

# GEOGRAPHY

TEACHER'S GUIDE

Grade 12



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FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA  
MINISTRY OF EDUCATION

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MINISTRY OF EDUCATION

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# **GEOGRAPHY**

## **TEACHER'S GUIDE**

### **GRADE 12**

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**MINISTRY OF EDUCATION**



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# INTRODUCTION

## The Student Textbook's General Approach

The study of geography uses two main approaches

- *Thematic or topical* – this approach studies a single subject and investigates its spatial distribution, its organization, and the impacts it has on human activity.
- *Regional* approach – this approach identifies a given region or geographic unit and investigates interactions among various geographic elements in that area.

This textbook uses the latter approach – the *regional approach*. The region under consideration is the Horn of Africa, with our focus centering on Ethiopia.

## The Student Textbook's Contents

*Units 1 and 2:* help the students understand and develop basic skills in:

- Performing and writing up research work
- Understanding map-making and creating sketch maps

*Units 3 and 4:* teach the students these subjects:

- Physical aspects of Ethiopia and the Horn
- Aspects of population in Ethiopia, relative to their influence on the country's level of development.

## Goals and Methods of the Teacher's Guide

The general objective of the teacher's guide is to provide *geographic education at the pre-college level*. The students' textbook's main goals are to help the students acquire information about, interest in, and appreciation of

- The subject matter
- The nation's values regarding these subjects

Each unit includes multiple student-centered activities. Most of them emphasize

- Practical work
- Field visits

The teacher's guide's objectives and goals can easily be met by teachers who follow its guidelines and methodologies for presenting the subject matter and for guiding students through the activities. In this process, you will provide your students with the pre-college subject matter, skills and attitudes that they need.

In short, the *student textbook* is designed to provide learners with the following information, skills and attitudes, and this *teacher's guide* is designed to guide you through

the process of transferring this information to them and helping them to develop these skills and attitudes.

- Pertinent geographic concepts and skills related to Ethiopia.
- Understanding and appreciation of Ethiopia's rich natural and human resources and potentials.
- The ability to make sound judgements – now and in the future, as adults – about assessing, solving, reducing or, at least, mitigating social problems pervading the nation.

## General Information for the Teacher

The students' textbook and this teacher's guide are based on *student-centered learning methods* and an *active teaching-learning methodology*. This approach is widely known to:

- Increase and enhance students' academic achievements
- Develop students' critical thinking skills
- Promote co-operation among learners
- Improve students' communication skills
- Develop student confidence
- Foster positive attitudes toward the subject matter

The methodology is also known to stimulate and motivate teachers who use it, because it fosters interest and enjoyment, and enhances professional development.

As you follow this teacher's guide, it will help you to guide your students as they acquire the above stated skills and attitudes. Remember, first and foremost, that your role is as a facilitator. Your goal is to help students develop their abilities to independently acquire knowledge and skills and to absorb the subject matter.

Each unit in this guide includes the sections listed below. Their names might vary slightly from unit to unit, but each section has the same contents in each unit and unit section.

The contents of the sections are described below the list.

1. *Unit Overview* or *Lesson Overview*
2. *The Teaching-Learning Process*

*Suggested Teaching Aids and References*

*Suggested Teaching Methods* – for each lesson, this section of your guide includes some or all of the following subsections.

*Brainstorming*

*Harmonizing (or Reorganizing) the Brain*

*Explanation*

*Questioning*

*Discussion*

*Demonstration*

*Documentation*

*Guest Speakers*

*Field Visits and Field Work*

*Group Project Work*

3. *Lesson and Pre-Lesson Preparation*
4. *Lesson Presentation*
5. *Evaluation and Follow-Up*

Descriptions of these sections of your teacher's guide follow.

1. ***Unit Overview or Lesson Overview***:- Summarizes the unit (or lesson) for you.
2. ***The Teaching-Learning Process***:- Presents the lesson's core activity, including instructions for setting up and presenting each lesson topic and every activity, in sequence.

As you saw in the preceding list, the *Teaching-Learning Process* section includes subsections such as:

***Suggested Teaching Aids and References***:- describes the teaching aids and references you must prepare or obtain before classtime. These items vary, of course, depending on the lesson's subject matter and activities. For instance, in Unit 1, "Basic Research Methodologies in Geography", research samples or papers are vital.

Your teaching aids and references will include charts, photographs, maps and so forth, as needed. The internet can be an excellent source of aids and references. If it is available to you, use different web sites and browse for such aids and research work.

A list of essential references is available at the end of this guide.

***Suggested Teaching Methods***:- For each lesson, we suggest particular teaching methods that are proven parts of the student-centered methodology. The specific methods depend on the lesson's subject and activities.

The methods we suggest most frequently in this teacher's guide are:

- ***Brainstorming*** – Use this method at the moment of introducing the topic of the lesson. Have the classroom of students' state, out loud, all possible ideas about the lesson subject. To get them started, use general questions. For example, at the start of Unit 1, you might ask "What is research?" and "Why is research important?" As the students *brainstorm*, encourage them to give their opinions freely, using their ideas, existing knowledge, intuition and imagination.

This useful technique lets you find out what the students already know about the topic and stimulates their interest. It also gives all the students a chance to participate without fear of being wrong. Use it whenever you start a new topic.

- *Harmonizing (or Reorganizing) the Brain* – Use this method when you need to guide your students to a correct understanding of a subject or topic. In particular, use the *harmonizing* technique after a brainstorming session.

Of course during brainstorming, the ideas your students offer are not well organized and many are probably unrelated to the topic. As you *harmonize* their ideas, you refine and reshape them so that they are relevant, meaningful and comprehensible. In this process, use your own approaches and talents to re-arrange and reorganize the ideas.

- *Explanation:* As you explain something to your class, take the approach of a talk with the students that disclose concepts and procedures. During the talk, do your best to help the students to understand and realize the information for themselves. Do not dominate the class.

To achieve those goals during the process of explanation, use these approaches and follow these procedures:

- Observe the time span defined in this guide for the explanation.
- Be sure that your explanation is precise and at the students' level of understanding.
- Use highly related and unambiguous, unequivocal examples.
- Connect your main points.
- As you talk with the students, ask them relevant questions to check whether or not they understand your explanation.

- *Questioning:-* Use this method frequently, particularly during explanations. Also, during discussions, pose questions periodically or intermittently. Give all of your students opportunities to answer questions. Considering and answering questions helps students develop their analytic and communication skills. This technique also helps you to assess student participation and achievements.

A good approach for this technique is to ask the question and then pause to cast your eyes around the class, and then ask an individual to answer. Be sure to praise correct answers and also the act of participation. If the students find your question difficult, write it on the board.

To achieve those goals during the process of questioning, use these approaches and follow these procedures:



- Keep the questions short and simple.
  - Pause for longer than you think is necessary.
  - Whenever possible, use questions that all levels of students (slow, normal, and fast learners) can engage with. When a single question cannot achieve this goal, use multiple questions.
  - Reward participation as well as correct answers with praise, bonus marks or other types of rewards.
- *Discussion:* - This important activity takes up a significant part of the active teaching-learning process. Use both whole-class discussions and small-group discussions. Discussion gives students a chance to develop their analytic and communication skills and their confidence as they
    - Express their views
    - Listen to others
- To achieve those goals, use these approaches and follow these procedures:
- Be one of the participants in the discussion. For small-group discussions, you can move between groups.
  - Observe each student to see how he or she participates in the discussion.  
Encourage inactive students to participate. Employ various techniques to encourage them, using your own approaches and talents.
  - When you see students facing difficulties, give clues about the topic.
- *Demonstration:-* In this technique, you show the students how something is done or why something is true. For example, you can
    - Demonstrate and compare the advantages and disadvantages between a globe and a map.
    - Show the size and shape of Ethiopia.
    - Demonstrate how to determine Ethiopia's absolute and relative locations.
  - *Documentation:-* In this technique, you provide the students with documentation in the form of notes about a subject. These notes can be yours or notes that the students make themselves. The approaches you use for the documentation technique should include the following:
    - On the board, write notes to highlight or briefly document a subject.
    - Teach your students how to take or jot down notes – from their text, from other relevant sources, and during your explanations. Require them to take notes during such activities.

You might want to differentiate main topics from subordinate ones. Experts sometimes suggest the use of graphic devices such as a special coloured chalk or pen for very important concepts. You can also use indentation.

- *Guest Speakers:-* From time to time, invite a guest speaker to address the class. You can choose someone who knows more about a subject than you do, or simply someone who is knowledgeable about it.

A main advantage of this technique is preventing student boredom by presenting your class with a new face and personality. This approach encourages them to pay attention, both during the new person's presentation and also afterwards when you resume the role of teacher. Also, if the guest speaker has more knowledge than you do, then both you and the students can increase your knowledge.

- *Field Visits and Field Work:-* Geography is primarily an observational science in its practical application – in contrast, for example, to chemistry and other sciences whose practical work is primarily conducted in laboratories. Due to this fact, geography students must experience field trips and field work. For example, you might take them to a nearby area to look for various land forms made by both endogenic and exogenic forces. In addition to satisfying the requirement for such practical experience, field trips and field work make the subject more realistic and increase student interest.

- *Group project work:-* In this technique, you have your students work together in small groups (including pairs) to perform activities. In many of these activities, students write group reports or choose a group representative to present the results of their discussions. This important method

- promotes teamwork
- promotes mutual cooperation
- develops interactive learning skills
- promotes confidence
- develops analytic organization and writing skills

### **3. Lesson Preparation or Pre-Lesson Preparation:**

You perform these activities before classtime. Both terms refer to the preparation of the necessary materials, methods and strategies that you will use to transfer the designed lesson to the learners.

4. **Lesson Presentation:** In this activity, the lesson is presented to the class as a whole. Usually this task is performed by the teacher, but can be performed by a guest speaker or assigned students.

5. **Evaluation and Follow-Up:**

**Evaluation:** This activity consists of continuous assessment during classtime, supplemented with further evaluations before and/or after class. Typically, you record your evaluations on sheets of paper on which you have copied your list of students. At short intervals, you analyze these records for each student and for the class as a whole. Each student must be evaluated continuously in terms of his or her level of participation and achievement. Use direct observation, quizzes, tests, homework, mid-semester examinations and final examinations. In addition to these conventional evaluation techniques, after you complete every subunit and unit, evaluate each student's performance to develop a clear picture of his or her overall performance. Records of these trends will eventually help you ascertain whether students are performing at the pre-college-level.

Record your students' performance in the following areas and in other areas that you consider important. For each area, assess each student's level of participation as well as his or her specific achievements, scores, and so forth. You might want to use a separate copy of your student list for each area.

- Discussion
- Field work
- Answering questions
- Raising questions
- Organizing group work
- Achievements in homework, quizzes, and tests
- Efforts to work hard

When you grade your students' work, base your ratings on required-competency benchmarks.

**Follow-Up:** Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

## Lesson Evaluation Guidelines

The following worksheet helps you to evaluate and improve your approach to the teaching-learning process as the year progresses. Make a copy of the worksheet for each lesson and fill it out after the lesson. If you need more space for your notes for any of the sections of the worksheet, attach extra sheets of paper to the worksheet.

### Reflections on the Lesson

#### *Reflections on the Lesson*

Think about

- Whether the objectives were achieved.
- The evidence you have that the objectives have been achieved.
- The balance between teacher and student activity.
- Which activity was most successful and why?
- The timing/ pace of the lesson.
- Student response to the lesson.

#### *Reflections on assessment*

- Were your student-assessment methods effective?
- How will you use the results of the assessment in the next lesson?
- Does anything else need to be recorded regarding student performance and evaluation? Do you need to record anything so you can apply it to the next lesson?
- Which individuals or groups of students made exceptional progress, and which need extra support?

### Self-Assessment

#### *Record two successful things about the lesson and why they were successful*

Identify two aspects of the lesson that you thought were particularly good. For each aspect think about what made the lesson successful, and record this.

1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

#### *One suggestion for improvement* Think about an aspect of the lesson that did not go well.

Write down how you could improve this next time. Make sure your future lesson plans show (a) the way you plan to act and (b) the ways that you have acted on these suggestions for improvement.

1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

It is assumed that the following questions are common to all students regardless of their differences in attitude, knowledge and skill.

Therefore, the teacher is required to organize the class on the basis of the efficiency of students. The questions should be addressed in terms of the aggregate ability of the students in the group formed for fast, average and slow learners.

You can also refer to the assessment at the end of each unit in the syllabus and needs to stress on it while you are dealing with any activities.

## **Learning outcomes of Grade 12**

### **1. To develop understanding and acquire knowledge of:**

- Research
- How to read topographic map and the difference between qualitative and quantitative distribution maps.
- Map projection and sketch map.
- Location, size, and shape of the Horn of Africa and Ethiopia.
- Geological structure and landform of the horn of Africa and Ethiopia.
- Drainage pattern and lakes of Ethiopia.
- Climate, climatic regions, natural vegetation, wild animals and soils of the Horn of Africa with particular emphasis to Ethiopia.
- Theories, growth, structure, distribution and settlement of population in Ethiopia.
- Impacts of rapid population growth on natural environment, socio - economic development and urbanization in Ethiopia.
- Economic growth and major feature of Ethiopian economy.
- Socio-economic development.
- Demonstrate conical, cylindrical and zenital map projections.

### **2. To develop skills and abilities of:**

- Conducting action research.
- Constructing statistical diagrams to represent data on distribution maps.

**3. To develop the habits and attitudes of:**

- Appreciating the significance of research in tackling social problems and reflecting the distinctive nature of geographic research.
- Showing interest for the implementation of water resource conservation and management policy of Ethiopia.
- Conforming to participate in conservation programs.
- Adhere to the realization of the Ethiopian population policy.
- Generalizing the present features of Ethiopian socio-economic development.
- Appreciating the economic relations of Ethiopia with its neighbouring countries
- Showing interest for the realization of Plan for Accelerated Sustained Development to End Poverty (PASDEP).

# Unit **1**

## **BASIC RESEARCH METHODOLOGIES IN GEOGRAPHY**

**Periods Allotted: 22**

### **1. Unit Introduction**

The primary objective of this unit, in general, is to familiarize students with the basic concepts of research and, in particular, with those of geographic research. The unit provides detailed discussions of

- the definition, significance and approaches of research
- the nature of geographic research
- basic research methodologies of geography
- how to conduct action research

As your students have learned in previous grades, geography is one of the earth sciences. Due to its concern about earth's places/spaces, geography is considered as a "spatial science". In its modern sense, geography is defined as "... *a discipline that studies the laws of spatial distribution, variation and organization of natural and human phenomena of the earth as well as the two-way interactions and influences that exist between them.*" Since it is concerned with both natural and human aspects of the earth, the issues studied in geography are very broad, interrelated and dynamic.

Historically, the need for conducting research in the field of geography was initiated by geographers' desires to better understand and explain natural and human aspects of the earth. For example, geographical research addresses issues such as: *How and why are places different? How and why does the natural environment influence where people reside and how they live? How and why do human beings change the natural environment?*

These days, geographical research is particularly important for

- understanding places
- tackling contemporary environmental, social, economic and political problems



Current global problems that occur in geographic context and that are addressed by geographic researchers include worldwide environmental degradation, problems of food supply, the societal effects of globalization, the effects of rapid population growth in the developing world, the growing HIV/AIDS epidemic, and the rise of religious fundamentalism around the world.

## 2. Unit Outcomes

*By the end of this unit, your students will:*

- ☞ *Acquire basic research skills to enable them conduct action research;*
- ☞ *Understand the significance of research and its nature in geography; and*
- ☞ *Know different approaches used in geographic research.*

## 3. Main-Contents

- 1.1 Definition and Concept
- 1.2 The Significance of Research
- 1.3 Approaches of Research (qualitative and quantitative)
- 1.4 The Nature of Geographic Research
- 1.5 Basic Research Methodologies in Geography
- 1.6 Conducting Action Research

### 1.1 DEFINITION AND CONCEPT

Periods Allotted: 1

#### 1. Competencies

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

- ✚ *explain the concept of research.*

#### 2. Overview

In this lesson, the students learn the meaning of *research*. Provide them with different working definitions of the term, as defined by various scholars. Be sure to explain the key terms and phrases in the definitions.

Here are some definitions of the term *research*:

- A scientific method of investigating solutions to a given problem.
- A systematic way of producing new knowledge or of improving and filling gaps in existing knowledge.
- Systematic, planned and organized efforts by which new facts are discovered.
- A search for knowledge through objective and systematic approaches.

### 3. The Teaching-learning Process

#### 3.1 Suggested Teaching Aids

- A chart showing the key terms and phrases used in definitions of *research*
- Samples of research papers

#### 3.2 Suggested Teaching Methods

Our new curriculum requires that teachers use a variety of active-learning methods to encourage students' involvement in the teaching-learning process. Therefore, think about the active learning methods you want to use and decide when you will use each during the lesson. We suggest the following methods for this lesson:

- Brainstorming
- Explanation
- Pair/small-group discussion
- Questioning
- Documentation
- Harmonizing

Be sure to read the Introduction's descriptions of these and other active-learning methods that our new curriculum requires.

#### 3.3 Pre-Lesson Preparation

- Read available literature related to the meaning of *research*.
- Prepare a chart, illustration, summary, and/or other visual materials to present the key terms and phrases related to the meaning of *research*.
- Decide which active-learning methods and evaluation techniques that you want to use during the lesson. Plan when to use them during the lesson.

#### 3.4 Lesson Presentation

##### a) Introducing the Lesson

- Introduce the topic by outlining or summarizing its main points and contents.
- Make the objectives of the lesson clear to the students.
- Have the students brainstorm about *research*: Direct them, as a group, to tell the whole class anything that they know about the subject. As they work, note what they know about the subject.

**b) Main Body of the Lesson**

Use the techniques of *explanation*, *discussion*, *group work*, *questioning*, *documentation*, and *harmonizing*, as described below.

- *Explain* the meaning of research by presenting different definitions.
- Encourage student *discussion* by asking them open-ended questions at different points during your explanation. For example, you can have them conduct discussions in *pairs or groups*. You can use the following concepts, all of which are related to research, as subjects for their discussions.
  - ✓ New discovery
  - ✓ Searching for solutions
  - ✓ Searching for knowledge
  - ✓ Investigating causes and consequences
  - ✓ Filling gaps in existing knowledge
- Have your students formulate and *ask and answer questions* at appropriate times during your explanation. Do not wait until the end of your explanation to conduct this activity
- Give the students sufficient time to prepare and organize their notes (*documentation*).
- Finally, *harmonize* the lesson by reviewing key ideas and concepts related to research.

**c) Stabilization**

You may stabilize the lesson by reviewing the key ideas and concepts of the lesson such as:

- A research is a scientific method of searching solutions that help to solve problem.
- A research is a scientific process of searching for knowledge through objective and systematic approaches.
- A research is a systematic, planned and organized effort by which a new knowledge is improved, or gap in the existing knowledge is filled.

### 3.5 Evaluation and Follow up

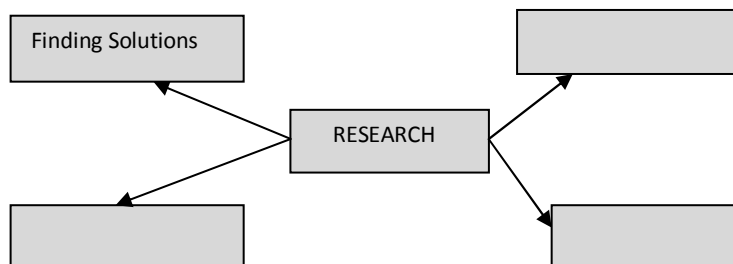
**a) Evaluation**

Be sure to read the Introduction's descriptions of the evaluation methods developed for the new curriculum. In your evaluation for this lesson, include all methods described in the Introduction.

As part of this process, check your students' understanding of the subject matter by *asking oral questions* and giving *classwork*.

- Ask oral *questions* such as:
  - What is *research*?

- What is *knowledge*?
- What do the following terms mean?  
*discovery, innovation, exploration, investigation*
- What does *systematic inquiry* mean?
- Give *classwork*. Here is a sample class activity you could use:  
Have the students complete the following mind map that shows key ideas and concepts of *research*.



- Give the students appropriate *feedback* for their responses and activities. Be sure to reward participation as well as results.

#### b) Follow up

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide additional activities that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

#### c) Additional Activities for Fast Learners (for students working above the minimum requirement level)

1. Explain the concept of research.
2. Discuss the relationship between research and
  - a. Science
  - b. Knowledge
3. In research, what does systematic enquiry mean?
4. “A research is a scientific process of searching for new knowledge or filling gaps in the existing knowledge.” Discuss the major ideas of this definition.

## Answers for Additional Activities

1. The concept of research involves the systematic process of:
  - Searching for possible solutions for various natural and human related problems;
  - Investigating the possible answers for various deeply nagging questions and satisfying one's curiosity about these questions;
  - Producing new knowledge and filling the gaps in the existing knowledge; and
  - Conducting scientific discoveries and innovations.
2. Relationship between:
  - a. **Research and Science:** There is two-way relationship between research and science. This is because scientific discoveries are often the results of research and research is conducted with the help of information collected and analyzed through scientific methods and instruments.
  - b. **Research and Knowledge:** There exists two-way relationship between research and knowledge also. A research cannot be conducted without a certain level of pre-knowledge about an identified research problem. On the other hand, research is an essential tool for the development of knowledge. It produces new knowledge and fills the gap in the already existing knowledge.
3. In research, systematic inquiry means a critical scientific methodical investigation into a subject in order to discover facts, to establish or revise a theory, or to develop a plan of action based on the facts discovered.
4. The major ideas of the definition are:
  - Research is a source of knowledge;
  - Research is a systematic process that helps to discover some kinds of new facts, information, ideas, concepts, and knowledge in general; and
  - Research is a process that enables us to improve a knowledge that already exists by discovering new ideas, concepts, facts, etc about a given problem.

## 1.2 THE SIGNIFICANCE OF RESEARCH

Periods Allotted: 1

### 1. Competencies

*By the end of this lesson, your students will:*

- ✚ Show appreciation to the significance of research in tackling social problems.

## 2. Overview

In this lesson, your students

- learn why we engage in research
- consider the rationales of conducting research.

The lesson addresses the significance of research at various levels, including the personal, institutional, societal, national, and global levels.

Whether conducted by individuals for private purposes or as a systematized and formalized effort in association with scientific disciplines such as geography, the goals of conducting research revolve around

- mitigating negative and enhancing positive dimensions of the human condition.
- satisfying one's curiosity about deeply nagging questions.

Often research is concerned with finding solutions to negative conditions and enhancing positive conditions. For example, research frequently investigates ways either to prevent harm, lessen disease, alleviate pain, reduce hunger, and so forth, or to attain greater comfort, convenience, security, and so forth, for society. Sometimes research is driven by intellectual needs, because we are discomfited by gaps in what we think we know and are prompted to seek new information and greater understanding.

However, whatever the precise stimulus is, in general the act of *conducting research* appears to be need-driven and goal-directed problem-solving behavior that is geared toward bettering the human condition.

For a large part of recorded history, advancements in science, technology and welfare have resulted from the work of capable researchers in geography and other disciplines. As a result, society now invests huge amounts of resources (money, material, time, and expertise) in research. Here are some of the major benefits of research and its results:

- Research enables us to identify specific problems, to define their magnitude, causes, and consequences, and to develop possible solutions.
- By providing new facts and knowledge, research enlightens scientists and students in the relevant field and in related fields and, often, society in general.
- Research enables us to identify, understand, and fill the gaps between formulated theories and the real world.
- Research and its results serve as springboards for further investigation and the acquisition of new knowledge.
- Research and its results widen scientists' and society's scope of thought.
- Research strengthens our capacity to make critical observations and predictions.
- Research enables us to make rational decisions.
- Research and its results help governments formulate sound policies which promote various kinds of development.

### 3. The Teaching-learning Process

#### 3.1 Suggested Teaching Aids

- A chart showing the key issues of the significance of research
- Samples of research papers
- Diagrams, pictures, films, and other graphic presentations of research findings

#### 3.2 Suggested Teaching Methods

As you know, our new curriculum requires active-learning methods that encourage students' involvement in the teaching-learning process. Therefore, decide which active learning methods you want to use and when you will use each during the lesson. We suggest the following methods for this lesson:

- Brainstorming
- Explanation
- Pair/small-group discussion
- Questioning

Be sure to read the Introduction's descriptions of these and other active-learning methods from our new curriculum.

#### 3.3 Pre Lesson-Preparation

- Read available literature related to the significance of research.
- Prepare a chart, illustration, summary, or other visual materials that present issues related to research's significance.
- Think over the active-learning methods and evaluation techniques that you want to use and decide when you will use them.

#### 3.4 Lesson Presentation

##### a) Introducing the Lesson

- *Recap* the previous lesson. As you do that, ask students questions such as:
  - How do you define *research*?
  - How do you explain the terms *discovery*, *innovation*, etc.
- Explain what the new lesson is all about. Ask relevant questions to check that the students understand your lesson overview.
- Explain the lesson's objectives. Again, check that your students understand the objectives.
- Approach the lesson as a problem to be solved by asking the following questions in a *questioning* or *brainstorming* session.
  - Why is research important?



- Why do you think that large amounts of personal, societal, national, and global resources, such as money, time, materials, and expertise, are used for research, although such resources are very scarce?

This *questioning* and *brainstorming* session will help you understand what students know about the subject of *the significance of research* before you begin your lesson presentation.

### **b) Main Body of the Lesson**

Use the techniques of *explanation*, *discussion*, *group work*, *questioning*, *documentation*, *feedback*, and *harmonizing* described in the Introduction. For this lesson

- *Explain* the main reasons for the significance of research. In this process, show your students the chart that you prepared in your pre-lesson preparations. Also, enhance students' motivation by showing them diagrams, pictures, and films related to major research findings. In your explanations, use simple examples that help the students relate the lesson to their real-life situations.
- Encourage *discussion* by asking open-ended questions at different points during your explanation,. For example, you can divide students into small *groups* and have them discuss the significance of research from various perspectives. You could have each group discuss one of these levels:
  - Personal
  - Societal
  - National
  - International

After their discussions, ask each group to choose a representative to *present the group's ideas to the class* so that the groups can share ideas.

- Provide your *feedback* on each group's report.
- Give students time to formulate and ask *questions*.
- Arrange time for students to effectively organize their notes (*documentation*).
- Finish your lesson presentation with a review of key ideas and concepts (*harmonizing*).

### **c) Stabilization**

Stabilize the lesson with a review of key ideas and concepts such as:

- A research helps us to tackle problems occur at various levels (personal, institutional, societal, national and global).
- Research enables us to identify problems, to investigate their causes and consequences, and to find their possible solutions.
- Research enables us to make rational decisions and to take appropriate actions against various problems of societies.

### 3.5 Evaluation and Follow up

#### a) Evaluation

In your evaluation for this lesson, include all methods described in the Introduction. As part of this process, check your students' understanding of the subject matter by *asking oral questions* and giving *classwork*.

- Here are some *questions* you can use:
  - ✓ How does research help to solve societal problems? Choose a problem and answer the question for it.
  - ✓ Why do we say that the technological, scientific, social, and economic advancements of this world are the results of capable researchers' work?
  - ✓ How can research help to formulate and check theories?
- Give this project for small *groups* as *classwork*:  
Have each group choose a significant research finding and *write a report* on its contributions to society on all appropriate levels. Have them *refer to sources of information* such as books, magazines, newspapers, journals, and the internet.  
Then ask each group to choose a representative to *present its report to the class*.

Give the students appropriate *feedback* for their responses and activities. Be sure to reward participation as well as results.

#### b) Follow up

Based on these and other evaluations you have performed for the lesson, assess each student and also the class as a whole. Decide whether you they have met the lesson objectives. Then encourage all students and assign extra work as described for the preceding lesson.

#### c) Additional Activities for Fast Learners

1. What makes research significant?
2. Discuss the importance of research in science and technology.
3. Explain how research helps to tackle the following problems of a society.
  - a. HIV/AIDS
  - b. Poverty
  - c. Climatic Change
  - d. Harmful Traditional Practices
4. How does research enable us to make rational decisions?
5. Explain the importance of research in the formulation of policies.

## Answers for the Activities Exercises in the Students' Textbook

### Activity 1.1

1. **Essay:** It is literary composition devoted to the presentation of the writer's own ideas on a topic and generally addressing a particular aspect of the subject. Essays are often brief in scope and informal in style. There are different forms of essays.

**Report:** It is a form of writing in order to tell about what happened or to give information about something that has happened. In research, a report is written to in order to summarize the major results of the research.

**Research:** It is a scientific methodical investigation into a subject in order to discover facts, to establish or revise a theory, or to develop a plan of action based on the facts discovered.

2. The following are some of the basic significances of research.
  - It enables us to identify specific problems and to develop solutions.
  - It enables us to identify, understand, and fill the gaps between formulated theories and the real world.
  - Research and its results serve as springboards for further investigation and the acquisition of new knowledge.
  - Research and its results widen scientists' and society's scope of thought.
  - Research strengthens our capacity to make critical observations and predictions.
  - Research enables us to make rational decisions.
  - Research and its results help governments formulate sound policies which promote various kinds of development.

### Answers for Additional Activities

1. Research is significant because:
  - It enables us to identify and solve wide ranges of natural and human related problems;
  - It enables us to make critical observations and predictions, to make and take rational decisions and actions, to formulate sound policies and strategies, etc
  - It helps us to acquire new knowledge, to widen our scope of thought, to conduct further investigation, to formulate theories, etc
2. The significance of research in science and technology can be explained in such a way that the advancements in science and technology are the results of the findings of capable researchers of different time. By conducting researches of various kinds,

scientists have been able to discover various things that have been contributing a lot for betterment of human lives in this world. To mention some, the discovery of:

- Various medicines for different diseases (e.g. An Ethiopian scientist, Dr. Aklilu Lemma discovered *endod* as a medicine for bilharzias.)
  - Telephone especially mobile telephone resulted in better communication among people of this world.
  - Computer technology and the related issues such as internet enables people to release and acquire information within a minute, to store information, and to make analysis of information with better accuracy.
3. Research helps to tackle the following societal problems.
    - **HIV/AIDS:** It helps us to formulate and implement sound policies, strategies, programs, etc, which can contribute to control the rate of transmission of HIV. In addition, it helps scientists to discover a vaccine and medicine for HIV/AIDS.
    - **Poverty:** It enables us identify the causes and consequences of poverty in a given society. Besides, it helps us to formulate and implement sound policies, strategies, programs, etc, which can contribute to address a problem of poverty.
    - **Climatic Change:** It helps us to identify the causes/factors of climatic change, its consequences/impacts, and to find possible solutions that address the problem.
    - **Harmful Traditional Practices:** It helps us to identify the traditional practices that are useful and harmful. Furthermore, it helps us to formulate and implement sound policies, strategies, programs, etc, which can contribute to avoid those traditional practices that are harmful to the society in which they are widely practiced.
  4. By enabling us making critical observation and investigation of various problems, research helps us to make rational decisions.
  5. Since research is a systematic process of observing and investigating various problems, it helps us to identify factors, consequences, and possible solutions of different problems. The findings of researches, therefore, are helpful in the formulation and implementation of policies rationally.

## 1.3 APPROACHES OF RESEARCH (QUALITATIVE AND QUANTITATIVE)

Periods Allotted: 4

### 1. Competencies

*By the end of this lesson, your students will be able to:*

- ✚ Use different geographic research approaches in action research.

### 2. Content

- Quantitative approach
- Qualitative approach
- Both approaches

### 3. Overview

In previous lessons of this unit, your students studied the meaning and significance of research. The focus of this lesson is to familiarize them with *the two major approaches to research*: the *quantitative* and *qualitative* approaches.

Depending on the nature of the research problem, research can be conducted using

- the quantitative approach
- the qualitative approach
- both approaches in combination

In the *quantitative approach*, a wide range of statistical and mathematical tools, models and techniques are employed in order to

- Analyze and interpret quantitative data obtained from different sources.
- Manipulate variables and see the effects of one variable on other variables.
- Verify a given theory.
- Test established hypotheses.

In the *qualitative approach*, however, non-numerical types of data obtained from different sources are systematically organized, analyzed and summarized. In this approach:

- Statistical and mathematical techniques are not used.
- No hypothesis is established or tested
- The relationships between variables are not analyzed or presented numerically.
- An established theory is not verified statistically or mathematically.

## 4. The Teaching-learning Process

### 4.1 Suggested Teaching Aids

- Collect sample research papers of work conducted through qualitative and quantitative approaches
- Prepare a chart showing quantitative and qualitative approaches to research.

### 4.2 Suggested Teaching Methods

The following active learning methods can be used at different points during the lessons presentation:

- Explanation
- Demonstration
- Questioning
- Discussion
- Brainstorming

### 4.3 Pre Lesson Preparation

- Organize the lesson in advance.
- Collect sample papers of research conducted through qualitative and quantitative approaches.
- Think about the active-learning methods that you want to use.
- Think about the assessment techniques that you want to use.

### 4.4 Lesson Presentation

#### a) Introducing the Lesson

*Recap* the preceding lesson, and use the brainstorming technique:

- Ask students to mention the most essential elements of the previous lesson.
- Ask them why research is significant.
- Check what students know about the lesson by asking diagnostic questions. This will help as a starting point for your teaching.

*Introduce* the new lesson and make its objectives clear to the students.

Ask *questions* such as:

- What do you think an approach is?
- How do you think statistics and mathematics are used in conducting research?
- What kind of information can be obtained from theory, interviews, and discussion? How is this information presented in research reports?

**b) Main Body of the Lesson**

- *Explain* the main ideas and concepts of the qualitative and quantitative approaches used to conduct research. Provide students with simple examples related to their real life situations.
- Do not lecture all the time. Instead, at different points during your lecture, try to encourage students to take part in *discussions* by asking them open-ended questions such as: In what circumstances are the quantitative and qualitative approaches to research most helpful?
- Have your students work in *pairs or small groups* and challenge them to develop their own examples in which quantitative and qualitative approaches of research could be used.
- Encourage students to ask *questions* at appropriate points during your lecture.
- Give students time to organize their notes (*documentation*) during or immediately after your lecture.
- Finally, ask students to identify the key points of the lesson and then *harmonize* your lesson presentation by reviewing all essential points, including those not mentioned by the students.

**c) Stabilization**

Ask students to identify the key points of the lesson and then stabilize your lesson presentation by reviewing all essential points, including those not mentioned by the students. You may mention the following.

- Qualitative and quantitative approaches are the two major approaches of research.
- Qualitative approach of research is used to organize, analyze, and summarize non-numerical types of data.
- Quantitative approach of research is used to organize, analyze and interpret numerical/quantitative data by using various mathematical and statistical tools.



## 4.5 Evaluation and Follow Up

### a) Evaluation

To gauge the performance of your students, *use all of the evaluation and assessment techniques* described in the Introduction. As part of this process, ask oral questions and give classwork.

- Here are some *questions*:
  - In qualitative approach, why do we say that no hypothesis tested?
  - In what kinds of cases is quantitative approach employed?
- Giving *classwork*:
  - Exercises are found in the students' text.
  - Giving this assignment to be done in groups.

Provide each group with a copy of a sample research paper and instruct them to carefully read it and *write a report* on the type of research approach used to conduct it.

### b) Follow up

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

### c) Additional Activities for Fast Learners

1. Discuss how information is collected, analyzed and interpreted in quantitative research.
2. Discuss the reasons why qualitative approach does not help to test hypothesis and check theories.
3. Determine which type of approach to research (qualitative or quantitative) is related to the following issues.
  - a. Testing hypothesis
  - b. Analyzing non-numerical information
  - c. Analyzing numerical information
  - d. Applying statistical and mathematical tools

## Answers for the Activities Exercises in the Students' Textbook

### Exercise 1.1

#### I. Complete the following sentences correctly

1. Qualitative and quantitative
2. Qualitative
3. Tested
4. Qualitative
5. Quantitative

#### II. Vocabulary Skills

- |      |      |      |       |      |      |
|------|------|------|-------|------|------|
| 1. H | 2. C | 3. A | 4. F  | 5. G | 6. E |
| 7. I | 8. D | 9. B | 10. J |      |      |

### Answers for Additional Activities

1. In quantitative research, information is collected from primary and secondary sources. Questionnaires, experiments, measurements, statistical reports, etc are used to get information used in quantitative researches.

