from natural environment. Meanwhile, in unit six the students learn about why and how people interact with their environment while using the resources.

The world's population is rapidly increasing. Today over 7 billion people live on the planet. This Figure has far-reaching implications as humans put a huge impact on the natural environment. Therefore, providing space, food, and resources for a large world population in a sustainable way into the distant future is the most serious challenge. Africa, coupled with its low level of economic development and very rapid population growth rate, will be highly affected. However, this challenge can be overcome if natural resources are sustainably used. Besides, the environment allows humans to make certain modifications for their survival. Hence, humans have made significant changes to the environment in a way that suits them.

As the global human population continues to grow, so do human impacts on the environment. Therefore, sustainable, and equitable solutions are required to address the interconnected challenges of protecting the natural environment. In this regard the indigenous knowledge and good practices of the African people are very important.

2. Learning Outcomes

At the end of this unit, the students will be able to:

- *analyze why human beings depend on environment;*
- *explain how human beings modify the natural environment;*
- *identify humans' adaptation strategies to environmental changes; and*
- *elaborate the significance of indigenous knowledge and practices of African people in natural resources conservation.*

3. Main Contents

- Introduction
- Overview of global population change
- Human-environment Relationship
- Indigenous knowledge in conservation of natural resources in Africa

6.1. OVERVIEW OF GLOBAL POPULATION CHANGE

Periods Allotted 2

1. Competencies

- *compare and contrast pattern of population growth in Africa and other continents*

2. Contents

- Overview of global population change

3. Overview

Population change is the difference in the size of the population from the beginning to the end of a certain time. The change in the population also changes the composition of the population because of birth and death rates, sex ratios, life expectancies and migration rates. Meanwhile, population growth is the increase in the number of individuals in a population. The two factors involved in the increase in the number of individuals in a population are birth rate and migration into the population. On the other hand, the death rate, and the migration out of the population decrease the number of individuals in a population. Understanding these changes at different spatial scales (local, national, regional, and global scales) is very important for development planning.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Map of the world showing the world's population distribution.
- Almanacs and atlases showing the world's population data.
- Graphs showing the population densities of different countries.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Debating
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps, almanacs, and graphs to describe the world's population change.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- How does population size and distribution change?
- What is population growth?
- What is the advantage of understanding global population trend?
- How did the history of Africa affect the current population growth of the continent?
- When did the accelerated rate of population growth begin in the

world?

- Why is the world population growing so quickly?

b) Body of the Lesson

- Explain how population changes through time.
- Explain the composition of population.
- Discuss the effects of births, deaths, and migration on population.
- Explain the importance of understanding the changes in population at different spatial scales.
- Describe how countries and regions should make population at the center of development plan.
- Explain how historical past of Africa affected its population growth and distribution.
- Explain why the world's population is growing very rapidly.

c) Stabilization

Review the main ideas and concepts of the lesson. Mention the following points:

- Population change is the difference in the size of the population from the beginning to the end of a certain period of time.
- The change in the population also changes the composition of the population because of **birth** and **death** rates, **sex ratios**, **life expectancies** and **migration** rates.
- Understanding global population trends and anticipating the demographic changes to come is crucial to the achievement of development goals that countries, regions, or global communities plan.
- Countries experiencing rapid population growth, most of which are in sub-Saharan Africa, must provide **schooling** and **health** care to growing numbers of children, and ensure **education** and **employment** opportunities to increasing numbers of youth.
- The population of Africa had stagnated between 1500 and 1900 because of the impact of the **slave trade**, the disturbances to traditional

societies due to **colonization,** and the spread of deadly **diseases**.

- The twentieth century witnessed the "demographic explosion" of the developing world. Especially the sub Saharan Africa has witnessed huge population growth.
- There are also great changes in fertility rates and life expectancy in the world.
- Advances in modern **medicines** and improvements in **living standards,** and reduced infant, child and maternal mortality rates have played significant role in rapid population growth.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. how does population size increase or decrease from time to time?
2. how can population data help planners?
3. why had the population of Africa stagnated between 1500 and 1900?
4. what is the average global life expectancy in 2020?

b) Follow up

- Order students to be in groups and discuss the impact of Africa's history on its current population size and pattern of growth.
- Let the students discuss in pairs the challenges of rapid population growth.

4.6. Answer Key for Activities

Activity 6.1

1. Based on the Table 6.1, how many years will it take to double the population of Africa and Europe, respectively?

- Using the **Rule of 70**, we can calculate the doubling time population of an area. Based on the rule we divide 70 by the annual growth rate of the target population. Assuming the annual growth rates of the continents is the same as the rates indicated in Table 6.1 (in actual case may differ) we can calculate the doubling time as follows.

The doubling time of Africa:

Doubling time= 70/2.45= 29 years

The doubling time of Europe:

Doubling time= 70/0.01 = 7000 years

6.2. HUMAN-ENVIRONMENT RELATIONSHIP

6.2.1. Dependence on the Environment

6.2.2. Modification of the environment

6.2.3. Adaptation to the Environment

Periods Allotted 4

1. Competencies

- *identify different adaptation strategies to the local environment character*

2. Contents

- Human-environment Relationships

3. Overview

Environment is defined as the surroundings or conditions in which persons, animals, or plants live or operate. It is the natural world, as a whole or in a particular geographical area, especially as affected by human activity. It is also related to the ways people adapt and modify nature. Environment is the sum-total of substances or forces external to organisms that affects the organism's existence. It refers to all the external factors affecting an organism. It is a multidimensional system of complex relationships in a continuing state of change.

Every living thing on the Earth depends on the environment. The dependence is basically to obtain the essential resources for survival. Therefore, human beings depend on the environment such as air, water, food or shelter they obtain from the environment.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Local trips to a convenient place in the village or the city, near the school.
- Atlases showing the distribution of natural resources.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Discussion
- Demonstration
- Field trip
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps, almanacs, and graphs to describe human – environment relationship.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- Why do people need to adapt to the environment?
- What does adaptation to the environment require?
- What is adaptation response?
- what are some common adaptation types to environmental changes?
- Can humans modify every environment?

b) Body of the Lesson

- Explain when and how people adapt to the environment.
- Explain the requirements of adaptation.
- Discuss the importance of adaptation strategies and responses.
- Explain the types of adaptations to the environment.
- Describe how humans can and cannot modify the natural environment.

c) Stabilization

Review the main ideas and concepts of the lesson. Mention the following

points:

- People adapt to the environment when changes occur to the existing environment or when they move to a new environment.
- Adaptation, refers to an adjustment to a new environment to improve the chances of survival in that environment. The main purpose of the adaptation is to fulfill the needs and survival of people.
- Adaptation requires an **adjustment** in natural or human systems in response to actual or expected stimuli or their effects (for example, increasing temperature, flooding, etc.).
- The adaptation of human systems is a process which requires the engagement of a wide range of stakeholders.
- It also requires analysis of **current** exposure to different **shocks** and **stresses**, as well as analysis of future impacts of **environmental changes** (e.g., climate change, deforestation, desertification, etc.).
- Next to the analysis of impacts, **adaptation strategies** should be designed and implemented.

    - *Then it is followed by* **monitoring** *and* **evaluation** *of the effectiveness of activities planned. Finally, sharing knowledge and lessons learnt are the last part of the adaptation process.*
    - *There are two types of adaptations; autonomous and planned adaptations.*
    - *There are some environmental conditions, which humans cannot modify. Hence, they adapt to such conditions for their survival.*
    - *Every living thing on the Earth depends on the environment. The dependence is basically to obtain the essential resources for survival. Therefore, human beings depend on the environment such as air, water, food or shelter they obtain from the environment.*

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. what is environmental determinism?
2. what is environmental possibilism?
3. what are some changes that force people to make adaptations?
4. what would happen to someone who fails to adapt to new environment?
5. what are some adaptation strategies?
6. why is monitoring and evaluation important?

b) Follow up

- Order students to be in groups and discuss the importance of adaptation to a new or changing environment.
- Let the students discuss in pairs the challenges of adaptation to changing circumstances or the environment.

4.6. Answer Key for Activities

Activity 6.2

1. Which of the two thoughts – environmental determinism or environmental possibilism, do you support? Why?

Note to the teacher organize the students in groups to prepare a debate note on the two ideas ahead of time. Then organize the debate in a class.

6.3. INDIGENOUS KNOWLEDGE IN CONSERVATION OF NATURAL RESOURCES IN AFRICA

Periods Allotted 2

1. Competencies

- *appreciate indigenous knowledge*

2. Contents

- Indigenous knowledge in conservation of natural resources in Africa

3. Overview

Africa is endowed with rich and highly diverse biological (natural) resources. In addition to the well-known uses of the biological resources for food, the building of houses, etc. the African people highly depend on biological resources for medicinal purposes. The heavy reliance on plant medicine in Africa is attributed to their local availability, low price, acceptance by local communities and the low number of health care centers and medical professionals, especially, in rural areas. Therefore, since ancient times plant medicine is an important part of the health care system in Africa.