To analyze the collected information, various mathematical and statistical methods are used. In quantitative researches, descriptive and analytical methods of analysis are usually employed.

Finally, the results of the mathematical and statistical analysis are interpreted and presented in clear and meaningful ways.

2. Hypothesis testing and checking of theories are most likely done with the help of mathematical and statistical techniques. Therefore, since qualitative research uses non-numerical data, it is not possible to apply this approach in testing hypothesis and checking theories.
3. Type of research approach related to the following issues are:
  - a. Testing hypothesis—Quantitative approach
  - b. Analyzing non-numerical information—Qualitative approach
  - c. Analyzing numerical information—Quantitative approach
  - d. Applying statistical and mathematical tools—Quantitative approach

## 1.4 THE NATURE OF GEOGRAPHIC RESEARCH

Periods Allotted: 4

### 1. Competencies

*By the end of this lesson, your students will be able to:*

- ✚ *Reflect the distinct nature of geographic research from other disciplines.*

### 2. Overview

In this lesson, your students will learn about

- the historical development and characteristics of geographic research in relation to other social science research
- the application or relevance of geographic research to real-life situations.

You will guide the students to an understanding of the following essential ideas and concepts.

- Applied geography
- Geographic Information Systems (GIS)
- Spatial science

Historically, various changes have been observed in the nature, scope and approaches of geographic researches.

Traditional geographers focused on the exploration of location and simple description of places in most of their research work. In the 18<sup>th</sup> century, research in the field of geography shifted to the description of the relationships between humans and their environments. In the mid- twentieth century, the use of quantitative methods, statistical and mathematical techniques revolutionized geographic research, causing it to focus more on spatial analysis of the distribution, variation and organization of the physical and human phenomena of the earth and of the two-way interaction that exists between them.

Since then, geography has been considered as an applied science. The scholarly products (research) of many geographers have been applied practically to address local, natural, regional and global problems of various kinds. In particular, the development of Geographic Information Systems (GIS) at the end of the 20<sup>th</sup> century resulted in a significant transformation in the nature of geographic research. By employing computer-based GIS software, geographers can now conduct research that brings practical and reliable solutions to a wide range of environmental, social, economic, cultural, political and other problems of societies in different parts of the world.

### 3. The Teaching-learning Process

#### 3.1 Suggested Teaching Aids

- Copies of geographic research papers
- Videos of geographic research
- Computers and GIS software
- Pictures and diagrams of some geographic research and their major findings

#### 3.2 Suggested Teaching Methods

- Explanation
- Demonstration
- Problem solving
- Discussion
- Guest speaker
- Questioning

#### 3.3 Pre Lesson Preparation

- Collect information related to geographic research in various historical periods and the present. Use various sources such as books, journals, the internet, etc.
- Organize the lesson effectively by using a framework, illustration, summary or other visual materials.
- Prepare audio-visual materials such as copies of geographic research papers, films, diagrams, etc.
- Think about the active-learning methods and assessment techniques that you want to employ.

#### 3.4 Lesson Presentation

##### a) Introducing the Lesson

- Introduce the lesson by relating it to the key ideas and concepts of the previous lesson.
- Make the objectives of the lesson clear to your students.
- Check what your students know about geography and geographic researches by asking them questions such as: What does geography mean? What kinds of issues are investigated and addressed to by geographic research? What is the significance of conducting research in the field of geography?

You can have the students work in pairs or small groups to discuss and answer the questions.

**b) Main Body of the Lesson**

- *Explain* the main ideas and concepts related to the historical development of geographic research, the similarities and differences between research in geography and in other social sciences, the significances of geographic research, and the applications of quantitative techniques and GIS to geographic research.
- Instead of explaining things all the time, *use active-learning methods* that enhance students' motivation and participation at different points during your presentation.
- Provide students with simple and familiar *examples*.
- Encourage students' *participation and discussion* by asking open-ended questions such as:
  - What kinds of changes have you observed in the historical development of geographic research?
  - Have you ever heard, read or seen any research conducted in the field of geography?
  - Can you identify a problem in your society that can be studied and solved by geographic research?
- Let them work in pairs or small *groups* to *discuss* your questions.
- Encourage students to ask *questions* at any time during your presentation.
- Give students time to organize their notes (*documentation*) during or following your presentation.
- Use audio-visual materials to demonstrate the nature of geographic research and its findings.
- Invite a researcher in geography or a GIS expert as a *guest lecturer* to help your students understand the lesson better.

**c) Stabilization**

Complete your lesson presentation with a review of the key ideas and concepts of the lesson such as:

- The nature of geographical researches have been changing and improving from time to time.
- The researches of traditional geographers were basically concerned with the exploration of locations and simple descriptions of places.

- Modern geographic researches show that geography is an applied spatial science that brings practical solutions to a wide range of problems related to the physical and social environment.
- In the modern geographic researches, wide ranges of statistical and mathematical tools as well as computer-based GIS software are used to analyze the spatial distribution, variation and organization of the elements of the physical and social environment.

### 3.5 Evaluation and Follow up

#### a) Evaluation

*Use all of the evaluation techniques described in the Introduction.* As one of your evaluation tools, use classwork that can be done independently or in pairs. The following questions can be used.

1. Explain the following.
  - a. GIS
  - b. Quantitative revolution
  - c. Spatial analysis
2. Explain why geography is considered to be a spatial science.
3. What are the differences between traditional/classical geographic research and modern geographic research?

**A group assignment** – Have the students write an essay in their groups on the socio-economic, political, environmental, and technological contributions and applications of geographic research.

#### b) Follow up

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

**c) Additional Activities for Fast Learners**

1. Explain the significance of conducting research in the field of geography.
2. In geographic research, what does quantitative revolution mean?
3. By using the results of certain geographic research works, discuss their applications in solving various problems exist in the current world.
4. How does GIS contribute to modern geographic research?

**Answers for Additional Activities**

1. Conducting researches in the field of geography is very significant to tackle wide ranges of natural and human related problems. In this regard, historically, it has been observed that the scholarly products (research) of many geographers have been applied practically to address local, natural, regional and global problems of various kinds (environmental, social, economic, political, etc).
2. In the history of geographic research, quantitative revolution refers to the application of various statistical tools to analyse and interpret spatial data of various kinds.
3. For example, Walter Christaller (1893-1969) was a German geographer, who conducted a research on agricultural geography and urban networks in southern Germany. Christaller collected information on variation in an area, gave an explanation, and then tested for empirical confirmation. Based on the findings of his research, Walter Christaller put forward a theory known as central-place theory. According to central-place theory, if each settlement of a particular order acts as a central place for certain levels of goods or services; there should be a regular pattern and distribution of settlements within an area. He suggested that each settlement be surrounded by a hexagonal sphere of influence (hexagonal rather than circular because circles cannot fit together exactly). The size of these hexagons depends on the order of the central place—village, town, or city. Each order would have a market area three times that of the settlement below. Settlements of each order would therefore be spaced at regular intervals in a spatial hierarchy. Christaller took a number of factors for granted. For example, he assumed that transportation was equally possible in all directions. In the real world this is not the case. However, the theory provides a starting point for explaining settlement distribution.
4. Computers have become a particularly useful tool in geography. During the 1960s, the Canadian government built the first geographic information system, or GIS, a computer system that records, stores, and analyzes geographic information. These computer systems can create two- or three-dimensional images of an area that are used as models in geographic studies. They are designed to process massive amounts of data, and help scientists conduct research much more quickly and accurately. The GIS has many applications in government and business also.

## 1.5 BASIC RESEARCH METHODOLOGIES IN GEOGRAPHY

Periods Allotted: 2

### 1. Competencies

*By the end of this lesson, your students will be able to:*

- ✚ Use basic elements of research in their action research.

### 2. Content

- Basic elements of research

### 3. Overview

In this lesson, students learn about *research methodology* and, in particular, *research methodology in the field of geography*. They discuss differences between *research*, *research technique*, and *research methodology*. At the end of the lesson, your students will have a clear understanding of the nature of geographic research and of how it is scientifically conducted.

*Research methodology* is a concept that refers to the science of systematically/scientifically conducting research. For a given research project, it is based on the project's fundamental issues, and it serves as a means of designing solutions. Research methodologies in geography generally consider the following fundamental issues.

- Why and how the research problem has been identified
- How the research has been conducted
- What assumptions/hypothesis have been formulated
- What types of data have been collected
- What technique of analysis has been employed

### 4. The Teaching-learning Process

#### 4.1 Suggested Teaching Aids

- Sample Research – present or produce sample research papers for the students.

#### 4.2 Suggested Teaching Methods

Use

- Explanation
- Discussion
- Brainstorming
- Problem solving
- Questioning



### 4.3 Pre Lesson Preparation

- Assemble the materials (short notes, books and other references) needed for the teaching-learning process.
- Prepare the necessary teaching aids (sample research papers).

### 4.4 Lesson Presentation

#### a) Introducing the Lesson

- Start by *recapping* the main points of the previous lesson. Ask students *questions* such as:
  - ✓ What makes geographic research different from research in other social science fields?
  - ✓ Why is geography considered to be a spatial science?
  - ✓ What does GIS mean?
- *Introduce the lesson by explaining its*
  - ✓ contents
  - ✓ objectives

Check to be sure that students understand your presentation.

- Use a *brainstorming* or *questioning* session to find out what the students understand about the lesson before you begin your presentation. Ask students to answer questions such as:
  - ✓ What does *research technique* mean?
  - ✓ What does *research methodology* mean?

#### b) Main Body of the Lesson

- *Explain* the differences between *research*, *research method* and *research methodology*. Make sure that students are clear about their differences and the basic issues of research methodology.

Have them conduct *discussions* in small groups to develop their own examples that show these differences and the basic issues considered in research methodology of geographic research. Give students time to *present* the highlights of their discussion. Give your *feedback* on the presentations. Give students time to ask *questions* and organise their notes (*documentation*).

#### c) Stabilization

Conclude the lesson by stabilizing with a review of the most essential elements of the lesson.

- Research methodology is a concept that refers to the science of conducting a research with scientific and systematic procedures and techniques.
- The fundamental issues considered in geographical research methodology, among others, are:

- identifying the research problem
- determining how the research is conducted
- formulating the hypothesis
- formulating the objectives of the research
- determining the types of data to be collected
- determining the technique of analysis to be used

## 4.5 Evaluation and Follow Up

### a) Evaluation

*Use all of the evaluation techniques described in the Introduction.*

As part of your evaluation process, use these methods:

- Oral questions such as:
  - What does *research method* mean?
  - What does *research methodology* mean?
  - Why do we say that the concept of *research methodology* has wider dimension than that of *research method*?
- **Group assignment:** Have the students answer the *questions* found in their textbook in groups. Have each *group* choose one of the two questions.
- Invite a *guest speaker* who has a deal of good experience in conducting research. Have the speaker conduct a discussion session on:
  - a. What is *research*?
  - b. What significance does research have?
  - c. What is the relevance of research in geography?
- Using any accessible reference materials such as the internet, Microsoft Encarta, books, etc, conduct a group discussion about the different concepts of *research technique* and *research methodology*.

### b) Follow up

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

**c) Additional Activities for Fast Learners**

1. What does a research methodology mean?
2. What are the basic elements of geographic research methodology
3. Discuss the difference between primary data and secondary data by giving examples for each.
4. Explain the meanings of the following elements of geographic research methodology.
  - a. Research problem
  - b. Research objectives
  - c. Hypothesis
  - d. Data collection
  - e. Data Analysis

## **Answers for the Activities and Exercises in the Students' Textbook**

**Activity 1.2**

1.
  - A. Research: is a scientific method of investigating solutions to a given problem. In other words, it is a systematic way of producing new knowledge or of improving and filling gaps in existing knowledge.
  - B. The following are the major significances of research.
    - It enables us to identify specific problems and to develop solutions.
    - It enables us to identify, understand, and fill the gaps between formulated theories and the real world.
    - Research and its results serve as springboards for further investigation and the acquisition of new knowledge.
    - Research and its results widen scientists' and society's scope of thought.
    - Research strengthens our capacity to make critical observations and predictions.
    - Research enables us to make rational decisions.
    - Research and its results help governments formulate sound policies which promote various kinds of development.
  - C. In geography, research is very important to tackle various problems related to both the physical (natural) and social environments.
2. A research technique is a skill that uses different steps or elements to solve a given identified problem and arrive at a possible solution. A research methodology, however, is much broader than a research technique. A research methodology is a science that studies how research is done scientifically.

## Answers for Additional Activities

1. Research methodology is a concept that refers to the science of systematically/scientifically conducting research. For a given research project, it is based on the project's fundamental issues, and it serves as a means of designing solutions.
2. The basic elements of geographical research methodology are:
  - Research Problem
  - Research Objectives
  - Hypothesis
  - Types of Data and Data collection Methods
  - Data Analysis and Interpretation
3. Primary data is first hand information which is collected through interview, or observation, or questionnaire, or experiment, or discussion. In contrast, secondary data is information that is collected by others and obtained from sources such as books, researches, statistical abstracts, magazines, newspapers, etc.
4. Their meanings are explained in the following ways.
  - **Research Problem:** It is the research topic identified by the researcher and upon which the research is going to be conducted.
  - **Research Objective:** It is a goal or purpose that the researcher desires to achieve after conducting a given research.
  - **Hypothesis:** It is a tentative assumption or explanation for a phenomenon, used as a basis for further investigation.
  - **Data Collection:** It is a process of gathering the information required for a given research.
  - **Data Analysis:** It is the examination of something in detail in order to understand it better or draw conclusions from it. In other words, it refers to an assessment, description, or explanation of something, usually based on careful consideration or investigation.

## 1.6 CONDUCTING ACTION RESEARCH

Periods Allotted: 10

### 1. Competencies

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

- ✚ *Conduct action research on selected problems.*

## 2. Overview

In this last lesson of the unit, the students will learn about action research:

- Its characteristics
- Its purposes
- The ways in which it differs from other types of scientific research
- The major stages involved in it

*Action research* is an ongoing research process by which a particular real problem is identified, information/data are gathered, practical solutions are tested, conclusions and recommendations are reached and finally improvements are made.

The following table compares action research with scientific/academic research.

Type of Research	Practical Purpose	Forms of Knowledge
Scientific/ Academic Research	To give a 'proven' base for improvement	Objective, leading to generalisations and explanations
Action Research	To improve action/practice directly by way of addressing a real problem, suggesting a solution and taking action	Evaluative, descriptive, analysing and improving action/practice

The following are the basic characteristics of action research.

- It is based on reality.
- It provides the opportunity to try out new ideas and solutions to problems.
- It enables researchers to put ideas into action.
- There is rapid feedback.
- It aims at improving action/practice, not at producing new knowledge.
- It encourages reflection and further development.
- It is based on primary data sources – data collected from real life by the researcher.
- Theory is created not as an end in itself, but to improve action/practice.
- The intention to improve action/practice often results in cyclical action research because striving for improvement is seen by many researchers and practitioners as an ongoing commitment.
- It is grounded in actual action/practice and does not have an established theoretical background which can provide a framework for testing the validity of the new findings.

The major stages that you go through in action research are the following:-

- i. Identify the problem
- ii. Briefly state the research rationale (background and general area/s of the research)
- iii. List objectives of the research
- iv. Collect data/evidence
- v. Analyse data/evidence
- vi. Propose action
- vii. Implement action
- viii. Evaluate action
- ix. Recommend change resulting from the evaluation

**N.B:** As we can understand from the above stages, action research is different from scientific research because it involves more action-oriented stages such as proposing action to be taken as a solution for the problem, implementing the proposed action, evaluating the effects of the implemented action and, finally, recommending changes resulting from the evaluation.

### 3. The Teaching-learning Process

#### 3.1 Suggested Teaching Aids

- Sample action research
- Charts
- Diagrams

#### 3.2 Suggested Teaching Methods

- Brainstorming
- Explanation
- Discussion
- Problem Solving
- Questioning

#### 3.3 Pre Lesson Preparation

- Assemble the necessary materials (short notes, books and other references) needed for the teaching-learning process.
- Prepare a chart showing the basic stages in action research.
- Prepare the necessary teaching aids (sample action research).

#### 3.4 Lesson Presentation

- Motivate the students.
- Make the objectives of the lesson clear to the students.
- Begin your lesson by using brainstorming.

- Categorize the entire lesson into two broad parts– i.e., the first part is explanation and the second part is research work.

**N.B:** the research work that the students attempt to practice should be localized and not very time-consuming.

### c) Stabilization

Conclude the lesson by reviewing the key points such as:

- Action research is a kind of research conducted on a specific and real problem to find practical solutions and to take actions accordingly.
- Action research is different from scientific research because:
  - It involves more action-oriented stages.
  - It addresses a real problem.
  - It aims at improving action.

## 3.5 Evaluation and Follow up

### a) Evaluation

*Use all of the methods described in the Introduction.* As part of that process, perform these tasks.

Correct the students' attempted research. After you correct them, point out the main mistakes to the students and suggest better attempts they could make.

### b) Follow up

*Use all of the methods described in the Introduction.* As part of that process, perform these tasks.

The works should be graded and registered.

- The grades should be rated based on a given benchmark.
- The students should be identified based on the set benchmark.
- Appreciation and encouragement should be given.

### c) Additional Activities for Fast Learners

1. Define action research and discuss its significances.
2. What are the major stages involved in action research?
3. Identify some of the problems in your locality or school that can be studied and solved by action research.
4. "Action research aims at improving action/practice, not at producing new knowledge." Discuss what this means.

## Answers for the Activities and Exercises in the Students' Textbook

**Note:** Activity 1.3 should be done by the students since it involves personal/students' involvement.

### Answers for Additional Activities

1. Action research is an ongoing research process by which a particular real problem is identified, information/data are gathered, practical solutions are tested, conclusions and recommendations are reached and finally improvements are made. Its basic significances are the following:
  - It helps us to address real problems.
  - It provides us the opportunity to try out new ideas and solutions to problems.
  - It enables us to put ideas into action.
  - It helps us to get rapid feedback.
  - It is an ongoing commitment to improve action/practice.
  - It encourages reflection and further development.
  - It is grounded in actual action/practice.
2. The major stages involved in action research are the following:-
  - a. Identify the problem
  - b. Briefly state the research rationale (background and general area/s of the research)
  - c. List objectives of the research
  - d. Collect data/evidence
  - e. Analyse data/evidence
  - f. Propose action
  - g. Implement action
  - h. Evaluate action
  - i. Recommend change resulting from the evaluation
3. The following can be examples:
  - The Problems of Female Students in the School
  - Classroom Disciplinary Problems in the School
  - Improving the Achievement of Students in Mathematics
  - Addressing the Problem of Students Absenteeism from School
4. It is to mean that the objective of action research is not to produce some kind of knowledge which is new. Instead, its basic purpose is to improve a certain issue by proposing and actually practicing certain kinds of actions.



## Answers for Review Questions of Unit 1

### I Choices

1. A    2. B    3. C    4. C    5. A    6. C    7. B    8. D    9. D

### Sample Lesson Plan

Teacher's Activity	Time	Students' Activity
<ul style="list-style-type: none"> <li>- Ask some questions from the previous lesson.               <ul style="list-style-type: none"> <li>• Tell the differences between                   <ul style="list-style-type: none"> <li>- Population and sample</li> <li>- Primary and secondary data</li> </ul> </li> </ul> </li> </ul>	3	<ul style="list-style-type: none"> <li>- Give individual responses for questions raised by the teacher.</li> </ul>
<ul style="list-style-type: none"> <li>- Introduce the lesson and its objectives and then give a warm up activity such as.               <ul style="list-style-type: none"> <li>• What do you think action research is?</li> </ul> </li> </ul>	5	<ul style="list-style-type: none"> <li>- Work in pairs and then share ideas with a friend.</li> </ul>
<ul style="list-style-type: none"> <li>- Explain what action research is and its purposes.</li> <li>- Present and explain the chart showing the basic stages of action research.</li> </ul>	10	<ul style="list-style-type: none"> <li>- Listen carefully, ask questions, and organize notes.</li> </ul>
<ul style="list-style-type: none"> <li>- Have the students discuss the basic differences between action research and other types of scientific research.</li> </ul>	5	<ul style="list-style-type: none"> <li>- Work in small groups to discuss and report on differences between action research and other types of research.</li> </ul>
<ul style="list-style-type: none"> <li>- Comment on the responses of the students and give further explanation.</li> </ul>	5	<ul style="list-style-type: none"> <li>- Listen carefully, ask questions and organize notes.</li> </ul>
<ul style="list-style-type: none"> <li>- Conclude the Lesson with a quick review of the key issues.</li> </ul>	3	<ul style="list-style-type: none"> <li>- Listen carefully, organize notes, ask and answer questions.</li> </ul>

<p>- Give classwork by asking/discussing such questions as:</p> <ul style="list-style-type: none"> <li>• What is action research?</li> <li>• Why is action research important?</li> <li>• What are the major stages in action research?</li> </ul>	<p>8</p>	<p>- Work in pairs and share ideas with friends.</p>
<p>- Do the exercise with the students.</p>	<p>3</p>	<p>- Work with the teacher on the exercises and get corrections.</p>
<p>- Give clear instructions to the students for doing an action research project on one of the topics found in the textbook. Have them do the project in small groups, each containing about 5 students.</p>	<p>3</p>	<p>- Listen to the instructions given by the teacher and think about how they can form groups and do the project.</p>

## Sample Test

### I. Choose the best possible answer

1. Which one is wrong about research?
  - A. It helps to solve a given problem.
  - B. It helps to make irrational decisions.
  - C. It serves as a means to formulate sound policies
  - D. It broadens our scope of thinking.
2. A research methodology considers all of the following, except:
  - A. The type of data
  - B. The technique of data analysis
  - C. The nature of research sample
  - D. None of the above
3. Which one of the following elements of the research process explains about what the researcher intends to achieve?
  - A. Scope of the study
  - B. Objectives of the study
  - C. Limitations of the study
  - D. Review of literature

### II. Say Whether the Following statements are True or False

4. Geographic research helps to solve contemporary global problems.
5. In random sampling, each member of the population has an equal chance of being selected.
6. Review of literature helps the researcher to widen his/her scope of thinking about the research problem.
7. A heterogeneous population can be represented by a smaller sample than homogeneous population.

### III. Fill in the blank spaces

8. \_\_\_\_\_ is a computer system that stores and analyzes spatial data or information.
9. Knowing the \_\_\_\_\_ of phenomena was the concern of most researches in traditional geography.
10. \_\_\_\_\_ is an approach to a research in which statistical technique is used to test a given hypothesis.

## Answers for the Sample Test

### I. Multiple Choice

1. B                      2. D                      3. B

### II. True or False

4. True                      5. True                      6. True                      7. False

### III. Fill in the Blank Spaces

8. GIS                      9. Location                      10. Quantitative

## Check List

Check the student’s performance according to the given competencies referring the questions under the check list for every unit. Put a tick (✓) mark against each task weather they are able to perform in the competencies of each unit. The students are expected to respond saying Yes or No. then, you can make your own evaluation whether the competencies are met or not.

**Can you:**

	Yes	No
1. Explain the concept of research? -----		
2. Show appreciation to the significance of research in tackling social problem? -----		
3. Use different geographic research approaches in action research? -----		
4. Reflect the distinct nature of geographic research from other disciplines?		
5. Use basic elements of research in your action research? -----		
6. Conduct action research on selected problems? -----		

## Assessment

Students' performance should be assessed continuously over the whole unit. You have to compare students with the specified level of competencies to make the assessment. Besides, you have to recognize the level of performance of each student and provide assistance accordingly. Thus:

- A student at a minimum requirement level will be able to explain the concept of research, show appreciation to the significance of research in tackling social problems, use different geographic research approaches in action research, reflect the distinct nature of geographic research from other disciplines, use basic elements of research in their action research and conduct action research on selected problems.
- A student working above the minimum requirement level and considered as higher achiever should be able to: discuss the findings of various research works, explain how problems of a research are identified, justify why various methods are implemented to conduct a research, evaluate the strengths and weakness of research works of their classmates.
- Students working below a minimum requirement level will require extra help if they are to catch up with the rest of the class.
- Students reaching at the minimum requirement level but achieved a little bit higher should be supported so that attain the higher achiever competencies. Students who fulfil the higher achiever competencies also need in special support to contribute and achieve more.

# Unit

## MAP USE AND MAP WORK

Periods Allotted: 34

### 1. Unit Introduction

Since time immemorial, man's desire to acquire resources from areas outside of his own locality has grown, along with his capacity to tame nature. These desires led to the use of maps or sketches, because people wanted to record productive sites so that they could return to them or share them. Over time, the need to record and store such geographic information increased our needs for maps, and eventually they became required tools for various disciplines, especially in the field of spatial science (geography).

In previous grades, your students learned definitions and uses of maps, and they gained middle-level map-reading skills. This unit introduces them to information and procedures that will give them wider and deeper knowledge and skills for map use and map work.

The main objective of this unit is to provide the students with pertinent information about

- The nature and uses of topographic and thematic maps
- The advantages of maps over globes
- Techniques of map-making that use different kinds of map projection
- Techniques for creating meaningful sketch maps in areas where ready-made maps are unavailable or unhelpful.

### 2. Unit Outcomes

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

- Recognize meaning, uses, conventional signs and symbols and distribution of topographic maps;
- Distinguish the properties of globes and maps;
- Analyze the meaning, significance, properties and classification of map projection; and
- Acquire basic skills to draw sketch maps.

### 3. Main-Contents

#### 2.1 The Study of Topographic Maps

#### 2.2 Globe and Map

#### 2.3 Map Projection

#### 2.4 Drawing Sketch Map

## 2.1 THE STUDY OF TOPOGRAPHIC MAPS

Periods Allotted: 10

### 1. Competencies

*After completing this lesson, the students will be able to:*

- ✚ *Define topographic map;*
- ✚ *Identify the uses of topographic maps;*
- ✚ *Interpret the conventional symbols and signs used on topographic maps;*
- ✚ *Realize the difference between qualitative and quantitative distribution maps; and*
- ✚ *Translate different data into distribution map using various diagrammatic methods.*

### 2. Contents

- Meaning and Nature of Topographic Maps
- Conventional Signs and Symbols on Topographic Maps
- The Study of distribution maps

### 3. Overview

In this lesson, the students will learn what topographic maps are, how they differ from other distribution maps, the various conventional symbols and signs used on topographic maps and how they are interpreted.

Topographic maps are defined as detailed maps, often made at a large scale, showing a number of topographic features at a time. The other pertinent point in topographic maps is that the symbols of certain features used in them, like boundaries, vary in kind from country to country and also within a country (see the students' text).

Other maps are distribution maps, or thematic maps, which are defined as special- purpose maps classified into two broad categories as *qualitative* and *quantitative* maps. Each category is subdivided, and related examples are given for each type in the students' textbook.

## 4. Teaching-learning Process

This process involves the following elements:

### 4.1 Suggested Teaching Aids

- Textbook and reference materials
- Sample topographic and topical maps
- Globe
- Diagrams and charts
- Maps of different scales
- The topographic map of Addis Ababa
- Thematic maps of different features

### 4.2 Suggested Teaching Methods

You must use the active-learning methods of various techniques to achieve the subunit's objectives. The following methods are suggested:

- Brainstorming
- Questioning
- Pair and group discussion
- Individual and group projects
- Demonstration
- Explanation
- Presentation

### 4.3 Pre-lesson Preparation

- Collecting related materials such as maps of different sizes and scales, the top sheet of Addis Ababa, etc.
- Designing the most appropriate teaching methods that you think are relevant.
- Preparing notes, activities and exercises.

### 4.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce your students to the topic they are going to learn (The Study of Topographic Maps).
- Make the objectives of the lesson clear to the students.
- Conduct a brainstorming session with the students to find out what they know about distribution maps, referring to topographic and thematic maps.
- Present powerful questions to stabilize the various views that the students have offered. Also, present the correct ideas suggested by the students.



**b) Main Body of the Lesson**

- Explain topographic maps and other distribution maps by providing examples and showing the maps that you have prepared. During your explanations, encourage the students to have discussions and to ask questions. Produce different types of maps at different scales and with different purposes.
- Have the students identify different maps and state whether they belong to the topographic or thematic category. Using the political maps that you have prepared, you may ask students to show the Horn of Africa region, to identify the countries found within the region, to tell the latitudinal and longitudinal extensions of the region, and to identify the bodies of water and landmasses surrounding the region.
- Schedule time for the students to organize their notes.
- At appropriate moments during your presentation, have the students do the activities found in their textbook. Make sure that all students are involved in the group activities and in the entire teaching-learning process.

**c) Stabilization**

- Complete your lesson presentation with a review of key ideas and concepts regarding topographic and other distribution maps.
  - A single topographic map shows multiple varied features of the earth.
  - Topographic maps usually cover relatively smaller areas but offer detailed information because they are prepared at large scales.
  - Thematic or topical maps show the distribution of a single feature. They are often prepared with smaller scales, covering large areas and offering less detailed information.

**4.5 Evaluation and Follow up****a) Evaluation**

*Use all of the evaluation techniques described in the Introduction.* Include these evaluation activities:

- Check your students' understanding of the lesson by giving them an exercise to be done independently. The exercise may contain such questions as:
  - What is the difference between topographic maps and thematic maps?
  - Give examples of qualitative and quantitative distribution maps.
  - What are the conventional symbols used for railways on topographic maps?
  - Which country of the region has direct contact with the Indian Ocean?

- Give them the following assignment.
  - Collect maps such as population-density maps, temperature-distribution maps, natural-vegetation maps, geological maps, land-use maps, transportation flow maps, etc.
  - Categorize them as quantitative and qualitative maps.

Analyze the evaluation data you have recorded for each individual and then extrapolate and analyze it for the class as a whole to find out whether you have succeeded in passing the lesson's information and techniques on to your students. Based on your conclusions, provide each student with appropriate activities, *as described in the Introduction*.

### **b) Follow up**

Include these activities in your follow-up work:

Rate and grade the various activities that the students have performed to get an indirect feedback of whether the lesson is well-understood or not and to identify those students who may need more assistance.

### **c) Additional Activities for Fast Learners**

1. Discuss the basic features of the following types of map.
  - a. Dot map
  - b. Isopleths map
2. Mention some examples of qualitative and quantitative distribution maps.

## **Answers for Activities and Exercises in the Textbook**

### **Activity 2.1**

- a. Landscape, rivers, etc
- b. Buildings, bole international airport, square/avenues, bridges, etc

### **Exercise 2.1**

1. When we say topographic maps are general purpose maps, we mean that they are maps useful for geographers, engineers, planners, etc. They serve for various purposes since they hold both cultural and physical features.
2. Sine it stores a large sum and different types of information, it has increased the investigating power of map users and developers.
3. Chorochromatic and choroschematic maps are both qualitative distribution maps. Their distinction is that chorochromatic maps use different shades of colours and symbolic letters while choroschematic maps use pictures of various phenomena or commodities.

4. The major historical events that promoted the development of map making were:
- The Renaissance (the revival) of Ancient Greeko-Roman civilization.
  - The age of exploration and discovery
  - The invention of the printing press
  - The introduction of GIS and remote sensing technology

## Answers for Additional Activities

1. Dot Maps: Dot maps are quantitative distribution maps. In dot maps, each dot represents a given quantity or value.  
Isopleth Map: They are also quantitative distribution maps in which lines of equal value or magnitude are used to represent a certain feature on a map..
2. Qualitative distribution maps: Chorochromatic and choroschematic  
Quantitative distribution maps: Dot maps, choroplethic maps, and Isoplethic maps

## 2.2 GLOBE AND MAP

**Periods Allotted: 2**

### 1. Competencies

*After completing this lesson, the students will be able to:*

- ✚ Compare and contrast the properties of globes and maps.

### 2. Contents

- Properties of a globe
- Advantages of a Map over a Globe

### 3. Overview

Globes are better representations of the earth than maps. Both are used by geographers as tools to demonstrate different geographical concepts and features. However, due to the limitations that globes have, geographers prefer to use maps.

### 4. Teaching-learning Process

#### 4.1 Suggested Teaching Aids

- Maps
- A globe

#### 4.2 Suggested Methods of Teaching

You must use the active-learning methods with all their various techniques in order to achieve the sub-unit's objectives. The following methods are suggested:

- Brainstorming

- Questioning
- Pair and group discussion
- Demonstration

### 4.3 Pre-lesson Preparation

- Obtaining a map and a globe to demonstrate.
- Designing the most appropriate teaching methods that encourage participation of the students while explaining the natures of a map and a globe.
- Preparing notes, activities and exercises.

### 4.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce the students to the topic that they are going to learn (Maps and Globes).
- Make the objectives of the lesson clear to the students.
- Conduct a brainstorming session with the students, as described in the Introduction, to find out what they know about the differences between maps and globes.

#### b) Main Body of the Lesson

- Explain the basic differences between maps and globes. During your explanations, encourage your students to have discussions and to ask questions.
- You may divide the students into small groups and instruct them to identify advantages and disadvantages of maps and globes. Explain more about the strengths and shortcomings of maps and globes.
- Support your presentation with demonstrations of maps and a globe.
- At appropriate moments of your presentation, have the students do the activities found in their textbook. Make sure that all students are involved in the group activities and the entire teaching-learning process.
- Give adequate time for students to raise questions, have discussions and organize notes.

#### c) Stabilization

- Complete your lesson presentation with a review of key ideas and concepts of topographic and distribution (thematic) maps.
  - A globe shows the real shape of the earth.
  - A map is a plane representation of the earth's surface.

## 4.5 Evaluation and Follow up

### a) Evaluation

*Use all of the evaluation techniques described in the Introduction.* Include these evaluation activities:

- Check the students' understanding of the lesson by giving them an exercise to be done independently. You may also ask them oral questions such as:
  - Between a map and a globe, which one most accurately represents the surface of the earth?
  - What are the limitations a globe?
  - What is the solution for overcoming these limitations?
- Give the students an assignment as follows.
  - Collect maps such as population-density maps, temperature-distribution maps, natural-vegetation maps, geological maps, land-use maps, transportation-flow maps, etc
  - Categorize them as quantitative and qualitative maps.
- Analyze the evaluation data you have recorded for each individual and then extrapolate and analyze it for the class as a whole to find out whether you have succeeded in passing the lesson's information and techniques on to your students. Based on your conclusions, provide each student with appropriate activities, *as described in the Introduction.*

### b) Follow up

Include these activities in your follow-up work:

- Guide the students when they discuss the major contrasts and comparisons between a map and a globe.
- Rate the students' performances and grade them.
- Identify the problems and strengths of entire teaching-learning process.

### c) Additional Activities for Fast Learners

1. Explain the limitations of both maps and globes.
2. Discuss the advantages of maps over globes.

**Answers for Activities and Exercises in the Textbook**

**Activity 2.2**

1. Please, let the students bring a map and a globe (if possible) and present it on the table for discussion.
  
2. The major drawback of a map is that because it is plain representation of the earth, it is not considered as true representation of the earth. On the other hand, the drawbacks of a globe are it is expensive to produce, it is not visually convenient, it is not easy to fold and handle, etc.

**Exercise 2.2**

**I. Multiple Choice**

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

**II. Short Answers**

1. Enumerate the differences between topographic maps and thematic maps.

Topographic Maps	Thematic Maps
<ul style="list-style-type: none"> <li>• Are often large-scale maps.</li> <li>• Portray both physical and cultural features at the same time.</li> <li>• Are general-purpose maps.</li> </ul>	<ul style="list-style-type: none"> <li>• Are mostly small-scale maps.</li> <li>• Portray only a single feature.</li> <li>• Are special/single-purpose maps.</li> </ul>

2. Advantages of maps over globes.

Maps are:

- Less expensive to produce and update.
- Easier to handle and fold.
- Bigger in size and can portray detailed information.
- Visually convenient.

3. List down the marginal information shown in the toposheet of the Addis Ababa map at the scale of 1:50,000.

- Scale
- Title

- Toposheet number
  - Date of publication
  - Magnetic declination
  - Legend
4. Precautions in preparing:
- A. Dot maps
- The dots should be placed in their correct places.
  - The dots must be of uniform size.
  - The dots should not be congested.
- B. Isoplethic maps
- Care must be taken in selecting the intervals between the isoplethic lines.
  - The lines should not be overcrowded.
  - The lines should not be far apart. If they are too far apart important details will not appear on the map because the lines that would have presented them will be missing.

## Answers for Additional Activities

1. Limitation of Maps
- they are two dimensional
  - they are selective
  - they may have distortions
- Limitations of Globe
- they are not visually convenient
  - they are not easy to fold and handle
2. Some of the advantages of maps over globes are:
- Globes are expensive to reproduce and update, but maps are not.
  - Globes are not easy to fold and handle, but maps are.
  - Globes are not visually convenient, but maps are.

## 2.3 MAP PROJECTIONS

**Periods Allotted: 12**

### 1. Competencies

*After completing this lesson, the students will be able to:*

- ✚ *Describe what map projection is;*
- ✚ *Discuss the significance of map projection;*
- ✚ *Identify the properties of the various kinds of map projections; and*
- ✚ *Demonstrate cylindrical, conical and zenithal map projections.*

## 2. Contents

2.3.1 Meaning and Significances of Map Projection

2.3.2 Properties of Map Projections

2.3.3 Geometrical Map Projection (Cylindrical, Conical and Zenithal)

## 3. Overview

In this lesson, the students will learn about the significance, nature and classification of map projections. The disadvantages of using globes for years led to the development of the techniques of map projection and the production of maps as alternative tools for geographers. The preparation of a map, especially from a globe, is not a simple task. It requires knowledge, skill and techniques to create a projected map that suits a particular purpose.

The problem is how to accurately transfer or acquire information that is shown on a globe. This problem or difficulty inevitably results in distortion, either in shape and area in direction and angle. Such distortions are inevitable when maps are projected from a globe in different ways and for different objectives.

Based on their distortion characteristics, map projections are classified as *equal area*, *conformal equidistant* and *zenithal* projections. Each type of projection has its own specific uses and significance. For example, conformal projections are used for navigational or metrological charts, whereas equidistant projections are used for radio navigation and seismic mapping.

Based on the source of light within a transparent globe, we generally classify map projections as *gnomonic*, *stereographic* or *orthographic* projections. All these together are sometimes known as *geometric* projections or *perspective* projections. If the parallel meridians are modified mathematically to satisfy particular needs, the projection becomes a *non-perspective* or *non-geometrical* projection. They are known as *conventional projections*, instead.

Considering how the projection is obtained by means of projecting light through a globe made of transparent material, so that shadows are cast on the developable surface, map projections are classified into three broad types: *cylindrical*, *conical* and *planar* projections. Each projection type is appropriate for a specific part of the earth's surface. For example, cylindrical equal area projections are best suited to tropical areas because this type of projection gives the least distortion for that part of the earth, while distortion increases pole wards.



## 4. The Teaching-learning Process

### 4.1 Suggested Teaching Aids

- A transparent globe
- Developable surfaces such as cylinders, cones, etc.
- Bulb that serves as a source of light
- White screen or wall
- Audio-visual equipment such as projectors

### 4.2 Suggested Methods of Teaching

It is essential to use the various types of active-learning methods to encourage students' involvement in the lessons. The following methods are suggested:

- Brainstorming
- Questioning
- Pair and group discussion
- Individual and group projects
- Demonstrations of different projection types

### 4.3 Pre-lesson Preparation

- Identifying and organizing the necessary materials.
- Designing the most appropriate teaching methods for the lesson.
- Deciding on the most appropriate means of assessment and scheduling the various activities in breakdowns.

### 4.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce students to what they are going to learn (map projections)
- Make the objectives of the lesson clear to the students.
- Conduct a brainstorming session to find out what your students know about map projections.

#### b) Main Body of the Lesson

- Explain why maps are significant for portraying distributions. Explain the different types of map projection and their basic differences. Guide your students in learning how they can transfer information from a transparent globe to a map. Explain the limitations of each type of map projection.
- Make sure that your students have appropriately done the activities in the students' textbook.
- Schedule time for students to organize their notes.

**c) Stabilization**

- Complete your lesson presentation with a review of key ideas and concepts of map projection.
  - ✓ *Map projection* is the process of transferring information from a globe to a map.
  - ✓ Based on their distortion characteristics, map projections are classified as *equal area*, *conformal equidistant* or *zenithal* projections.
  - ✓ Based on the source of light within a transparent globe, we generally classify map projections as *gnomonic*, *stereographic* or *orthographic* projections.
  - ✓ Based on how the projection is obtained by means of projecting light through a globe made of transparent material so that shadows are cast on the developable surface, map projections are classified into three broad types: *cylindrical*, *conical* and *planar* projections.

**4.5 Evaluation and Follow up****a) Evaluation**

*Use all of the evaluation techniques described in the Introduction.* Include these evaluation activities:

- Check the students' understanding of the lesson by asking them oral questions, giving them class work, take-home assignments, and quizzes. You may ask them oral questions such as:
  - Why do we need to make maps?
  - What is map projection?
  - What are the limitations of cylindrical equal area projection?
  - Which type of map projection is best for showing distributions in areas in the mid-latitudes, such as the USA and Russia?
- Give them classwork; the following can be used as an example.
  - From the following list, identify the conventional and non-conventional map projections.
    - ✓ Sinusoidal projection
    - ✓ Moll Weide's projection
    - ✓ Goods's Interrupted Homolosine projection
    - ✓ Lambert's equal area projection
    - ✓ Planar projection
    - ✓ Conical projection

Analyze the evaluation data you have recorded for each individual and then extrapolate and analyze it for the class as a whole to find out whether you have succeeded in passing the lesson's information and techniques on to your students. Based on your conclusions, provide each student with appropriate activities, *as described in the Introduction*.

**b) Follow up**

Include these activities in your follow-up work:

Grade all the activities performed by the students. Classify the grades to understand how many of the students have understood the lesson as planned, and how many of them have not.

**c) Additional Activities for Fast Learners**

1. Identify the most appropriate map projection for each of the following parts of the world.
  - a. Equatorial Areas
  - b. Polar Areas
  - c. Temperate Areas
2. Identify the type of map projection appropriate to preserve each of the following.
  - a. Area
  - b. Shape
  - c. Direction
  - d. Distance

## Answers for Activities and Exercises in the Textbook

### Activity 2.3

1.
  - Globes are spherical surfaces while maps are plane surfaces.
  - Globes are more ideal to show the shape of the earth while maps are only representative.
  - Globes are not true to scale but maps are.
  - Maps can be reproduced, updated at lower costs but globes are not.
2. Geometrical projection is a kind of projection, which is performed by using different geometrical developable surfaces such as plane, cone and cylinder. Therefore based on the shape of the developable surfaces used, geometrical projections can be clarified into three as planar, conical and cylindrical.

## Answers for Additional Activities

1. Equatorial: Cylindrical Projection  
Temperate: Conical Projection  
Polar: Planar Projection
2. Area: Equal area projection  
Shape: Conformal projection  
Direction: Azimutal projection  
Distance: Equidistant Projection

## 2.4 DRAWING SKETCH MAP

Periods Allotted: 10

### 1. Competencies

*After completing this lesson, the students will be able to:*

- ✚ Define what a sketch map is;
- ✚ Explain the purposes of a sketch map;
- ✚ Discuss the guidelines for making good sketch maps; and
- ✚ Draw a sketch map of a given area.

### 2. Contents

- 2.4.1 The meaning of a sketch map
- 2.4.2 Some guidelines for making good sketch maps
- 2.4.3 Producing a sketch map

### 3. Overview

In situations where standardized maps are not available, geographers need to make rough or crude pictures of the area under study so that they can record and store facts and related information. Such pictures are referred to as *sketch maps*.

A sketch map is a simple free-hand drawing that attempts to simulate real features. It is not true to scale. It is an important tool that serves geographers and other professionals when they need to record field observations.

In making good sketch maps, basic guidelines and procedures must be followed. Some of them are: fixing a boundary that can appropriately enclose the desired area, deciding on the elements to be sketched in order to avoid clumsiness, selecting the proper symbols and direction, etc.

## 4. The Teaching-learning Process

### 4.1 Suggested Teaching Aids

- Different sketch maps
- Rough plane paper
- 2 HB pencils
- Markers

### 4.2 Suggested Methods of Teaching

- Brainstorming
- Explanation
- Questioning
- Individual and group practical work

### 4.3 Pre-lesson Preparation

- Prepare different sketch maps.
- Select appropriate areas to be sketched.
- Prepare the necessary materials that are used in sketching.
- Organize a trip or tour to make a practical exercise.
- Select the most appropriate methods to deliver the lesson.

### 4.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce students to what they are going to learn (sketch maps).
- Make the objectives of the lesson clear to the students.
- Conduct a brainstorming session to find out what the students know about sketch maps.

#### b) Main Body of the Lesson

- Clarify what sketch maps are. Explain where they are necessary and their general significance. Show students some samples of sketch maps in the class. Ask them to identify the strengths and drawbacks of sketch maps. Present the basic guidelines for making good sketch maps.
- Make sure that the students have appropriately done the activities in the students' textbook.
- Schedule time for the students to ask questions and organize their notes.
- Take the students outdoors to the school compound. Have them practice making sketch maps by sketching various features found in the compound. You may also organize a field trip to a nearby area where mountains or hills or other physical features are available.

**c) Stabilization**

- Complete your lesson presentation with a review of key ideas and concepts of map projection.
  - A sketch map is a simple free-hand drawing that attempts to simulate real features
  - A sketch map is not true to scale.
  - Sketch maps are used to show locations, routes, landscapes, etc.
  - Sketch maps have strong points and drawbacks.

**4.5 Evaluation and Follow Up****a) Evaluation**

- Check the students' activities to see whether they have acquired the minimum expected competencies in drawing a sketch map.
- Give them assignments, such as:
  - Draw a sketch map of your house, referring to your neighbors' areas.
  - Draw a sketch map of your school.
  - Draw a sketch map of a nearby river bank, mountain, hill, etc.

Analyze the evaluation data you have recorded for each individual and then extrapolate and analyze it for the class as a whole to find out whether you have succeeded in passing the lesson's information and techniques on to your students. Based on your conclusions, provide each student with appropriate activities, *as described in the Introduction*.

**b) Follow up**

Include these activities in your follow-up work:

- Check assignments.
- Grade them.
- Give the students feedback.

**c) Additional Activities for Fast Learners**

1. If you are asked to draw a sketch map of your school, what are the procedures that you will follow?
2. Draw a sketch map of your school.

## Answers for Activities and Exercises in the Textbook

### Activity 2.4

1. Ground Distance = 500 meters  
Distance on the Map = 5cm  
Scale =  $\frac{\text{Distance on the Map}}{\text{Ground Distance}} = \frac{5\text{cm}}{0.5\text{km}} = \frac{1}{0.1} = 1:100$
2. A) West-North (NW)  
B) East-North (NE)
3. The northern part

### Activity 2.5

1. It is located at the south west
2.
  - a. It is the road that is running northward from the center of the city.
  - b. It is the road that is running west-ward before reaching Ras Mekonin Bridge and your home.
  - c. It is the same route/road that takes you to sadist kilo.
3. Yes, you can go to the east towards Miazia 27 square first, then to the north towards 6 killo and then before you reach to 6 killo, you will turn to the east to go to the school.

## Answers for Additional Activities

1. The major procedures are the following.
  - Choose an area to sketch
  - Select the important frames of reference for the area
  - Create a complete mental picture of the sketch map that you will make.
  - Create the map's boundaries
  - Divide the edges of the boundary horizontally and vertically to create a temporary grid of squares or rectangles
  - Begin the sketching using a pensile, a ruler and an eraser
  - Erase the quadrant lines after finishing the sketch
  - Annotate the sketch map by including important marginal information such as title, key, and northings
2. Instruct your students to draw a sketch map of their school following the above procedures appropriately.

**Answers for the Unit Review Exercise in the Textbook**

**I. Multiple Choice**

1. B                      2. D                      3. D                      4. D                      5. C                      6. A

**II. Short Answers**

7. Contrasts between thematic and general purpose maps

General Purpose Maps	Thematic Maps
<ul style="list-style-type: none"> <li>- Show various natural and cultural features</li> <li>- Prepared often with large scale</li> <li>- Cover a relatively smaller area</li> <li>- Show relatively more detailed information</li> </ul> <p><b>Example:</b> Topographic Map of North Eastern Addis Ababa</p>	<ul style="list-style-type: none"> <li>- Show single or specific feature</li> <li>- Prepared often with small scale</li> <li>- Cover a relatively larger area</li> <li>- Show relatively less detailed information</li> </ul> <p><b>Example:</b> Population Distribution Map of Ethiopia</p>

8. The differences between chorochromatic and choropleth maps are the following.

- Chorochromatic maps are qualitative distribution maps while choropleth maps are quantitative distribution maps.
- Chorochromatic maps use colour tint, shading, dots, or line symbols with no quantitative/numerical values attached to the symbols. In contrast, choropleth maps show the quantitative variation of the distribution of features by using shadings with specific numerical values.

**Examples**

- Chorochromatic Map- Soil Distribution Map of Ethiopia
- Choropleth Map- Population Density Map of Ethiopia



## 9. Distinction between sketch and conventional maps.

<b>Sketch Maps</b>	<b>Conventional Maps</b>
<ul style="list-style-type: none"><li>- Prepared with no scale</li><li>- Can be prepared quickly</li><li>- Not based upon conventional signs and symbols</li><li>- Easier to understand</li></ul>	<ul style="list-style-type: none"><li>- Prepared with scale</li><li>- Need more time to prepare</li><li>- Conventional signs and symbols are used</li><li>- Relatively more difficult to understand</li></ul>

## 10. The major factors that necessitates the use of map projection are:

- The need to overcome the limitations of globes.
- The need to transfer information from a spherical surface (globe) to a plane surface (map).

## Check List

Check the student’s performance according to the given competencies referring the questions under the check list for every unit. Put a tick (✓) mark against each task weather they are able to perform in the competencies of each unit. The students are expected to respond saying Yes or No. then, you can make your own evaluation whether the competencies are met or not.

**Can you:**

	Yes	No
1. Define topographic map? -----		
2. Identify the uses of topographic map? -----		
3. Interpret conventional signs and symbols on topographic map? -----		
4. Realize the difference between qualitative and quantitative distribution maps? -----		
5. Translate different data into distribution map using various diagrammatic methods? -----		
6. Compare and contrast the properties of globe and map? -----		
7. Define map projection? -----		
8. Discuss the significance of map projection? -----		
9. Identify properties of map projection? -----		
10. Demonstrate cylindrical, conical and zenithal map projection? -----		
11. Define what sketch map is? -----		
12. Explain the purpose of drawing sketch map? -----		
13. Discuss the guidelines for making good sketch maps? -----		
14. Draw a sketch map of a given area? -----		

## Assessment

Students' performance has to be assessed continuously over the whole unit. The assessment will be made by comparing students' performance with the specified level of competencies. Besides, the teacher has to recognize the level of performance of each student and provide assistance accordingly, Thus:

- A student at a minimum requirement level will be able to define topographic map; identify the uses of topographic map; realize the difference between qualitative and quantitative distribution maps; translate different data into distribution map using various diagrammatic methods; compare and contrast the properties of globe and map; define map projection; discuss the significance of map projection; identify properties of map projection; define what sketch map is, explain the purpose of drawing sketch map; discuss the guidelines for making good sketch maps and draw a sketch map of a given area.
- In addition, a student working above the minimum requirement level and considered as higher achiever should be able to: compare and contrast the definition of topographic map with other definition of map, justify why and when they use qualitative and quantitative distribution map, explain the appropriate map projection for different part of the earth, discuss why and how map projections differ in shape and content, compare and contrast sketch map with conventional map.
- Students working below a minimum requirement level will require extra help if they are to catch up with the rest of the class.
- Students reaching at the minimum requirement level but achieved a little bit higher should be supported so that attain the higher achiever competencies students who fulfill the higher achiever competencies also need special support to contribute and achieve more.

# Unit 3

## PHYSICAL GEOGRAPHY OF ETHIOPIA AND THE HORN

Periods Allotted: 48

### 1. Unit Introduction

The Horn of Africa is the eastern most region of Africa and includes the countries of Eritrea, Ethiopia, Djibouti, and Somalia. It is called the Horn because Somalia protrudes northeastward to a hornlike point, separating the Gulf of Aden from the rest of the Indian Ocean. Covering an area of 1.8 million km<sup>2</sup>, the region is inhabited by more than 95 million people. The Horn of Africa is a region of diversified physical and human-related features. In the region, there exists a great variety of landforms, climates, vegetation, wildlife, soils, cultures, languages, religions, economic activities, etc.

In this unit, students will learn the physical geography of Ethiopia and that of the Horn of Africa. More specifically, the unit treats such topics as the location, size and shape of Ethiopia and other countries of the Horn; the geological structure and relief of Ethiopia and the Horn; climatic characteristics of Ethiopia and the Horn; the natural vegetation and wild animals of Ethiopia; and the soils of Ethiopia. Though some topics consider the entire region of the Horn of Africa, much emphasis is placed on the physical geography of Ethiopia.

### 2. Unit Outcomes

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

- Describe the location, size and countries of the Horn of Africa;
- Recognize the geological history, structure and relief of the Horn of Africa;
- Discuss the drainage systems of Ethiopia and the Horn characteristics and significance;
- Appreciate water- resource conservation and management policy;
- Identify the factors influencing the spatial and temporal distribution of elements of climate in Ethiopia;
- Realize the different types of natural vegetation and wild animals of Ethiopia; and
- Describe soil types, problems and conservation in Ethiopia.

### 3. Main Contents

#### 3.2 Location of the Horn of Africa and Sizes of Member Countries

#### 3.2 Location, Size and Shape of Ethiopia

#### 3.3 Geological Structure and Relief of the Horn of Africa

#### 3.4 Climate of Ethiopia and the Horn

#### 3.5 Natural Vegetation and Wild Animals of Ethiopia

#### 3.6 Soils of Ethiopia

### 3.1 LOCATION OF THE HORN OF AFRICA AND SIZES MEMBER COUNTRIES

Periods Allotted: 2

#### 1. Competencies

*After completing this lesson, the students will be able to:*

- ✚ Indicate the location of the Horn of Africa; and
- ✚ Compare the size of countries in the Horn of Africa.

#### 2. Contents

3.1.1 Concept of Location and Location of the Horn of Africa

3.1.2 Sizes of Countries of the Horn

#### 3. Overview

In this lesson, students will learn about the location of the Horn of Africa and the sizes of the countries that exist in the region. With the belief that students have background information on the meaning of location and the two ways of expressing location from the geography lessons of previous grades, this lesson focuses particularly on the absolute and relative location of the Horn of Africa.

The location of the Horn of Africa can be expressed *absolutely* by using latitudes and longitudes. In this regard, the region's latitudinal location is within the tropics and close to the equator. Most of the region is found in the northern hemisphere. The exception is a few parts of southern Somalia which are found in the southern hemisphere. Due to the longitudinal extension of the region, it is within the GMT +3 time zone.

The relative location of the region can be expressed with reference to the major bodies of water and landmasses surrounding it. The Horn of Africa is found:

- Northwest of the Indian Ocean
- West of the Red Sea and Gulf of Aden
- South and Southeast of the Sudan
- Southeast of the Arabian Peninsula/the Middle East
- North of Kenya
- South of the Mediterranean Sea

There is variation in the geographical size of the countries of the Horn of Africa. Ethiopia is the largest of all, while Djibouti is the smallest.

## **4. The Teaching-learning Process**

### **4.1 Suggested Teaching Aids**

- Political map of Africa
- Political map of the Horn of Africa
- Charts that show the sizes of the countries of the Horn

### **4.2 Suggested Methods of Teaching**

- Brainstorming
- Questioning
- Pair discussion
- Demonstration

### **4.3 Pre-lesson Preparation**

- Get ready in advance with the suggested teaching aids and other reference materials.
- Design the most appropriate teaching method for the context.
- Prepare notes, activities and exercises.

### **4.4 Lesson Presentation**

#### **a) Introduction to the Lesson**

- Introduce students to what they are going to learn (The Location, Size and Countries of the Horn of Africa).
- Make the objectives of the lesson clear to students.
- Conduct a brainstorming session to find out the students' background understanding of location in general and of absolute and relative location in particular. You may ask questions such as: What is location? What do you know about relative and absolute location?

**b) Main Body of the Lesson**

- Based on students' previous knowledge, fully explain the meaning of *location*, its significance, and the difference between *absolute* and *relative* location.
- Using the political maps that you have prepared, ask the students to show you the region *Horn of Africa*, to identify the countries found in the region, to tell the latitudinal and longitudinal extensions of the region, and to identify the bodies of water and landmasses surrounding the region.
- Strengthen the students' understanding by explaining more about the absolute and relative locations of the Horn of Africa, as well as of the countries found in the region.
- You may divide students into groups and instruct them about the activity found in their textbook, which contains instructions and questions such as: Draw the map of the Horn of Africa and show the political divisions of the countries of the region and state their capital cities. Which other capital city is the nearest to Addis Ababa?
- With the help of the chart that you have prepared, make sure that the students understand the variation of the geographical size/area of the countries of the Horn of Africa. You may also ask them to identify the biggest and smallest countries of the region.
- Instruct students to do activity 3.2 found in their textbook as an assignment. This activity may help them to relate the lesson with the issues that they learned in grade 11.
- Make sure that all students are involved in the group activities and the entire teaching-learning process.
- Give time to students to ask questions and organize their notes.

**c) Stabilization**

- Complete your lesson presentation with a review of key ideas and concepts such as:
  - ✓ The Horn of Africa is the easternmost region of Africa.
  - ✓ Ethiopia, Eritrea, Djibouti and Somalia are the countries that make up the Horn.
  - ✓ The Indian Ocean, Red Sea, and Gulf of Aden are the major bodies of water surrounding the region.
  - ✓ The Horn of Africa is found within the tropics and GMT+3 time zone.
  - ✓ Ethiopia is the largest country of the region, while Djibouti is the smallest.

## 4.5 Evaluation and Follow Up

### a) Evaluation

*Use all of the evaluation techniques described in the Introduction.* Include these evaluation activities:

Check the students' understanding of the lesson by giving them an exercise to be done independently. The exercise may contain questions such as:

- What are the countries found in the Horn of Africa?
- Which country of the Horn of Africa is located in both the northern and southern hemispheres?
- Which country of the Horn of Africa is landlocked?
- Which country of the region has direct contact with the Indian Ocean?

Analyze the evaluation data you have recorded for each individual and then extrapolate and analyze it for the class as a whole to find out whether you have succeeded in passing the lesson's information and techniques on to your students. Based on your conclusions, provide each student with appropriate activities, *as described in the Introduction.*

### b) Follow up

Include these activities in your follow-up work:

Rate and grade the various activities that the students have performed so that you can have an indirect feedback on whether the lesson is well-learned or not, and to identify those students who may need more assistance.

### c) Additional Activities for Fast Learners

1. Discuss the difference between relative and absolute location.
2. Describe the major water bodies found around the Horn of Africa.
3. Enumerate all the countries that are found in the Horn of Africa.
4. Compare the countries of the Horn of Africa in terms of their size and put them in order from the largest to the smallest.

## Answers for the Activities and Exercises in the Text book

### Activity 3.1

1. Let the students draw the map or let them use map 3.1
2. Capital cities: Djibouti-Djibouti, Ethiopia-Addis Ababa, Eritrea-Asmara, Somalia-Mogadishu
3. Djibouti is the nearest capital city to Addis Ababa



**Activity 3.2**

1. Coffee, hides and skins, pulses, oil seeds, cute flowers, banana, salt, etc
2. No
3. It is possible, but there are boarder disputes and political interests.
4. IGAD's present status is good except that boarder disputes and other issues resulted in skirmishes.
5. Let us say that the proportionate statistical diagram we chose is a square. Assuming 1 centimeter square for the smallest areal extent i.e. Djibouti, we can draw the proportionate squares as the following.

$$\text{Djibouti (23,200 km}^2\text{)} \quad 1\text{cm} \times 1\text{cm} = 1\text{cm}^2$$

$$\text{Eritrea (118,000 km}^2\text{)} = 118,000 \text{ km}^2 \times 1 \text{ cm} / 23,000 \text{ km}^2 = 5.13 \text{ cm}^2$$

$$\text{Ethiopia (1,106,000 km}^2\text{)} = 1,106,000 \text{ km}^2 \times 1 \text{ cm} / 23,000 \text{ km}^2 = 48.08 \text{ cm}^2$$

$$\text{Somalia (637,661 km}^2\text{)} = 637,661 \text{ km}^2 \times 1 \text{ cm} / 23,000 \text{ km}^2 = 27.72 \text{ cm}^2$$

(Because of the sizes, your paper can not accommodate the radius. Therefore, change these radii into millimeters and draw the proportional squares to show the different sizes of the Horn countries.)

**Answers for Additional Activities**

1. Absolute location is the exact position of places which is expressed with the help of latitudinal and longitudinal degrees. On the other hand, relative location is the general position of places which is expressed with reference to the position of other places such as countries, water bodies, and landmasses.
2. The major water bodies found around the Horn of Africa are the Indian Ocean, Red Sea, and Gulf of Aden.
3. Ethiopia, Eritrea, Djibouti, and Somalia are the four countries of the Horn of Africa.
4. Ethiopia is the largest and Djibouti is the smallest of all the countries of the Horn of Africa. The four countries of the Horn of Africa can be ordered in terms of their size from the largest to the smallest in the following ways.  
Ethiopia (1,106,000 km<sup>2</sup>) → Somalia (637,661 km<sup>2</sup>) → Eritrea (118,000 km<sup>2</sup>) → Djibouti (23,200 km<sup>2</sup>)

**3.2 LOCATION, SIZE AND SHAPE OF ETHIOPIA****Periods Allotted: 1****1. Competencies**

*After completing this lesson, the students will be able to:*

- ✚ Demonstrate the absolute and relative locations of Ethiopia.

## 2. Contents

- Location of Ethiopia
- Sizes of Ethiopia
- Shape of Ethiopia

## 3. Overview

In this lesson, students will learn particularly the location, size and shape of Ethiopia. The location of the Horn of Africa can be expressed absolutely (using latitudes and longitudes) and relatively (with reference to the neighboring countries and the major bodies of water and landmasses).

The absolute location of Ethiopia is between  $3^{\circ}\text{N}$  to  $15^{\circ}\text{N}$  latitudes and  $33^{\circ}\text{E}$  to  $48^{\circ}\text{E}$  longitudes. Thus, from the country's absolute location, we can understand that:

- Ethiopia is located within the tropics.
- Ethiopia is a country found in the northern and eastern hemispheres.
- Ethiopia is located in the GMT+3 time zone.
- The latitudinal (north-south) distance of Ethiopia is slightly longer than its longitudinal (east-west) distance.

The relative location of Ethiopia can be expressed with reference to its neighbors (vicinal location) and with reference to the major bodies of water and landmasses (geological location). Ethiopia is a landlocked country, surrounded by five neighboring countries, Kenya, Somalia, Djibouti, Eritrea, and the Sudan. The vicinal location of Ethiopia is:

- South of Eritrea
- West of Djibouti
- North of Kenya
- Northwest of Somalia
- East of the Sudan

Its geological location can be expressed in the following ways. Ethiopia is found:

- Southwest of Asia
- South of Europe
- Northwest of the Indian Ocean
- West of the Gulf of Aden
- Southwest of the Red Sea
- In the northeast (Horn) of Africa

With a total area of  $1,106,000 \text{ km}^2$ , Ethiopia is one of the ten largest countries of Africa. When we compare its area with that of its neighbors, Ethiopia stands second, next to the Sudan, and it is almost five times bigger than Djibouti. The large geographical area of

Ethiopia has both positive and negative impacts on the socio-economic, political and natural conditions of the country.

Since Ethiopia's north-south and east-west stretches are almost equal, the country has a moderately compact shape. The compact nature of Ethiopia's shape has advantages for the country's socio-economic, political and security-related programs and activities.

## 4. Teaching-learning Process

### 4.1 Suggested Teaching Aids

- Political map of Africa
- Political map of Ethiopia
- Charts that show the sizes of Ethiopia and its neighboring countries

### 4.2 Suggested Methods of Teaching

- Brainstorming
- Questioning
- Pair/group discussion
- Demonstration

### 4.3 Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Design the most appropriate teaching method for the lesson.
- Prepare notes, activities and exercises.

### 4.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce the students to what they are going to learn (The Location, Size and Shape of Ethiopia).
- Make the objectives of the lesson clear to your students.
- Remind the students about the differences between absolute and relative location.
- Conduct a brainstorming session to find out the students' background knowledge of location, size and shape of Ethiopia. You may ask questions such as: How do you express the location of the Ethiopia? Is Ethiopia a large or a small country in comparison with its neighbours? Which kind of shape does Ethiopia's have?

**b) Main Body of the Lesson**

- Using the political maps that you have prepared, have your students describe the position of Ethiopia with reference to the neighboring countries, major bodies of water and landmasses, latitudes and longitudes.
- Based on the students' background knowledge, explain more about the absolute and relative location of Ethiopia. When you explain the vicinal location of Ethiopia, be sure that the students are aware of the types of international boundaries and the stages of formation of international boundaries. Support your presentation with the map that shows the boundaries shared between Ethiopia and its neighbors. You may ask students questions such as: Which country shares the longest boundary with Ethiopia? Which country shares the smallest boundary with Ethiopia? As compared with its neighbors, what is the rank of Ethiopia in terms of boundary length?
- Using the chart that you have prepared, have the students compare the size of Ethiopia with those of its neighbors. Explain more how large Ethiopia is as compared with other countries of the world. Have the students discuss this question in their groups: What advantages and disadvantages does Ethiopia have because of its big size?
- Explain to the students the three indices of measuring compactness. Help the students to calculate by themselves the B/C, A/B and A/A' ratios to determine the shape of Ethiopia. Invite some students to come to the blackboard to show the steps. Explain more about the moderately compact shape of Ethiopia and its advantages. Using the political maps, have your students compare and contrast Ethiopia's shape with those of the other countries that have elongated, perfectly compact, or other shapes.
- Make sure that all students are involved in the group activities and the entire teaching-learning process.
- Give them time to ask questions and organize their notes.

**c) Stabilization**

Stabilize your lesson presentation with a review of key ideas and concepts of such as:

- ✓ Ethiopia is located between 3°N-15°N and 33°E-48°E.
- ✓ Ethiopia is a landlocked country surrounded by five neighboring countries.
- ✓ Ethiopia is the tenth biggest country in Africa.
- ✓ Ethiopia's large size has both advantages and disadvantages for the country
- ✓ Boundary allocation, boundary delimitation and boundary demarcation are the three major stages of boundary formation.
- ✓ International boundaries can be classified into four categories: *natural anthropogenic, geometrical, and complex* boundaries.

## 4.5 Evaluation and Follow Up

### a) Evaluation

*Use all of the evaluation techniques described in the Introduction.* Include these evaluation activities:

Check your students' understanding of the lesson by giving them an exercise to be done independently. The exercise may contain questions such as:

- What is the absolute location of Ethiopia?
- Why do we say that Ethiopia is a country in the northern and eastern hemispheres?
- What are the merits and demerits of Ethiopia's large size?
- Why do we say that the type of boundary between Ethiopia and its five neighbors is complex?
- What is the shape of Ethiopia?

### b) Follow up

You may also have them independently do the exercise found in their textbook as classwork. In addition, instruct them to do activity 3.3, which is found in their textbook, in groups, as an assignment

- Rate and grade the various activities performed by the students to get an indirect feedback whether the lesson is well-understood or not and to identify those students who may need additional assistance.

### c) Additional Activities for Fast Learners

1. Describe the absolute and relative location of Ethiopia.
2. Discuss the advantages and disadvantages of large size for a country.
3. Mention and explain the major stages of boundary formation.
4. In which hemispheres that Ethiopia is found?

## Answers for the Activities and Exercises in the Text book

### Activity 3.3

2. The major religions practiced are expected to be Christianity and Islam.

The place of origin

- Christianity is believed to be originated within the Middle East in the place which is now occupied by countries such as Israel, Jordan, Syria, Palestine, Lebanon, etc.
- Islam religion is also believed to be originated in the Middle East in the place which is now occupied by Saudi Arabia.

3. The major factors were

**Christianity**

- The strong relationship existed between the ancient kingdoms and states of Ethiopia and the kingdoms in the Middle East.
- The proximity of Ethiopia's location to the Middle East.
- The coming to Ethiopia of the European Jesuit missionaries

**Islam**

- The strong socio-economic and political relationship existed between Ethiopian Kingdoms and the kingdoms of the Middle East.
- The proximity of Ethiopia to the Middle East.
- The coming to Ethiopia of Prophet Mohammed's followers into the Axumite state.
- The influence of the Ottoman Turks.

### Exercise 3.1

#### I. Multiple Choice

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

### Answers for Additional Activities

- Absolute Location:** Ethiopia is found between  $3^{\circ}\text{N}$  —  $15^{\circ}\text{N}$  and  $33^{\circ}\text{E}$  —  $48^{\circ}\text{E}$ .

**Relative Location:** Ethiopia is found to the South of Eritrea, North of Kenya, East of Djibouti, Northwest of Somalia, Northwest of the Indian Ocean, Southeast of the Red Sea, etc.
- Some of the advantages of large size are:

  - High probability of the presence of varieties of natural resources.
  - High probability of having different climates.
  - Large space for population settlement.

Some of the disadvantages of large size are:

  - High cost of infrastructural development.
  - Difficulty of political administration and unity.
  - High cost of defense to protect each and every corner of the country.
- The major stages of boundary formation are:

  - a. **Boundary Definition:** Verbal agreement to identify the position of the boundary between two countries.
  - b. **Boundary Delimitation:** Putting the verbally agreed boundary exactly on its position on the map.

- c. Boundary Demarcation: Putting the boundary that is defined on the map exactly on the ground.
  - d. Boundary Administration: Protection or administration of the demarcated boundary by the two countries.
4. Ethiopia is found in the Northern and Eastern Hemispheres.

### 3.3 GEOLOGICAL STRUCTURE AND RELIEF OF THE HORN OF AFRICA

Periods Allotted: 27

#### 1. Competencies

*After completing this lesson, the students will be able to:*

- ✚ Explain geological structure and major events of the Horn of Africa;
- ✚ Describe the major landforms of Ethiopia and the Horn;
- ✚ Discuss the general characteristic of Ethiopian rivers and drainage patterns;
- ✚ Classify the Ethiopian lakes as highland and rift valley;
- ✚ Show appreciation for the significances of Ethiopian rivers and lakes; and
- ✚ Show interest for the implementation of water-resource conservation and management policy.

#### 2. Contents

- 3.3.1 Geological History and Major Events of the Horn of Africa
- 3.3.2 Landforms of Ethiopia and the Horn
- 3.3.3 Drainage Systems and Water Resources of Ethiopia

### 3.3.1 GEOLOGICAL HISTORY AND MAJOR EVENTS OF THE HORN OF AFRICA

Period Allotted: 8 Periods

#### 1. Overview

In this lesson, the students will learn about the geological events that have happened in the Horn of Africa. The discussion will be based upon the geological timescale of the earth.

*Geological time scale* refers to the classification of the entire geological history of the earth into different time segments. The largest type of time segment in the geological timescale is known as *era*. In the geological timescale, four eras are chronologically distinguished from the oldest to the recent as: Precambrian, Paleozoic, Mesozoic, and Cenozoic. In these four eras, various geological and biological events have happened in the region of the Horn

of Africa. For a detailed study of the events, the eras are further classified into smaller time segments called *periods*. Each period is classified into smaller time segments called *epochs*. Therefore, in the geological timescale, the longest time segment is an era while the smallest is an epoch. In this lesson, students will learn in detail about the major geological events in the Horn of Africa that have happened within the four eras and their respective periods and epochs.

## 2. The Teaching-learning Process

### 2.1 Suggested Teaching Aids

- Geological Time Table
- Geological Maps of Africa and Ethiopia
- Physical Maps of Africa and Ethiopia
- Pictures and diagrams that show the geological processes and their consequences in Africa.

### 2.2 Suggested Methods of Teaching

- Brainstorming
- Questioning
- Pair and group discussion
- Demonstration

### 2.3 Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Design the most appropriate teaching method/for the lesson.
- Prepare notes, activities and exercises.

### 2.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce students to what they are going to learn (Geological History and Major Events of the Horn of Africa)
- Make the objectives of the lesson clear to the students.
- Conduct a brainstorming session to find out the students background knowledge of the concept of geology, the geological history of the earth, geological time scale, and the geological processes and forces. You may ask students questions such as: What do you know about the geological history of the earth? What do you know about the concept of geology and the geological time scale?