The African people have an enormous amount of knowledge about biodiversity and its uses. Such indigenous knowledge has been accumulated among indigenous peoples of the continent and has been orally transferred across many generations. Indigenous knowledge has been the basis for conservation of natural resources in Africa. Therefore, indigenous knowledge is valuable in managing environmental degradation and in the sustainable use of natural resources.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Local trips to a convenient place in the village or the city, near the school to a local elder.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Field trip
- Project work
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lesson:

- What is indigenous knowledge?
- What local examples do you know about indigenous knowledge?

b) Body of the Lesson

- Explain indigenous knowledge is diverse in Africa.
- Explain how African people used indigenous knowledge to protect the environment.

c) Stabilization

Review the main ideas and concepts of the lesson. Mention the following points:

- Africa is endowed with rich and highly diverse biological (natural) resources.
- *African people highly depend on biological resources for medicinal purposes. The heavy reliance on plant medicine in Africa is attributed to their local availability, low price, acceptance by local communities and the low number of health care centers and medical professionals,*

especially, in rural areas. Therefore, since ancient times plant medicine is an important part of the health care system in Africa.

- *The African people have an enormous amount of knowledge about biodiversity and its uses. Such indigenous knowledge has been accumulated among indigenous peoples of the continent and has been orally transferred across many generations. Indigenous knowledge has been the basis for conservation of natural resources in Africa. Therefore, indigenous knowledge is valuable in managing environmental degradation and in the sustainable use of natural resources.*

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. what is indigenous knowledge?
2. how can indigenous knowledge be used in the conservation of natural resources?

b) Follow up

- Order students to be in groups and prepare an essay on their local indigenous knowledge that the people have been using to conserve natural resources or the environment.

4.6. Answer key for Review Questions (Unit Six)

Part I. Multiple choice

1. D 2. C 3. C 4. A 5. B

Part II. Define key terms

6. Adaptation: is an adjustment to a new environment so as to improve the chances of survival in that environment.

7. Environment: the surroundings or conditions in which persons, animals, or plants live or operate.

8. Mortality: the occurrence of death in the human population.

9. Migration: the movement of people from one place to another.

10. Dependence: the state of relying on or being controlled by someone or something else to obtain the essential resources for survival.

Part III. Essay Question

11. Note to the teacher assign students in a group to write an essay on an exemplary (typical) indigenous knowledge of the people or community of their area in conservation of natural resources.

UNIT SEVEN

7. GEOGRAPHIC ISSUES AND PUBLIC CONCERNS IN AFRICA

Periods Allotted: 5

1. Introduction

In this unit the students learn main geographic issues that affect the peoples of Africa. One such issue is unplanned urbanization. It is a process of increasing around urban centers and the proportion of people living in that area. The increase in population pressure causes the surrounding areas of town to change in to urban areas. Hence, urbanization includes the urban area and the growth of population living there. Therefore, urbanization does not only denote the growth of the area of towns but also the growth of population. In big cities or small towns, there must be basic physical facilities like electricity, road, drinking water, communication, health, and education facilities. Such infrastructure can be found when effective management comes before rapid urbanization. But Africa is facing the problem of effective management.

Migration is the movement of people from one place to another; they do this to establish their permanent or semi-permanent residence at the destination. Immigration is an essential component of change and structure; whereas population growth, is related with birth rates and mortality. The causes of migration vary from the pure desire to experience life in another place to the obligation to move to avoid risks found in an area of origin. Africans are facing serious coastal pollution. The pollution of coastal waters can originate from land-based sources (industrial, municipal, agricultural run-off), shipping activity (accidental or deliberate discharges, garbage, and dumping). Therefore, this unit explores the nature and effects of unplanned urbanization, migration, and coastal pollutions in Africa.

2. Learning Outcomes

At the successful completion of this unit, the students will be able to:

- *explain the cause and consequences of unplanned urbanization in Africa;*
- *analyze the factors and impact of migration in Africa; and*
- *describe cause and effects of coastal pollution on African population.*

3. Main Contents

- Introduction
- Unplanned Urbanization
- Migration – Factors and Impacts on Africa
- Coastal Pollution in Africa

7.1. UNPLANNED URBANIZATION

7.1.1. Causes of Unplanned Urbanization in Africa

7.1.2. Consequences of Unplanned Urbanization

Periods Allotted 3

1. Competencies

- *explain the causes and consequences of unplanned urbanization.*

2. Contents

- Unplanned Urbanization

3. Overview

Urbanization refers to the population shift from rural to urban areas. It involves the corresponding decrease in the proportion of people living in rural areas. It also relates to the ways in which societies adapt to these situations. It is predominantly the process by which towns and cities are formed and become larger as more people begin living and working in them.

As cities grow in population size, spatial extent and density, their environmental and ecological footprints increase (i.e., human impact on the environment

increases). Urban expansion that takes place in forests, wetlands and agricultural systems leads to habitat clearing, degradation and fragmentation of the landscapes. Urban lifestyles, which tend to be consumptive, requiring great natural resources and generating increasing amounts of waste also lead to increased levels of air, water, and soil pollution. Therefore, unplanned urbanization is the root cause of damage to the environment and nature.

Though Africa is still largely rural, it is one of the fastest urbanizing regions around the world. Africa's urban population is expected to reach 1.3 billion in 2050. This accounts for 21% of the world's projected urban population. Currently, the continent has seven megacities, that is cities with populations over 10 million: Cairo, Kinshasa, Lagos, Accra, Johannesburg–Pretoria, Khartoum, and Nairobi.

The cost of living in urban areas is very high. Urbanization has a lot of effects on the living conditions of the habitants. Some of the consequences of unplanned urbanization are; the development of slums, poor infrastructure, prevalence of economic and health problems, social insecurity.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Map of the world showing the world's urban population.
- Almanacs and atlases showing the world's urban size data.
- Graphs showing the urban sizes of different countries.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Pair and group discussion
- Demonstration
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps, almanacs, and graphs to describe the world's

urban population.

- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lessons:

- What is unplanned urbanization?
- What is effect of the growth of cities on the environment and ecology?
- What is the advantage of urbanization?
- What are some key features of unplanned urbanization?
- What are the causes of unplanned urbanization?
- What is urban primacy?
- What are the consequences of unplanned urbanization?
- What are the characteristics of urban infrastructure in Africa?

b) Body of the Lesson

- Explain how population changes through time.
- Explain the causes and consequences of unplanned urbanization.
- Discuss the benefits urbanization brings to countries.
- Explain the impacts of rapid urbanization.
- Describe the characteristics of urban infrastructure in Africa.

c) Stabilization

Review the main ideas and concepts of the lesson. Mention the following points:

- Urbanization refers to the population shift from rural to urban areas.
- Urbanization is the process by which **towns** and **cities** are formed and become larger as more people begin living and working in them.
- Urbanization increases human impact on the environment.
- Urbanization brings important benefits for economic, cultural, and societal development. It can only be a problem whenever it is unplanned.
- Much of urban expansion in Africa is characterized by unplanned

and unregulated growth, exacerbated by the **legacy of colonialism**, structural adjustment program, and effects of neoliberalism that spawned weak urban planning institutions.

- Africa is one of the fastest urbanizing regions in the world.
- Urbanization has a lot of effects on the living conditions of the inhabitants, impacts such as:

  - *The development of slums,*
  - *The prevalence of poor infrastructure,*
  - *Economic hardship of residents,*
  - *Health problems, and*
  - *Social instability.*

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. what are environmental impacts of urbanization?
2. why do people move from rural areas to urban centers?
3. what the key features of unplanned urbanization?
4. how do slums develop?
5. what is the level of urban infrastructure in Africa?
6. why do urban areas face economic hardship?
7. what are some health risks that the inhabitants of urban centers face?
8. how does urbanization relate to high level of social instability?

b) Follow up

- Order students to be in groups and discuss the causes, and consequences of unplanned urbanization.
- Let the students discuss in pairs the positive and negative aspects of urbanization.

4.6. Answer Key for Activities

Activity 7.1

1. Where is crime more prevalent, urban, or rural areas?

- It is quite normally thought that in rural areas have good social cohesion, and organization. Therefore, the rate of crime in rural areas is much less than urban centers.

2. What types of crime can you identify in urban and rural areas?

Urban	Rural
Pickpocketing	Theft of cattle
Burglary	Abduction

7.2. MIGRATION – FACTORS AND IMPACTS ON AFRICA

Periods Allotted 2

1. Competencies

- *Describe the pattern of internal and international migration in Africa.*

2. Contents

- Migration – Factors and Impacts on Africa

3. Overview

Human migration is the permanent change of residence by an individual or group of people. It can occur within a country or international boundary. Migration falls into several broad categories. First, internal, and international migration may be distinguished. Within any country there are movements of individuals and families from one area to another (for example, from rural areas to the cities), and this is distinct from movements from one country to another. Second, migration may be voluntary or forced. Most voluntary migration, whether internal or external, is undertaken in search of better economic opportunities or seeking good life.

Forced migrations usually involve people who have been expelled by different factors, such as war, drought, famine, natural disasters, or other political conflicts.

The causes of migration are multitude since a complex web of factors underlie the process. There are push and pull factors of migration. In Africa multiple push factors spur migration both within the continent and to other regions. Some of the push factors are economic in nature, like; poor socio-economic conditions, low wages, high levels of unemployment, poverty and lack of opportunity. These factors are usually brought about by a mismatch between the rapid population growth and the available resources, low level of requisite technology and capacity to create employment and jobs at the origin.