**b) Main Body of the Lesson**

- Based on your students' previous knowledge, explain more about the concept of geology, the meaning and importance of the geological timescale, and the various geological events that have happened in the horn of Africa with the four eras. Support your presentation with maps, diagrams, pictures, and tables that show the events and the resulted features.
- Using the geological map that you have prepared, you may ask students to identify the areas of the Horn of Africa in which various geological events have occurred. Also, you may ask the students to do activity 3.4 and exercise 3.2 from their textbook.
- Make sure that all students are involved in the group activities and the entire teaching-learning process.
- Give time to the students to ask questions and organize their notes.

**c) Stabilization**

Complete your lesson presentation with a review of key ideas and concepts of map such as:

- ✓ The entire geological history of the earth is classified into four eras.
- ✓ Orogenic folding, intrusive volcanism, and metamorphism were the major events of the Precambrian era in the Horn of Africa.
- ✓ Denudation and peniplanation were the major events of the Paleozoic era.
- ✓ Mesozoic era was an era of alternate sinking and rising of the Horn of African landmass. Besides, there was transgression and regression of water in the region.
- ✓ Uplifting of landmass, faulting, volcanism and climatic change were the major events that have occurred in the Horn of Africa and in Ethiopia during the Cenozoic era. Most of the current physical features of the region are the results of the events of this era.

**2.5 Evaluation and Follow up****a) Evaluation**

*Use all of the evaluation techniques described in the Introduction.* Include these evaluation activities:

- check the students' understanding of the lesson by asking them oral questions, giving them class work, take-home assignments, and quizzes. You may ask them oral questions such as:
  - What is a geological time scale?
  - Enumerate the major geological events that have happened in the Horn of Africa during the Cenozoic era?

Analyze the evaluation data you have recorded for each individual and then extrapolate and analyze it for the class as a whole to find out whether you have succeeded in passing the lesson's information and techniques on to your students. Based on your conclusions, provide each student with appropriate activities, *as described in the Introduction.*

**b) Follow up**

Include these activities in your follow-up work:

Grade all the activities performed by the students. Classify the grades to understand how many of the students have understood the lesson as planned, and how many of them have not.

**c) Additional Activities for Fast Learners**

1. Define what geological time scale means and discuss its purposes.
2. Describe the major geological events that have happened in the Horn of Africa and Ethiopia during the Mesozoic era.
3. Discuss the major geological events that have happened in the Horn of Africa and Ethiopia during the Tertiary and Quaternary periods of the Cenozoic era.

## Answers for the Activities and Exercises in the Text book

### Exercise 3.2

#### I. Multiple choice

- |      |      |      |      |      |
|------|------|------|------|------|
| 1. D | 2. B | 3. D | 4. D | 5. C |
| 6. A | 7. A | 8. B | 9. C |      |

#### II. Matching

- |       |       |       |       |
|-------|-------|-------|-------|
| 10. B | 11. A | 12. C | 13. D |
| 14. I | 15. J | 16. H | 17. E |
| 18. F | 19. G |       |       |

### Activity 3.4

- a. Metamorphic rocks- Abay Gorge, Assossa, Western and Central Eritrea, etc
- b. Sedimentary rocks- Almost all the South Eastern part of Ethiopia, the Somali lowlands, etc.
- c. Quaternary lava deposits- Afar region, Djibouti, etc.

### Activity 3.5

1. Map of the Ethiopian Rift Valley (Refer the students text book)
2. Afar Triangle- Semera, Gewane  
Awash Valley- Abomssa, Awash Sebat Kilo  
Lakes Region- Awassa, Arba Minch

## Answers for Additional Activities

1. Geological time scale is the classification of the entire history of the earth into different time segments such as eras, periods and epochs. The purpose of the geological time scale is to make intensive study of the geological and evolutionary events happened in the history of the earth since its formation.
2. The major geological events were:
  - Alternate sinking and rising of the landmass
  - Alternate transgression and regression of water
  - Formation of sedimentary rock layers
3. The major geological events of tertiary and quaternary periods were:

### **Tertiary Period**

- Uplifting of the landmass
- Fracturing and faulting of the landmass
- Formation of the Great East African Rift Valley
- Volcanism and flow of the Trappean Lava Series
- Formation of the high volcanic mountains and plateaus of Ethiopia

### **Quaternary Period**

- Volcanism and flow of the Aden Volcanic Series
- Climatic change with alternate wet and dry conditions
- The occurrence of pluvial rainfall
- Enlargement of rivers and lakes
- Formation of the Afar Alps block mountains
- High rate of evaporation resulted in the deposition of salt in the Afar region of the rift valley
- Formation of the quaternary sedimentary rocks

## 3.3.2 LANDFORMS OF ETHIOPIA AND THE HORN

**Period Allotted: 8 Periods**

### 1. Overview

In this lesson, the students will learn about the relief of Ethiopia and the Horn of Africa. The landforms of Ethiopia and the Horn are the results of the geological processes and changes that have happened since the formation of the region. However, the majority of the current landforms of the region are results of the geological events of the tertiary and quaternary periods of the Cenozoic era. Many of the Ethiopian landforms, for example, are results of the internal and external forces and processes of this era.

Within the Horn of Africa, there are various types of landforms which can be broadly categorized into three groups as *highlands*, *lowlands*, and *the rift valley*. The highlands of the region include the north and western highlands of Ethiopia, the south and eastern highlands of Ethiopia, and the plateau of Eritrea. On the other hand, the lowlands of the region contain the north and western lowlands and the northeastern and southeastern lowlands. The north and western lowlands are mainly found in Ethiopia along its boundary with the Sudan, but they are also in some parts of western Eritrea. The northeastern lowlands are found in Ethiopia, Eritrea and Djibouti, while the southeastern lowlands occupy extensive areas of the southeastern part of Ethiopia and much of Somalia. The Rift Valley region of the Horn stretches north-south, crossing almost all of the four countries of the region.

## 2. The Teaching-learning Process

### 2.1 Suggested Teaching Aids

- Physical Maps of Africa and Ethiopia
- Pictures and diagrams that show the landform features in Ethiopia and the Horn.

### 2.2 Suggested Methods of Teaching

- Brainstorming
- Questioning
- Pair and group discussion
- Demonstration

### 2.3 Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Design the most appropriate teaching method/s for the lesson.
- Prepare notes, activities and exercises.

### 2.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce students to what they are going to learn (Landforms of Ethiopia and the Horn)
- Make the objectives of the lesson clear to the students.
- Conduct a brainstorming session to find out the students background knowledge of the concept of geology, the geological history of the earth, geological time scale, and the geological processes and forces. You may ask students questions such as: What do you know about the landforms of Ethiopia? Can you tell some of the landforms that exist in your area? Do you know how the mountains and plateaus of Ethiopia were created?

**b) Main Body of the Lesson**

- Based on your students' previous knowledge, explain more about the three broad types of landforms (highland, lowlands and rift valley) exist in Ethiopia and the Horn. Discuss more about the characteristics of the physiographic regions of Ethiopia.
- With the help of the physical map of Ethiopia and the Horn, make your students identify the areas of the three major landforms of the Horn of African region. Explain more about the sub-divisions of each of the three landform types and their respective locations. At appropriate times during your presentation, have the students do exercise 3.3, 3.4, and 3.5 from their textbook.
- Make sure that all students are involved in the group activities and the entire teaching-learning process.
- Give time to the students to ask questions and organize their notes.

**c) Stabilization**

Complete your lesson presentation with a review of key ideas and concepts of map such as:

- ✓ The landforms of Ethiopia and the Horn of Africa are the results of the geological events of the Cenozoic era.
- ✓ Highlands, lowlands, and the rift valley are the major landform features in the Horn of Africa.
- ✓ The three major landforms of the region are further classified into other physiographic regions.

## 2.5 Evaluation and Follow up

**a) Evaluation**

*Use all of the evaluation techniques described in the Introduction.* Include these evaluation activities:

- Check the students' understanding of the lesson by asking them oral questions, giving them class work, take-home assignments, and quizzes. You may ask them oral questions such as:
  - What are the three major landform features of Ethiopia and the Horn of Africa?
  - What are the subdivisions exist in the Rift Valley physiographic region of the Horn?
  - Enumerate the major highland and lowland physiographic regions of Ethiopia?

Analyze the evaluation data you have recorded for each individual and then extrapolate and analyze it for the class as a whole to find out whether you have succeeded in passing the lesson's information and techniques on to your students. Based on your conclusions, provide each student with appropriate activities, *as described in the Introduction.*

**b) Follow up**

Include these activities in your follow-up work:

Grade all the activities performed by the students. Classify the grades to understand how many of the students have understood the lesson as planned, and how many of them have not.

**c) Additional Activities**

1. Explain the basic features of highlands and lowlands in Ethiopia.
2. Write the five highest mountain peaks of Ethiopia.
3. Describe the most elevated and lowest parts of the Ethiopian rift valley.

**Answers for the Activities and Exercises in the Text book**

**Exercise 3.3**

**I True or False**

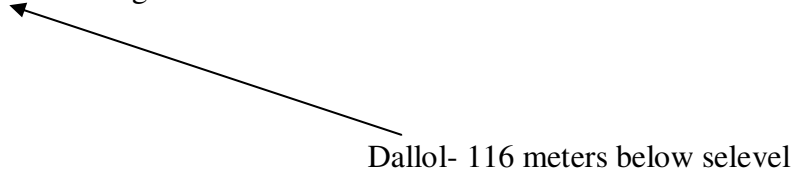
1. False            2. False            3. True            4. True            5. True            6. True

**II Multiple choices**

- |       |       |       |       |
|-------|-------|-------|-------|
| 7. B  | 8. A  | 9. C  | 10. D |
| 11. D | 12. B | 13. A | 14. A |
| 15. D | 16. D |       |       |

**III Short Answers**

17. It is because of continuous denudation.
18. Mt. Ambalage- 3291 meter above sea level



**Activity 3.6**

1. Map of the Physiographic regions of Ethiopia (Refer the students text book)
2. Three important towns for each division are:
  - The North-Western Highlands- Addis Ababa, Bahir Dar, Mekele, etc.
  - The South-Eastern Highlands- Jijiga, Assela, Goba, etc.

- The Rift Valley System- Adama, Hawassa, Arbaminch, etc.
  - The Western Lowlands- Gambella, Metema, Assossa, etc.
  - The South-Eastern Lowlands- Gode, Yabelo, Moyale, etc.
3. The economic significance of each division:
- a. North-Western Highlands**
    - Production of cereals such as teff, pulses, and oil seeds.
    - Hydro-Electric Power generation in the Tekeze, Tis Abay, etc projects.
    - The region has significant potential in terms of HEP generation, minerals exploitation, and production of cash crops, cereals, fruits and vegetables.
  - b. South-Eastern Highlands**
    - Production of coffee, inset, maize, chat, sorghum, millet, etc.
    - There is great potential of mining, irrigation agriculture, HEP generation, etc.
  - c. Rift Valley**
    - There are activities such as fishing, extraction of salt, irrigation agriculture, etc.
    - There exists great potential of geothermal energy, irrigation agriculture, fishing, extraction of salt and other minerals, etc
  - d. Western Lowlands**
    - They are known for high production of oil seeds, hide and skin, etc.
    - They are known for livestock.
    - They have high potential of irrigation agriculture, mining, dairy farming, hide and skin, etc.
  - e. South-Eastern Lowlands**
    - There are activities such as irrigation agriculture, cattle raising, etc.
    - There exists high production of hide and skin.
    - They have great potential of irrigation agriculture, mining, dairy farming, ranching, hide and skin, etc.
4. The Baro-Akobo lowlands are wettest lowlands. This is because they get rain in most of the months. The factors responsible for this abundance of rain are:
- The equatorial westerlies that have greater magnitudes in the area in most of the months especially during the summer season.
  - The convectional rainfall that is resulted from high evapo-transpiration.
  - They are located on the wind ward side of the equatorial westerlies.

## Answers for Additional Activities

1. Highlands in Ethiopia are characterized by:
- Lower temperature conditions
  - Higher rainfall conditions
  - High concentration of people

- Relatively denser vegetation cover
- Mixed farming of crops and animals
- Absence of tropical diseases

Lowlands in Ethiopia have the following features.

- Higher temperature condition
  - Lower rainfall conditions
  - Less concentration of people
  - Sparse vegetation cover
  - Pastoralist way of life
  - Presence of tropical diseases
2. Some of the highest mountain peaks of Ethiopia are Ras Dashen, Guna, Abune Yosef, Tulu Dimtu, Batu, etc
  3. The most elevated part of the Ethiopian rift valley is the lakes region, while the lowest part is within the Afar Triangle.

### 3.3.3 DRAINAGE SYSTEMS AND WATER RESOURCES OF ETHIOPIA

**Period Allotted: 11 Periods**

#### 1. Overview

In this lesson, the students will learn about the drainage systems and water resources of Ethiopia. The drainage systems and water resources of Ethiopia are also the results of the geological events of the Cenozoic era. In contrast to the other countries of the Horn, Ethiopia is endowed with many rivers, lakes and other enormous water resources. Because of this, the country is even described as the “water tower of eastern Africa.” The rivers of Ethiopia are grouped into three broad drainage systems, namely: The Western (Mediterranean) Drainage System, the Southeastern (Indian Ocean) Drainage System, and the Inland (Rift Valley) Drainage System. The lakes of the country are also categorized into two as highland (non-Rift Valley) lakes and Rift Valley lakes.

The government of Ethiopia is now trying to exploit this enormous water resource potential of the country. It has formulated a water-resource policy of the country which has a goal of improving and enhancing the health and quality of life of all Ethiopians and promoting sustainable socio-economic development through the sound management and use of the water resources of the country. That is why a number of big hydro-electric power projects have been launched in the country in recent years.



## 2. The Teaching-learning Process

### 2.1 Suggested Teaching Aids

- Physical Maps of Africa and Ethiopia
- Pictures and diagrams that show the rivers and lakes of Ethiopia and the Horn of Africa

### 2.2 Suggested Methods of Teaching

- Brainstorming
- Questioning
- Pair and group discussion
- Demonstration

### 2.3 Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials.
- Design the most appropriate teaching method/s for the lesson.
- Prepare notes, activities and exercises.

### 2.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce students to what they are going to learn (Drainage Systems and Water resources of Ethiopia)
- Make the objectives of the lesson clear to the students.
- Conduct a brainstorming session to find out the students background knowledge of the water resources of Ethiopia and the Horn. You may ask students questions such as: What do you know about the water resources of Ethiopia and the Horn? Can you name some of the rivers and lakes that are found in Ethiopia? Can you tell how the rivers and lakes of Ethiopia are significant to the people of the country?

#### b) Main Body of the Lesson

- Based on your students' previous knowledge, explain more about the concept of drainage and drainage systems, the drainage systems in Ethiopia and the Horn (the Western/Mediterranean Sea drainage system), (the South-eastern/Indian Ocean drainage system and the Inland/Rift Valley drainage system). Support your presentation with maps, diagrams, pictures, and tables that show the drainage systems and the existing major rivers.
- With the help of the physical map of Ethiopia, have the students identify the major lakes and rivers of the country. Explain the three drainage systems of Ethiopian rivers. Ask the students to identify the rivers that belong to each of the drainage systems. Explain more about the highland and Rift Valley lakes of

Ethiopia. Have the students categorize Ethiopian lakes as highland or Rift Valley lakes. Also, present the artificial lakes of the country. Explain the significance of Ethiopian lakes and rivers and their potential, and contrast that with their current actual utilization. Finally, conduct a discussion about the nature of water-resource conservation and management in Ethiopia and the water-resource policy of the government. Then, ask the students to do exercise 3.6 from their textbook.

- Make sure that all students are involved in the group activities and the entire teaching-learning process.
- Give time to the students to ask questions and organize their notes.

### c) **Stabilization**

Complete your lesson presentation with a review of key ideas and concepts of map such as:

- ✓ Ethiopia is rich in water resources, as it has several rivers and lakes.
- ✓ The rivers of Ethiopia are grouped into three drainage systems, based on the direction of their flow.
- ✓ The lakes of Ethiopia are grouped into two: highland lakes and Rift Valley lakes.
- ✓ The lakes and rivers of Ethiopia have great potential for promoting socio-economic development within the country.
- ✓ Ethiopia's government has formulated and has been implementing a policy that helps in the proper and efficient utilization of the water resources of the country.

## 2.5 Evaluation and Follow up

### a) **Evaluation**

*Use all of the evaluation techniques described in the Introduction.* Include these evaluation activities:

Check the students' understanding of the lesson by asking them oral questions, giving them class work, take-home assignments, and quizzes. You may ask them oral questions such as:

- Which rivers of Ethiopia are found in the Western Drainage System?
- Which lakes of Ethiopia are the highland lakes?

Analyze the evaluation data you have recorded for each individual and then extrapolate and analyze it for the class as a whole to find out whether you have succeeded in passing the lesson's information and techniques on to your students. Based on your conclusions, provide each student with appropriate activities, *as described in the Introduction.*

**b) Follow up**

Include these activities in your follow-up work:

Grade all the activities performed by the students. Classify the grades to understand how many of the students have understood the lesson as planned, and how many of them have not.

**c) Additional Activities for Fast Learners**

1. Describe general characteristics of the Ethiopian rivers.
2. Enumerate the rivers of Ethiopia that have been used for Hydro-Electric Power generation.
3. Give examples of the rift valley and non-rift valley lakes of Ethiopia.
4. Discuss the reasons why most of the rivers of Ethiopia are not suitable for transportation.

**Answers for the Activities and Exercises in the Text book****Activity 3.7**

1. Map of the Drainage Systems of Ethiopia (Refer the students text book)
2. The prevailing drainage patterns in all systems are dendritic drainage systems.
3. Development-based projects in the drainage systems
  - i. Mediterranean Drainage System
    - Hydro-Electric Power projects such as the Tekeze, Tis Abay, Fincha, etc.
  - ii. Inland Drainage System
    - Hydro-Electric Power projects such as Awash (1,2,3) and Gilgel Ghibe (1,2,3).
    - Irrigation agriculture along the Awash valley.
  - iii. Indian Ocean Drainage System
    - Irrigation agriculture along the courses of Wabeshebelle river.

**Activity 3.8**

Since it is a local-based activity, the answers are expected to vary from place to place. Therefore, please organize an educational field trip to a nearby river and have your students do the questions found in this activity.

**Exercise 3.4****I. True or False**

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

**II. Multiple Choice**

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 7. C  | 8. A  | 9. A  | 10. C | 11. D |
| 12. B | 13. C | 14. C | 15. B | 16. C |
| 17. A | 18. D | 19. A |       |       |

## Answers for Additional Activities

1. The major characteristics of the Ethiopian rivers are:
  - They have rapids and falls
  - The flow over steep slope courses
  - They show seasonal fluctuation
  - They are suitable for hydroelectric power generation
  - Most of them are not navigable
2. Awash, Ghibe, and Tekeze are the major rivers of Ethiopia that have been used for hydroelectric power generation. However, the government has now launched the Hedase Dam Project on the Abay (Blue Nile) river, which is largest river of the country. It is the ever biggest hydroelectric power project in the history of the country with a potential generating 5250 mega watt electric power.
3. Some of the examples of the rift valley lakes of Ethiopia are Langano, Awassa, Ziway, Shalla, Abaya, Chamo, etc. On the other hand, Lake Tana, Ashenghe, Haik, etc are some of the examples of non-rift valley lakes of Ethiopia.
4. The major reasons for the unsuitability for navigation of most Ethiopian rivers are:
  - Because of their seasonal fluctuation.
  - Because they flow over very rugged and steep courses.
  - Because they have rapids and falls.

### 3.4 CLIMATE OF ETHIOPIA AND THE HORN

Periods Allotted: 10

#### Contents

- 3.4.1 Factors influencing the spatial distribution of the elements of climate in Ethiopia and the Horn
- 3.4.2 Spatial and temporal variation of temperature in Ethiopia and the Horn
- 3.4.3 Spatial and temporal variation of rainfall in Ethiopia and the Horn
- 3.4.4 Rainfall regions in Ethiopia and the Horn

#### 3.4.1 FACTORS INFLUENCING THE SPATIAL DISTRIBUTION OF THE ELEMENTS OF CLIMATE IN ETHIOPIA AND THE HORN

Periods Allotted: 2

#### 1. Competencies

*After completing this lesson, the students will be able to:*

- ✚ *Discuss the factors that influence the spatial distribution of the elements of climate in Ethiopia and the Horn.*

## 2. Overview

In this lesson, students will specifically learn about the major factors responsible for the spatial distribution of the elements of climate in Ethiopia and the Horn.

People often mistakenly use the terms *weather* and *climate* interchangeably as if they were similar. However, though the two terms are interrelated, they have different meanings. *Weather* refers to the atmospheric conditions of a given place for a short period of time, while *climate* is the average weather condition of a given place for a relatively longer period of time. In other words, the day-by-day variations of atmospheric conditions (temperature, rainfall, cloud cover, humidity, wind, etc.) in a given area constitute the weather, whereas climate is the long-term synthesis of such variations. Therefore, climate can be understood most easily in terms of annual or seasonal averages of temperature, precipitation, humidity, sunshine, cloud cover, etc. In addition, weather is measured by thermometers, rain gauges, barometers, and other instruments, but the study of climate relies on statistics. The major elements of weather and climate are the following.

- Temperature
- Precipitation
- Humidity
- Wind
- Air pressure
- Cloud cover
- Sunshine

The conditions of these elements of weather and climate significantly vary from place to place and from time to time, even at the same place. For example, in Ethiopia, different places experience different degrees of temperature, amounts of rainfall, etc., even if the season is the same. During the summer season, for instance, the amount of rainfall over the highlands is not the same as that of the lowlands. Highlands receive much more rainfall than the lowlands. In the country, the amount of temperature, rainfall, etc. within the same place also varies during different seasons of the year. In Addis Ababa, for instance, the amount of rainfall during the summer and winter seasons is significantly different. Summer is the rainiest season for the city, while winter is the driest season. This spatial and temporal variation of the elements of weather and climate is also the characteristic of other places in the Horn of Africa.

In general, the following major factors influence the spatial distribution of the elements of climate in Ethiopia and the Horn.

- Latitude
- Altitude
- Revolution of the earth and the  $23.5^{\circ}$  inclination of the axis of the earth
- Distance from the sea

- Mountain barriers
- Weather systems

These factors influence the climatic characteristics of the region in the following ways.

- Because of their tropical latitudinal location, all places in the region experience the overhead sun twice a year.
- Because of differences in altitude, different places experience different temperatures and amounts of rainfall. Temperature over the high-altitude areas of the region is lower than that of the low-altitude areas, while the reverse is the case in the amount of rainfall. Altitude is the major factor that controls the distribution of temperature in the region.
- Based on their distances from the major bodies of water, such as the Atlantic Ocean, Indian Ocean, and the Red Sea, places found in the region experience different amounts of rainfall in different seasons.
- Because of the earth's revolution and the inclination of its axis, places found in the region experience the four seasons, i.e., summer, winter, spring, and autumn.
- Due to the seasonal variation of the direction or position of other weather systems such as winds and air pressure, there is temporal variation in the amount of rainfall in the region.
- As a result of mountain barriers, the direction of rain-giving winds is affected—especially in the highlands of Ethiopia. Most places found on the windward side of the mountains receive orographic type of rainfall; while places found on the lee-ward sides experience little or no rainfall.

### **3. The Teaching-learning Process**

#### **3.1 Suggested Teaching Aids**

- Climatic map of Africa and Ethiopia
- Physical map of Africa and Ethiopia
- Globe
- Charts prepared on the spatial distribution of the elements of climate in Ethiopia and the Horn
- Pictures and diagrams that show the life of people in different climatic conditions in Ethiopia and the Horn

#### **3.2 Suggested Methods of Teaching**

- Brainstorming
- Questioning
- Pair and group discussion
- Demonstration

- Presentation
- Inviting a guest speaker
- Visiting a local metrological station

### 3.3 Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials such as climatic maps, physical maps, statistical data, pictures, charts, etc.
- Design the most appropriate teaching methods for the lesson.
- Prepare notes, activities and exercises.
- Organize a trip to a nearby metrological station.

### 3.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce students to what they are going to learn (Factors Influencing the Spatial Distribution of the Elements of Climate in Ethiopia and the Horn)
- Make the objectives of the lesson clear to students.
- Conduct a brainstorming session to find out the students' background knowledge of weather and climate, the elements of weather and climate, and the controls of weather and climate. You may ask them questions such as: What do you know about weather and climate? Do you think they are the same or different? Can you mention some of the elements of weather and climate? Do temperature and the amount of rainfall in your area vary from time to time? What do you think are the reasons? Do all places in Ethiopia experience the same temperature and amount of rainfall? What do you think are the reasons?

#### b) Main Body of the Lesson

- Based on your students' previous knowledge, explain more about the differences between weather and climate, the elements of these, and their controls. Have your students discuss, in groups, the relationships between the elements and controls of weather and climate. Help them to relate their discussion with the practical situations of their own local environment.
- Explain more about the major factors that influence the spatial distribution of the elements of climate in Ethiopia and the Horn. Using the climatic maps and physical maps, help the students to understand the altitudinal differences within the region and its implications on the climate, the regions latitudinal position its impacts on the climate, and so forth.
- At appropriate moments of your presentation, ask the students to do the activities and exercises found in their textbook. Make sure that all students are

involved in the group activities and in the entire teaching-learning process. Give them time to ask questions and to organize their notes.

- To strengthen your students' understanding, you can invite a guest speaker/resource person who works in a nearby metrological station and/or organize a field trip to a local metrological station.

### c) Stabilization

- Review the main ideas and concepts of the lesson.
  - ✓ Weather refers to the atmospheric condition of a given place for a short period of time.
  - ✓ Climate is the average weather condition of a given place for a relatively longer period of time.
  - ✓ Temperature, precipitation, wind, air pressure, cloud cover, humidity and sunshine are the major elements of weather and climate.
  - ✓ Latitude, altitude, distance from the sea, weather systems (wind, air pressure), and mountain barriers are the major factors influencing the elements of climate in Ethiopia and the Horn.

## 4.5 Evaluation and Follow Up

### a) Evaluation

*Use all of the evaluation techniques described in the Introduction.* Include these evaluation activities:

Check the students' understanding of the lesson by giving them an exercise to be done independently. The exercise may contain questions such as:

- What are the major factors that affect the spatial distribution of the elements of climate in Ethiopia and the Horn?
- Discuss the relationship between altitude and temperature in Ethiopia and the Horn.
- How do weather systems such as winds and air pressure systems affect the spatial distribution of rainfall in Ethiopia and the Horn?

### b) Follow up

Rate and grade the various activities performed by the students. Analyze the results to understand whether or not the lesson has been well-understood, and to identify those students who may need extra coaching.

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.



Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

**c) Additional Activities for Fast Learners**

1. Discuss the differences between weather and climate.
2. Explain why and how latitude affects the spatial distribution of the elements of climate in Ethiopia and the Horn.
3. Identify the water bodies that have significant impact on the spatial distribution of the elements of climate in Ethiopia and the Horn.

### Answers for Additional Activities

1. Weather refers to the atmospheric conditions of a given place for a short period of time, while climate is the average weather condition of a given place for a relatively longer period of time. In other words, the day-by-day variations of atmospheric conditions (temperature, rainfall, cloud cover, humidity, wind, etc.) in a given area constitute the weather, whereas climate is the long-term synthesis of such variations.
2. Based on their latitudinal location, places in the region experience different amount of angle of the sun. However, because of their tropical location, all places found in the region experience the overhead sun ( $90^{\circ}$  angle of the sun) twice in a year. The latitudinal position of the sun also affects the position of the ITCZ, the low pressure cell that controls the direction of movement of winds in the region. Therefore, latitude has an effect on the spatial distribution of temperature and rainfall in the region.
3. The major water bodies that have impact on the spatial distribution of the elements of climate in the Horn of Africa are the Atlantic Ocean, Indian Ocean, Red Sea, and Gulf of Aden.

## 3.4.2 SPATIAL AND TEMPORAL VARIATION OF TEMPERATURE IN ETHIOPIA AND THE HORN

Periods Allotted: 3

### 1. Competencies

*After completing this lesson, the students will be able to:*

- ✚ Describe the spatial and temporal variation of temperature in Ethiopia and the Horn.

### 2. Overview

In this lesson, students will learn about why and how temperature distribution in Ethiopia and the Horn varies from place to place and from time to time. The major factors that result

the spatial and temporal variation of temperature in Ethiopia and the Horn are altitude and cloud cover.

As altitude increases, we know that the amount of temperature will decrease. This shows that there is inverse relationship between altitude and temperature. Because of differences in altitude, therefore, different places in Ethiopia and the Horn experience different amounts of temperature. Temperature over the high-altitude areas of the region is lower than that of the low-altitude areas. Among all factors, altitude is the major factor that controls the distribution of temperature in the region. For example, based on their altitudes, places found in Ethiopia are grouped into five temperature zones (i.e., agro-ecological zones). They are: Wurch/Kur, Dega, WoinaDega, Kolla, and Berha.

Cloud cover is also another factor influencing the spatial and temporal variation of temperature in Ethiopia the Horn. This is because cloud cover affects the amount of solar radiation that reaches the earth's surface. It acts as a barrier that absorbs and reflects back the solar radiation that comes from the sun. For instance, though summer in many parts of the world is a season of high temperature, because of the high cloud cover during this season, most places in Ethiopia experience low temperature condition.

### **3. The Teaching-learning Process**

#### **3.1 Suggested Teaching Aids**

- Climatic map of Africa and Ethiopia
- Physical map of Africa and Ethiopia
- Statistical data of temperature in different places and times in Ethiopia and the Horn
- Charts and diagrams prepared on the spatial and temporal distribution of temperature in Ethiopia and the Horn
- Pictures and diagrams that show the life of people in different temperature conditions in Ethiopia and the Horn

#### **3.2 Suggested Methods of Teaching**

- Brainstorming
- Questioning
- Pair and group discussion
- Demonstration
- Presentation

#### **3.3 Pre-lesson Preparation**

- Get ready in advance with the suggested teaching aids and other reference materials such as climatic maps, physical maps, statistical data, pictures, charts, etc.
- Design the most appropriate teaching methods for the lesson.
- Prepare notes, activities and exercises.

### 3.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce students to what they are going to learn (Spatial and Temporal Variation of Temperature in Ethiopia and the Horn)
- Make the objectives of the lesson clear to students.
- Conduct a brainstorming session to find out the students' background knowledge of temporal and spatial distribution of temperature and rainfall in Ethiopia and the Horn. You may ask them questions such as: Do temperature in your area vary from time to time? What do you think are the reasons? Do all places in Ethiopia experience the same amount of temperature? What do you think are the reasons?

#### b) Main Body of the Lesson

- Based on your students previous knowledge, explain more about the major factors, such as altitude, cloud cover, and latitude, that are responsible for spatial and temporal variation of temperature in Ethiopia and the Horn. Have your students discuss, in groups, the relationships exist between temperature and altitude, cloud cover as well as latitude. Help them to relate their discussion with the practical situations of their own local environment.
- Explain to them the reasons why temperature distribution in Ethiopia and the Horn varies from place to place and from time to time. Support your presentation with statistical data of temperature conditions of different places found in Ethiopia and other countries of the Horn. Help the students understand well how altitude is the major factor of temperature distribution in the region. You may use the five temperature zones of Ethiopia to help the students to understand the relationship between altitude and temperature. Have the students precisely locate all of the temperature zones and discuss them. Then have them identify their own zone and compare it with others that they know.
- Help your students to understand how and why the spatial and seasonal variations of cloud cover in Ethiopia and the Horn result spatial and temporal variations in the distribution of temperature. Help them to relate this condition with the practical conditions in their own local environment.
- Help your students to identify the hottest and coldest places as well as the hottest and coldest months in Ethiopia and the Horn.
- At appropriate moments of your presentation, ask the students to do the activities and exercises found in their textbook. Make sure that all students are involved in the group activities and in the entire teaching-learning process. Give them time to ask questions and to organize their notes.

**c) Stabilization**

- Review the main ideas and concepts of the lesson.
  - ✓ Altitude and cloud cover are the major factors that influence the spatial and temporal distribution of temperature in Ethiopia and the Horn.
  - ✓ The most significant factor of temperature distribution and variation between places in Ethiopia is altitude.
  - ✓ Based the relationship between altitude and temperature, in Ethiopia there are five temperature zones or agro-climatic zones.
  - ✓ Because of their tropical location, all places in Ethiopia and the Horn experience overhead sun twice in a year.
  - ✓ Cloud cover is one of the factors responsible for the seasonal variation of temperature in Ethiopia and the Horn.

**4.5 Evaluation and Follow Up****a) Evaluation**

*Use all of the evaluation techniques described in the Introduction.* Include these evaluation activities:

Check the students' understanding of the lesson by giving them an exercise to be done independently. The exercise may contain questions such as:

- What are the major factors that affect the spatial and temporal distribution of temperature distribution in Ethiopia?
- What are the five temperature zones found in Ethiopia?
- Why do most places in Ethiopia experience low temperature condition during the summer season?

**b) Follow up**

Rate and grade the various activities performed by the students. Analyze the results to understand whether or not the lesson has been well-understood, and to identify those students who may need extra coaching.

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

**c) Additional Activities for Fast Learners**

1. Identify the coldest and hottest parts of Ethiopia and explain the possible reasons.
2. Discuss the temperature differences within the five temperature zones of Ethiopia.
3. What is the reason for the relatively higher temperature conditions in most areas of Ethiopia during the winter season?

**Answers for the Activities and Exercises in the Text book****Activity 3.9**

1. Help your students to get information about the altitude of their locality. Then, make them discuss and identify to which temperature (agro-climatic) zone that their locality belongs to.
2. Help your students to discuss and identify the characteristics of the temperature (agro-climatic) zone that they are living in.
3. Finally, instruct your students to write a report on the above two issues that they have discussed.

**Answers for Additional Activities**

1. The very high altitudinal areas of Ethiopia such as the North-Central Massif, Arsi-Bale massif and Shewan Plateau are the coldest areas of the country. On the other hand, the very low altitudinal areas of the country such as the Afar Triangle, the Ogaden and Elkerer lowlands are the hottest places of the country. The coldest and hottest nature of the places is mainly attributed to the impact of altitude. In the country, altitude is the major factor that controls the spatial variation of temperature.
2. The Wurch/Kur temperature zone experiences the lowest temperature condition of all the temperature zones.  
The Dega temperature zone experiences low temperature condition, but higher temperature than the wurch.  
The Woina Dega region has moderate temperature condition, which is considered as neither high nor low.  
Kolla temperature zone of the country experiences relatively higher temperature than the wurch, dega and weina dega zones.  
The Berha temperature zone has the highest temperature condition of all the temperature zones in the country.
3. The main reason is the presence of clear sky condition in most places of the country. In most parts of the country, there is no or little cloud cover during the winter season.

### 3.4.3 SPATIAL AND TEMPORAL VARIATION OF RAINFALL IN ETHIOPIA AND THE HORN

Periods Allotted: 3

#### 1. Competencies

*After completing this lesson, the students will be able to:*

- ✚ Explain the spatial and temporal variation of temperature in Ethiopia and the Horn.

#### 2. Overview

In this lesson, students will learn about why and how rainfall distribution in Ethiopia and the Horn varies from place to place and from time to time. The major factors that result the spatial and temporal variation of rainfall in Ethiopia and the Horn are the prevailing weather systems, mainly the prevailing winds and air pressure systems. However, there are also other factors such as distance from water bodies and mountain barriers that are responsible for the spatial and temporal variation of rainfall in Ethiopia and the Horn.

In general, the following are the major issues that explain the spatial and temporal variation of rainfall in Ethiopia and the Horn.

- Based on their distances from the major bodies of water, such as the Atlantic Ocean, Indian Ocean, and the Red Sea, different places found in the region experience different amounts of rainfall in different seasons.
- Because of the earth's revolution and the inclination of its axis, places found in the region experience the four seasons, i.e., summer, winter, spring, and autumn.
- Due to the seasonal variation of the direction or position of other weather systems such as winds and air pressure, there is temporal and spatial variation in the amount of rainfall in the region.
- Because of the earth's revolution, the Inter-Tropical Convergence Zone (ITCZ) moves north and south together with the movement of the overhead sun. The ITCZ is a low pressure cell that significantly controls the direction of winds that comes to Ethiopia and the Horn. The temporal and spatial distribution of rainfall in the region, therefore, is the result of seasonal changes in the position of the ITCZ that causes variations in the type of winds blowing to different places of Ethiopia and the Horn.
- As a result of mountain barriers, the direction of rain-giving winds is affected- especially in the highlands of Ethiopia. Most places found on the windward side of the mountains receive orographic type of rainfall; while places found on the leeward sides experience little or no rainfall.

### 3. The Teaching-learning Process

#### 3.1 Suggested Teaching Aids

- Climatic map of Africa and Ethiopia
- Physical map of Africa and Ethiopia
- Statistical data of temporal and spatial distribution of rainfall in Ethiopia and the Horn
- Charts and diagrams prepared on the spatial and temporal distribution of rainfall in Ethiopia and the Horn

#### 3.2 Suggested Methods of Teaching

- Brainstorming
- Questioning
- Pair and group discussion
- Demonstration
- Presentation

#### 3.3 Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials such as climatic maps, physical maps, statistical data, pictures, charts, etc.
- Design the most appropriate teaching methods for the lesson.
- Prepare notes, activities and exercises.

#### 3.4 Lesson Presentation

##### a) Introduction to the Lesson

- Introduce students to what they are going to learn (Spatial and Temporal Variation of Rainfall in Ethiopia and the Horn)
- Make the objectives of the lesson clear to students.
- Conduct a brainstorming session to find out the students' background knowledge of the spatial and temporal distribution of rainfall in Ethiopia and the Horn. You may ask them questions such as: Do the amounts of rainfall in your area vary from time to time? What do you think are the reasons? Do all places in Ethiopia experience the same amount of rainfall during the same season? What do you think are the reasons?

##### b) Main Body of the Lesson

Based on your students previous knowledge, explain more about the major factors, such as the ITCZ, wind systems, air pressure systems, mountain barriers and distance from the sea, that are responsible for spatial and temporal variation of rainfall in Ethiopia and the Horn. Have your students discuss, in groups, the relationships exist

between rainfall and the above factors. Help them to relate their discussion with the practical situations of their own local environment.

- Explain more to your students about the seasonal distribution of rainfall in Ethiopia and the Horn and the reasons why the distribution varies from place to place. Support your presentation with statistical data of rainfall in different months/seasons in different places found in Ethiopia and other countries of the Horn. Help the students understand well how the ITCZ influences the seasonal and spatial distribution of rainfall in the region. Help the students to understand the major type of winds blowing to the region and their variation from time to time and from place to place.
- Help your students to understand how and why the major water bodies and mountain barriers influence the distribution of rainfall in Ethiopia and the Horn. Help them to relate this condition with the practical conditions in their own local environment.
- Help your students to identify the wettest and driest places as well as the rainiest and driest seasons in different places of Ethiopia and the Horn.
- At appropriate moments of your presentation, ask the students to do the activities and exercises found in their textbook. Make sure that all students are involved in the group activities and in the entire teaching-learning process. Give them time to ask questions and to organize their notes.

**c) Stabilization**

- Review the main ideas and concepts of the lesson.
  - ✓ Weather systems (winds and air pressure), ITCZ, distance from the sea, and mountain barriers are the major factors that influence the spatial and temporal distribution of rainfall in Ethiopia and the Horn.
  - ✓ Summer is the rainiest season in Ethiopia and the Horn because of the influence of the prevailing moist winds of the equatorial westerlies and easterlies originate from the Atlantic and Indian oceans.
  - ✓ Winter is the driest season in Ethiopia and the Horn because of the influence of the prevailing dry winds of the north-east trade winds originate from the dry landmasses of Asia.
  - ✓ The highland areas of Ethiopia are places in the Horn that receive the highest amount of annual rainfall.



### 3.5 Evaluation and Follow Up

#### a) Evaluation

*Use all of the evaluation techniques described in the Introduction.* Include these evaluation activities:

Check the students' understanding of the lesson by giving them an exercise to be done independently. The exercise may contain questions such as:

- What are the major factors that affect the spatial and temporal distribution of rainfall distribution in Ethiopia?
- Why do most places in Ethiopia receive rainfall during the summer season?
- What is the reason for the dryness of most areas of Ethiopia during the winter season?
- What is the ITCZ? What is the reason for its north-south movement in different seasons? How does it affect rainfall distribution in Ethiopia?

#### b) Follow up

Rate and grade the various activities performed by the students. Analyze the results to understand whether or not the lesson has been well-understood, and to identify those students who may need extra coaching.

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

#### c) Additional Activities for Fast Learners

1. Discuss the reasons for the dry winter and wet summer conditions in Ethiopia and the Horn.
2. Identify the wettest and driest parts of Ethiopia and discuss the possible reasons.
3. Identify the major wind systems that influence different places in Ethiopia in different seasons.
4. Discuss why and how the ITCZ controls the prevailing wind systems in Ethiopia and the Horn.

## Answers for the Activities and Exercises in the Text book

### Activity 3.10

1. Instruct and help your students to identify the driest and rainiest seasons of their own local area.
2. Instruct and help them to relate the rainfall pattern in their own local area with the prevailing major wind systems in Ethiopia.

3. Instruct and help them to identify the factors that are responsible for moist winds to blow towards their local area during the rainiest season of the area.
4. Instruct and help them to identify the hottest and coldest months in their own local area.

## Answers for Additional Activities

1. The major reason for the dry winter condition in Ethiopia is the position of the ITCZ south of the equator around the Tropic of Capricorn, which causes most parts of Ethiopia to be dominated by the dry Northeast trade winds that come from the dry landmasses of Asia. On the other hand, the main reason for the wet summer condition in Ethiopia is the position of the ITCZ north of the equator around the Tropic of Cancer, which causes moisture carrying and rain giving winds such as equatorial westerlies and southeast trade winds to dominate most parts of the country.
2. The southwestern highlands are the wettest parts of Ethiopia caused mainly by the rain giving equatorial westerlies comes to the region almost through out the year. In contrast, the Afar Triangle region is the driest part of Ethiopia because of the absence of rain giving winds for most of the months.
3. **Summer Season:** the Equatorial Westerly are the most dominant winds in most parts of Ethiopia except few places in the south eastern parts that are dominated by Southeast trade winds.  
**Winter Season:** the Northeast trades are the most dominant winds in most parts of the country except the southwestern highlands in which the equatorial westerlies are strong.  
**Spring and Autumn Seasons:** the Southeast trades are the most dominant winds in most parts of the country except some places in the north and western parts of the country which are dominated by the equatorial westerlies.
4. The ITCZ is a low pressure cell that moves up and down or north and south of the equator following the north-south movement of the overhead sun. Since it is a low pressure cell, it has an effect of attracting winds towards it. Therefore, the types of winds that blow to Ethiopia and the Horn in different seasons are controlled by the position of the ITCZ.

## 3.4.4 RAINFALL REGIONS IN ETHIOPIA AND THE HORN

Periods Allotted: 2

### 1. Competencies

*After completing this lesson, the students will be able to:*

1. Compare the rainfall regions in Ethiopia.

## 2. Overview

In this lesson, students will learn about the rainfall regions in Ethiopia and the Horn. Based on the distribution of rainfall both in space and time, five types of rainfall regions can be identified in Ethiopia and the Horn. These are:

- All year-round rainfall region
- Summer rainfall region
- Autumn and spring rainfall region
- Winter rainfall region
- Merged spring, summer and autumn rainfall region

The variations in the pattern of rainfall in these rainfall regions are the results of interrelated factors such as the position of the ITCZ, the wind systems, and air pressure systems.

- The all year-round rainfall region in Ethiopia is found in the south-western highlands of the Oromiya Region and some parts of SNNPR specifically in Wellega, Keffa, Illubabor, and Gamo Gofa.
- The summer rainfall region in Ethiopia consists of the north-western highlands and western lowlands. Gondar, Gojjam, Wello, Shewa, etc are the major places found within this rainfall region. This rainfall region is the largest in the country.
- The autumn and spring rainfall region is mainly found in the south-eastern highlands and associated lowlands occupying places such as Harar, Dire Dawa, Ogaden, Jijiga, Yabello, etc
- The winter rainfall region is found in the eastern escarpments of the western highlands, the middle section of the Ethiopian rift valley, the Afar lowlands of Ethiopia, the west coasts of Eritrea.
- The merged spring, summer, and autumn rainfall region is mainly found in the foothills of the south-eastern highlands of Ethiopia. It occupies a small corridor that stretches from the Sidamo highlands to the Hararghe plateaus. It is the smallest of all rainfall regions.

## 3. The Teaching-learning Process

### 3.1 Suggested Teaching Aids

- Climatic map of Africa and Ethiopia
- Physical map of Africa and Ethiopia
- Statistical data of temporal and spatial distribution of rainfall in Ethiopia and the Horn
- Map of the Rainfall Regions in Ethiopia

### 3.2 Suggested Methods of Teaching

- Brainstorming
- Questioning
- Pair and group discussion
- Demonstration
- Presentation

### 3.3 Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials such as climatic maps, physical maps, statistical data, etc.
- Design the most appropriate teaching methods for the lesson.
- Prepare notes, activities and exercises.

### 3.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce students to what they are going to learn (Rainfall Regions in Ethiopia and the Horn)
- Make the objectives of the lesson clear to students.

Conduct a brainstorming session to find out the students' background knowledge of rainfall regions in Ethiopia and the Horn. You may ask them questions such as: Do you know the rainfall regions in Ethiopia? Do rainfall regions indicate the variation in the magnitude and duration of rainfall within Ethiopia and the Horn?

#### b) Main Body of the Lesson

Based on your students' previous knowledge, explain more about the five rainfall regions in Ethiopia and the Horn and the major factors for the classification.

- By using maps and diagrams, help the students understand the major rain giving winds that come to each rainfall region, from where they originate, how their direction is controlled by the position of the ITCZ, how the direction of the winds is affected by the mountains, etc.
- Help your students to discuss the basic features of the rainfall region in which they are living and compare it with other places that they know.
- At appropriate moments of your presentation, ask the students to do the activities and exercises found in their textbook. Make sure that all students are involved in the group activities and in the entire teaching-learning process. Give them time to ask questions and to organize their notes.

#### c) Stabilization

- Review the main ideas and concepts of the lesson.
  - ✓ In Ethiopia and the Horn there are five rainfall regions.

- ✓ The seasonal variation in the distribution of rainfall is the basic factor the categorization of different places into different rainfall regions.
- ✓ The variation in the position of the ITCZ that causes different weather systems (winds and air pressure) is the major factors for the variations of rainfall patterns in the five rainfall regions.

### 3.5 Evaluation and Follow Up

#### a) Evaluation

*Use all of the evaluation techniques described in the Introduction.* Include these evaluation activities:

Check the students' understanding of the lesson by giving them an exercise to be done independently. The exercise may contain questions such as:

- What are the five rainfall regions found in Ethiopia and the Horn?
- Which rainfall region is the largest of all rainfall regions in Ethiopia?
- Mention some of the places found within the all year round rainfall region of Ethiopia?

#### b) Follow up

Rate and grade the various activities performed by the students. Analyze the results to understand whether or not the lesson has been well-understood, and to identify those students who may need extra coaching.

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

#### c) Additional Activities for Fast Learners

1. Discuss the reasons for the categorization of different places into different rainfall regions in Ethiopia.
2. Explain the relationship between the ITCZ and the rainfall regions in Ethiopia.
3. Identify the major winds responsible for autumn and spring rainfall within the autumn and spring rainfall region of Ethiopia and the Horn.
4. Discuss the basic features of the summer rainfall region in Ethiopia.

**Answers for the Activities and Exercises in the Text book****Exercise 3.5****I. Matching**

- |      |      |      |      |
|------|------|------|------|
| 1. H | 2. B | 3. D | 4. C |
| 5. E | 6. F | 7. G | 8. A |

**II. Questions to Think Over**

9. The thick forests that result in evapo-transpiration and the influence of the equatorial westerly winds that resulting in the formation of convectional rainfall.
10. It is a low pressure zone formed by the convergence of North easterlies and equatorial westerlies. It shifts north and south of the equator due to the movement of the overhead sun between the Tropic of Cancer and Capricorn.
11. The amount of temperature in a place would not vary from season to season. This is because the angle and duration of the sun in a place would become the same every time.
12. Help your students to do the following.
  - a. Identify to which rainfall region that their locality belongs to.
  - b. To find information and to suggest the total annual rainfall in their locality.
  - c. To refer their text book, the National Atlas of Ethiopia, or other sources and to select a town for each rainfall region and prepare a bar graph that shows rainfall pattern of each town.

**Example:**

- All year-round rainfall region- Nekemt
  - Summer rainfall region- Gondar
  - Winter rainfall region- Assaita
  - Autumn and spring rainfall region- Gode
  - Merged spring, summer and autumn rainfall region- Harar
- d. All year-round rainfall region

**Answers for Additional Activities**

1. The categorization of different places into different rainfall regions in Ethiopia is mainly due to the spatial and temporal variation of winds and rainfall conditions in the country.
2. The all year-round rainfall region is a region that almost receives rain through out the year even if the ITCZ changes its position from season to season.  
The summer rainfall region is a region that receives its maximum rainfall when the ITCZ is positioned north of the equator around the Tropic of Cancer.  
The winter rainfall region obtains its maximum rainfall when the ITCZ is positioned south of the equator around the Tropic of Capricorn.

The autumn and spring rainfall region receives its highest rainfall when the ITCZ is positioned around the equator.

The merged spring, summer and autumn rainfall region is a region that receives its maximum rainfall when the ITCZ is found around the Tropic of Cancer and along the equator.

3. The major winds responsible for autumn and spring rainfall within the autumn and spring rainfall region of Ethiopia and the Horn are the southeast trade winds that originate from the Indian Ocean and the Gulf of Aden.
4. The major features of the summer rainfall region in Ethiopia are:
  - It receives its maximum rainfall during the summer season.
  - The major winds that bring rain to the region are the equatorial westerlies.
  - Some parts of the region receive little rain during the autumn and spring seasons.
  - Most parts of the region are dry during the winter season.

## 3.5 NATURAL VEGETATION AND WILD ANIMALS OF ETHIOPIA

Periods Allotted: 4

### 1. Competencies

*After completing this lesson, your students will be able to:*

- ✚ *Relate types of natural vegetation to climatic regions;*
- ✚ *Identify wild animals of Ethiopia;*
- ✚ *Discuss causes and effects of human intervention on forestland; and*
- ✚ *Develop an interest in participating in the conservation of natural vegetation and wild animals.*

### 2. Contents

- 3.5.1 Type of natural vegetation
- 3.5.2 Wild animals of Ethiopia
- 3.5.3 Human intervention in forestland

### 3. Overview

In this lesson, students will learn about the natural-vegetation and wild-animal resources of Ethiopia. First, they will learn about the types of natural vegetation in Ethiopia. Then, there will be a discussion about the wild animals of Ethiopia. Finally, they will be involved in discussions about the level and impact of human intervention on forest resources of the country.

*Natural vegetation* refers to plants in general or the mass of original plants growing in a particular place. The type and distribution of natural vegetation varies from place to place,

owing to factors such as climate (especially temperature and rainfall), altitude, soil type, drainage (water supply), and so forth. Since natural vegetation and its distribution are greatly affected by rainfall and temperature conditions, the natural vegetation that exists in an area is a good indicator of that area's climate.

Natural vegetation is a valuable national resource because of the many diverse benefits that it provides to the physical environment and to human beings' socio-economic conditions. The most significant values of natural vegetations include the following, among other ones:

- They serve as habitats of wild animals.
- They reduce soil erosion.
- By improving evapo-transpiration, they moderate climatic conditions.
- They provide wood for fuel, construction, and furniture.
- They are raw materials for pulp and paper manufacturing.
- They serve as pasture for grazing.
- They increase natural beauty of an area.
- They control the destruction of bio-diversity.

In Ethiopia, the type and distribution of natural vegetation is controlled mainly by altitude, which is the major factor that affects the distribution of rainfall and temperature in the country. Because of high rainfall and moderate temperatures, the highlands of Ethiopia are better vegetated. On the other hand, the arid and semi-arid lowland areas of the country have very sparse vegetation cover.

Based on altitude, the natural vegetation of Ethiopia is grouped into five types. They are:

- Afro-Alpine and Sub-Afro-Alpine vegetation
- Forest
- Woodland Savanna
- Desert and semi-desert vegetation

The natural vegetation cover of Ethiopia has been declining very fast, mainly due to the rapid growth of population. The estimated 40% forest cover of the country at the beginning of the 20<sup>th</sup> century has been reduced to a total of less than 3% now. This drastic destruction of natural vegetation in the country is caused by:

- Unwise cutting of trees due to highly increasing demand for wood for various purposes (mainly for fuel, construction, and furniture).
- Overgrazing due to increasing numbers of livestock and the expansion of grazing lands into forestlands.
- Expansion of agriculture/cultivation into forestlands due to shortages of farmland and rapidly increasing demands for it.



- Expansion of settlements into forestlands due to rapidly increasing demands for settlement areas.

Ethiopia is also rich in terms of its wild-animal resources. This is mainly the result of the diversified nature of the country's climate, natural vegetation and relief. It is estimated that there are about 103 species of mammals and 832 species of birds in the country. Of these, seven species of mammals and 25 species of birds are endemic.

Wild animals are important resources because they have the following values.

- Scientific and educational values (i.e., for research purposes related to medicine, environment, etc.)
- Economic value (for the purpose of promoting tourism)
- Aesthetic value (natural beauty and recreation)

As in the case of to the natural vegetation, the wild animals of the country have been negatively affected, mainly by human-related factors. Some of our animals are greatly endangered. Others have already become extinct. Here are the main factors that negatively affect Ethiopia's wild animals:

- Destruction of natural vegetation which are the habitats of the animals.
- Illegal hunting.
- Expansion of grazing lands pushing into the habitats of the animals.
- Wildfires.
- Migration of animals into neighboring countries due to shortages of food and water.

## 4. The Teaching-learning Process

### 4.1 Suggested Teaching Aids

- Physical map of Ethiopia
- Climatic map of Ethiopia
- Thematic maps of Ethiopia that show the distribution of natural vegetation, wild animals, national parks, etc
- Pictures and diagrams that show the various types of natural vegetation and wild animals found in Ethiopia.
- Charts that show statistical data related to the natural-vegetation and wild-animal resources of Ethiopia.

### 4.2 Suggested Methods of Teaching

- Brainstorming
- Questioning
- Pair and group discussion
- Presentation
- Guest speaker
- Visit

### 4.3 Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials such as maps, pictures, diagrams and charts.
- Design the most appropriate teaching methods for the lesson.
- Prepare notes, activities and exercises.
- Facilitate the required pre-conditions to invite a guest speaker and to organize a trip to nearby sites where students can observe natural vegetation and, if possible, wild animals also.

### 4.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce the students to what they are going to learn (The Natural Vegetation and Wild Animals of Ethiopia)
- Make the objectives of the lesson clear to your students.
- Conduct a brainstorming session to find out the students' background knowledge of the values of natural vegetation and wild animals, as well as the problems related to natural vegetation and wild animals in Ethiopia. You may ask them questions such as: What do you know about the importance of natural vegetation and wild animals? What do you think are the reasons for the ongoing reduction of forest cover in Ethiopia? What are the factors negatively affecting wild animals in Ethiopia?

#### b) Main Body of the Lesson

- Based on your students' previous knowledge, further explain the values of natural vegetation and the major factors that negatively affect the distribution of natural vegetation in Ethiopia. Using maps that show natural vegetation, climate, relief, etc. of Ethiopia, have the students discuss, in small groups, the relationships between the distribution of natural vegetations and factors such as climate, relief, drainage, etc.
- Explain the major types of natural vegetation in Ethiopia. Using available maps, help the students to fully understand how altitude affects the distribution of natural vegetation in the country. In addition, help them recollect the causes for the destruction of natural vegetation in Ethiopia and the conservation measures that help to mitigate the problem.
- Ask the students to discuss the relationships between Ethiopia's wild animals and their surrounding natural vegetation, climate, topography, etc. Help them to use relevant maps during their discussions. Strengthen the students' understanding by further explaining the types, uses, problems and protection of Ethiopia's wild animals. During your presentation, encourage the students to

discuss the magnitude of human intervention and its negative effects on wild animals and the resulting negative consequences to the country. Also, have your students do the activities and exercises found in their textbooks.

- You may invite a guest speaker from a local office working on the protection of natural vegetation and/or wild animals. You may also organize a visit to local sites where students can observe natural vegetation and wild animals. This helps them to relate the lesson to actual situations in their locality.
- Make sure that all students are involved in the group activities and in the entire teaching learning process. Give them adequate time to ask questions and jot down their notes.

### c) Stabilization

- Review the main ideas and concepts of the lesson.
  - ✓ The distribution of natural vegetation in Ethiopia is controlled mainly by altitude and other related factors such as climate, water supply, etc.
  - ✓ Based on the altitude at which it grows natural vegetation of Ethiopia is grouped into five types.
  - ✓ Deforestation and overgrazing are the major causes for the rapid rate of deterioration of the natural vegetation cover in Ethiopia.
  - ✓ Because of its diversified climate, topography, natural vegetation, etc., Ethiopia is rich in terms of wild-animal resources.
  - ✓ Ethiopia is the home for seven endemic mammals and 25 endemic birds.
  - ✓ Because of human intervention, the wild animals of Ethiopia are in a state of danger, and some have become extinct.
  - ✓ In Ethiopia, there are about 13 national parks and 18 game reserves.

## 4.5 Evaluation and Follow up

### a) Evaluation

*Use all of the evaluation techniques described in the Introduction.* Include these evaluation activities:

Check students' understanding of the lesson by giving them an exercise to be done independently. The exercise may contain questions such as:

- What are the uses of natural vegetation?
  - What kinds of vegetation exist in the very-low-altitude areas of Ethiopia?
  - What are the major problems regarding natural vegetation and wild animals in Ethiopia?
  - Mention some of the national parks found in Ethiopia.
  - Mention some of the endemic mammals in Ethiopia.
- You may also have the students do the exercises found in their textbook.

Analyze the evaluation data you have recorded for each individual and then extrapolate and analyze it for the class as a whole to find out whether you have succeeded in passing the lesson's information and techniques on to your students. Based on your conclusions, provide each student with appropriate activities, *as described in the Introduction*.

#### **b) Follow up**

Rate and grade the various activities performed by the students. Analyze the results to understand whether or not the lesson has been well-understood, and to identify those students who may need extra coaching.

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

#### **c) Additional Activities for Fast Learners**

1. What are the factors that affect the distribution of natural vegetation in Ethiopia?
2. Which types of natural vegetation grow in the very highest mountainous areas of Ethiopia?
3. Discuss the major problems of natural vegetation and wild animals of Ethiopia. What are the possible solutions?
4. Identify some of the endemic animals of Ethiopia and the place where they are living.

## Answers for the Activities and Exercises in the Text book

### Exercise 3.6

1. B    2. A    3. C    4. F    5. G    6. H    7. I    8. D    9. E

## Answers for Additional Activities

1. In Ethiopia altitude is the major factor that affects the distribution of natural vegetation. Natural vegetation distribution in the country is the result of altitude that affects temperature and rainfall distribution.
2. Afro-Alpine and Sub-Afro-Alpine vegetation
3. The major problems that affect the natural vegetation of Ethiopia are:
  - Unwise cutting of trees due to highly increasing demand for wood for various purposes (mainly for fuel, construction, and furniture).

- Overgrazing due to increasing numbers of livestock and the expansion of grazing lands into forestlands.
- Expansion of agriculture/cultivation into forestlands due to shortages of farmland and rapidly increasing demands for it.
- Expansion of settlements into forestlands due to rapidly increasing demands for settlement areas.

The major problems that affect the wild animals of Ethiopia are:

- Destruction of natural vegetation which are the habitats of the animals.
- Illegal hunting.
- Expansion of grazing lands pushing into the habitats of the animals.
- Wildfires.
- Migration of animals into neighboring countries due to shortages of food and water.

Some of the possible solutions for the problems are:

- Afforestation: planting trees in areas which have not been covered by forests.
- Reforestation: planting trees in areas where the original forests have been destroyed.
- Limiting the number of livestock
- Educating the people
- Rules, regulations and laws to punish those who illegally cut forests, hunt wild animals, etc
- Establishing wild animals conservation sites such as national parks, sanctuaries and game reserves
- Careful administration of the wild animal conservation sites

4. Some of the endemic wild animals of Ethiopia are:

- Chelada Baboon—found in the Semein mountains
- Semein Fox—dominantly found in the Semein mountains and Bale mountains
- Walya Ibex—found in the Semein mountains

## 3.6 SOILS OF ETHIOPIA

Periods Allotted: 4

### 1. Competencies

*After completing this lesson, your students will be able to:*

- ✚ *Relate formation of soils of Ethiopia with geological events of the past;*
- ✚ *Distinguish major soil types in Ethiopia; and*
- ✚ *Realize soils problems and its conservation in Ethiopia.*

## 2. Contents

3.6.1 Formation of Soils in Ethiopia

3.6.2 Type of Soils in Ethiopia

3.6.3 Soil Problems and Conservation in Ethiopia

## 3. Overview

In this lesson, students will learn about the soils of Ethiopia. First, they discuss the types of soils found in Ethiopia. Then, they learn about the problems of soils and soil conservation in Ethiopia.

Soil is the loose material that covers the land surfaces of Earth and supports the growth of plants. In general, soil is an unconsolidated, or loose, combination of inorganic and organic materials. The inorganic components of soil are principally the products of rocks and minerals that have been gradually broken down into pieces by weather, chemical action, and other natural processes. The organic materials are composed of debris from plants and from the decomposition of the many tiny life forms that inhabit the soil.

Soils vary widely from place to place. Many factors determine the chemical composition and physical structure of the soil of any given location. The different kinds of rocks, minerals, and other geologic materials from which the soil is originally formed play a role. The kinds of plants or other vegetation that grow in the soil are also important. Topography that is, whether the terrain is steep, flat, or a combination of these, is another factor. In some cases, human activities such as farming and building have caused disruption. Soils also differ in color, texture, chemical makeup, and the kinds of plants they can support.

The soils of Ethiopia are basically derived from crystalline, volcanic and sedimentary rocks. According to the latest classification made by the FAO, there are about 18 types of soils in Ethiopia. However, the following are the most dominant soil types, and they cover more than 85% of the country.

- Nithosols
- Vertisols
- Acrisols
- Cambisols
- Regosols
- Xerosols
- Yermisols
- Luvisols
- Lithosols
- Fluvisols

Soil erosion, caused by natural and human-related factors, is the most critical problem in Ethiopia. Rugged topography and heavy summer rainfall are the major natural factors in soil erosion in Ethiopia. The main human-related factors are deforestation, overgrazing, over cultivation, traditional cultivation techniques, etc., Reforestation, afforestation, terracing, contour ploughing, controlled grazing, etc., are some of the conservation methods that can be used to reduce soil erosion in Ethiopia.

## 4. The Teaching-learning Process

### 4.1 Suggested Teaching Aids

- Thematic maps of Ethiopia that show the types and distribution of soils, natural vegetation, climate and relief.
- Pictures and diagrams that show soil erosion and conservation methods.
- Samples of different types of soils.

### 4.2 Suggested Methods of Teaching

- Brainstorming
- Questioning
- Pair and group discussion
- Presentation
- Demonstration
- Visit

### 4.3 Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials such as maps (soil, vegetation, climate, and relief), pictures, diagrams and sample soils.
- Design the most appropriate teaching methods for the lesson.
- Prepare notes, activities and exercises.
- Facilitate the necessary pre-conditions to organize a visit to nearby sites where students can observe different soils, soil erosion and conservation methods.

### 4.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce students to what they are going to learn (The Soils of Ethiopia)
- Make the objectives of the lesson clear to students.
- Conduct a brainstorming session to find out your students' background knowledge of soil, including its formation, components, and uses, in particular. You may ask them questions such as: What is soil? What do you know about the formation of soil? What are the major components of soil? What are the uses of soil?

#### b) Body of the Lesson

- Based on the students' previous knowledge, explain the formation, components and uses of soil.
- You may divide students into small groups, provide them with soil, vegetation, climate, and relief maps of Ethiopia, and have them discuss the major types of soils in Ethiopia and their association with the distribution of the vegetation,

climate and relief of the country. Enhance the students' understanding by explaining these issues in depth. Also, show them some soil samples that you have prepared as one of teaching aids.

- Have the students discuss the problems of soil in Ethiopia. Guide them also to talk over the major factors causing soil erosion in the country and the methods of conserving the soil resources of the country. Provide them with some pictures that illustrate the problem of soil erosion in Ethiopia and also some of the conservation techniques.
- You may also organize a visit to local sites where students can observe different soils, soil problems and conservation methods. This helps them to relate the lesson with actual situations in their locality.
- Have the students do the activities and exercises found in their textbook. Make sure that all students are involved in the group activities and the entire teaching-learning process. Give them adequate time to ask questions and organize their notes.

#### 4.5 Evaluation and Follow up

- Review the main ideas and concepts of the lesson.
  - Soil is the loose material that covers the land surfaces of Earth and supports the growth of plants.
  - Soils are composed of organic and inorganic materials.
  - The inorganic components of soil are principally the products of rocks and minerals that have been gradually broken down into pieces by weather, chemical action, and other natural processes.
    - ✓ The organic materials are composed of debris from plants and from the decomposition of the many tiny life forms that inhabit the soil.
    - ✓ Soils in Ethiopia vary widely from place to place, owing to factors such as rocks, minerals, topography, climate, vegetation, water, etc.
    - ✓ The soils of Ethiopia are basically derived from crystalline, volcanic and sedimentary rocks.
    - ✓ Soil erosion caused by natural and human-related factors is the most critical problem in Ethiopia.
    - ✓ Reforestation, afforestation, terracing, contour ploughing, controlled grazing, etc are some of the conservation methods that can be used to reduce soil erosion in the country.

#### 4.6 Evaluation and Follow up

##### a) Evaluation

*Use all of the evaluation techniques described in the Introduction.* Include these evaluation activities:

Check your students' understanding of the lesson by giving them an exercise to be done independently. The exercise may contain questions such as:



- What is soil?
  - Mention some of the soils in Ethiopia.
  - What factors cause the extensive soil erosion in Ethiopia?
- You may also have the students do the review exercises found in their textbook. Analyze the evaluation data you have recorded for each individual and then extrapolate and analyze it for the class as a whole to find out whether you have succeeded in passing the lesson's information and techniques on to your students. Based on your conclusions, provide each student with appropriate activities, *as described in the Introduction*.

#### **b) Follow up**

Rate and grade the various activities performed by the students. Analyze the results to understand whether or not the lesson has been well-understood, and to identify those students who may need extra coaching.

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

#### **c) Additional Activities for Fast Learners**

1. Discuss the factors of soil formation.
2. What factors cause the variation of soils from place to place in Ethiopia?
3. Mention some of the soil conservation methods that can be used to reduce the problem of soil erosion in Ethiopia.
4. Identify the dominant type of soil in your locality and discuss its basic features.

## Answers for the Activities and Exercises in the Text book

### Exercise 3.7

1. Compare and contrast

#### **a) Cambisols with Regosols and Xerosols.**

**Comparison:** Three of them are young and shallow soils. They are not fertile or not good for farming purposes.

**Contrasts:** Cambisols are found on the rugged and sloping terrain while regosols and xerosols are found in arid or semi-arid areas.

#### **b) Nitosols with Vertisols**

**Comparison:** Both are basaltic soils.

**Contrasts:** Nitosols are red basaltic soil while vertisols are black basaltic soils. Nitosols have high iron content while vertisols have high clay content. Nitosols are friable while vertisols are sticky. Nitosols are intensively used for crop production while vertisols are largely suitable for grazing.

**c) Luvisols with Fluvisols**

**Comparison:** Both have very good agricultural potential.

**Contrasts:** Luvisols are not transported soils from highland areas while fluvisols are. Luvisols are found around Lake Tana, eastern parts of north central highlands and southern lowlands, while fluvisols are found in the lower courses of the Omo, Awash, Abay, and Baro-Akobo.

2. Fluvisols, luvisols, nithosols, vertisols, acrisols, cambisols, lithosols, regosols, xerosols, and yermisols.

### Matching

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

### Activity 3.12

**Note:** Give instructions and support your students to perform all the three local based activities appropriately. The first question is to collect a sample soil and to determine its colour, texture and workability. The second question is about to determine whether there are gullies in their local area or not and to gather information from community members about the changes happened and will happen. The last question deals with soil erosion in their local area.

### Answers for Additional Activities

1. The major factors that affect soil formation process are the nature and type of natural vegetation, the topography which includes the slope and altitude of the land, the bed/parent rock which affects the type of minerals in the soil, the climate which mainly includes temperature and rainfall that controls the weathering process, and time.
2. The variation of the above discussed soil formation factors from place to place is the major reason for the variation soils from place to place in the country.
3. Some of the soil conservation methods are:
  - Terracing
  - Afforestation
  - Reforestation
  - Contour ploughing
  - Crop rotation
  - Rotation of grazing lands

4. Since the distribution of soils in Ethiopia varies from place to place, the answer for this question also varies from place to place. Therefore, help your students to identify the most dominant soil in their locality and instruct them to discuss its basic features.

## Answers for Unit Review Exercise

### I. Short Answers

1. The major geological events of the tertiary period of the Cenozoic era in Ethiopia and the Horn include:
  - Uplifting of the land into maximum heights
  - Cracking of the land that caused the flow of the trappean lava series that formed high plateaus in Ethiopia
  - Continued cracking of the land that caused the formation of the Great East African Rift Valley
2. Topography and the nature of the surface rock (lithic factor).
3. A. North-eastern Shoa, North-eastern Tigray  
b. Western Oromiya, Gambella
4. Yermosols, because its salty and acidic nature.
5. Walia Ibex (Semien Mountains), Mountain Nyala (Semeien and Bale Mountains), Semien Fox (Semien and Bale Mountains), Chilada Baboon (Semien Mountains)

### II. Complete the sentences

6. Topography and the summer heavy rainfall
7. Covering bare lands with forests/trees
8. The southwestern Ethiopia
9. The utilization of hydro-thermal energy and non-metallic minerals such as ash and salt

## Check List

Check the student’s performance according to the given competencies referring the questions under the check list for every unit. Put a tick (✓) mark against each task weather they are able to perform in the competencies of each unit. The students are expected to respond saying Yes or No. then, you can make your own evaluation whether the competencies are met or not.

**Can you:**

	YES	NO
1. Indicate the location of Horn of Africa? -----		
2. Compare the size of countries of the horn? -----		
3. Demonstrate the relative and absolute location of Ethiopia? -----		
4. Discuss the shape of Ethiopia? -----		
5. Explain geological structure of the Horn of Africa? -----		
6. Discuss major events of the Horn of Africa? -----		
7. Describe major land forms of the Horn of Africa? -----		
8. Explain major landforms of Ethiopia? -----		
9. Discuss the general characteristics of Ethiopian rivers and drainage patterns? -----		
10. Classify lakes of Ethiopian as highland and river valley lakes? -----		
11. Show appreciation for the significance of rivers and lakes of Ethiopia? -----		
12. Show interest for the implementation of water resource conservation and management policy? -----		
13. Discuss the factors influencing the spatial distribution of the elements of climate in Ethiopia and the horn? -----		
14. Describe the spatial and temporal variation of temperature in Ethiopia and the Horn? -----		
15. Explain the spatial & temporal variation of rainfall in Ethiopia and the Horn? -----		
16. Compare rainfall regions in Ethiopia? -----		
17. Relate types of natural vegetations to climatic regions? -----		
18. Identify wild animals of Ethiopia? -----		
19. Discuss human intervention on forest land? -----		

20. Show interest to participate in the conservation of natural vegetation and wild animals? -----
21. Relate formation of soils of Ethiopia with geological events of the past? -----
22. Distinguish major soil types in Ethiopia? -----
23. Realize soils problems and its conservation in Ethiopia? -----


## Assessment

Students' performance has to be assessed continuously over the whole unit. The assessment will be made by comparing students' performance with the specified level of competencies. Besides, the teacher has to recognize the level of performance of each student and provide assistance accordingly, Thus:

- A student at a minimum requirement level will be able to indicate the location of Horn of Africa; compare the size of countries of the Horn; demonstrate the relative and absolute location as well as the shape of Ethiopia; explain geological structure and major events of the Horn of Africa; describe major landforms of Ethiopia and the Horn; discuss the general characteristics of Ethiopian rivers and drainage patterns; classify the Ethiopian lakes as high land and rift valley; show appreciation for the significance of rivers and lakes of Ethiopia; show interest for the implementation of water resource conservation and management policy; discuss the factors influencing the spatial distribution of the elements of climate in Ethiopia; describe the spatial and temporal variation of temperature in Ethiopia; explain the spatial and temporal variation of rainfall in Ethiopia; compare the rainfall regions in Ethiopia; relate types of natural vegetation to climatic regions; discuss human intervention on forest land; show interest to participate in the conservation of natural vegetation and wild animals; identify wild animals of Ethiopia; distinguish major soil types in Ethiopia and realize soils problems and its conservation in Ethiopia.
- In addition, a student working above the minimum requirement level and considered as higher achiever should be able to:- discuss the opportunities and the challenges Ethiopia faced due to its location in the Horn of Africa, explain how land forms affect the drainage patterns and climate of Ethiopia, describe the impact of Ethiopian rivers and lakes on the livelihood and culture of the people, analyze the purpose of each elements incorporated in the water resource conservation and management policy of Ethiopia, justify why wild animals fiercely attack human being in varied places, compare and contrast the strength and weakness of each soil conservation methods.
- Students working below a minimum requirement level will require extra help if they are to catch up with the rest of the class.
- Students reaching at the minimum requirement level but achieved a little bit higher should be supported so that attain the higher achiever competencies. Students who fulfill the higher achiever competencies also need special support to contribute and achieve more.