In addition to economic factors, various political and social factors create fertile grounds for migration. Among these, poor governance, corruption, political instability, conflict, and civil strife are major causes of migration for both skilled and unskilled workers. The real or perceived opportunity for a better life, high income, greater security, better quality of education and health care at the destinations influence decision to migrate.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Map of the world showing the world's migration pattern.
- Almanacs and atlases showing the world's migration data.
- Graphs showing migration in different countries.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Pair and group discussion
- Demonstration
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different maps, almanacs, and graphs to describe migration.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lessons:

- What is migration?
- What are the types of migration?
- What are the factors for migration?
- Why have oceans so polluted at present time?
- What are the main pollutants of oceans?

b) Body of the Lesson

- Explain how and why migration occurs.
- Explain the types of migration.
- Discuss the factors of migration.
- Explain how oceans polluted.
- Describe the main pollutants of oceans.

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- Migration is the permanent change of residence by an individual or group of people.
- It occurs within a country or international boundary, hence known as **internal** and **international** migration.
- It can also be **voluntary** or **forced**.
- There are **push** and **pull** factors of migration.
- There are factors that accelerate migration. Some of the factors are;

poor governance, corruption, political instability, conflict, and civil strife. Both skilled and unskilled workers can migrate.

- Pollution of coastal waters may arise from various sources, such as:
  - *the discharge of sewage and industrial waste from coastal channels,*
  - *the dumping of wastes at sea,*
  - *the discharge of sewage and rubbish from ships,*
  - *the handling of cargo,*
  - *the exploration and exploitation of the sea bed and ocean floor,*
  - *accidental pollution by oil, and*
  - *other substance of pollutants from the land by air and other routes.*
- ***The most frequent cause of coastal pollution problems is the discharge of municipal sewage and industrial wastes into coastal waters or into estuaries through unsatisfactory disposal facilities.***
- ***The coastal marine environment is clearly being affected by the modification and destruction of habitats, over-fishing, and pollution.***
- ***The destruction of wetlands and mangroves, which act as natural filters for sediment, excessive nitrogen, and wastes, has also accelerated nutrient buildup.***

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. what is human migration?
2. why do people migrate from place to place?
3. what the pull and push factors of migration?
4. what factors influence people's decision to migrate?

5. what are the sources of ocean pollution?
6. what are the major classes of pollutants that reach the coastal waters?

b) Follow up

- Order students to be in groups and discuss the causes, and consequences of migration.
- Let the students discuss in pairs the causes and consequences of coastal pollution.

4.6. Answer Key for Activities

Activity 7.2

1. Use a dictionary or the internet and define the following terms.?

- ***Migration: to move from one country, place, or locality to another.***
- ***Immigration: travel into a country, other than one's own, for the purpose of permanent residence.***
- ***Immigrant: a person who comes to a country to permanently reside.***
- ***Voluntary Migration: migration based on person decision and choice.***
- ***Forced migration: migration resulting from push factors.***
- ***International Migration: moving away to a different country by crossing international boundary.***
- ***Country of origin: the place where the migrant was born.***
- ***Illegal immigrant: migrant who crossed the national boundary of a country without permission of the country.***
- ***Push factor: factors which force migrants to leave their regular place of residence.***
- ***Pull factor: factors which attract migrants to move away from their regular place of residence.***

Activity 7.3

1. Why does the pollution of the vast ocean matter for humanity?

- Oceans matter for humanity because they are the source of moisture on the surface of the Earth, fishes and other marine lives.

Activity 7.4

Note to the teacher, please facilitate the students to be in groups and discuss on the causes, consequences, and solutions to coastal pollution. Then, summarize the responses of the students in an organized way.

4.7. Answers to Review Questions (Unit Seven)

Part I. Multiple choice

1. A 2. B 3. A 4. C 5. B

Part II. Short answer questions.

1. There are several causes for unplanned urbanization in Africa. Much of urban expansion in Africa is characterized by unplanned and unregulated growth mainly caused by rapid population growth, and being unguided by urban plan. This situation was exacerbated by the legacy of colonialism, structural adjustment program, and effects of neoliberalism that spawned weak urban planning institutions.
2. The consequences of unplanned urbanization in Africa include:
   - The developments of slums and squatter settlements (informal settlements)
   - Poor infrastructure and service provision, and
   - Economic and health problems to the urban community.
3. The push factors are largely economic in nature (poor socioeconomic conditions, unemployment, poverty, etc.). Whereas, the pool factors are; real or perceived opportunity for a better life, high income, greater security, better quality of education and health.
4. The Slave Trade had serious impact on the population of Africa by depopulating the continents' population. It moved the young working age population out of Africa, hence it affected the economy of the continent.
5. Coastal pollution can be reduced through:

- Proper management of municipal and industrial wastes,
- Recycling of plastic materials,
- Multi stakeholder interventions and coordinated actions on the causes of coastal pollution.

UNIT EIGHT

8. GEOSPATIAL INFORMATION AND DATA PROCESSING

Periods Allotted: 15

1. Introduction

In this unit the students study how geographic data are gathered, compiled, and used. However, before the output reaches the end user a lot of steps, tools and processes are involved. Hence, the overall process of geospatial information and data processing depends on geographic data. The sources of the data could be from direct and remotely sensed sources. There are different types of tools or hardware that help us to collect data. The two most important tools include a global positioning system (GPS) and digitizers.

The geographic data gathered through the methods and tools mentioned above helps us to answer basic geographic questions such as 'what is where?', and 'why is it there?' Answering these questions helps us to identify risk areas and solve critical problems.

The result or the output of geographic data analysis can be representation of data in numeric values, display on maps, graphs, charts, and diagrams.

2. Learning Outcome

After completing this unit, you will be able to:

- *recognize ways of presenting geographic information;*
- *explain the concepts of geospatial information;*
- *identify sources and tools of geographic data;*
- *describe ways of geographic data representations; and*
- *produce graphs, charts and diagrams from raw data.*

3. Main Contents

- Introduction
- Basic Concepts of Geospatial Information
- Sources and tools of geographic data
- Geographic Data Representations
- Advances in Mapmaking and the Birth of Geographic Information System
- Making and Interpretation of Graphs, Charts and Diagrams

8.1. BASIC CONCEPTS OF GEOSPATIAL INFORMATION

8.1.1. The Similarity and Difference between Information and Data

8.1.2. Basic Concepts of Geospatial Data

8.1.3. Visualizing Geographic Data

Periods Allotted 2

1. Competencies

- *acquiring and presenting spatial data using geo-spatial tools.*

2. Contents

- Basic Concepts of Geospatial Information

3. Overview

Although the ***data*** and ***information*** are often used interchangeably, they are not the same. They both have specific meanings.

i. Data: refer to different **observations** which are collected and stored as numbers, characters, images, facts, and symbols. They describe a feature, idea, status, or situation that we want to focus on or are interested in. Therefore, data are a set of values of **qualitative** or **quantitative** variables about one or more persons or objects. Data can be meaningful when it is

further processed by human interpretations or input into a computer and the results disseminated.

ii. Information: is the result of processing, manipulating, and organizing data in a way that adds to the knowledge of a receiver. In other words, it is the context, in which data is taken.

Geospatial data: is data about objects, events or phenomena that have **location** information of the surface of the earth they represent. Geospatial data typically combines **location information** (usually coordinates on the earth) and **attribute information** (the characteristics of the object, event or phenomena concerned) with **temporal information** (the time at which the location and attributes existed).

Geographical data links **place**, **time**, and **attributes**. Geographical data is at the heart of map making. Without geographical data events, or phenomena of an area of our interest (AOI) cannot be visualized and analyzed.

There are two fundamental ways of visualizing geographic data. It can be visualized as a discrete object or as continuous data.

A. Discrete objects represent an area as objects with well-defined boundaries in open space. Hence, a **discrete object** has known and definable boundaries. It is easy to define precisely where the object begins and where it ends. For example, a lake is a discrete object within the surrounding landscape.

B. Continuous data represents areas or phenomena that progressively vary across a surface or a location. The values of a measure of variables may vary from point to point. Continuous data is also referred to as field, non-discrete, or surface data. An example of continuous data is elevation. The starting point being sea level, the elevation of an area varies across the surface.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Graphs showing different spatial data.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Pair and group discussion
- Demonstration
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different graphs to describe spatial data.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lessons:

- Can you define data?
- What is information?
- What is the similarity and difference between data and information?
- What are the main features of geospatial data?
- What are the ways of visualization of data?

b) Body of the Lesson

- Define data, information, and geospatial data.
- Explain the main features of data, information, and geospatial data.
- Describe how geographic data are visualized.

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- **Data** (plural form of datum) are observations which are collected

and stored as numbers, characters, images, facts, and symbols. They describe a feature, idea, status, or situation that we want to focus on or are interested in.

- Data are sets of values of **qualitative** or **quantitative** variables about one or more persons or objects. Data can be meaningful when it is further processed by human interpretations or input into a computer and the results disseminated.
- **Information** is the result of processing, manipulating, and organizing data in a way that adds to the knowledge of a receiver.
- **Geospatial data** is data about objects, events, or phenomena that have **location** (usually coordinates on the earth) information of the surface of the earth they represent.
- Geographical data links **place**, **time**, and **attributes**. It is at the heart of map making. Without geographical data events, or phenomena of an area of our interest (AOI) cannot be visualized and analyzed.
- There are two fundamental ways of visualizing geographic data as; **discrete objects** or as **continuous data.**

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. what is datum?
2. what is information?
3. how can data be meaningful?
4. what are the processes involved in the data cycle?
5. what are the differences between data and information?
6. what are the features of geospatial data?
7. what is a discrete object?
8. what is a continuous object?

b) Follow up

- Order students to be in groups and discuss the similarities and differences among data, information, and geospatial data.
- Let the students discuss basic concepts of geospatial data.