# Unit 4

## POPULATION OF ETHIOPIA AND THE HORN

Periods Allotted: 22

### 1. Unit Introduction

*Population* is one of the critical factors that affect the socio-economic development and environmental protection activities of societies and countries. Geography is one of the fields that studies issues related to the human population of the world. Other fields that study population include demography, sociology, anthropology, biology, statistics, economics and history.

*Human geography* is one of the two branches of geography that deal with human-related issues of the world. The sub-field of human geography that is particularly concerned with the study of human population is known as *population geography*. Population geography deals with the spatial patterns and characteristics of population. It is a sub-field of geography that focuses mainly on the spatial characteristics of the size, growth, structure, distribution, settlement, density, etc. of human population.

The study of population in geography and other fields is very important for societies and countries. This is because it provides the necessary information needed for appropriate planning of socio-economic development and environmental protection programs. It also provides significant tools for governments, helping them to formulate and implement appropriate policies and strategies that help to address population-related problems. Especially for Ethiopia and other developing nations of the world where population has been growing very rapidly, population studies in geography and other fields are essential for formulating population policies. These policies seek to bring changes in the size, trends of growth, composition, and distribution of population in order to achieve their socio-economic and environmental objectives.

In this unit, therefore, the students learn the major characteristics of Ethiopia's population. The unit specifically addresses topics such as population theories, trends of population growth in Ethiopia, the composition and distribution of Ethiopia's population, determinants of population change in Ethiopia, and the trends and differentials of urbanization in this country.

## 2. Unit Outcomes

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

- ☉ Discuss population theories, trends, growth, structure, spatial distribution and factors affecting population distribution in Ethiopia;
- ☉ Explain settlement patterns, determinants of population changes, impacts of rapid population growth and urbanization in Ethiopia.

## 3. Main Contents

- 4.1 Population Theories
- 4.2 Trends of Population Growth and Structure in Ethiopia
- 4.3 The Spatial Distribution of Population in Ethiopia
- 4.4 Factors Affecting Population Distribution in Ethiopia
- 4.5 Settlement Patterns of Ethiopian Population
- 4.6 Determinants of Population Change in Ethiopia
- 4.7 Impacts of Rapid Population Growth in Ethiopia
- 4.8 Population Policy of Ethiopia
- 4.9 Urbanization in Ethiopia

## 4.1 POPULATION THEORIES

Period Allotted: 4

### 1. Competencies

*After completing this lesson, your students will be able to:*

- ✚ Analyze population theories of Malthusian and anti-Malthusian.

### 2. Contents

- 4.1.1 Malthusian concept of population theory
- 4.1.2 Anti-Malthusian concept of population theory

### 3. Overview

In this lesson, the students will learn about population theories in general and about the Malthusian and anti-Malthusian population theories in particular. Various scholars have



developed different theories that explain the relationships between population growth and social, economic and environmental aspects of the world. Based on their optimistic or pessimistic views regarding population growth, such theories are grouped in two:

- Malthusian population theories
- Anti-Malthusian population theories

The emergence of modern population theories is related to the writings of Malthus, who lived in the late eighteenth century. The controversial nature of the issues he raised led to the development of many other population theories. Malthus and his disciples hold a pessimistic view of population growth. They say that population growth will bring scarcity of food (inadequate food supply) and other resources, and that this scarcity will lead to catastrophes such as war, famine, diseases, etc. Scholars who follow this trend of thought are known as Malthusians/Neo-Malthusians. On the other hand, other scholars have optimistic views of population growth. They do not consider population growth to be a problem. In fact, they believe that it is a very useful economic resource if used properly. These scholars are known as anti-Malthusians.

Malthus was a British economist who worried that population would grow faster than the supply of food. He believed that, while the supply of food could be increased only in *arithmetical progression* (1 – 2 – 3 – 4 – 5), the human population had the tendency to multiply in *geometric progression* (1 – 2 – 4 – 8 – 16). In time, thus, population would outstrip food supply until a catastrophe occurred. He called these catastrophes, which include war, diseases, famine, drought, etc. *positive checks*. He said that human population will continue to increase rapidly until it is checked by these positive checks. He also suggested that, in order to avoid the occurrence of the positive checks, human beings should adopt *preventive checks* or moral restraint, which include late marriage and avoidance of sexual conduct before marriage. Malthus, therefore, focused on individual actions and took moral restraint (and/or preventive checks) as the solution to problems related to population growth.

In contrast to Malthus' view is Marx's view. Marx was a German philosopher, economist and politician. He was among opponents of Malthus who developed the anti-Malthusian population theory called the "surplus population theory". In his presentation of this theory, Marx stated that population problems could not occur under a socialist mode of production and resource ownership. He believed that population only becomes a problem, and part of the population becomes "surplus", under capitalist modes of production: That part of the population which is in excess of the capacity of the food supply to feed the world's people is *surplus* in an economic sense, and it is the result of unequal distribution of resources. Therefore, Marx believed, a new social order and economic structure of society

would solve the problems related to overpopulation. This, he said, would only be possible under socialism.

Boserup was a Danish economist who developed another anti-Malthusian population theory called “theory on population and agriculture”. She thought that, as the size of population increases, it results in technological innovations and advancement. She believed that population growth, therefore, could not lead to scarcity of food (inadequate food supply) and other catastrophes. She also thought that population growth could not be controlled by food shortages. Rather, the increasing demand for food that resulted from population growth would increase agricultural production because people would develop improved new agricultural systems and technologies.

## 4. Teaching-learning Process

### 4.1 Suggested Teaching Aids

- Charts and diagrams of different population theories
- Historical notes about the effects of population growth proposed by different scholars

### 4.2 Suggested Methods of Teaching

- Brainstorming
- Questioning
- Pair and group discussion
- Presentation

### 4.3 Pre-lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials such as charts and diagrams that summarize the main ideas of Malthusian and anti-Malthusian theories. Also, collect some historical notes written by different scholars on the effects of population growth.
- Design the most appropriate teaching methods for the lesson.
- Prepare notes, activities and exercises.

### 4.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce your students to what they are going to learn (Population Theories).
- Make the objectives of the lesson clear to the students.
- Conduct a brainstorming session with the students to ascertain their background knowledge of the meaning and significance of theories in general and of population theories in particular. Have them do activity 4.1 from their textbook.

This activity includes questions such as: What do you know about theories? How do you think a theory is developed? How do we prove the truth or falsity of a theory? You may also ask them some other questions such as: What is the significance of theories in general and of population theories in particular? Can you recall some examples of theories that you have learned about in other subjects?

**b) Main Body of the Lesson**

- After considering the students' previous knowledge, define *theory* and explain the significance of theories. Make sure that your students clearly understand the historical development of population theories and their importance. Have the students discuss, in groups, the questions of activity 4.2 from their textbook and have each group present their ideas about the basic differences between Malthusian and anti-Malthusian population theories to the class.
- Using the figure found in their textbook, ensure that your students fully understand the differences between the two types of population theories.
- Introduce the ideas of Thomas Robert Malthus to students and have them discuss activity 4.3, which is concerned with Malthus's "Principle of Population". Strengthen the students' understanding of Malthus' tenets regarding the causes, consequences and solutions of population growth. Invite students to comment on the *positive checks* and *preventive checks* of population growth suggested by Malthus.
- Introduce students to the ideas of Karl Marx and explain his "Surplus Population Theory." Have them do activity 4.5 in groups. This activity deals with differences between Marx's and Malthus' views on the causes, effects and solutions of population growth. Have each group present the students' ideas to the class.
- Introduce students to Esther Boserup's ideas and explain her theory of "Population and Agriculture". Have the students discuss the differences between Boserup's and Malthus' views, in groups, and have each group present the students' ideas to class.
- Make sure that all students are involved in the group activities and in the entire teaching-learning process.
- Give the students enough time to ask questions and organize their notes.

**c) Stabilization**

- Review the main ideas and concepts of the lesson. Mention the following points.
  - Population theories are developed to analyze and explain the relationship that exist between population growth and various social, economic, environmental and political issues.

- Malthusian population theories have pessimistic views on the effects of population growth, while anti-Malthusian theories are very optimistic.
- Malthus believed that population growth would cause food scarcities, which would, in turn, lead to catastrophes. Malthus categorized the solutions to problems related to population growth into two classes—*positive checks* and *preventive checks*.
- Marx believed that the solution to population problems was socialism.
- Boserup believed that population growth could not result in food scarcities. She said that population growth would, instead, result in innovation and inventions that would increase human productivity.

## 4.5 Evaluation and Follow Up

### a) Evaluation

*Use all of the evaluation and follow-up techniques described in the Introduction.*

As part of those activities, use these approaches:

- Check your students' understanding of the lesson by giving them an exercise to do independently. The exercise may contain questions such as:
  - What are the major differences between Malthusian and anti-Malthusian views?
  - What is the major difference between the positive checks and the preventive checks of Malthus?
  - According to Marx, what is the major reason for surplus population and its problems?
  - According to Boserup, how does population growth lead to agricultural development?

### b) Follow up

Rate and grade the various activities performed by the students. Analyze the results to understand whether or not the lesson has been well-understood, and to identify those students who may need extra coaching.

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

**c) Additional Activities for Fast Learners**

1. Explain how the Malthusian and Anti-Malthusian population theories vary regarding their views about population growth.
2. Between Malthusian and Anti-Malthusian population theories, which one is most related to the current population characteristics of Ethiopia? Explain your reasons.
3. According to Boserup, how does population growth bring positive consequences?
4. As suggested by Malthus, what are the two possible ways by which rapid population growth can be controlled?

## Answers for Activities and Exercises in the Textbook

### Activity 4.1

1. Figure 4.1 (A), which is the view of Malthusians shows that since population growth leads to growing demand for food, it would only continue to grow until it is checked by scarcity of food and other necessities. In contrast, Figure 4.1 (B) indicates that despite the growing demand for food, population would continue to grow. This is because the growing demand for food would lead people to new innovations that enable them to cope up with the problems.
2. Figure 4.1 (A) shows the pessimistic view of the Malthusians who consider population growth as having devastating consequences.

Figure 4.1 (B) presents the optimistic view of the anti-Malthusians who consider population growth as having positive consequences such as innovations and technological advancement.

### Activity 4.2

1. Malthus's Principle of Population Growth

Causes: hot passion or sexual desire of people

Consequences: scarcity of food and other necessities that lead to catastrophe, misery and vice.

Solutions: unless people control their sexual urge and apply the preventive checks population growth would be controlled by the positive checks such as diseases, hunger, war, etc.

### Activity 4.3

1. The positive checks of Malthus are the catastrophes, miseries and vices that would result from uncontrolled population growth. To avoid the occurrence of these, Malthus suggested that people should control their sexual urges and apply the preventive checks.
2. Malthus considered that people are poor because of their failure to control their sexual urge and limit their family size.

**Activity 4.4**

## Malthus vs Marx

- a. Malthus considered that scarcity of food and other resources is the result of mainly population growth. However, Marx considered that scarcity of food and other resources is not the result of population growth. Instead, it is the result of the capitalist mode of production and distribution.
- b. Malthus considered that people are poor because of their failure to control their sexual urge and limit their family size. Marx believed that people are poor because of capitalism that causes unfair distribution of wealth.
- c. Malthus recommended moral restraint (preventive checks) or individuals action to control their sexual urge. However, Marx recommended socialist economic order as a solution.

Their views about the poor are different in such a way that Malthus considered that people are poor because of their failure to control their sexual urge and limit their family size. However, Marx considered that capitalism that causes unequal distribution of resources is the basic reason for the exploitation of the poor by the rich and that makes people poor.

**Activity 4.5**

## Malthus vs Boserup

Malthus: population growth leads to scarcity of food and other resources, which result in catastrophe. Population growth is checked by the positive checks.

Boserup: Population growth leads to technological advancement and transformation. Population growth could not lead to the scarcity of food and other necessities and also the catastrophes. Population growth could not be controlled by shortage of food.

**Answers for Additional Activities**

1. The Malthusians have pessimistic view while the anti-Malthusians have optimistic view about the effects of rapid population growth.
2. Malthusian population theory seems to be more related to the current population characteristics of Ethiopia. This is because; we are now clearly observing that rapid population growth in Ethiopia has been resulting devastating consequences in the socio-economic and environmental developments of the country.  
There are various problems that resulted from the rapidly growing population of the country such as
  - Scarcity of food
  - Scarcity of farmlands

- High rate of deforestation
  - Pollution of air and water
  - High rate of soil erosion
  - Over – cultivation of farmlands
3. According to Boserup, when population grows rapidly, human beings would innovate some kinds of technological or scientific mechanisms in order to cope up with the scarcity of food and other resources.
  4. Malthus suggested two possible mechanisms by which population growth can be controlled.
    - i. The positive checks – catastrophes such as war, disease, famine, hunger, etc.
    - ii. The preventive checks – the moral restrains such as late marriage, avoiding sex before marriage, controlling sexual urges, etc.

## 4.2 TRENDS OF POPULATION GROWTH AND STRUCTURE IN ETHIOPIA

**Period Allotted: 2**

### 1. Competencies

*After completing this lesson, your students will be able to:*

- ✚ Explain the trends of population growth and structure in Ethiopia.

### 2. Contents

- 4.2.1 Trends of population growth in Ethiopia
- 4.2.2 Age and sex structure of Ethiopia’ s population

### 3. Overview

In this lesson, students will learn the trends of population growth and structure in Ethiopia. First, they will discuss the sizes and growth rates of Ethiopia’s population during different periods. Then, the age and sex structures of Ethiopia’s population and their socio-economic implications will be discussed in detail.

Ethiopia is one of the most populous countries of the world; it stands third in Africa, next to Nigeria and Egypt. Currently, the total population of the country is around 63.8 million. With a growth rate of 2.23 percent per year, the country’s population is also among the fastest growing populations in the world.

In the entire history of Ethiopia, population and housing censuses were conducted three times. These censuses were conducted in 1984, 1994 and 2007. However, from the 20<sup>th</sup>

century onwards, a number of surveys have been conducted to estimate the total population of the country and to generate other reliable population-related information.

Available data show that Ethiopia had a total population of 11.8 million in 1900, which increased to 23.5 million in 1960, to 42.6 million in 1984 and to 73.8 million in 2007. The growth rate of the country's population was thus 0.2% in 1900, 2.2% in 1960 and 3.1% in 1984. Since 1984, a slight decline in the growth rate of the country's population has been observed. It decreased from 3.1% in 1984 to 2.9% in 1994 and to 2.23% in 2008.

The age structure of Ethiopia's population indicates that the country has a high proportion of young age dependent population (between 0-14 years of age), and that it accounts for close to 45% of its total population. In contrast, the country has a very low proportion of old age population (65 and above years), and that it constitutes about 3.2% of the total population. The working age adult population (between 14-64 years) constitutes 51.8% of the total population of the country.

*Population pyramid* refers to the graphic representation of the age and sex structure of a given population. The population pyramid of Ethiopia looks like a triangle with a very broad base tapering to a narrow apex. The broad base of the country's population pyramid indicates the preponderance of the young age population, which is the result of high fertility rates. On the other hand, the narrow apex shows that the level of mortality is high and that very few people reach old age.

As measured by Ethiopia's age dependency ratio, there is a heavy burden of dependency of the young age and old age population on the working age or economically active population. For example, the age dependency ratio in 2007 was 93%, which means that for every 100 people in the working age, there were 93 dependents of young and old age people.

With regard to the sex structure of Ethiopia's population, its sex ratio (the ratio of male population to female population) indicates that the number of males has been increasing slightly over time. The nation's sex ratio increased from 99% in 1984 to 101.3% in 1994 and to 101.9% in 2007. In all the three censuses, sex ratios were higher in rural areas than in urban ones. In rural areas, sex ratios of above 100 were recorded during the three censuses, which shows that there were more males than females in these areas. In contrast, urban areas had sex ratios of below 100 in the three censuses, which means that there were more females than males in these areas.

## 4. Teaching-learning Process

### 4.1 Suggested Teaching Aids

- Reports of population censuses and surveys of Ethiopia
- Charts and diagrams that show statistical data regarding Ethiopia's population
- Population pyramids of Ethiopia and other country



## 4.2 Suggested Methods of Teaching

- Brainstorming
- Questioning
- Pair and group discussion
- Presentation

## 4.3 Pre Lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials such as reports of censuses and surveys of Ethiopia's population charts and diagrams that summarize the statistical information of the trends of population growth, the age and sex structure of Ethiopia's population, and population pyramids of Ethiopia and some developed countries.
- Design the most appropriate teaching methods for the lesson.
- Prepare notes, activities and exercises.

## 4.4 Lesson Presentation

### a) Introducing the Lesson

- Introduce your students to what they are going to learn (Trends of Population Growth and Structure in Ethiopia)
- Make the objectives of the lesson clear to the students.
- Conduct a brainstorming session with the students to ascertain their background knowledge of population growth, the difference between *census* and *survey*, age structure, sex structure, etc. Ask them questions such as: What are the reasons for fast population growth in some countries and slow population growth in other countries? What do you know about censuses and surveys? Have them do the activity from their textbook, which includes questions such as: What are the advantages of learning about the trends of population growth by conducting censuses and surveys in a given country? What do you think are the reasons for Ethiopia's very fast population growth?

### b) Main Body of the Lesson

- After considering your students' previous knowledge, explain the importance of censuses and surveys, the history of censuses and surveys in Ethiopia, and the current size and growth rate of Ethiopia's population.
- Divide students into small groups, provide them with a figure/chart that shows the statistical data of the size and growth rates of Ethiopia's population in different periods, and then instruct them to discuss the trends of population growth in the country.

- Explain the meaning of *age structure* and *population pyramid*. Have the students work in groups and do the activity from their textbook and present their ideas to the class. The activity includes questions such as: What do you think are the benefits of knowing about the age structure of a given population? In addition, have the students work on activity in small groups. This activity helps them to compare and contrast the population pyramid of Ethiopia with that of some developed countries. Have the students write a short essay on the differences between the two pyramids and the basic features of population in the two contexts. Finally, have them read their essays to the class. Strengthen your students' understanding by further explaining the significance of knowing the age structure of a population and the differences between population pyramids of developing and developed countries.
- Use tables and diagrams to show students the proportion of the young age, working age, and old age populations of Ethiopia during the three census periods. In addition, explain the meanings and calculations of age dependency ratio. Have the students work in pairs on the activity from their textbook, which includes questions on the calculations and interpretations of Ethiopia's age dependency ratio. Be sure that the students understand the high age dependency ratio in Ethiopia and the implications of the very high youth dependency ratio in the country. Give the students an assignment to write a short report on the issues which are: the benefits and problems of a large young age population; the benefits and problems of a large elderly/old age population.
- Explain *sex structure* and the calculation and interpretation of *sex ratio*. Have the students work in small groups to discuss questions such as: Why is it important to know the sex ratio of a given population? Can you suggest reasons why sex ratios can differ both between and within countries? What are the reasons for the variation of sex ratios between different age groups?
- Further explain the sex ratio of Ethiopia's population; its trends, its urban-rural variations, and its variations by age. Support your presentation with statistical data related to these issues from the three census periods.
- Make sure that all students are involved in group activities and in the entire teaching-learning process.
- Give your students enough time to ask questions and organize their notes.

### c) Stabilization

- Review the main ideas and concepts of the lesson. Emphasize the following points.
  - With a total population of 73.8 million, Ethiopia is the third most-populous country in Africa.

- The 2.23% growth rate of Ethiopia's population is among the highest in the world.
- The three censuses of Ethiopia were conducted in 1984, 1994 and 2007.
- The growth rate of Ethiopia's population has been declining slightly since 1984.
- A population pyramid is a graphic representation of the age and sex structure of a given population. Ethiopia's population pyramid has a shape of a triangle with a narrow apex and broad base.
- Ethiopia's population has a very high proportion of young age population.
- The age dependency ratio of Ethiopia's population is very high.
- The very large young age population of Ethiopia has various implications for the socio-economic conditions of the country.
- The sex structure of a given population is measured by sex ratio, which refers to the ratio between males and females.
- The sex ratio of Ethiopia is increasing slightly over time. Sex ratio varies between rural and urban places and between different age groups.

## 4.5 Evaluation and Follow up

### a) Evaluation

*Use all of the evaluation and follow-up techniques described in the Introduction.*

As part of that process, perform these tasks:

- Check your students' understanding of the lesson by giving them an exercise to do independently. The exercise may contain questions such as:
  - What is the difference between a census and survey?
  - What is the current size and growth rate of Ethiopia's population?
  - What is a population pyramid?
  - What are the reasons for the broad base and narrow apex of Ethiopia's population pyramid?
  - What does *age dependency ratio* mean?
  - What is the reason for the high age dependency ratio in Ethiopia?
  - What does *sex ratio* mean?
  - Why is it important to know the age and sex structures of a given population?

### b) Follow up

Rate and grade the various activities and exercises performed by the students. Analyze the results to understand whether or not the lesson has been well-understood and to identify those students who may need extra support.

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

### c) Additional Activities for Fast Learners

1. Explain the following:
  - a. Population Pyramid
  - b. Age Dependency Ratio
  - c. Sex Ratio
2. Why is it important to know the age and sex structure of a population?
3. Discuss the implications of very high age dependency ratio in Ethiopia.
4. Describe the trends of population growth in Ethiopia.

## Answers for Activities and Exercises in the Textbook

### Activity 4.6

1. For socio-economic planning that addresses the demands of the people and also for appropriate formulation and implementation of policies and strategies.
2. The major reason is the high rate of fertility that prevails in the country.

### Activity 4.7

Population Pyramid (The following points can be used to organize the essay)

#### **Ethiopia**

- Broader in its base
- Narrower in its apex
- Shows high rate of fertility and mortality
- Shows high proportion of young people

#### **Developed country**

- A shape that looks like a rectangle with nearly balanced base and top
- Low fertility and low mortality
- Balanced proportion of people in various ages

### Activity 4.8

Example for the year 1984

$$\text{ADR} = 49.8 + 3.4 = 53.2$$

$$53.2 / 50.2 = 1.06$$

$$1.06 \times 100 = 105.9$$

The result can be interpreted in such a way that according to the information obtained from the 1984 census, in Ethiopia, there were about 106 dependent young and old people for every 100 adult or working age people of the country.

### Activity 4.9

The variation in both cases is attributed to certain social, economic, and political factors.

## Answers for Additional Activities

1. a. *Population pyramid* – is the graphic representation of the distribution of a given population by age and sex.
  - b. *Age dependency ratio* – is the ratio between dependent (young and old age) population and working age (adult) population
  - c. *Sex ratio* – is the ratio between male population and female population.
2. Knowing the age and sex structure of a given population helps:
    - To design policies and strategies according to the actual characteristics of the population.
    - To plan for the future to make certain arrangements in the age and sex structure of the population
    - To take appropriate actions and decisions to meet the actual demands of the population.
  3. It results in the following impacts
    - It is a set back to the development efforts of the country.
    - Large amount of resource is spent on the fulfillment of basic services such as education, health care, etc.
    - Scarcity of resources for investment.
  4. According to the available information, Ethiopia's population had grown very slowly between the 1900 and the 1920s. Then, the growth rate was very fast between 1930s and 1980s. Since the 1990s, although the country has been continuing to have high rate of population growth, the growth rate has been slightly declining from time to time.

## 4.3 THE SPATIAL DISTRIBUTION OF POPULATION IN ETHIOPIA

Periods Allotted: 2

### 1. Competencies

*After completing this lesson, your students will be able to:*

- ✚ Discuss the spatial distribution of population in Ethiopia.

### 2. Contents

- Population distribution in Ethiopia
- Densely and sparsely populated areas of Ethiopia

### 3. Overview

In this lesson, the students will learn about the spatial distribution of population in Ethiopia. First, they will learn the concepts of *population distribution* and *population density* along with their measurement. Then, they will discuss the distribution of population and the densely and sparsely populated regions of the country.

The manner in which population is spread out over a given area is known as *population distribution*. The distribution of population in a given country or region is measured by *population density*. Population density is simply defined as the average number of people per square kilometer in a given country or region. Areas with high population densities are known as *densely populated areas*, while those with a low population density are referred to as *sparsely populated*. *Crude density*, *physiological density* and *agricultural density* are the three measurable types of population density in a given country or region.

- **Crude Density:** This refers to the ratio between the total population and the total area of a given country or region.
- **Physiological Density:** This refers to the ratio between the total population and the total arable/cultivable area of a given country or region.
- **Agricultural/Rural Density:** This is the ratio between the total agricultural/rural population and the total area of cultivable land in a given country or region.

Because of certain natural and human-related factors, population distribution in Ethiopia is very uneven. In the country, places with favorable natural and human-related conditions have high concentrations of people, while areas of poor natural and human conditions have lower concentrations of people. Since the highlands and plateau lands of the country have favorable natural conditions for human settlement and crop cultivation, most people of the country are concentrated in these places. On the other hand, because of the unfavorable

climatic conditions and the presence of tropical diseases, the lowlands of the country are areas of lower population concentrations.

In Ethiopia, the spatial distribution of population by region shows significant variations. The region with the largest proportion of population is Oromiya, which contains about 36.6% of the total population of the country. In contrast, the region with the smallest proportion of population is Harari, which is about 0.5% of Ethiopia's total population. The Amhara and SNNP regions, with about 23.3% and 20.2% respectively, have the second and third largest proportion of the total population of the country.

The overall population density in Ethiopia is about 66.5 persons per km<sup>2</sup>. In terms of region, the most densely populated regions of the country are, in descending order, Addis Ababa, Dire Dawa, and Harari. The density of population in these regions is exceptionally high because they are urban-dominated regions which occupy very small areas. Excluding these regions, the most densely populated region in Ethiopia is SNNP, successively followed by the Amhara and Tigray regions. On the other hand, the three most sparsely populated regions of the country are Somali, Afar and Gambela.

In the country, there are various zones with population densities above 200 persons per km<sup>2</sup>. Most of these zones are found in the SNNP region. Some of them are Ghedeo, Sidama, Kembata-Alaba-Tembaro, and Hadiya. In contrast, Gode, Borena, KebriDehar, Kamashi, Metekel, etc. are zones with population densities below 10 persons per km<sup>2</sup>.

In some enset and coffee growing weredas of Ethiopia, mainly in the SNNP region, population densities are higher than 500 persons per km<sup>2</sup>. On the other hand, in some other weredas found in the peripheral lowlands of the country, population densities are lower than 5 persons per km<sup>2</sup>.

## 4. Teaching-learning Process

### 4.1 Suggested Teaching Aids

- Population distribution/density map of Ethiopia
- Physical map of Ethiopia
- Reports of population censuses and surveys of Ethiopia
- Charts and diagrams that show population densities in Ethiopia

### 4.2 Suggested Methods of Teaching

- Brainstorming
- Questioning
- Explanation

- Pair and group discussion
- Presentation

### 4.3 Pre Lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials such as a map of population density Ethiopia, the physical map of Ethiopia, and charts and diagrams that summarize population densities in Ethiopia.
- Design the most appropriate teaching methods for the lesson.
- Prepare notes, activities and exercises.

### 4.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce students to what they are going to learn (The Spatial Distribution of Population in Ethiopia)
- Make the objectives of the lesson clear to students.
- Conduct a brainstorming session with the students to ascertain their students background knowledge of population distribution and density. Ask them questions such as: What are the reasons for the variation of population distribution in a given country? What is population density? Do you know how population density is calculated?

#### b) Main Body of the Lesson

- After considering your students' previous knowledge, start your presentation with the explanation of the meanings of *population distribution*, *population density*, and the different measures of population density. Then, have the students calculate population densities of Ethiopia by using the data given in activity 4.13 in their textbook.
- Divide the students into small groups, provide them with a map of population distribution in Ethiopia, and instruct them to identify the densely and sparsely populated areas of the country. In addition, have them use the data available in their textbook to calculate the crude density of each region and identify the most densely and sparsely populated regions of Ethiopia.
- Further explain the variation of population densities in Ethiopia in terms of regions, zones and weredas. You may enhance their learning by using charts and diagrams that clearly show the variations of population densities between the densely and sparsely populated areas of the country.
- Make sure that all students are involved in the group activities and in the entire teaching-learning process.
- Give your students enough time to ask questions and organize their notes.



**c) Stabilization**

- Review the main ideas and concepts of the lesson. Stress the following points.
  - Population distribution in a given country/region is measured by population density. Population density refers to the number of people in a square kilometer area.
  - The population of Ethiopia is unevenly distributed because of certain natural and human factors.
  - The crude density of Ethiopia's population is about 66.5 persons per km<sup>2</sup>.
  - In Ethiopia, there is significant variation in population density between regions, zones, and weredas. In some weredas of the SNNP region, population density is higher than 500 persons per km<sup>2</sup>. In contrast, in the peripheral lowland areas of the country there are weredas with a population density of less than 5 persons per km<sup>2</sup>.

**4.5 Evaluation and Follow Up****a) Evaluation**

*Use all of the evaluation techniques described in the Introduction.* As part of that process, perform these evaluation tasks:

- Check your students' understanding of the lesson by giving them an exercise to do independently. The exercise may contain questions such as:
  - What is *population density*?
  - Mention some of the areas in Ethiopia where population density is more than 500 persons per km<sup>2</sup>.
  - Mention some of the areas in Ethiopia with a population density of less than 5 persons per km<sup>2</sup>.
  - Using the following table, calculate the crude density of the given three places and identify the most densely and sparsely populated places along them.

Place	Population (Millions)	Area (km <sup>2</sup> )
X	25.6	303,209
Y	13.9	50,025
Z	1.3	156,304

**b) Follow up**

Rate and grade the various activities and exercises performed by the students. Analyze the results to understand whether or not the lesson has been well-understood or not and to identify those students who may need extra support.

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

**c) Additional Activities for Fast Learners**

1. What is the current figure of Ethiopia's population density?
2. Why is Ethiopia's population distributed unevenly?
3. Discuss the implications of uneven distribution of population in Ethiopia.
4. Which regions of Ethiopia contain the very sparsely populated areas with less than 5 persons per square kilometer?

## Answers for Activities and Exercises in the Textbook

### Activity 4.10

1. Population Density =  $\frac{\text{Total Population}}{\text{Total Area}} = \frac{73.8}{1.1 \text{ km}^2} = 67.1$  persons per km<sup>2</sup>
2. This means that the average density of people in Ethiopia is that there are 67 people living over a kilometer square area.

### Activity 4.11

Most densely populated = SNNPR, Amhara and Tigray

Most sparsely populated = Somali, Afar and Gambela

## Answers for Additional Activities

1. The current population density in Ethiopia is about 67 persons per square kilometre.
2. Ethiopia's population is distributed unevenly due to certain natural and human related factors.
  - **National Factors:** Climate, latitude, water supply, soil type, etc.
  - **Human Factors:** Economic activities, historical population movements, etc.

3. It has an impact on the:

- Provision of social services for the people
- Development of infrastructure within the country
- Land use pattern of the country
- Resource use pattern of the country

3. Afar and Somali regions are the regions that contain the sparsely populated areas in Ethiopia with less than 5 persons per square kilometre.

## 4.4 FACTORS AFFECTING POPULATION DISTRIBUTION IN ETHIOPIA

Period Allotted: 2

### 1. Competencies

*After completing this lesson, your students will be able to:*

- ✚ State factors affecting population distribution in Ethiopia.

### 2. Contents

4.4.1 Physical Factors

4.4.2 Human Factors

### 3. Overview

In this lesson, the students will learn about the factors affecting population distribution in Ethiopia. The major factors for the uneven distribution of population in Ethiopia are categorized into two classes: *physical* and *human*. In this lesson, the students will first learn the physical factors, and then the human factors.

Climate (temperature and rainfall), relief (altitude and slope), soil fertility, water supply, and vegetation cover are the most significant physical factors that affect the distribution of population in Ethiopia. Most people prefer living in areas where these natural conditions are favorable for settlement and cultivation. Altitude is the major factor affecting those conditions because it influences such physical factors. In Ethiopia, areas with relatively high altitude have moderate temperatures, adequate rainfall, fertile soils, better vegetation covers, and better supplies of water. That is why most people live in the highlands and plateau lands of the country. In contrast, areas of low altitude have high temperatures, little rainfall, infertile soils, sparse vegetation, and insufficient water supplies. In addition, these places are often infested with disease-causing vectors and insects. Due to all these unfavorable conditions, the lowland areas of Ethiopia have far fewer people settled on them than the highlands.

Regarding the human factors, the type of economic activities and the historical pattern of population movement determine population distribution in Ethiopia. Types of economic activities in the country influence the carrying capacity of land. The carrying capacity of land, in turn, determines the number of people that can inhabit a given area. In Ethiopia's lowland areas, pastoralism or nomadic herding is the major economic activity. In areas where nomadic herding is practiced, the carrying capacity of land is low. This is because nomadic herding, by nature, needs large areas in which people to move from spot to spot looking for better grazing lands and water for their herds. Therefore, due to pastoralism, Ethiopia's lowland areas are sparsely populated and they have low population densities. On the other hand, crop farming highland areas have greater carrying capacity, and therefore high population density. The activity of crop farming, by nature, needs smaller areas than nomadic herding. It also supports more people in a very limited area than does nomadic herding. Because of this, population concentration in Ethiopia's crop farming highland areas of the country is very high.

Furthermore, the higher concentration of people in the central highlands of Ethiopia is the result of historical movements of people from the north and south of the country. The movement of the Semitic population from the northern areas during the periods of the Axumite Empire and the Agaw dynasty, movement of people during and the war of Ahmad Gragn and movement of the Oromo population in the 16<sup>th</sup> century from the southern parts of the country were the major factors for the high concentration of people in the central highlands of the country.

## **4. Teaching-learning Process**

### **4.1 Suggested Teaching Aids**

- Population distribution/density map of Ethiopia
- Physical map of Ethiopia
- Pictures of crop farming and nomadic herding areas of Ethiopia
- Historical notes on population movements in Ethiopia

### **4.2 Suggested Methods of Teaching**

- Brainstorming
- Questioning
- Explanation
- Pair and group discussion
- Presentation
- Guest lecture

### 4.3 Pre Lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials such as a map of population distribution in Ethiopia, a physical map of Ethiopia, pictures of crop farming and nomadic herding areas in Ethiopia and some historical notes on the patterns of population movements in Ethiopia.
- Design the most appropriate teaching methods for the lesson.
- Prepare notes, activities and exercises.

### 4.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce the students to what they are going to learn (Factors Affecting Population Distribution in Ethiopia)
- Make the objectives of the lesson clear to the students.
- Conduct a brainstorming session with the students to ascertain their background knowledge of the physical and human factors that affect population distribution. Ask them questions such as: What are the reasons for the variation of population distribution in a given country? In what places do people want to live?

#### b) Main Body of the Lesson

- Start your presentation with the physical factors affecting population distribution in Ethiopia. First, provide the students with the list of the major physical factors and give them a brief explanation of each factor by using the physical map of Ethiopia and other topical maps such as vegetation maps, soil maps, climatic maps, etc. Then, provide them with the map of population distribution in Ethiopia. Help them to associate the physical factors with the densely and sparsely populated areas of Ethiopia.
- Divide the students into small groups and have them do activity 4.12 from their textbook. The activity includes questions such as:
  - What do you think are the major factors that attracted large population settlements over the highland areas of Ethiopia?
  - Discuss why the lowland areas of Ethiopia are sparsely populated.
  - In most parts of the world, valleys of major rivers are zones of large concentration of population. Unlike these, the river valleys of Ethiopia are areas of little concentration of population. Discuss the reasons.
- Explain the impact of altitude on the distribution of population in Ethiopia. Be sure that the students fully understand how altitude influences the other physical factors such as climate (temperature and rainfall), vegetation, soil, and water

supply. Use the table found in their textbook to show them the relationship between altitude and population in Ethiopia.

- Provide the students with the list of the major human factors that affect population distribution in Ethiopia. Explain how the major economic activities, especially farming and nomadic herding, influence population distribution in Ethiopia. You may show them some pictures of densely populated enset-growing and coffee-farming areas and the sparsely populated nomadic herding areas of the country. Have the students do activity 4.13 from their textbook, which includes the following activity.
  - Discuss the reasons why the farming areas of Ethiopia have high carrying capacity and high density of population while the nomadic herding areas have low carrying capacity and low density of population.
- Explain the impacts of urban development and industrial growth on the re-distribution of population of Ethiopia over time.
- Introduce the students to the two historical population movements in the country: the Semitic and the Cushitic (mainly that of the Oromo). Explain how the two movements have affected population distribution in Ethiopia. You may enhance the students' understanding by inviting a history teacher as a guest speaker to explain these movements in greater detail.
- Make sure that all students are involved in the group activities and in the entire teaching-learning process.
- Give the students enough time to ask questions and organize their notes.

**c) Stabilization**

- Review the main ideas and concepts of the lesson. Emphasize the following points.
  - ✓ Population distribution in Ethiopia is affected by certain physical and human factors.
  - ✓ The major physical factors are climate, topography (altitude and slope), soil fertility, vegetation cover, and water supply.
  - ✓ The type of economic activities and historical patterns of movements of population are the major human factors.
  - ✓ In Ethiopia, altitude, in its capacity to influence the other physical factors and human factors is the major factor affecting population.
  - ✓ Most people in Ethiopia live in the highland areas where there are favorable physical conditions to settle and to cultivate crops.
  - ✓ The very high concentration of people over the central highlands of Ethiopia is partly the result of movements of the Semitic and Cushitic (Oromo) people.

## 4.5 Evaluation and Follow up

### a) Evaluation

*Use all of the evaluation and follow-up techniques described in the Introduction.* As part of those activities, use these approaches:

- Check the students' understanding of the lesson by giving them an exercise to do independently. The exercise may contain questions such as:
  - What are the major physical factors that affect population distribution in Ethiopia.
  - Why is altitude considered to be the major factor affecting population distribution in Ethiopia?
  - What are the two historical movements of population that have affected population distribution in Ethiopia?
  - Explain why areas of nomadic herding in Ethiopia are of low population density?

### b) Follow up

Rate and grade the various activities and exercises performed by the students. Analyze the results to understand whether or not the lesson has been well-understood, and to identify those students who may need additional guidance.

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

### c) Additional Activities for Fast Learners

1. Explain the reasons why the Somali and Afar regions of Ethiopia are sparsely populated?
2. Discuss the benefits of understanding the distribution of population in a given country.
3. Explain why and how altitude determines the distribution of population in Ethiopia.
4. Discuss how economic activities influence the distribution of population in Ethiopia.

## Answers for Activities and Exercises in the Textbook

### Activity 4.12

1.
  - Favorable climate (moderate temperature and adequate rainfall)
  - Adequate supply of water
  - Absence of tropical diseases
  - Availability of fertile soil
2. It is because of:
  - The harsh climatic condition
  - Inadequate water
  - Infertile soil
  - The presence of tropical diseases
3. It is because the river valleys are found in the low land areas where there are tropical diseases.

### Activity 4.13

Farming: High yield per area. It requires less land as compared to pastoralism.

Pastoralism: requires large areas of pasture land. It depends on the mobility of people over large areas.

## Answers for Additional Activities

1. Because they are regions which are dominated by areas with arid and semi-arid climatic conditions.
  - There are areas with extremely high temperature and low rainfall conditions.
  - There is scarce water supply in most of the places.
  - They are dominated by people who lead pastoralist way of life.
2. It helps governments to formulate and implement appropriate policies on
  - the development of infrastructure.
  - the distribution of social services.
3. Because altitude is the major factor which affects the other factors of population distribution such as climate, water supply, economic activities, etc. In Ethiopia, due to the favourable conditions such as moderate temperature, adequate rainfall, fertile soil, etc, more people are attracted to settle over the highlands. In contrast, because of the unattractive natural conditions such as high temperature, inadequate rainfall, infertile soil, scarcity of fresh water, etc, there exists very less concentration of people over the low land areas of the country.



4. In Ethiopia, there is high concentration of people in those areas where there is crop cultivation. In the country, because of the relatively higher yield per farmland, crop cultivation areas supports large number of people. In contrast, those areas dominated by pastoralist way of economic life have less concentration of people. This is mainly because the activity by its nature demands large space and supports less number of people per unit area.

## 4.5 SETTLEMENT PATTERNS OF ETHIOPIAN POPULATION

Period Allotted: 4

### 1. Competencies

*After completing this lesson, the students will be able to:*

- ✚ Realize settlement patterns of the Ethiopian population.

### 2. Contents

4.5.1 Rural Settlements

4.5.2 Urban Settlements

### 3. Overview

In this lesson, the students will learn the settlement patterns of the Ethiopian population. The settlements in Ethiopia are broadly categorized into two groups. They are *rural* and *urban* settlements. In this lesson, the students will learn the patterns of these two types of settlements.

In Ethiopia, the major factors that influence the patterns and types of settlements are the following.

- Relief (altitude and slope of the land)
- Climate (temperature and the amount of rainfall)
- Type of land ownership
- The level of development (transportation and industrial development)
- The need for community defense
- The need for communal life

Settlements in Ethiopia are categorized as urban and rural, on the bases of dominant economic activities and degree of population density. Ethiopia's rural settlements are almost totally agricultural, while the urban settlements are categorized by non-agricultural economic activities. In addition, urban settlements often have higher population densities than rural settlements.

Rural settlements of Ethiopia are categorized into two classes: *permanent* and *temporary*. The permanent rural settlements are mostly associated with the crop farming highland areas of the country. The temporary/mobile rural settlements, on the other hand, are associated with the nomadic herding lowland areas of the country.

In Ethiopia, a given settlement is said to be urban when it fulfils the following criteria.

- The settlement has a minimum of 2000 people.
- Two-thirds of the population in the settlement are engaged in non-agricultural activities
- The settlement has a chartered municipality.

The two major historical factors beneath the development of many urban centers in Ethiopia were the interconnection of different parts of the country by all-weather roads and the five-year Italian occupation that intensified the construction of roads, the development of industries and service-giving institutions. Most urban settlements of Ethiopia are found along transport routes and in areas with greater concentrations of industries and social services.

## 4. Teaching-learning Process

### 4.1 Suggested Teaching Aids

- Settlement map of Ethiopia
- Pictures of urban settlements in Ethiopia
- Pictures of permanent and mobile settlements in rural Ethiopia

### 4.2 Suggested Methods of Teaching

- Brainstorming
- Questioning
- Explanation
- Pair and group discussion
- Presentation

### 4.3 Pre Lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials such as a settlement map of Ethiopia, pictures of urban centers (towns and cities) in Ethiopia, pictures of permanent (scattered and grouped) rural settlements found in the crop farming highland areas of Ethiopia, and pictures of mobile settlements found in the nomadic herding lowland areas of Ethiopia.
- Design the most appropriate teaching methods for the lesson.
- Prepare notes, activities and exercises.

## 4.4 Lesson Presentation

### a) Introduction to the Lesson

- Introduce the students to what they are going to learn (Settlement Patterns of Ethiopian Population)
- Make the objectives of the lesson clear to the students.
- Conduct a brainstorming session with the students to ascertain their background knowledge of the meaning of *settlement* and the reasons for the variation of settlement patterns. Ask them questions such as: What is *settlement*? Why do settlements vary from place to place?

### b) Main Body of the Lesson

- After considering your students' previous knowledge, start your presentation with an explanation of the meaning of *settlement* and the reasons for the variations of settlement patterns from place to place, particularly in Ethiopia. Explain how settlements in Ethiopia are categorized as *rural* and *urban*. Show the students the settlement map of Ethiopia and help them to realize the locations of most of the rural and urban settlements of the country.
- Provide the students with some pictures of permanent and temporary rural settlements in Ethiopia and have them work in groups to discuss the characteristics of the two types of rural settlements and to identify the areas in Ethiopia associated with these settlements.
- Explain the nature of urban settlements in general and how they are differentiated from rural settlements in Ethiopia in particular. Explain the historical development of urban settlements in the country. You may show them a map that portrays the distribution of urban settlements and some pictures of towns and cities in Ethiopia and have them discuss the reasons why most urban settlements of the country are concentrated along the major transport routes and networks.
- Make sure that all students are involved in the group activities and in the entire teaching-learning process.
- Give the students enough time to ask questions and organize their notes.

### c) Stabilization

- Review the main ideas and concepts of the lesson. The following are the highlights.
  - In Ethiopia, the development and patterns of settlements vary from place to place due to certain physical and human factors.
  - Settlements in Ethiopian population are broadly categorized into two classes: *rural* and *urban*.
  - The rural settlements of Ethiopia are also categorized into two classes: *permanent* and *temporary*. The permanent rural settlements are associated with the crop farming highlands, while the temporary ones are associated with the nomadic herding lowland areas of the country.

- The origin and development of most urban settlements in Ethiopia is associated with the construction of roads that connect different parts of the country and the five-year Italian occupation that resulted in the setting up of industries, roads, and service-giving institutions.
- In Ethiopia, most urban settlements have come into existence along major transport routes and networks.

## 4.5 Evaluation and Follow up

### a) Evaluation

*Use all of the evaluation and follow-up techniques described in the Introduction.*

As part of those activities, use these approaches:

- Check the students' understanding of the lesson by giving them an exercise to do independently. The exercise may contain questions such as:
  - What is *settlement*?
  - What are the two major kinds of settlements in Ethiopia?
  - Why are temporary settlements found in the nomadic herding areas of Ethiopia?
  - What are the criteria used in Ethiopia to differentiate urban settlements from rural settlements?
  - What were the major factors that contributed to the development of urban settlements in Ethiopia?

### b) Follow up

Rate and grade the various activities and exercises performed by the students. Analyze the results to understand whether or not the lesson has been well-understood, and to identify those students who may need extra help.

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

### c) Additional Activities for fast Learners

1. Explain the reasons why temporary rural settlements of Ethiopia are concentrated over the lowland areas.

2. Why the permanent rural settlements of Ethiopia are mainly found over the highland areas?
3. What were the major factors contributed to the development of urban settlements in Ethiopia?

## Answers for Activities and Exercises in the Textbook

### Activity 4.14

1. Settlement is a concept that refers to the way of populating a place with permanent or temporary residents.
2. The reasons for the variation of settlements from place to place are because of the spatial variation of factors such as relief, climate, the kind of land ownership, economic activities, the level of development, etc.

### Activity 4.15

The major reason is the desire of people to get advantages of social services, better communications and better employment opportunities.

## Answers for Additional Activities

1. It is mainly due to:
  - The scarcity of pasture lands
  - The scarcity of fresh water
  - The pastoralist way of life of the people
2. It is mainly due to:
  - The favorable conditions for crop cultivation such as adequate rainfall, adequate supply of fresh water, relatively fertile soil, etc.
  - The dependence of the people on the cultivation of crops.
  - The scarcity of farm lands and settlement areas to move from place to place.
3. The major factors were:
  - The development of transport infrastructure especially roads
  - The development of social services such as education, health care, etc.
  - Industrial development that creates better employment opportunities.

## 4.6 DETERMINANTS OF POPULATION CHANGE IN ETHIOPIA

**Period Allotted: 2**

### 1. Competencies

*After completing this lesson, the students will be able to:*

- ✚ Compare fertility and mortality rate from a given data.

## 2. Contents

4.6.1 Fertility in Ethiopia

4.6.2 Mortality in Ethiopia

## 3. Overview

In this lesson, the students will learn the determinants of population change in general and their bearing on the Ethiopian situation in particular. First, they will learn the trends, levels and differentials of fertility in Ethiopia. Then, they will learn the trends, levels and differentials of mortality. Finally, they will be taught the nature of migration in the country.

Population change in any country or region is a result of three factors, namely: *fertility*, *mortality* and *migration*. The difference between fertility and mortality is known as *natural change*. However, population change caused by the difference between *immigration* (internal-migration) and *emigration* (external-migration) is known as *net-migration*.

Level of fertility is indicated by different measures such as crude birth rate (CBR), general fertility rate (GFR), age specific fertility rate (ASFR) and total fertility rate (TFR). Based on these measures, Ethiopia is a country with a high fertility rate. The country has a TFR of 5.4 children per woman, a CBR of 35.7 births per 1000 people and 179 births per 1000 women in the reproductive ages. These rates of fertility are among the highest levels in the world.

The major factors for high rates of fertility in Ethiopia are the following.

- Low levels of family planning practices
- Early marriage
- Low status of women
- High rates of infant and child mortality
- Parental valuing of children in terms of high social and economic value.

In Ethiopia, there are significant differences in the levels of fertility between urban and rural places, and between regions. Fertility is significantly higher in rural areas than urban areas. Ethiopia's fertility rate had been increasing very rapidly until the 1990s. However, since 1990, there has been a slight decline, especially in urban areas, owing to higher rates of contraceptive use.

Level of mortality is assessed by measures such as crude death rate (CDR), infant mortality rate (IMR), child mortality rate (CMR), under-five mortality rate (U5MR), maternal mortality rate (MMR) and life expectancy. Based on these measures, the mortality level of Ethiopia's population is among the highest in the world. For example, the country has an IMR of 80, a CMR of 56, and a MMR of 1.34. However, from studying the trends of mortality rates over different periods, we can see that there has been a slight decline since

the 1990s, though it is still high by world standards. In addition, mortality rates in Ethiopia vary significantly by rural-urban residence, and by region. The rates are much higher in rural places than they are in urban areas.

## 4. Teaching-learning Process

### 4.1 Suggested Teaching Aids

- Reports of censuses and survey results in Ethiopia
- Tables and charts that summarize fertility, mortality and migration data in Ethiopia.

### 4.2 Suggested Methods of Teaching

- Brainstorming
- Questioning
- Explanation
- Pair and group discussion
- Presentation
- Problem solving

### 4.3 Pre Lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials such as results of censuses and surveys conducted in Ethiopia. Besides these, you can produce tables and charts such as pie charts, bar graphs, line graphs, etc. that present statistical data on fertility, mortality and migration levels, trends and differentials.
- Design the most appropriate teaching methods for the lesson.
- Prepare notes, activities and exercises.

### 4.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce the students to what they are going to learn (Determinants of Population Change in Ethiopia)
- Make the objectives of the lesson clear to the students.
- Conduct a brainstorming session with the students to ascertain their background knowledge of the three principal factors of population change in any country or region. Ask them questions such as: What are the reasons for the rapid growth of population in some countries and slow growth of population in other countries? Can you define *fertility*, *mortality* and *migration*?

**b) Main Body of the Lesson**

- After considering your students' previous knowledge, start your presentation by defining *fertility*, *mortality* and *migration*. Be sure that the students fully understand how these factors, particularly natural change (births - deaths) and net migration (immigration - emigration), bring about population change. Show them the figure provided in their textbook that shows the input-output model of population change. Using the model, have the students identify the input and output factors and discuss their reasons. Show the students how population change is calculated by using the example found in their textbook. You may also give them another similar exercise to have them practice such calculations by themselves.
- Before you present the fertility characteristics of Ethiopia's population, make sure that your students are clear about the different measures of fertility such as Crude Birth Rate (CBR), Total Fertility Rate (TFR), General Fertility Rate (GFR) and Age Specific Fertility Rate (ASFR). Then, using data summarized in the tables and charts, explain to them the levels and trends of fertility in Ethiopia, as well as its differentials, in terms of region and urban-rural residence. To ensure that the students understand how high Ethiopia's fertility rates are, show them fertility rates of some developed countries. Have the students work in groups on activities 4.17 and 4.18 from their textbook. These activities will enable the students to interpret the different rates of fertility in Ethiopia and discuss the reasons for the significant variations of fertility rates between urban and rural areas. They will also bring to light the reasons for the sharp contrast in fertility between Addis Ababa and the rest of Ethiopia. After that, finalize your presentation by explaining the demographic, socio-cultural, and economic factors responsible for the high level of fertility in the country.
- Similarly, before discussing the mortality characteristics of Ethiopia's population, make certain that the students are clear about the different measures of mortality such as Crude Death Rate (CDR), Infant Mortality Rate (IMR), Child Mortality rate (CMR), Under-5 Mortality Rate (U-5MR), Maternal Mortality Rate (MMR), and Life Expectancy. Then, using census and survey data summarized in tables and charts, explain to them the trends, levels and differentials of mortality in Ethiopia. Be sure that the students fully understand how high the rates are in Ethiopia by comparing the mortality rates of Ethiopia's population with rates of some developed countries. Have the students work in small groups to discuss and perform the activities given in their textbook. The activities include questions and activities such as: What are the reasons for high infant, child, maternal and adult mortality rates in Ethiopia? Discuss the reasons for the differentials in these mortality rates by urban-rural residences. How do you interpret the given rates of



mortality in Ethiopia? Is mortality in Ethiopia increasing or decreasing? What are the factors that you think are responsible for this?

- Make sure that all students are involved in group activities and in the entire teaching-learning process.
- Give them ample time to ask questions and organize their notes.

### c) Stabilization

- Review the main ideas and concepts of the lesson. The points to focus on are the following.
  - *Fertility, mortality and migration* are the three factors of population change in any country or region.
  - Ethiopia is still grouped among countries with high rates of fertility. However, fertility rates in the country have been declining slightly, especially since the 1990s.
  - Fertility in Ethiopia is significantly higher in rural areas than in urban areas.
  - The high level of fertility in Ethiopia is the result of certain demographic, socio-cultural and economic factors.
  - The mortality rates of Ethiopia's population are among the highest in the world. Because of the low socio-economic and health status of children and women, Ethiopia has significantly higher rates of infant, child and maternal mortality rates. However, the trends of mortality in the country show that there have been modest declines in mortality rates in the last three decades.

## 4.6 Evaluation and Follow up

### a) Evaluation

*Use all of the evaluation and follow-up techniques described in the Introduction.*

As part of those activities, use these approaches:

- Check the students' comprehension of the lesson by giving them an exercise to do independently. The exercise may contain questions such as:
  - What are the three factors of population change?
  - Mention some of the measures for fertility and mortality.
  - The TFR of Ethiopia's population is 4.2. What does this mean?
  - What are the reasons for the high level of fertility in Ethiopia?
  - What are the reasons for the high level of maternal mortality in Ethiopia?
  - What does *net-migration rate* mean?

**b) Follow Up**

Rate and grade the various activities and exercises performed by the students. Analyze the results to understand whether or not the lesson has been well-understood, and to identify those students who may need additional support.

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

**c) Additional Activities for Fast Learners**

1. Explain the reasons why there are higher rates of fertility in rural areas than urban areas of Ethiopia.
2. Suggest some possible mechanisms that help to reduce fertility rates and mortality rates of Ethiopian population.
3. What are the major reasons for high rates of infant and maternal mortality rates in Ethiopia?
4. Identify the regions with the highest rates of fertility in Ethiopia.

## Answers for Activities and Exercises in the Textbook

**Activity 4.16**

Births and immigrants are factors that can be considered as input. This is because these factors tend to bring increase in population size. On the other hand, deaths and emigrants are output factors since they have an impact of decreasing population size.

**Activity 4.17**

1. A TFR of 5.4 means that the average number of children that a woman would have in Ethiopia is about 5.4.  
A CBR of 33.5 refers to the condition that in Ethiopia there are about 33.5 births per 1000 people.  
A GFR of 179 refers to the condition that in Ethiopia there are about 179 births per 1000 women in the reproductive ages.

2. The major reasons for high rate of fertility in the rural areas are:
  - Low family planning practices
  - Early marriage
  - Low social status of women
  - High infant and child mortality
3. This means that the average number of children that a rural woman can have at the end of her child bearing age is higher by 2.5 children than the average number for an urban woman.

#### **Activity 4.18**

IMR = 80 means that in Ethiopia among 1000 live births the number of deaths of infants below the age of 1 is about 80.

CMR= 56 means that in Ethiopia among 1000 children between the age of 1 and 5 the number of deaths of children in the same age is about 56.

#### **Activity 4.19**

1. Mortality rate in Ethiopia is much higher in rural areas than urban areas.
2. There is high childhood mortality in rural parts of Ethiopia than urban parts of Ethiopia. This mainly because of:
  - Lack of health care services and facilities
  - Poor hygiene
  - Lack of nutritious food for the children
  - Very close birth spacing
  - Delivery with traditional birth attendants

#### **Activity 4.20**

1. The major reasons for high rate of maternal mortality rates in Ethiopia are the following.
  - Delivery with traditional birth attendants
  - High frequency of births
  - Very close birth spacing
  - Lack of health care services and facilities

## Answers for Additional Activities

1. The main reasons are:

- Low access to family planning services
- Low status of women
- High rate of infant mortality
- Traditional belief of the society about having large no of children. Considering children as economic and social assets.

Because of the presence of all the above mentioned factors in the rural areas, these areas have higher rates of fertility than their urban counterparts.

2. Possible mechanisms to reduce fertility are:

- Improving peoples' access to family planning services
- Educating the people about the effects of large family size.
- Improving the status of women
- Educating the people to change their wrong traditional belief about having large family size.

Possible mechanisms to reduce mortality are:

- Improving peoples' access to health care services.
- Educating the people to avoid those traditions which are harmful.
- Improving women's status

3. The major reasons are:

- The low access to health care services in many rural parts of the country
- Lack of frequent health-care follow up of women during their pregnancy
- Delivery with the help of traditional birth attendants
- Lack of nutritious food for babies and mothers also
- Early marriage that causes childhood pregnancy without the physical and psychological maturity of girls.
- Female genital mutilation that causes complications during pregnancy and also delivery
- High frequency of births and very close birth spacing

4. Fertility: Oromyia, SNNPR, and Benishangul

## 4.7 IMPACTS OF RAPID POPULATION GROWTH IN ETHIOPIA

Periods Allotted: 3

### 1. Competencies

*After completing this lesson, the students will be able to:*

- ✚ Analyze the impact of rapid population growth on the socio-economic and environmental conditions of Ethiopia.

### 2. Contents

4.7.1 Deforestation

4.7.2 Socio-Economic Impact

### 3. Overview

In this lesson, the students will learn the impacts of rapid population growth in Ethiopia. In particular, they will come to appreciate how rapid population growth leads to environmental degradation such as deforestation, pollution of water and air, noise, and soil erosion. In addition, they will have a discussion on the impact of rapid population growth on socio-economic resources such as education, health-care, employment, security, food supply, etc.

In lessons before this, the students have learned that Ethiopia's population is one of the most rapidly growing in the world. The rate of population growth in the country is much higher than the rate of economic growth. Also, the population is growing beyond the carrying capacity of the natural environment and its resources. Therefore, the rapid population growth of the country has been causing a variety of environmental and socio-economic problems.

Rapid population growth causes serious environmental degradation in areas where it occurs. It causes, for example, deforestation, water and air pollution, soil erosion, destruction of resources, etc., all of which are both consequences and causes of climatic change. Climatic change brings about global warming, desertification, drought and famine. Emphasize that all of these are results of environmental degradation which, as has just been pointed out, is itself caused by rapid population growth. In Ethiopia, many places have been suffering from these problems. Because of climatic changes, rainfall has become unreliable in many places, and many places are suffering from inadequate rainfall for the cultivation of crops. In addition, because of over-cultivation, which results from shortage of farmlands, soil erosion has become a very serious problem in many parts of the country. The productivity of farmers has been seriously affected by climatic changes and soil degradation. This, in turn, has resulted in scarcity of food (inadequate food supply) in

many regions of the country. Generally, due to rapid population growth, the quality and ability of the environment to support the people of the country has been deteriorating over time.

As well as having negative environmental impacts, rapid population growth in Ethiopia has been negatively affecting socio-economic conditions of the people. For instance, it is causing serious challenges to the government in meeting the growing demands of the people for education, health care, housing, employment, etc. Although it has few available resources, the government has been placing great emphasis on expanding and maintaining the quality of these social services in all parts of the country.

## 4. Teaching-learning Process

### 4.1 Suggested Teaching Aids

- Statistical data presented in tables and charts that show impacts of rapid population growth on forests, soil erosion, farmland, food supply, education, housing, health-care, employment, etc.
- Pictures of different places exposed to environmental degradation (deforestation, soil erosion, pollution, etc.) because of population pressure.
- Pictures of different places with problems such as over-crowded classrooms, over-crowded health institutions, land defragmentation, over-crowded and sub-standard housing (slums).
- Case studies of different places in Ethiopia that have been suffering from problems resulting from rapid population growth.

### 4.2 Suggested Methods of Teaching

- Brainstorming
- Questioning
- Explanation
- Pair and group discussion
- Group project work
- Presentation

### 4.3 Pre Lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials such as statistical data, tables and charts, pictures, and case studies that deal with the environmental and socio-economic impacts of rapid population growth in Ethiopia.
- Design the most appropriate teaching methods for the lesson.
- Prepare notes, activities and exercises.

## 4.4 Lesson Presentation

### a) Introduction to the Lesson

- Introduce the students to what they are going to learn (Impacts of Rapid Population Growth in Ethiopia)
- Make the objectives of the lesson clear to the students.
- Conduct a brainstorming session with the students to ascertain their background knowledge of the impacts of rapid population growth on the environmental and socio-economic conditions of countries. Ask them questions such as: How does rapid population growth lead to environmental degradation? What do you know about global warming? How does rapid population growth lead to inadequate food supplies? How does rapid population growth affect the quality of education and health-care services in a country?

### b) Main Body of the Lesson

- After considering your students' previous knowledge, start your presentation by describing the growth rate of Ethiopia's population in relation to the country's economic growth and available resources.
- Choose two places in Ethiopia, one with dense population and the other with sparse population. Then have the students work in groups to discuss places where land degradation is very serious and relate this to more developed areas having high population pressure with less environmental degradation. Have the students justify their views on these subjects with facts. Then, explain how rapid population growth causes problems such as deforestation, pollution (water and air), and soil erosion in Ethiopia. Support your presentation with statistical data of the rates of deforestation and soil erosion in the country. You may also use pictures and case studies of areas affected by deforestation, soil erosion, and water and air pollution. You can organize trips to areas not far from the students' locality where they can actually observe these problems. Have the students work in groups to discuss the direct and indirect consequences of deforestation, soil erosion, and water and air pollution.
- Give them appropriate instructions to carry out the group project given in their textbook. In this context:
  - Help the students to form small groups.
  - Have each group discuss one of the following topics in connection with the impact of rapid population growth in Ethiopia:
    1. Housing
    2. Food supply
    3. Farmland

4. Education
  5. Health care
  6. Employment
- Instruct them to collect information and write a short paper on the topic they have chosen.
  - Have each group present its paper to the class for further discussion.
- Make sure that all students are involved in the group activities and in the entire teaching-learning process.
  - Give the students enough time to ask questions and organize their notes.
- c) Stabilization**
- Review the main ideas and concepts of the lesson. Emphasize the following points.
    - In Ethiopia, population growth is faster than economic growth.
    - The population of Ethiopia is rapidly growing beyond the carrying capacity of the natural environment and its resources.
    - Rapid population growth in Ethiopia has resulted in environmental degradation such as deforestation, pollution, and soil erosion.
    - Because of environmental degradation, the productivity of farmers in Ethiopia has been seriously negatively affected, and this has resulted in scarcity of food (inadequate food supply) in many parts of the country.
    - Rapid population growth in Ethiopia has a huge impact on the provision of social services such as education, health care, housing, etc.

## 4.5 Evaluation and Follow up

### a) Evaluation

*Use all of the evaluation and follow-up techniques described in the Introduction.*

As part of those activities, use these approaches:

- Check the students' understanding of the lesson by giving them an exercise to do independently. The exercise may contain questions and activities such as:
  - How does rapid population growth affect the natural environment in Ethiopia?
  - What are some of the consequences of deforestation in Ethiopia?
  - Explain how rapid population growth in Ethiopia affects the productivity of farmers.
  - Explain how rapid population growth affects the quality of education in Ethiopia.



**b) Follow up**

Rate and grade the various activities and exercises performed by the students. Analyze the results to understand whether or not the lesson has been well-understood, and to identify those students who need extra support.

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

**c) Additional activities for Fast Learners**

1. Explain how rapid population growth affects the provision of health care services.
2. Explain how agricultural activity is affected by rapid population growth.
3. Identify and discuss some of the real problems in your locality that you think are the results of population growth.

## Answers for Activities and Exercises in the Textbook

### Activity 4.21

1. Global Warming refers to increases in the average temperature of Earth's atmosphere, oceans, and landmasses. Scientists believe Earth is currently facing a period of rapid warming brought on by rising levels of heat-trapping gases, known as greenhouse gases, in the atmosphere.
2. Since rapid population growth increases the demands for natural resources, there would be high pressure on the resources, which in turn causes serious environmental degradation including soil erosion, deforestation, pollution, etc.

### Activity 4.22

Some of the indirect consequences of deforestation include:

- Reduced agricultural productivity.
- Reduced socio economic progress.
- Climatic change.

**Activity 4.23**

## Housing

- Growing demand and scarcity of housing.
- Presence of unstandardized houses with very poor qualities.

## Food Supply

- Growing demand and scarcity of food supply
- Lack of adequate food supply because of reduced productivity of farmers caused by soil erosion, climatic change, etc.

## Farmland

- Fragmentation of farmlands
- Over cultivation of farmlands
- Soil erosion

## Education

- Growing demand for educational facilities
- Decline in the quality of education

## Health care

- Growing demand for health care services
- Decline in the quality of health care

## Drought and Famine

- Climatic change because of deforestation, overgrazing, pollution, etc.
- Decline in agricultural productivity because of over cultivation of farm lands

**Answers for Additional Activities**

1. When population grows rapidly, it leads to:
  - High demand for health care services
  - Difficulty of the government in meeting the demands of the people for more health care services.
  - High pressure on the existing health care services that causes deterioration of the quality of the services.
2. When population grows rapidly, it affects agricultural activity due to mainly:
  - The scarcity of farmlands
  - Fragmentation of farmlands
  - Over-cultivation of farmlands
  - High rate of soil erosion
  - High rate of deforestation
  - Over-grazing
3. Instruct your students to identify and discuss some of the problems in their locality that they think are the results of population growth.

## 4.8 POPULATION POLICY OF ETHIOPIA

Period Allotted: 1

### 1. Competencies

*After completing this lesson, the students will be able to:*

- ✚ Adhere to the realization of population policy of Ethiopia.

### 2. Overview

In this lesson, the students will learn the meaning and significance of population policy in general, and the population policy of Ethiopia in particular. First, they will discuss the meaning, importance, and types of population policy. Then, they will consider the population policy of Ethiopia, and its goals, objectives and strategies will be treated in detail.

A population policy is a policy formulated and implemented by a government in response to concerns related to population growth in relation to economic, social, cultural, political, and demographic conditions of the country. It mainly addresses population-related problems in a country. The population policies of countries can broadly be categorized into two *asanti-natalist* and *pro-natalist* policies. An *anti-natalist population policy* is a policy that seeks to lower fertility rates in particular, and the rates of population growth in general. In contrast, a *pro-natalist population policy* is one that seeks to increase fertility rates in particular, and population growth rates in general.

The national population policy of Ethiopia was formulated in 1993 by the Transitional Government of Ethiopia (TGE). The policy was formulated based on an awareness that a large population size and continued rapid population growth in Ethiopia can be antagonistic to development, bringing about economic, social and environmental problems in the country.

In its broad sense, the objective of Ethiopia's population policy is to promote social welfare by harmonizing the rate of population growth and the country's capacity for socio-economic development and rational utilization of natural resources. In addition to this top-level goal, the policy has a number of general and specific objectives, as well as strategies for actualizing the policy. (Refer to the students' textbook.)

### 3. Teaching-learning Process

#### 3.1 Suggested Teaching Aids

- A copy of The Population Policy of Ethiopia

#### 3.2 Suggested Methods of Teaching

- Brainstorming
- Questioning
- Explanation
- Pair and group discussion

#### 3.3 Pre Lesson Preparation

- Get ready in advance with the suggested teaching aid and other reference materials.
- Design the most appropriate teaching methods for the lesson.
- Prepare notes, activities and exercises.

#### 3.4 Lesson Presentation

##### a) Introduction to the Lesson

- Introduce the students to what they are going to learn (Population Policy of Ethiopia)
- Make the objectives of the lesson clear to the students.
- Conduct a brainstorming session with the students to ascertain their background knowledge of the impacts of rapid population growth on the environmental and socio-economic conditions of countries. Ask them questions such as: What is a *population policy*? Why do you think governments and organizations today are emphasizing population planning, especially in developing countries like Ethiopia?

##### b) Main Body of the Lesson

- After considering your students' previous knowledge, start your presentation by defining the two types of population policy and explaining their importance.
- Have the students work in groups to discuss the activity given in their textbook. That activity includes questions such as: Which of the two types of population policies is relevant for addressing population-related problems in Ethiopia and in other similar developing countries of the world? Explain why. What kind of countries, do you think, use a pro-natalist population policy? Explain why.
- Give a brief description of the population policy of Ethiopia, its goals, objectives and strategies. Then, have the students work in groups to discuss the following

question and write a short essay on it. What are your responsibilities and roles in the implementation of Ethiopia's population policy?

- Make sure that all students are involved in group activities and in the entire teaching-learning process.
- Give the students enough time to ask questions and organize their notes.

### c) **Stabilization**

- Review the main ideas and concepts of the lesson. Concentrate on the facts below.
  - There are two types of population policies. They are: *anti-natalist* and *pro-natalist*.
  - Ethiopia uses an anti-natalist population policy that promotes the reduction of fertility within the country.
  - The broad goal of Ethiopia's population policy is to promote social welfare by harmonizing the rate of population growth and the country's capacity for socio-economic development and rational utilization of natural resources.
  - One of the objectives of Ethiopia's population policy is to close the gap between high population growth and low economic productivity by way of a planned reduction of population growth, and a planned increase in economic returns.
  - The population policy of Ethiopia takes into account the facts that existing delivery systems in reproductive health services are limited in scope and that the choice of family planning methods is also limited.

## **3.6 Evaluation and Follow up**

### a) **Evaluation**

*Use all of the evaluation and follow-up techniques described in the Introduction.*  
As part of those activities, use these approaches:

- Check the students' understanding of the lesson by giving them an exercise to do independently. The exercise may contain questions and activities such as the following:
  - Explain the difference between anti-natalist and pro-natalist population policies.
  - Why does Ethiopia use an anti-natalist population policy?
  - What is the broad goal of Ethiopia's population policy?
  - Mention some of the specific objectives of the population policy of Ethiopia.

**b) Follow up**

Rate and grade the various activities and exercises performed by the students. Analyze the results to understand whether or not the lesson has been well-understood, and to identify weaker students to whom you want to give extra support.

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

**c) Additional activities for Fast Learners**

1. Discuss why anti-natalist population policy is used in Ethiopia.
2. What is the goal of Ethiopia's population policy?
3. Describe some of the objectives of Ethiopia's population policy.

## Answers for Activities and Exercises in the Textbook

### Activity 4.24

- The type of population policy appropriate to the context of Ethiopia is anti-natalist. This is because the major problem of population in Ethiopia is high rate of fertility and this policy addresses this problem.
- Those economically advanced countries are the one that mostly use pro-natalist policy.