8.2. SOURCES AND TOOLS OF GEOGRAPHIC DATA

8.2.1. Sources of Geographic Data

8.2.2. Tools for Geographic Data Collection

Periods Allotted 2

1. Competencies

- *Describe ways of representing geographic data on maps.*

2. Contents

- Sources and tools of geographic data

3. Overview

Geographic data come from a variety of **sources** and in different **formats**. The data can be collected using instruments that measure natural phenomena (e.g., temperature, rainfall, humidity, etc.) as well as by advanced satellites (e.g., remote sensing). Therefore, geographic data come from two important sources:

A. Directly collected
B. Remotely sensed

A. Directly collected data are generated at the source of the phenomena being measured. Examples of directly collected data include measurements such as temperature readings at specific weather stations and elevations recorded by visiting the location of interest. Data can also be obtained through **surveys** (e.g., the census and sample surveys) or **observation** (e.g., counting the number of

trees in a farmland).

B. Remotely sensed data are measured from remote distances without any direct contact with the phenomena or a need to visit the locations of interest. Satellite images are examples of remotely sensed data.

Data collection is the process of gathering and measuring information on variables of our interest. It is usually carried out systematically so that it enables us to appropriately map the area of our interest. Therefore, the first step in making a map is to complete a **field survey**. Surveyors observe, measure, and record what they see in the specific area.

Geographic data is collected, first of all, to create **a base map of an area.** Then other information about the layers which are going to overlap on the map will be collected. The data needed for the base map belong in a category named "**primary sources**" because these spatial and location data are received for direct use in making the map. The other category of data is called "**secondary sources**" and refers to data of general interest gathered for many reasons which can further be used by end users, based on their interest.

Hard copy maps (analogue maps) can be used as a secondary source. The information on these sources can be used by **enlargement** of a map of the area of our interest on paper or by digitizing on a computer in a digital format. However, whenever we use data from secondary sources, we should be very careful and check if the data are right and **up-to-date**. Otherwise, our final result will be wrong and outdated.

Today, most mapping is done by remote sensing, that is, the gathering of geographic information is from a distance by an instrument which is not physically in contact with the mapping site. These data are gathered primarily by aerial photography or by satellites. The data gathered includes information such as elevation, differences in land cover, and variations in temperature. This information is recorded and converted to a digital format. Cartographers or mapmakers then use these data and computer software to make maps.

There are different types of tools or hardware that help us in data collection. The tools include: **global positioning system** (GPS) and **digitizers**.

i. Global Positioning System (GPS)

A global positioning system is a satellite network that is used to determine the exact location of a place. It communicates with GPS receivers accessed by individual users on the surface of the Earth. The GPS receiver needs to connect with four or more satellites orbiting the Earth, as a reference to calculate the precise location of the user within a few meters.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Graphs showing different data sources.
- Pictures of some common geographic data collection tools.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Pair and group discussion
- Project work
- Demonstration
- Problem based learning

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different graphs, and pictures to describe spatial data gathering tools.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lessons:

- What are the sources of geographic data?
- What is data collection process?
- What is primary source?
- What is secondary source?
- Why is it important to check whether the data are up-to-date or not?
- What is global positioning system (GPS)?

b) Body of the Lesson

- List or identify the sources of geographic data.
- Explain the processes involved in data collection.
- Describe how the GPS functions.
- Explain how digitizers are used to generate geographic data.

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- Geographic data come from a variety of **sources** and in different **formats**.
- The sources include; direct collection of the data, and through remote sensing.
- **Data collection** is the process of gathering and measuring information on variables of our interest. It enables us to appropriately map the area of our interest (AOI).
- The first step in making a map is to complete a **field survey**. Surveyors observe, measure, and record what they see in the specific area.
- Geographic data is collected to create **a base map of an area.**
- The data needed for the base map belong in a category named "**primary sources**" because these spatial and location data are received for direct use in making the map.
- The other category of data is called "**secondary sources**" and refers to data of general interest gathered for many reasons which can further be used by end users, based on their interest.
- Whenever we use data from secondary sources, we should be very

careful and check if the data are right and **up-to-date**. That is important to avoid using wrong or outdated data.

- There are different types of tools or hardware that help us in data collection. The tools include: **global positioning system** (GPS) and **digitizers**.
- GPS is a satellite network that is used to determine the exact location of a place. It communicates with GPS receivers accessed by individual users on the surface of the Earth.
- A digitizer is a tool used to change images on an analogue form or in paper into a digital form on a computer.

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. how can we acquire geographic data?
2. which data collection method does not make any contact with object of our interest?
3. what is a field survey?
4. what is a base map?
5. why is it important to have up-to-date data in the mapping process?
6. what is GPS? How does it function?

b) Follow up

- Order students to be in groups and discuss how geographic data is acquired.
- Let the students discuss why it is important to have up-to-date data in the mapping process.

4.6. Answer Key for Activities

Activity 8.1

1. What is the purpose of geographic data collection?

- The main purpose of geographic data is to make maps and create geographic databases, (that is, the information stored in a computer system and retrieved whenever needed).

8.3. GEOGRAPHIC DATA REPRESENTATIONS

Periods Allotted 2

1. Competencies

- *describe and explain how to present geographic information.*

2. Contents

- Geographic Data Representations

3. Overview

Geographic data representation involves graphical visualization of the data or producing map of an area. We use the map to gain better insight and understanding of the area of our interest. There are two main forms of geographic data representations. These are hardcopy also known as analogue format and digital format. The digital format is becoming increasingly important in the world today. The digital representation of geographical data has enormous advantages over paper maps. This is because we can use the same digital devices such as personal computer (PC), and information providers such as the internet, or mass storage devices for many purposes. Digital data are also easy to copy and transmit at very high speeds. Moreover, digital data can be stored at high density in very small spaces, and it is less subject to the physical deterioration that affects paper format. Finally, data in digital form are easy to transform, process and analyze.

A map is composed of different geographic features represented either as **points**, **lines**, and/or **areas**. Each feature is defined both by its location in space (with

reference to a coordinate system), and by its characteristics (typically referred to as **attributes**). Quite simply, a map is a model of the real world. Therefore, all geographic features on the earth's surface can be characterized and defined as one of the three basic feature types.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Graphs showing different data structure.
- Pictures of some common geographic data collection tools.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Pair and group discussion
- Demonstration
- Project work

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different graphs, and pictures to describe data structure.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lessons:

- What graphic visualization of data?
- What the two geographic data representations?
- What are geographic features that a map can be composed?
- What are the digital formats that geographic features are represented?

b) Body of the Lesson

- List or identify the forms of geographic data representation.
- Explain how digitally geographic data are represented using vector data models and raster data models.
- Describe the geographic features that can be represented using point, line, and area (polygon).

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- Geographic data representation involves graphical visualization of the data or producing map of an area.
- We use the map to gain better insight and understanding of the area of our interest.
- There are two main forms of geographic data representations. These are hardcopy also known as **analogue** format and **digital** format.
- The digital representation of geographical data has enormous advantages over paper maps.
- A map is composed of different geographic features represented either as **points**, **lines**, and/or **areas**.
- *In the digital format, geographic features can be stored and displayed in three basic types of spatial data models.*
    - ➲ *Vector,*
    - ➲ *Raster, and*
    - ➲ *Image data models*

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. what is an analogue map?
2. how can geographic features represented on a map?
3. what are digital models of geographic representation?

b) Follow up

- Order students to be in pairs and identify the data models on computer (in lab).
- Let the students discuss the types of geographic data representation.

4.6. Answer Key for Activities

Activity 8.2

1. Describe the advantages of digital data formats and storage facilities over hardcopy, or analogue format?

- The digital format has several advantages over a hardcopy. Some of the advantages include:
  - *It can easily be retrieved.*
  - *It can be easily enlarged or reduced.*
  - *Different analyses are possible on a digital format.*

Activity 8.3

1. Yes, whatever we can draw on a paper map using point, line, or polygon can also be drawn by vector and raster models on a computer.

8.4. ADVANCES IN MAPMAKING AND THE BIRTH OF GEOGRAPHIC INFORMATION SYSTEM

8.4.1. Historical Development of Mapmaking

8.4.2. Geographic Information System (GIS)

Periods Allotted 3

1. Competencies

- *describe the development in map making.*

2. Contents

- Advances in Mapmaking and the Birth of Geographic Information System

3. Overview

Mapmaking has been an integral part of human history for thousands of years. It is believed that the human activity of graphically representing one's perception of the world is a universally acquired skill and one that pre-dates virtually all other forms of written communication. From cave paintings to ancient maps of Babylon, Greece, and Asia, right into the 21st century, people have created and used maps as an essential tool to help them define, explain, and navigate their way through the world.

Mapping represented a significant step forward in the intellectual development of human beings and it serves as a record of the advancement of knowledge of humans, which could be passed from members of one generation to those that follow in the development of culture.

Early maps were a garbled or distorted mass of land that bear no resemblance to the actual world. As the centuries passed, maps became larger, more detailed, and more accurate.

Several technical advances since the 18th Century helped mapmakers to accurately draw the general outline of the continents and locate their precise positions. The advances in mathematics and astronomy and dividing the Earth into lines of longitude and latitude were among the most notable advances.

There has been an ever-increasing demand for maps and greater reliability on maps in the 21st Century. Specially, improvements in printing and photography, the mass production of maps and the ability to make accurate reproductions from more accurate data, as well as, the availability of airplanes and satellites made it possible to photograph and provide images of large areas at a time. In regard, the role of satellites is very important. Satellites perform continuous scans to provide detailed up-to-date maps of nearly the entire Earth.

It is interesting that during the last few decades more sophisticated mapping systems came into existence. It was mainly due to the advancement of geographic information system (GIS). The geographic information system is a computer-based system that enables us to store, visualize, analyze, and interpret geographic data.

4. Teaching Learning Process

4.1. Suggested Teaching Aids

- Graphs showing the components of GIS.
- Pictures of the components of GIS - different hardware.

4.2. Suggested Teaching Methods

In this lesson you may apply teaching methods such as:

- Pair and group discussion
- Demonstration
- Project work

4.3. Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Use different graphs, and pictures to describe the components of GIS.
- Prepare notes, activities, and exercises.

4.4. Presentation of the Lesson

a) Introduction to the Lessons

Ask the following questions to start the lessons:

- Why do people use maps?
- How long have people been using maps?
- What are the advantages of maps?
- What are the main features of early maps?
- What is GIS?
- What are the components of GIS?

b) Body of the Lesson

- Explain the historical development of maps, and map using.
- Discuss the advantages of maps.
- Describe the main features of early maps.
- Discuss the development of geographic information system.
- Describe the components of GIS.

c) Stabilization

Review the main ideas and concepts of the lessons. Mention the following points:

- Mapmaking has been an integral part of human history for thousands of years.
- Mapmaking skills of humans' pre-dates virtually all other forms of written communication.
- Early maps were a garbled or distorted mass of land that bear no resemblance to the actual world.
- Several technical advances since the 18th Century helped mapmakers to accurately draw the general outline of the continents and locate their precise positions.
- There has been an ever-increasing demand for maps and greater reliability on maps in the 21st Century.
- The geographic information system is a computer-based system that

enables us to **store**, **visualize**, **analyze**, and **interpret** geographic data. It has the following components:

- *The* **hardware** *is the computer and other devices (printers, plotters, scanners, etc.) attached with it. The hardware helps the GIS to operate.*
- **Methods** *are well-designed plans and application specific procedures and rules describing how the technology is applied.*
- *GIS* **software** *provides the functions and tools users need to store, analyze, and display geographical information.*
- *Geographic* **data** *(also called spatial, or geospatial data) identifies the geographic location of features.*
- *GIS technology is clearly of limited value without* **people** *to manage the system and to develop plans for applying it.*

4.5. Evaluation and Follow up

a) Evaluation

You must evaluate the whole performance of students (in discussions, answering questions etc.) throughout each period.

Check the students' understanding of the lesson by asking them questions such as:

1. how long has maps been used in the world?
2. what are some human communication skills that mapping could have predated?
3. what are some common features of early maps?
4. what important historical developments have taken place in mapping since the 18th century?
5. What are the components of GIS?

b) Follow up

- Order students to be in pairs and identify the components of GIS (in lab).
- Let the students discuss the historical development of mapping.

4.6. Answer Key for Activities

Activity 8.4

1. "There is an ever-increasing demand for maps and greater reliability on it". Why do you think the demand for maps and its reliability are highly increased?

The demand for maps and people's reliability on it has greatly increased due to:

- *People's desire to travel, and understand new places.*
- *People's desire to identify resources.*
- *The advancement of information and communication technologies, etc.*

Activity 8.5

1. Match items under column 'A' with its appropriate descriptions under column 'B'

Column A	Column B
1. Vector data → D	A. Characteristic feature of a data
2. Raster data → B	B. Uses of grid-cell
3. Image data → C	C. Not a geo-referenced data
4. Attribute data → A	D. Uses sequential points or vertices to define a line segment

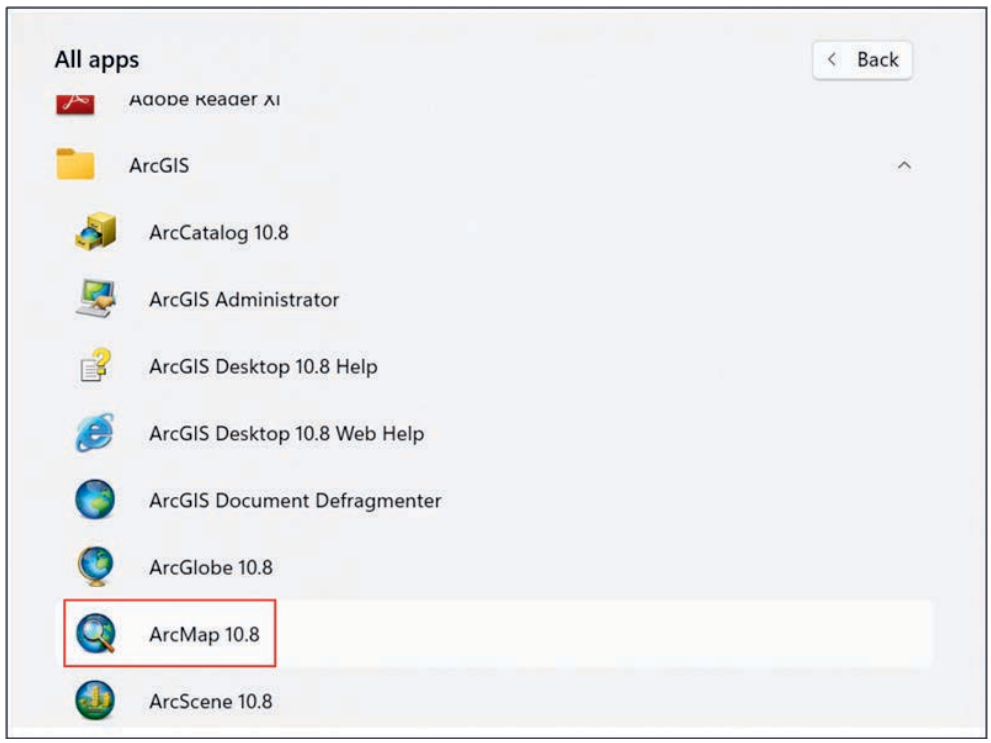
PRACTICAL GUIDE ON MAP MAKING IN ARCGIS

Step 1: Starting ArcMap, and adding data layers

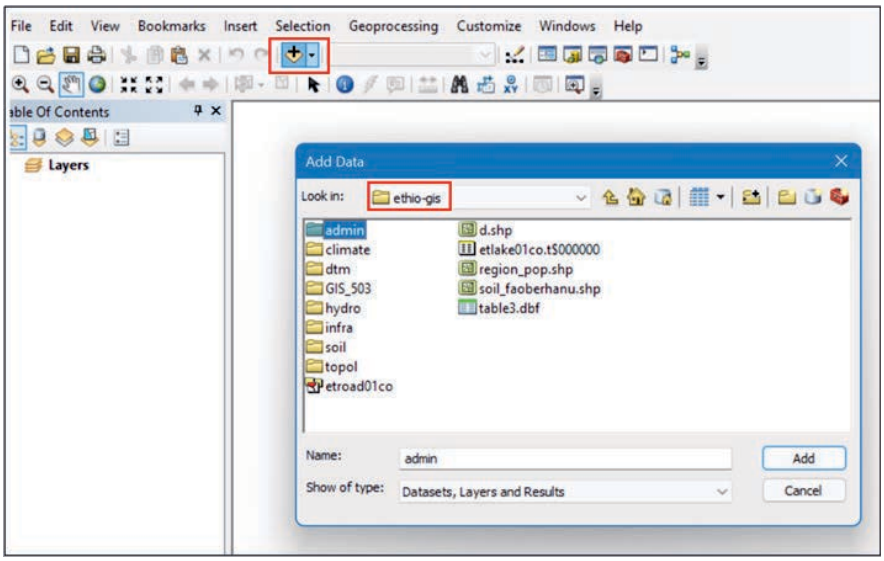
To start ArcMap choose start → all programs → ArcGIS →ArcMap 10.x.

N.B. The data to produce an administrative map can be obtained from different sources. One of the sources is from the internet using the following link (https://africaopendata.org/dataset/ethiopia-shapefiles). Then download the data and extract the file in a folder. It is very important to create a folder and save the data on a hard drive of a computer. From the folder using the following steps it is possible to create an administrative map of area of our interest.

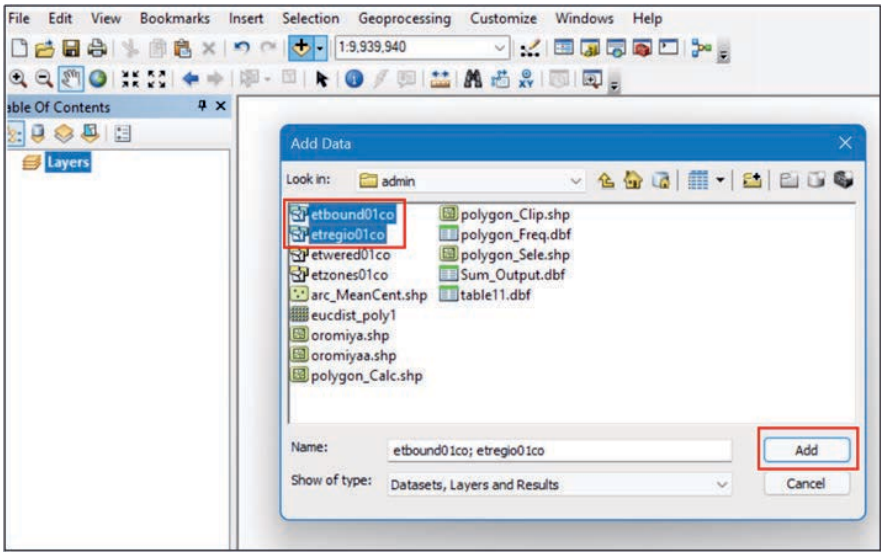
For example, to create an administrative map of Oromia National Regional State, we follow the following steps.



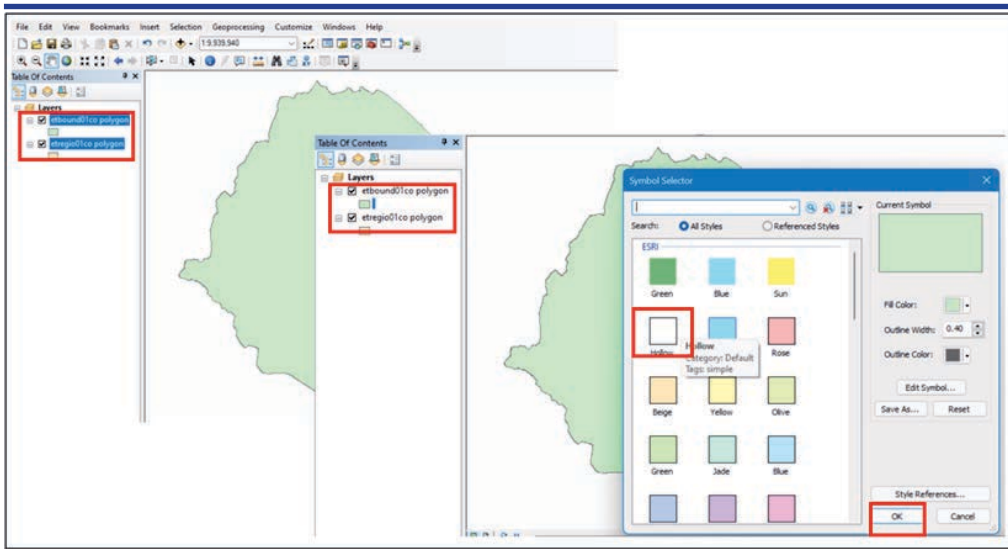
Step 2: Click the connect to folder icon. This allows you to access a folder where the Ethio-GIS data is located.



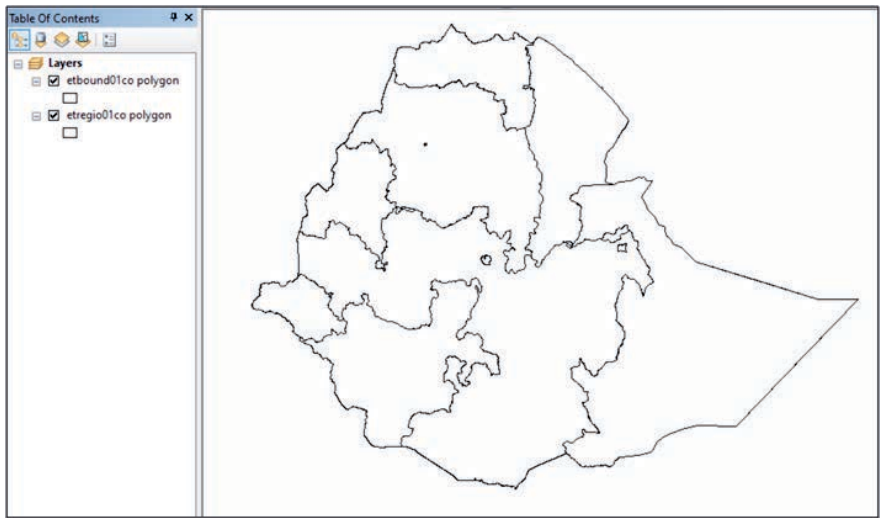
Step 3: By clicking on the admin folder, select etbound01co and etregio01co. Then, click on the add button.



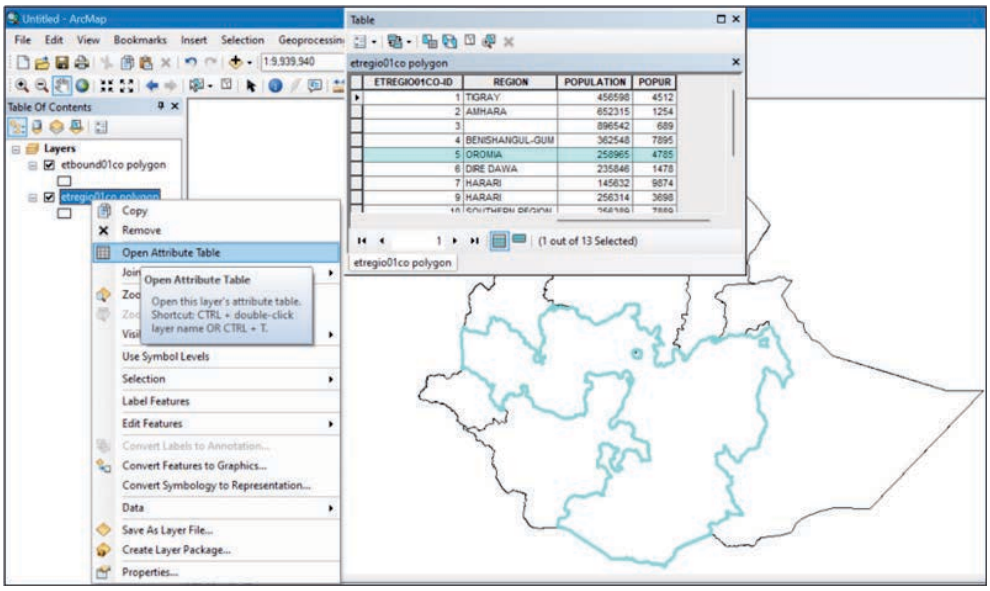
Once the selected shapefiles are added, it is important to remove the background shade of the files by clicking on the small squares, then choosing hollow from symbol selector and click on ok button.



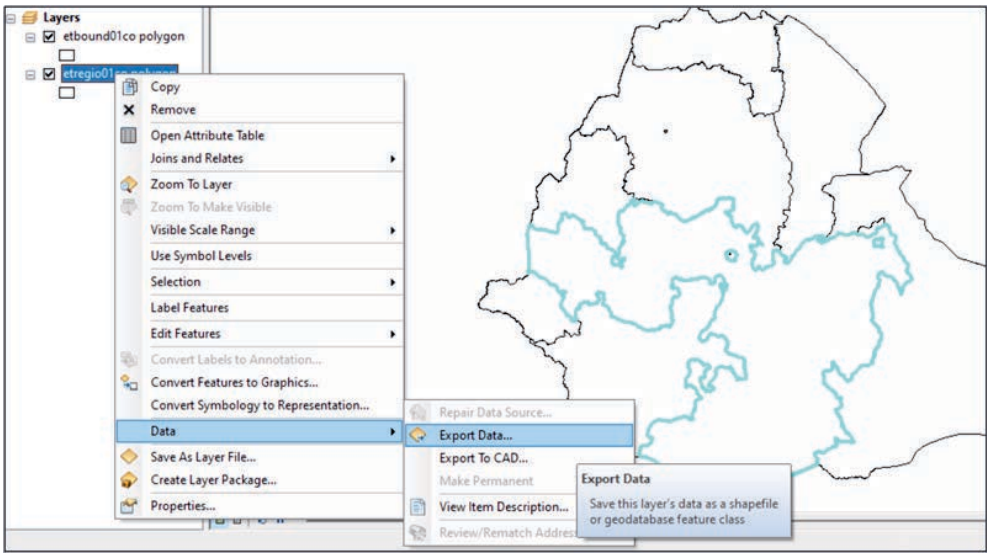
Now the in the window the image should appear as follows.



To select the area of your interest, (Oromia National Regional State), right click on etregio01co layer open attribute table click on the left margin of the table where Oromia is found in the list of tables, then check that Oromia is selected and highlighted.



Then right click on etregio01co layer and click on data, export data and save in a folder. It will prompt you to add the data in your project, click yes.

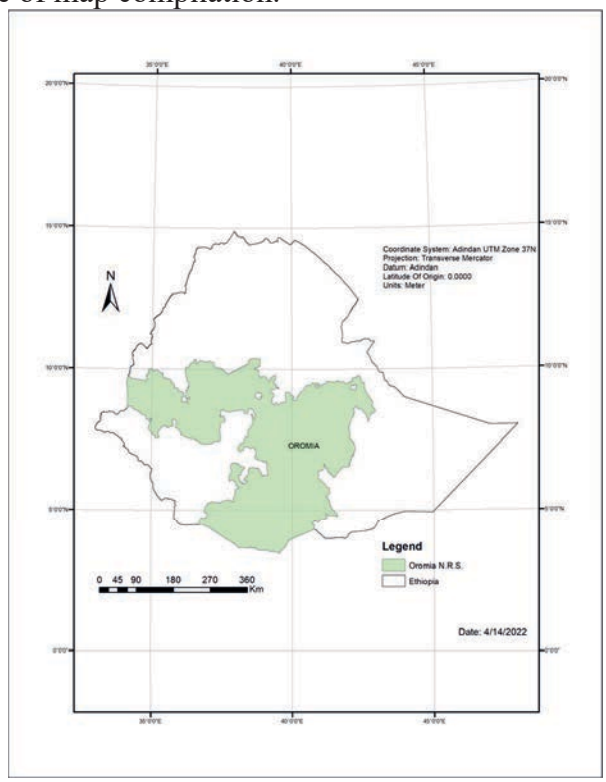


Now the map of the region appears as follows, after being renamed to its proper name, and unticking the other layers we do not want for the moment.



Finally, by clicking on a layout view we should include the necessary marginal information such as:

- legend;
- scale bar;
- north arrow;
- coordinate information;
- gridlines; and
- date of map compilation.



8.5. MAKING AND INTERPRETATION OF GRAPHS, CHARTS AND DIAGRAMS

Periods Allotted 6

1. Competencies

- *Making and interpreting graphs, charts, and diagrams.*

2. Contents

- Making and Interpretation of Graphs, Charts and Diagrams

3. Overview

Many studies, researches and textbooks use data and numbers. Hence, presentations using charts, graphs, and diagrams can help the presenter draw and keep the **attention** of the listeners. Presentation using graphs, charts and diagrams also helps the presenter to have a profound evidence-based work. People will also understand and memorize at least the main points from the presentation. Moreover, they are very important in describing **trends**, making a **comparison,** or showing **relationships** between two or more items.

Computer programs such as Microsoft Excel, Microsoft Word, and other spreadsheets like SPSS (statistical package for social sciences) are widely used for making graphs, charts, and diagrams. There are so many types of graphs, charts and diagrams that can be produced on a computer. Therefore, the main task of the user is to choose the right one. Here are some common types out of which the user can make his or her choice. Bar graph, line graph and pie chart can be prepared in Microsoft Excel.

Note to the teacher: this session is a practical one. Therefore, you can take the students to a computer lab, and let them practice to redraw the graphs and diagrams on the textbook. The data and steps provided for the graphs and charts can be modified for the students to practice.

3.1. Answers to Review Questions (Unit Eight)

Part I. True or false

1. False 2. True 3. True 4. False 5. True

Part II. Matching

6. I 7. H 8. C 9. B 10. E 11. J 12. D 13. A 14. G 15. F

Part III. Project Work

16. Note to the teacher, instruct the students to collect the age and sex data of their class. Then, guide the students to draw and show the sex distribution of students in their class using pie chart.

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MINIMUM LEARNING COMPETENCIES (MLCS) GRADE 10

Grade 10

Unit One: Landforms of Africa

- Explain the formations of major landforms of the world
- Locate the major landforms in Africa
- Explain the spatial variations in the distribution of the major landforms in Africa

Unit Two: Climate of Africa

- Identify the major climate types and regions of the world
- Identify the major climate types and regions of Africa
- Distinguish the controls of climate of Africa
- Explain benefits of climate for life of people in Africa
- Explain the major challenges of climate change on African development vision

Unit Three: Natural Resource Base of Africa

- Describe the locations of major natural resources (including water, wildlife, oil and gas, gold, iron ore, etc.) in the world'
- Describe the major drainage systems and water resources of Africa
- Demonstrate the major vegetation and wild life distribution zones of Africa
- Identify the main soils types and mineral resources in Africa

Unit Four: Population of Africa

- Describe the demographic characteristics of the African population
- Explain why the population of Africa has the structure it has now
- Discuss the impact of colonialism on the current settlement patterns of Africa

Unit Five: Major Economic and cultural Activities of Africa

- Describe Africa's Agenda 2063 and its implications
- Compare and contrast the indicators of Agenda 2063 with those of SDGs
- Compare and contrast the major economic activities of Africa with those of other continents
- Identify the cultural landscape of Africa
- Explain why Africa is a home of diverse languages and religions

Unit Six: Human – Natural Environment Interaction

- Compare and contrast pattern of population growth in Africa and other continents
- Explain how population density affects the degradation levels of natural resources (vegetation, water and soils) in Africa
- Identify different adaptation strategies to the local environment character
- Analyze the impacts of rapid population growth on environment and socio-economic conditions of Africa

Unit Seven: Geographic Issues and Public Concerns in Africa

- Explain the causes and consequences of unplanned urbanization
- Describe the pattern of internal and international migration in Africa
- Identify the causes of coastal pollutions in Africa
- Suggest solution to the issue of coastal pollution in Africa

Unit Eight: Geospatial Information and Data Processing

- Acquiring and presenting spatial data using geo-spatial tools
- Describe ways of representing geographic data on maps
- Enlarge and reduce maps using GIS
- Describe and explain how to present geographic information
- Making and interpreting graphs, charts, and diagrams
- Making administration map using geographical information system

GEOGRAPHY GRADE 10 LEARNING OUTCOMES AND SYLLABUS

GRADE LEVEL LEARNING OUTCOMES: GRADE 10

1. Create understanding and acquire knowledge of:

- major landforms and their spatial distribution in Africa;
- geological processes that gave Africa its present landform;
- major climate types and regions of the African continent;
- the climatic regions and climate types of Africa;
- the drainage systems and water resources, soils, natural vegetation, wild life, and mineral resources of the African continent;
- the population characteristics of the African continent;
- major economic activities and cultural landscape in Africa;
- the human – natural environment interaction in Africa;
- the impacts of rapid population growth on environmental and socioeconomic conditions of the African continent; and
- the current geographic issues and public concerns in Africa.

2. Develop skills and abilities to:

- illustrate the distribution of soils types, major water resources, natural vegetation and wild life in Africa;
- make a diagram to illustrate the demographic structure of the population of Africa;
- outline the indicators of Agenda 2063 with those of Sustainable Development Goals (SDGs);

- analyze the effects of misguided urbanization and coastal pollution on African population;
- illustrate the ways of presenting geographic information;
- present spatial data using geographic information technology;
- undertake map enlargement and reduction; and
- produce geographic maps, graphs and diagrams.

3. Develop the habits and attitudes to:

- explain the opportunities and challenges posed by climate change on development in Africa;
- justify the effects of colonial powers on distribution and settlement of African population;
- appreciate the cultural landscape of Africa;
- justify the pillars of Africa's Agenda 2063 and their implication for socio-economic transformation of the continent; and
- explain the impacts of rapid population growth on environmental and socioeconomic conditions of the African continent.

GEOGRAPHY GRADE 10 SYLLABUS

Unit One: Landforms of Africa' (5 periods)

Learning Outcomes: By the time students complete this unit, they will be able to:

- develop general idea on the major landforms of the world;
- identify the major landforms and their spatial distribution in Africa;
- describe the major landform features of Africa; and
- recognize the spatial variations in the distribution of the major landforms in Africa.

Competencies	Contents	Learning Strategies	Assessment
• Locate the major landforms in Africa; and • Explain the spatial variations in the distribution of the major landforms in Africa.	1. Landforms of Africa (5 periods) 1.1. Overview of world major landforms(2 periods) 1.2. Location and related features of Africa(1period) 1.3. Major landforms of Africa (2 periods)	• Assign students in group to draw a map of Africa and locate and indicate the major landforms • Form another group consisting of 5 students and ask them to establish relationships between geological processes and landforms and present their work. Let the teacher provide a summary.	• Observe them as they draw, locate and present; and record their presentation taking photographs using your phone. Show them the record. • Give students time to question each other on the content and quality of their work. Record their participation. • Provide feedback for each question and discuss on the feedback at the end of each class. .

Unit Two: Climate of Africa (9 periods)

Learning Outcomes: By the time students complete this unit, they will be able to:

- assess the climatic regions and climate types of the world;
- compare climatic regions within Africa;
- examine how climate provide substantial benefits for the life of people in Africa; and
- analyze the challenges posed by climate change on development in Africa.

Competencies	Contents	Learning Strategies	Assessment
• Identify the climate types and regions of the world; • Describe the major climate types and regions of Africa; • Explain the implications of climate for people of Africa; and • Explain the major challenges of climate change on African development vision.	1. Climate of Africa (9 periods) 1.1. Overview of world climatic regions and types (2 periods) 1.2. Climate types and regions of Africa(3 periods) 1.3. Benefits of climate for the life of people in Africa (2 periods) 1.4. Climate change and its challenges to Africa's development vision (2 periods)	• Organize the students into teams to undertake a collaborative learning on overview of world climate region, and climate types and region of Africa • Provide two or three climate charts with contrasting characteristics and the students have to identify the climate from the chart • Form groups consisting of 5 students discuss on benefits brought by climate in Africa while the remaining on challenges posed • Assign four students, three from benefits and another three from challenges to debate on the issue.	• Observe the groups as they discuss on the assigned issue. • Record the discussions and provide feedback based on your assessment of their performance. • Prepare questions in advance and ask the class to respond. • Record students' performance on every aspect of the unit and provide overall feedback at the end of the Unit.

Unit Three: Natural Resource Base of Africa (12 periods)

Learning Outcomes: By the time students complete this unit, they will be able to:

- identify key natural resources of the world;
- assess the main vegetation and wild life of Africa;
- identify the major soils types and mineral resources of the African continent; and
- describe the main drainage system and water resources of Africa.

Competencies	Contents	Learning Strategies	Assessment
• Describe the locations of major natural resources, including water, wildlife, and mineral resources in the world; • Describe the major drainage systems and water resources of Africa; • Demonstrate the major vegetation and wild life distribution zones of Africa; and • Identify the main soils types and mineral resources in Africa.	3.Natural Resource Base of Africa (12 periods) 1.1 Overview of major natural resources of the world (3 periods) 1.2 Major drainage and water resources of Africa (3 periods) 1.3 Main types of soils and mineral resources in Africa (3 periods) 1.4 Major vegetation and wildlife of Africa (3 periods)	• Start the lesson by forming group of 5 students and show a map of drainage and natural vegetation and then ask each group to name the main lakes and drainage systems in Africa. • Observing major soils types and mineral resources map in Africa • Show how natural vegetation and human influence wildlife distribution and density by giving two or three examples of a particular species. • Then, give them a short summary of the resource base of the African continent.	• Observe students' performance and provide feedback, encourage all efforts on the part of the students. • Use map interpretation to help examine the drainage and water resources of Africa. • Record students' performance in the various aspects of the Unit and give them a comprehensive feedback at the end of the Unit.

Unit Four: Population of Africa (12 periods)

Learning Outcomes: By the time students complete this unit, they will be able to:

- analyze the demographic structure of the population of Africa;
- examine the population characteristics of the African continent; and
- describe the population distribution and settlement patterns in Africa.

Competencies	Contents	Learning Strategies	Assessment
• Describe the demographic characteristics of the African population; • Describe the structure of population of Africa; • Demonstrate distribution patterns of African population using graphs, pie charts, line and map; and • Discuss the impact of colonialism on the current settlement patterns of Africa.	4. Population of Africa(12 periods) 4.1 Overview of World Population Growth and Size (3 periods) 4.1.1. Global Population Trends 4.1.2. Population Size and Growth in Africa 4.2. Africa's Major Demographic Trends (3 period) 4.3. Population Structure (2 periods) 4.4. Distribution and density of Africa population (2 periods) 4.5. Urban and rural settlement patterns in Africa (2 periods)	• Form groups each consisting of five students and let discuss on the effect of the population characteristics on settlement; and let the groups present their summary to the class and the conduct a class wide discussion. • Ask the students to discuss on distribution patterns of African population and present using graphs, pie charts, line and map • Develop a case study: the location of the main cities and the main mining areas and main farming areas of a given country in relation to the settlement pattern that reflects the colonial past (South Africa and Nigeria) • Provide a quick summary at the end of each class. • Prepare key questions in advance and ask the class	• Conduct a systematic observation as the class makes discussions and presentations. • Record interaction and performance of each group. • Give time for groups to ask each other. • Record students' performance in the various aspects of the Unit and give them a comprehensive feedback at the end of the Unit.

Unit Five: Major Economic Activities and cultural landscapes of Africa (12 periods)

Learning Outcomes: By the time students complete this unit, they will be able to:

- identify the major economic activities in Africa;
- identify the major cultural landscapes in Africa;
- describelinguistic and religious diversity of Africa;
- assess the pillars of Africa's Agenda 2063 and their implication for socio-economic transformation of the Continent; and
- compare and contrast the indicators of Agenda 2063 with those of Sustainable Development Goals (SDGs).

Competencies	Contents	Learning Strategies	Assessment
• Describe Africa's Agenda 2063 and its implications; • Compare and contrast the indicators of Agenda 2063 with those of Sustainable Development Goals (SDGs); • Compare and contrast the major economic activities of Africa with those of other continents; and • Identify the major cultural landscapes, and linguistic and religious diversity of Africa.	5. Major Economic Activities and Culture of Africa (12 periods) 5.1. Overview of employment structure in the world (1 period) 5.2. Major economic activities in Africa (2 periods) 5.3. Possible Solutions to the Problem of Unemployment (2 periods) 5.4 Africa's Agenda 2063 and its implications (2 periods) 5.6. Africa's Agenda 2063 vis-à-vis Sustainable Development Goals (SDGs) (3 periods) 5.6. Linguistic, and religious diversity in Africa (2 periods)	• Organize the students into teams to undertake a collaborative learning on overview of employment structure worldwide, and major economic activities in Africa • Assign the students could focus on one of the seven 'aspirations Africa's Agenda 2063 and write the one-page report • Ask the students on what do people need to do for Agenda 2063 to be successful? How can people benefit? • Conduct a group discussion on what are the important elements of the African cultural landscape, and why Africa is a home of diverse languages and religions • Project: After debating on Africa Agenda 2063, recommend possible solutions for unemployment rate in the continent	• Conduct a systematic observation as the class makes discussions and presentations. • Record interaction and performance of the students during group discussion • Record students' performance in the various aspects of the Unit and give them a comprehensive feedback at the end of the Unit.

Unit Six: Human – Natural Environment Interaction (8 periods)

Learning Outcomes: By the time students complete this unit, they will be able to:

- analyze the dependence nature of human being on environment;
- explain how human can modify natural environment;
- identify the adaptation strategies of environmental changes; and
- assess the impacts of rapid population growth on environmental and socioeconomic conditions of the African continent.

Competencies	Contents	Learning Strategies	Assessment
• Compare and contrast pattern of population growth in Africa and other continents; • Explain how population density affects the degradation levels of natural resources (including vegetation, water and soils) in Africa; • Identify different adaptation strategies to the local environment character; and • Analyze the impacts of rapid population growth on environment and socio-economic conditions of Africa.	6. Human – natural environment interaction (8 periods) 6.1. Overview of global population change (2 period) 6.2. Human-environment relationship (4 periods) 1.2.1. Dependence on the environment 1.3.2 Modification of the environment 6.2.3 Adaptation to the environment 6.3 Indigenous knowledge in conservation of natural resources in Africa (2 period)	• Ask students to compare and contrast' the pattern of population growth (rather than of population distribution) in Africa and other continents. • Organize the students into teams to undertake a collaborative learning on dependence on the environment, modification of the environment, and adaptation to the environment • Conduct a debate on the potential and actual impact of population size in Africa.	• Conduct a systematic observation as the class makes discussions and presentations. • Record interaction and performance of the students during debates and discussions • Record students' performance in the various aspects of the Unit and give them a comprehensive feedback at the end of the Unit.

Unit Seven: Geographic Issues and Public Concerns in Africa (5 periods)

Learning Outcomes: By the time students complete this unit, they will be able to:

- explain the cause and consequences of unplanned urbanization in Africa;
- analyze the factors and impact of migration in African; and
- describe cause and effects of coastal pollution on African population.

Competencies	Contents	Learning Strategies	Assessment
• Explain the causes and consequences of unplanned urbanization; • Describe the pattern of internal and international migration in Africa; • Identify the causes of coastal pollutions in Africa; and • Suggest solution to the issue of coastal pollution in Africa.	7. Geographic Issues and Public Concerns in Africa (5 periods) 1.1. Unplanned urbanization(2 periods) 7.1.1 Causes of unplanned urbanization in Africa 7.1.2 Consequences of unplanned urbanization in Africa 7.2. Migration Factors and Impacts on Africa (2 period) 7.3. Coastal pollution in Africa (1 period)	• Conduct brainstorming session to gather a range of ideas on causes and consequences of urbanization. Students in groups then develop spider diagrams to illustrate the variety of contributing factors and to show links between factors. • students could concentrate on one problem e.g., waste disposal and investigate it in detail, along with any solutions Project: 1. What are the major pushing and pulling factors? 2. What are the major consequences of urbanization • Debate on balance between preservation and use of coastal areas in Africa • Ask students to demonstrate how coastal areas could be used for sustainable development using thematic maps. potential for Africa	• Conduct a systematic observation as the class makes discussions and reflections. • Record interaction and performance of the students during debates and discussions • Record students' performance in the various aspects of the Unit and give them a comprehensive feedback at the end of the Unit.

Unit Eight: Geospatial Information and Data Processing (15 periods)

Learning Outcomes: By the time students complete this unit, they will be able to:

- recognize ways of presenting geographic information;
- represent spatial data using global position system technology;
- develop skills of map enlargement and reduction; and
- produce geographic maps, graphs and diagrams.

Competencies	Contents	Learning Strategies	Assessment
• Present spatial data using geo-spatial tools; • Describe ways of representing geographic data on maps; • Enlarge and reduce maps using GIS; • Explain how to present geographic information; • Interpret graphs, charts, and diagrams; and • Make administration map using geographical information system.	Geospatial Information and Data Processing (15 periods) 8.1 Basic Concepts of Geospatial Information (3 periods) 8.1.1 The Similarity and Difference between Information and Data 8.1.2 Basic concepts of geospatial data 8.2 Sources and tools of geographic data (3 periods) 8.2.1 Sources of geographical data 8.2.2 Tools for geographical data collection 8.3 Geographic Data Representations (2 periods) 8.4. Advances in Mapmaking and the Birth of Geographic Information System (4 periods) 8.4.1 Historical development of map making 8.4.2 Geographical Information System (GIS) 8.4.3 the components of GIS 8.5. Making and Interpretation of Graphs, Charts and Diagrams (3 periods)	• Assign students to prepare simple maps, charts and diagrams using geographic information related to issues discussed in the previous chapter. • Project: Use geographical and digital skills in your project on urbanization or coastal pollution and focus on a particular location to show some of the problems • Project on: • Generating spatial data using GPS technology and present the data in the form of map • Sketching and interpreting major economic activities and population density using chart, graphs, and diagram across Africa	• Assess students' work and provide individual feedback • Record students' performance in the various aspects of the Unit and give them a comprehensive feedback at the end of the Unit.