### Activity 4.25

Some of your responsibilities and roles in the realization of Ethiopia's population policy are:

- Knowing about family planning services
- Educating others to limit their family size by using family planning services

## Answers for Additional Activities

1. It is because Ethiopia's population has been growing very rapidly, it has to be controlled before it becomes beyond the capacity of the resources and the economy to support it. Therefore, the kind of population policy that is designed to reduce fertility rates is the one which is appropriate to the current context of Ethiopia's population.

2. The major goal of Ethiopia's population policy is to promote social welfare by harmonizing the rate of population growth and the country's capacity for socio-economic development and the rational utilization of natural resources..
3. Some of the objectives of Ethiopia's population policy are:
  - Closing the gap between high population growth and low economic productivity
  - Ensuring environmental protections
  - Reducing morbidity and mortality
  - Reducing the rate of rural-to-urban migration
  - Reducing fertility rates such as TFR and CBR
  - Expanding the provision of family planning services
  - Improving the social and economic status of women.

## 4.9 URBANIZATION IN ETHIOPIA

Period Allotted: 2

### 1. Competencies

*After completing this lesson, the students will be able to:*

- ✚ Compare rate of urbanization in Ethiopia in regional level.

### 2. Contents

- 4.9.1 The Concept of Urbanization
- 4.9.2 Trends of Urbanization in Ethiopia

### 3. Overview

In this lesson, the students will learn the concept of *urbanization* and its characteristics in Ethiopia. *Urbanization* is a process of population shift from rural areas to cities, and the resulting growth of urban areas. It is a process whereby a large number of people leave countryside/rural places and small towns in order to settle in cities and surrounding metropolitan/urban areas. A country is said to be more urbanized as its cities grow in number, urban populations increase in size, and the proportion of its urban population rises.

The definition of an *urban area*, as distinguished from a rural area, differs from country to country. The major criteria used in Ethiopia to define an urban area are the following.

- a. The settlement should have a minimum of 2000 people.
- b. Two-thirds of the population in the settlement should be engaged in non-agricultural activities

- c. The settlement should have a chartered municipality.

In Ethiopia, urbanization is a recent phenomenon that began in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries. Peoples' need for better living conditions has been the major cause for the origin, growth and development of many of the urban centers in the country. Many rural people have been motivated to move and settle in urban places for reasons of relatively greater concentrations of social services, industries, and employment opportunities.

In spite of the high rate of rural-urban migration in Ethiopia, the level of urbanization has been very low in the country. Earlier estimates (those of the 1940's) show that less than 3 percent of Ethiopia's population lived in urban areas. This figure increased to about 8.5 percent in 1967 and 9.7 percent in 1970. The three censuses of the country indicate that the percentage of urban population was 10.6 percent in 1984, 13.7 percent in 1994, and 16.1 percent in 2007.

In Ethiopia, there is regional variation in the distribution of urban population. According to the results of the 2007 Census, the disparity in the proportion of urban population by region is very large, ranging from 10 percent in SNNP to 100 percent in Addis Ababa. Despite the fact that the Addis Ababa City Administration is entirely urban, its percentage share of the total urban population of Ethiopia is only 23.1 percent. The largest share, about 28 percent of the country's urban population, is living in the Oromiya Region. In contrast, the Gambela Region has the smallest share of the country's urban population, though more than one-fourth of its population resides in urban areas.

## **4. Teaching-learning Process**

### **4.1 Suggested Teaching Aids**

- Census and survey reports
- Tables and charts that show the rate of urbanization and its regional differences in Ethiopia
- Maps that show the distribution of urban centers in Ethiopia
- Historical notes on the origin and development of urbanization in Ethiopia

### **4.2 Suggested Methods of Teaching**

- Brainstorming
- Questioning
- Explanation
- Pair and group discussion



### 4.3 Pre Lesson Preparation

- Get ready in advance with the suggested teaching aids and other reference materials such as maps, statistical data, and tables and charts related to urbanization in Ethiopia.
- Design the most appropriate teaching methods for the lesson.
- Prepare notes, activities and exercises.

### 4.4 Lesson Presentation

#### a) Introduction to the Lesson

- Introduce the students to what they are going to learn (Urbanization in Ethiopia)
- Make the objectives of the lesson clear to the students.
- Conduct a brainstorming session with the students to ascertain their background knowledge of the concept of urbanization. Ask them questions such as: What is *urbanization*? Why does the level of urbanization vary between and within countries?

#### b) Main Body of the Lesson

- After considering your students' previous knowledge, start your presentation with an explanation of the basic concepts of urbanization: its definition, causes, and consequences, and the variation in urbanization between developed and developing countries.
- Have the students form small groups. Instruct them to collect information and prepare a short essay on the origin and development of urbanization in Ethiopia. Then, have them present their findings to the class.
- Explain more about Ethiopia's rate of urbanization and regional variations in urbanization. Use maps and statistical data presented in tables and charts to strengthen the students' understanding.
- Have the students do the activity from their textbook.
- Make sure that all students are involved in group activities and in the entire teaching-learning process.
- Give the students enough time to ask questions and organize notes.

#### c) Stabilization

- Review the main ideas and concepts of the lesson. Emphasize the following points.
  - *Urbanization* is the process of population shifts from rural areas to cities, and the resulting growth of urban areas.
  - A country is said to be more urbanized as its cities grow in number and its urban populations increase in size.
  - The definition of an urban area differs from country to country.

- In Ethiopia, urbanization is a recent phenomenon which began in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries.
- Despite a high rate of rural-urban migration in Ethiopia, the level of its urbanization has been very low.
- In Ethiopia, there is regional variation in the distribution of urban populations. The Oromiya region has the largest share of Ethiopia's urban population, while the Gambela Region has the smallest share.

## 4.5 Evaluation and Follow up

### a) Evaluation

*Use all of the evaluation and follow-up techniques described in the Introduction.*

As part of those activities, use these approaches:

- Check the students' understanding of the lesson by giving them an exercise to do independently. The exercise may contain questions such as:
  - What is *urbanization*?
  - What are the criteria used to define an urban area in Ethiopia?
  - What are some of the problems related to the rapid growth of urban populations in cities like Addis Ababa?
  - Which regions of Ethiopia have the largest and smallest share of the country's urban population?

### b) Follow up

Rate and grade the various activities and exercises performed by the students. Analyze the results to understand whether or not the lesson has been well-understood, and to identify weaker students so that you can give them further assistance.

Based on these and other *evaluations you have performed for the lesson*, assess each student and also the class as a whole. Decide whether you have succeeded in guiding them to meet the *lesson objectives*.

Then encourage all students (for example, individually and in groups) and assign extra work to each student as needed. For below-average students, provide exercises and activities to help them meet the minimum competencies. For above-average students, provide work that will stimulate their further advancement and eliminate any possible complacency. For average students, assign work you think appropriate.

### c) Additional Activities for Fast Learners

1. Explain the concept of urbanization.
2. Describe the history of urbanization in Ethiopia.
3. Enumerate the three most urbanized and least urbanized regions of Ethiopia.
4. Discuss the consequences of high rate of urbanization in Addis Ababa.

## Answers for Activities and Exercises in the Textbook

### Activity 4.26

1. SNNPR, Amhara and Oromiya are the three least urbanized regions in Ethiopia.
2. Gambella, Harari and Benishanguul are the three regions with the smallest number of urban population in Ethiopia. The reasons for this are the less number of population with in this three regions as compared to the other regions of the country.

## Answers for Additional Activities

1. Urbanization is a concept which refers to the expansion and growth of the number of urban settlements such as cities and towns and growth in the number of urban population. It is a condition resulted mainly from the shift of more people from rural to urban areas.
2. The history of urbanization in Ethiopia begun in the early 20<sup>th</sup> century with the emergence of infrastructural, industrial, other developments during especially the five years Italian occupation. In the country, the level and rate of urbanization has been increasing due to mainly the movement of people from rural to urban areas of the country looking for better employment, education, health care, etc opportunities. However, until now, the level of urbanization and the number of urban population in the country is very low as compared to the level in some other developed countries.
3. The three most urbanized regions in Ethiopia are Addis Ababa, Dire Dawa , and Harari, while SNNPR, Amhara and Oromiya are the three least urbanized regions in the country.
4. High rate of urbanization in Addis Ababa would have the following consequences.
  - Scarcity of housing
  - High level of air and water pollution
  - Scarcity of transport facilities
  - High pressure on social services such as education, health care, etc
  - High rate of unemployment
  - High rate of crime and lawlessness

## Answers for the Unit Review Exercise

### I. True or False

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

### II. Multiple Choice

6. C      7. B      8. E      9. E      10. A

### III. Matching

11. D      12. F      13. C      14. A      15. G

### IV. Fill in the blank spaces

16. Urbanization  
17. Maternal death  
18. 4.2 children per woman  
19. Low or sparse  
20. Oromiya

### V. Short Answers

21. Early marriage, high infant and child mortality rates, high social and economic value of children, a low level of family planning practices, etc.
22. Because they have unfavorable natural conditions for settling and for cultivating crops. The high temperature, scarcity of rainfall, disease-causing insects, etc. are some of the unfavorable conditions in the lowlands of Ethiopia.
23. It is mainly because of the country's very large young population, aged between 0 and 14.
24. The major goal of Ethiopia's population policy is to promote social welfare by harmonizing the rate of population growth and the country's capacity for socio-economic development and rational utilization of natural resources.



## Assessment

Students' performance has to be assessed continuously over the whole unit. The assessment will be made by comparing students' performance with the specified level of competencies. Besides, the teacher has to recognize the level of performance of each student and provide assistance accordingly, Thus

- A student at a minimum requirement level will be able to analyse Malthusian and anti-Malthusian population theories; explain trends of population of growth and structure in Ethiopia and compare fertility and mortality rate from given data; discuss the spatial distribution of population in Ethiopia and state factors affecting population distribution in Ethiopia. Realize settlement patterns of Ethiopian population and analyse impacts of rapid population growth on natural environment and socio-economic development of Ethiopia. Adhere to the realization of population policy of Ethiopia and compare rate of urbanization in Ethiopia in regional level.
- In addition, a student working above the minimum requirement level and considered as higher achiever should be able to: evaluate why countries select Malthusian or anti-Malthusian population theories, compare and contrast population pyramids of different levels of development, compute population growth rates, and justify Ethiopia's rate of urbanization and development.
- Students working below a minimum requirement level will require extra help if they are to catch up with the rest of the class.
- Students reaching at the minimum requirement level but achieved a little bit higher should be supported so that attain the higher achiever competencies students who fulfil the higher achiever competencies also need special support to contribute and achieve more.

# Unit 5

## ECONOMIC GROWTH AND DEVELOPMENT TREND IN ETHIOPIA

Total Periods Allotted: 10

### 1. Unit Introduction

Although Ethiopia's economic growth and development has not seen satisfactory for more than half a century, recent policy measures and actions taken indicate forward growth. Growth and development are being recorded in literacy rate, expansion of schools both in urban and rural areas gross domestic product, etc.

### 2. Unit Outcomes

*After this unit, students will be able to:*

- *Realize economic growth, development trend, major features and present socio-economic development and its indicators;*
- *Analyze the challenges and prospects of socio-economic development for Ethiopia;*
- *Appreciate the economic relation with its neighboring countries and other continents; and*
- *Recognize plan for accelerated and sustainable development to end poverty (PASDEP) as guiding document for development of Ethiopia.*

### 3. Main Contents

- 5.1 **An Overview of Growth and Development trend in Ethiopia**
- 5.2 **Major features of Ethiopian economy**
- 5.3 **Present features of Ethiopian socio-economic development**
- 5.4 **Challenges and prospects of socio-economic development for Ethiopia**
- 5.5 **Economic relation**
- 5.6 **PASDEP (plan for Accelerated and Sustained Development to End Poverty)**

## 5.1 AN OVERVIEW OF GROWTH AND DEVELOPMENT TREND IN ETHIOPIA

Periods Allotted: 1

### 1. Competencies

*After completing this lesson students will be able to:*

- ✚ discuss economic growth and development trend in Ethiopia.

### 2. Overview

The two concepts or economic categories-growth and development seem to be the same. But they are not. Economic growth is simply the quantitative accumulation of national capital. It does not regard the society's betterment in economic, cultural, political, environmental aspects. On the contrary, economic development is a broader and complex concept that considers the nation's improvement or change in living standards and altitudes.

### 3. Teaching-learning Process

#### 3.1 Suggested Teaching Aids

- Quite a number of articles and reports made by the Ethiopian Economic Association and Government documents are necessary to be over-looked.
- Additional sources such as Internet, magazines, etc can be referred.

#### 3.2 Suggested Teaching Methods

- Brain storming
- Reorganizing the ideas forwarded during brain storming and giving explanation
- Organize groups to collect data
- Conduct discussion based on the collected data and supply well integrated notes.

#### 3.3 Pre-lesson Preparation

- Collect and organize the necessary information from that and other sources
- Make a break-down of your daily and weekly less plan.
- Prepare relevant teaching aids so that you can employ it automatically during the lesson.



### 3.4 Presentation of the Lesson

#### a) Introduction of the lesson

- Before you start the lesson, motivate the students towards the topic
- Then, forward powerful questions that will create awareness and concern to the lesson.

For example:- Do you know what economic growth mean? What is its difference from development? Etc

#### b) Body of the lesson

- Explain and show whether economic growth and developments are different categories in essence and scope.
- Make sure that the students have realized the forward growth and development trends so far achieved in Ethiopia.
- Give chances for discussions and documentation.

#### c) Stabilization

Complete your presentation with a review of the following points.

- Economic growth is a quantitative change in the national capital regardless of political, economic, cultural and other improvements.
- Development is a process involving economic as well as social, political, cultural, and environmental changes.
- Development is the transformation of the entire quality of life of a whole society.
- The recent trends of Ethiopian economy have shown that the economy has been growing forward at the rate of 11% per annum.
- In rural areas of Ethiopia, the literacy rate increased from 18% in 1995/96 to 31% in 2004/05.

### 3.5 Evaluation and Follow up

#### a) Evaluation

- Ask questions to check whether the students have understood or not.
- Give assignments so that the students will produce reports referring the activity they are assigned for
- Prepare a quiz.

#### b) Follow up

- Appreciate students responses to the forwarded questions.
- Give bonus marks for those who have responded correctly.

- Give values record to the expected responses
- Comment the strengths and weakness of students observed during the teaching-learning process of this particular lesson.

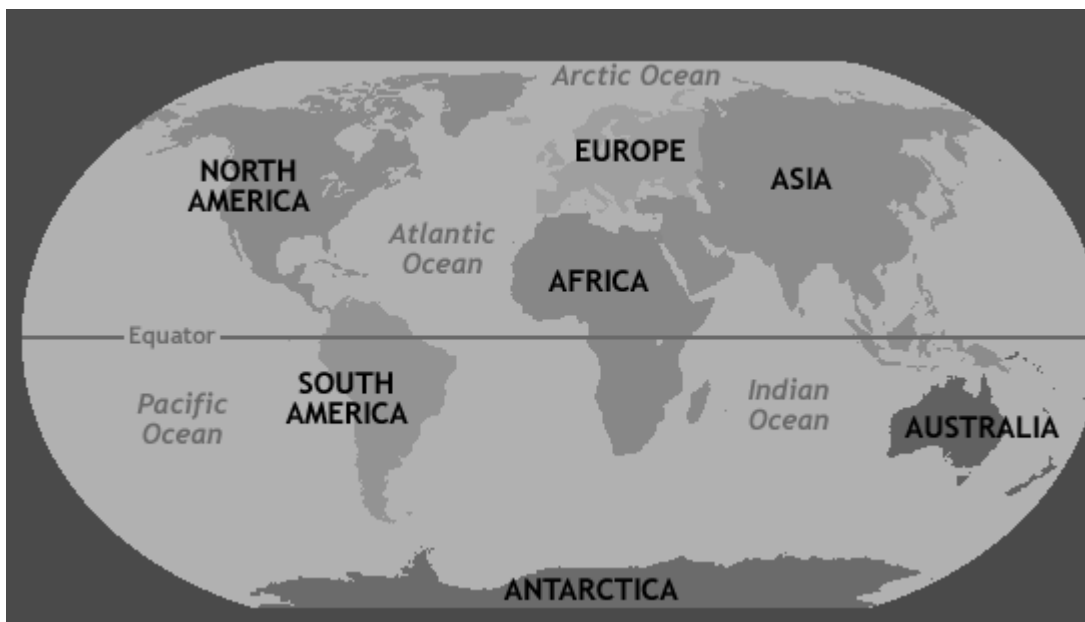
**c) Additional Activities for Fast Learners**

1. Discuss the differences between economic development and growth.
2. State the indicators of economic development and economic growth.
3. Mention the aspects of the Ethiopian economy that indicate economic growth as well as economic development in the country.

## Answers for Activities and Exercises in the Textbook

### Activity 5.2

1. The continents considered developed are North America, Europe and Australia. The continents considered developing are Africa, Latin America and Asia.



2. Developed countries: USA, Canada, France, Russia, Japan

Developing countries: Haiti, Senegal, Ethiopia, Bangladesh, India

### Exercise 5.1

1. Give examples that express growth
  - Increase of agricultural outputs
  - Increase of industrial outputs
  - Increase of export earning, etc.

2. Give aspects that explain or show economic development
  - Percentage of population having access to clean water
  - Consumption of calories per head per day
  - Percentage of population having access to health services
  - Percentage of literate people
  - Life expectancy
  - GNP per capita income, etc.

## **Answers for Additional Activities**

1. Economic growth is indicated quantitatively in terms of the increase in agricultural outputs, industrial outputs, export earnings, etc. In contrast, economic development is indicated qualitatively with the entire quality of life of the people which is expressed in terms of their access to quality education, health care services, housing, etc as well as their ability to live in a way that their basic rights and freedoms are protected.

2. Some of the indicators of economic growth are:

- Increase of agricultural outputs
- Increase of industrial outputs
- Increase of export earnings
- Increase in the level of social services such as transport, education, health care, housing, etc.

Some of the indicators of economic development are:

- Infrastructural development
- Increasing life expectancy
- Declining population growth rate
- Increasing GDP per capita
- Better access to social services
- Better employment opportunities
- Declining rate of illiteracy
- Declining rate of infant, child, and material mortality.
- Better condition of social, economic and political freedom.

4. Some of them are:

- Increasing level of transport infrastructural development.
- Improvement in the peoples' access to education and health care services due to the growing number of schools, hospitals, clinics, etc.
- Declining rate of illiteracy
- Increasing level of agricultural and industrial outputs.
- Increasing level of export earnings
- Improvement in the peoples' access to fresh water supply and electricity.

## 5.2 Major Features of Ethiopian Economy

Periods Allotted: 1

### 1. Competencies

*After completing this lesson, students will be expected to:*

- ✚ *Characterize the major features of Ethiopian economy;*
- ✚ *Reflect the links among different economic sectors of Ethiopia.*

### 2. Overview

By treating the performance of the major economic activities in Ethiopia, major features are treated briefly because of the limited number of periods assigned.

The agricultural sector in Ethiopia is the leading sector in many aspects. It contributes the highest share to the country's DGP, employs the created labour force, earns the highest percentage of export earnings, etc. The service sector follows contributing 39.2% of the country's GDP in the year 2005/06. Among the three sectors faster growth is being performed by the service sector.

The current development strategy adopted is the preordination of agriculture and support the sector to generate growth and form backward and forward linkage with the industrial sector.

### 3. Teaching-learning Process

#### 3.1 Suggested Teaching Aids

- The text itself, official reports and professional reports like EEA bulletins are very helpful.

#### 3.2 Suggested Teaching Methods

- Brainstorming
- Integrating the ideas made during brainstorming
- Use diagrams
- Make discussion and then
- Documentation (giving notes)
- Organize groups so that the students will participate in gathering information.

### 3.3 Pre-lesson Preparation

This task involves the preparation of texts; break down of the weekly and daily lesson plan. It also involves the formulation of techniques how to deliver the lesson and organize the note.

### 3.4 Presentation of the Lesson

#### a) Introduction of the lesson

- Motivate the class so that your lesson will be interesting.
- You can use what, how and why questions to develop active participation in the class.

#### b) Body of the lesson

- Explain briefly about the dominant failures of the Ethiopian economy and how the various sectors or features are linked.
- Apply very simple local examples to show the links.

#### c) Stabilization

- The major sectors of the Ethiopian economy are agriculture, industry and service.
- The agricultural sector is the dominant sector of the Ethiopian economy that accounts almost half of the GDP followed by the service and industrial sectors respectively.

### 3.5 Evaluation and Follow up

#### a) Evaluation

- Ask questions
- Check the group work
- Give a quiz

#### b) Follow up

- Rate the students according to the proper answers forwarded
- Rate every activity
- Comment on the rating

#### c) Additional Activities for Fast Learners

1. Discuss why agriculture becomes the main stay of the Ethiopian economy.
2. Select two economic sectors in Ethiopia and show their forward and backward linkages.
3. Discuss then goals and objectives of ADLI strategy in Ethiopia.

## Answers for Activities and Exercises in the Textbook

### Activity 5.3

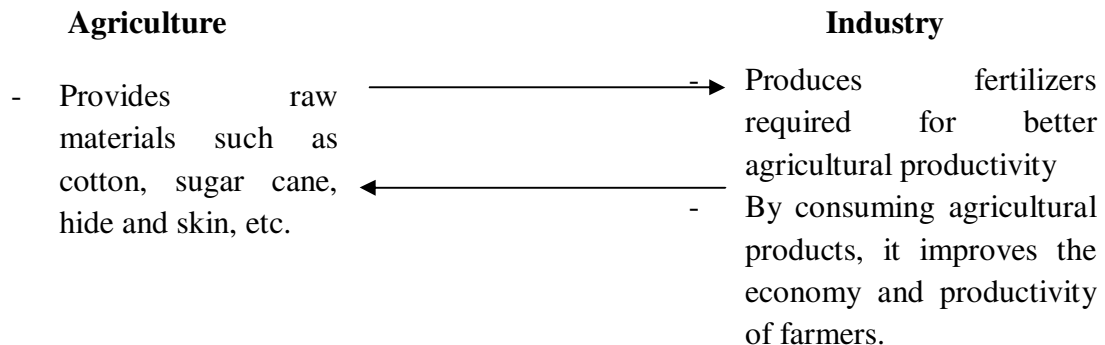
It is an activity that needs to be done based on information collected from their own local area. Therefore, instruct and help them to do all the required activities appropriately.

### Exercise 5.2

1. Agriculture and allied activities, service/distributive sector, and industrial sector.
2. Construction, large scale and medium scale industries, small scale and handicraft industries, electricity and water, and mining and quarrying.
3. It is because of the concentration of small scale or light industries within the countries.
4. Developing the other sectors of the economy of the country to support the growth and expansion of heavy industries, development in science and technology, using labour intensive industrial technology, etc

## Answers for Additional Activities

1. It is because agriculture is the major source of food for the people, raw materials for industries and export items. In addition, it is an activity that supports more than 80% of the country's labour force and holds the lion share of the GDP of the country.
2. For example, we can see the relationship between the agricultural and industrial sectors of the country's economy.



3. The goals of ADLI strategy in Ethiopia are:
  - Improving the linkage between the agricultural and industrial sectors of the economy
  - Using the agricultural sector as a spring board towards the development of industrialization.
  - Ensuring food security and self – sufficiency.

The major objectives of ADLI are:

- Improving agricultural productivity
- Improving farmers' access to fertilizers.
- Assisting farmers with extensional services
- Expanding financial institutions that help to improve the financial status of local farmers.
- Expanding the development of transport infrastructure throughout the country.

## 5.3 PRESENT FEATURES OF ETHIOPIAN SOCIO-ECONOMIC DEVELOPMENT

Periods Allotted: 2

### 1. Competencies

*After completing this lesson, students will able to:*

- ⚡ *Reflect links among different economic sectors of Ethiopia;*
- ⚡ *Generalize the present features of Ethiopian socio-economic development;*
- ⚡ *Analyze indicators of development in the Ethiopian context.*

### 2. Contents

- Indicators of development

### 3. Overview

Generally speaking, Ethiopia is identified as one of the less developed countries based on the socio-economic development indicators accepted at international level. The most recent development strategy, Growth and Transformation programme, which is the third phase of poverty eradication strategy is being launched to alleviate the problem.

### 4. Teaching-learning Process

#### 4.1 Suggested Teaching Aids

- World Bank reports, PASDEP document, Quarterly reports of professional associations like EEA and Encarta 2009 with the text brood are very supporting references.

## 4.2 Suggested Teaching Methods

- Allow or invite students to say the information they had water to related to socio-economic development.
- Open a discussion
- Organize the ideas
- Try to apply local examples
- Provide an organize note

## 4.3 Pre-lesson Preparation

- Search and organize relevant and current data.
- Make a breakdown of your weekly and daily less plan to produce an interesting and comprehensible lesson.
- Lest down the most accessible resources or references that should be read by the students.
- Schedule your grading/rating system.

## 4.4 Presentation of the Lesson

### a) Introduction of the lesson

- Select and forward motivating technique. i.e either ask questions or inject local versions that reflect the topic.

### b) Body of the lesson

- Make a thorough discussion on the indicators so that they could be able to generalize Ethiopia's socio-economic development status.

### c) Stabilization

Complete your lesson presentation with a review of the following key points.

- The most widely used indicators used to measure the level of development are GDP per capita, illiteracy rate, infant mortality rate, life expectancy, population growth rate, infrastructural development, etc.
- Ethiopia's GDP per capita is one of the lowest in the world but it has been growing since recently and the country will expected to join the middle income countries within the next five years (2010-215)

## 4.5 Evaluation and Follow up

### a) Evaluation

- Give grades or scores according to your schedule.
- Disclose the grades to your students so that the weaker ones will be aware of their status
- Appreciate high achievers



**b) Follow up**

- Rate the students according to the proper answers forwarded
- Rate every activity
- Comment on the rating

**c) Additional Activities for Fast Learners**

1. State the indicators of development in the context of Ethiopia.
2. Evaluate the present features of the Ethiopian socio-economic development.

## Answers for Activities and Exercises in the Textbook

### Exercise 5.3

1. What is the basic difference between GDP and GNP? GDP is the total sum of goods and services produced in a country in a given year while GNP is more than GDP by Net factor Income (the difference in value between exports and imports.  

$$\text{GNP} = \text{GDP} + \text{NFI}$$
2. Life expectancy is the result of various social and economic services available. They have positive relationship. When social and economic services develop, life expectancy of the citizens rise.
3. The major strategic measures are:
  - In education, informal community-based schools and teaching arrangements are being made.
  - Special programs with improved veterinary services.
  - Marketing and early warning systems.
  - Water points are being developed adjacent to range lands for dry season utilization.
  - Small scale irrigation projects.

## Answers for Additional Activities

1. The major indicators are:
  - Improved access of people to social services such as education, health care, transportation, etc.
  - Improved access of people to fresh water supply and electricity
  - Declining rates of illiteracy, infant mortality, child mortality, maternal mortality, etc
  - Better access to information and communication services
  - Increasing rate of females' educational enrolment.

2. The current economic and social development conditions seem to be better than the conditions prevailed the past. Since recently, it has been observed that there have been improvements in the various dimensions of the economic and social sectors such as agriculture, industry, education, health, transportation, foreign trade, etc. If the current economic growth rate sustains, the economic development will clearly be seen in the improvements of quality of lives of the people of the country.

## 5.4 CHALLENGES AND PROSPECTS OF SOCIO-ECONOMIC DEVELOPMENT FOR ETHIOPIA

Periods Allotted: 2

### 1. Competencies

*After completing this lesson, students will be able to:*

- ± *Predict the challenges and prospects of socio-economic development for Ethiopia.*

### 2. Overview

It is apparent that Ethiopia is one of the less developed countries where poverty is prevailing. The attempts made for the last fifty years to alleviate poverty have not become successful. Still income poverty is wide spread, 31 million people are below the poverty line and every year between 6 and 13 million are at risk of starvation. This demands a clarion call to end the pain-poverty.

Starting from 2002, a strategy that pursues the preconsolidation of the agricultural sector has been adopted first to score faster growth and gradually achieve sustainable development.

### 3. Teaching-learning Process

#### 3.1 Suggested Teaching Aids

- World bank reports, Review papers,
- Government sartorial department reports
- GSA, 2006-2010, etc are helpful reference.
- Pictures, data, etc are vital teaching and

#### 3.2 Suggested Teaching Methods

- Brain-storming
- Discussion
- Reinforcing questions
- Documentation
- Group work activity

### 3.3 Pre-lesson Preparation

- Collect and synchronize the necessary inputs to the lesson
- Arrange the teaching aids and references in sequential order relevant to the topic
- Make a breakdown of the teaching-learning activities period-wise.

### 3.4 Presentation of the Lesson

#### a) Introduction of the lesson

- Before you start the lesson, motivate or draw the attention of your students.
- Then, allow the students to forward their views or ideas they have beforehand.
- Deliver the lesson with explanation documentation.

#### b) Body of the lesson

- The students shall realize the prevailing challenges and future prospect of the countries socio-economic development.
- Core ideas and concepts of the lesson should be discussed clearly.
- Relevant local examples shall be identified for clarification.

#### c) Stabilization

The major challenges for the sustainability of the improvements in the economy of Ethiopia are:

- Rapid population growth
- Land fragmentation Environmental degradation
- Very low productivity
- Low level of investment
- High rate of unemployment
- Low infrastructural coverage, etc.

### 3.5 Evaluation and Follow up

#### a) Evaluation

- Ask questions relevant to the topic
- Give assignment and group work
- Rate the works
- Identify the different level achieves

**b) Follow up**

- Give grades or scores according to your schedule.
- Disclose the grades to your students so that the weaker ones will be aware of their status
- Appreciate high achievers

**c) Additional Activities for Fast Learners**

1. State the major challenges of economic growth and development in Ethiopia.
2. Explain how the following influence the economy of Ethiopia.
  - a. Environmental degradation
  - b. Rapid population growth
3. State some of the possible solutions for the challenges of economic development in Ethiopia.

## Answers for Activities and Exercises in the Textbook

### Exercise 5.4

1. Rapid population growth ---- increase of demand for more farmland, more fuel wood supply, more social services---- excessive use of resources----environmental degradation
2. Reduces the dependence on one item.  
Reduces the crises of fluctuation of world market prices  
Promotes better opportunities for farmers to raise their incomes, etc
3. Educating people mean orienting people with better skills, new technology and systems. When people are educated they become efficient and more productive.  
This is capacity building.
4. About 8% per annum.

### Activity 5.5

It is a local-based activity that students are required to gather information about the challenges to economic growth and development in their own area. Then, predict the possible prospects for overcoming challenges. Therefore, instruct and help them to do all the required activities appropriately.

## Answers for Additional Activities

1. The major challenges of economic growth and development in Ethiopia are:
  - Rapid population growth
  - Environmental degradation

- Land fragmentation
  - Very low productivity
  - Low income
  - Low levels of investment
  - Dependence on unreliable rainfall
  - Low infrastructural coverage
2. Environmental degradation would have serious impact on the economy since the main stay of Ethiopian economy is agriculture, declining in the productivity of the agricultural sector mainly due to climatic change and soil erosion will critically affect the economy of the country.
- Rapid population growth would also affect the economy of the country due to:
- The growing demand of people for more social services such as schools, hospitals, clinics, housing, etc.
  - The declining productivity of the agricultural sector because of the scarcity of farmlands, fragmentation of farmlands, over cultivation of farmlands, high rate of soil erosion, etc.
  - The growing demand of people for fresh water supply, electricity, transportation, employment opportunities, etc.
3. Some of the possible solutions are:
- Educating the people to build their capacity.
  - Proper utilization of agricultural potential
  - Expansion of exports
  - Promotion of better links between markets and producers
  - Slowing the existing rapid population growth
  - Proper utilization of the potential of women

## 5.5 ECONOMIC RELATION

Periods Allotted: 2

### 1. Competencies

*After completing this lesson students will be able to:*

- ✚ *Show appreciation for economic relations of Ethiopia with its neighboring and other continents.*

## 2. Contents

- With neighboring countries
- With other continents

## 3. Overview

Geographical and political factors influence establishment of economic relations among countries Ethiopia's economic relations with its neighbouring and other countries have been influenced by the same factors. Among the neighbouring factors; its relations with the republic of Djibouti has been very strong due to geographical factor. Recent relations are being strengthened with the Republic of Sudan.

Regarding the economic relation with distant countries Germany appears to be the leading export partner followed by China, Japan and Saudi Arabia. In terms of import sources Middle East and Asia countries take the lead followed by European countries.

## 4. Teaching-learning Process

### 4.1 Suggested Teaching Aids

- Charts,
- Annual reports of CSA, and
- Sectoral reports are preferred teaching aids and references.

### 4.2 Suggested Teaching Methods

- Brainstorming related to the lesson
- Open discussion to organize the views forwarded during brainstorming.
- Provide notes and group works that explain the comparative advantage of Ethiopia over the neighboring countries to promote its economic relations.

### 4.3 Pre-lesson Preparation

- Select the appropriate thing map variant.
- Organize or systematize your less period-wise.
- Set the various activities to be employed during and after the lesson.

### 4.4 Presentation of the Lesson

#### a) Introduction of the lesson

- Before you start the lesson motivate the students to enhance their learning interests
- Write the topic on the board and give chances to your students so that they can forward their opinions.

**b) Body of the lesson**

- The core idea of the lesson should be discussed taking more time.
- Ask students to comment on the existing economic relations of Ethiopia on the neighboring countries and others.
- Give them chances to forward question for more explanation.

**c) Stabilization**

- Many geographical, economic and political factors determine the relationships between countries.
- Ethiopia has a long standing economic relationship with its different neighbours.
- Due to the unhealthy political relationship with Eritrea, economic relationships are minor.
- Due to political instability prevailing in Somalia, economic relationships are also minor

**4.5 Evaluation and Follow up****a) Evaluation**

You can apply different means of evaluation. For instance; forwarding powerful questions like what, why and how.

**b) Follow up**

- You should record and rate (assign scores) for the responses the students make.
- Watch carefully the slow learners and fast learners. Design a supporting means to slow learners.

**c) Additional Activities for Fast Learners**

1. Why do countries make economic relationships among each other?
2. Discuss the economic relations exist between Ethiopia and countries of the other continents.

**Answers for Activities and Exercises in the Textbook****Activity 5.6**

Cut flowers, citrus fruits, canned meat, animal products, tea, coffee, etc

**Exercise 5.5**

1. Djibouti
2. Germany
3. Middle East, Gulf States, Western Europe, USA, etc

## Answers for Additional Activities

1. Many geographical and political factors drive countries to establish economic relationship with other countries, including the following.
  - Geographic factors, such as physiographic variation that result in product variation
  - Political factors such as political affiliations due to temporary or permanent common interests
  - Economic factors such as comparative advantages
2. Ethiopia has strong economic relations with different countries of Europe, Far East, and North America, in addition to the countries of Africa. The major trade destinations are Germany, China, Japan, Saudi Arabia, Djibouti, Italy and USA. The country exports to these countries various agricultural products such as coffee, hides and skin, pulses, etc. In addition, it also imports various manufacturing products from various countries of the world.

## 5.6 PASDEP (PLAN FOR ACCELERATED AND SUSTAINED DEVELOPMENT TO END POVERTY)

Periods Allotted: 2

### 1. Competencies

*After completing this lesson students will be able to:*

- ± *show interests for the realization of PASDEP.*

### 2. Overview

PASDEP is a developmental strategic document that covered the period between 2005-2010. It is the continuation of SDPRP (Sustainable Development and Poverty Reduction Programme). It carried important strategic direction pursued under SDPRP. To fulfil its target, PASDEP had faced less support from the donors as expected, poor rainfall and the world-wide global crises that swept the whole world. Its unleashed targets and aims are being conducted by Growth and Transformation programme that is going to take place within the coming five years (2010-2015).

### 3. Teaching-learning Process

#### 3.1 Suggested Teaching Aids

- Brochures
- Sectorial department reports, etc are important references and teaching aids.



### 3.2 Suggested Teaching Methods

- Brain storming
- Discussion on what are forwarded during brain storming
- Reorganize the ideas and provide integrated note.

### 3.3 Pre-lesson Preparation

- Collect and organize the necessary information and rate.
- Make a breakdown of your daily and weekly lesson plan
- Prepare relevant teaching aids

### 3.4 Presentation of the lesson

#### a) Introduction of the lesson

- Motivate the students by asking questions and raising issues related to planning objectives.
- Give clues related to the lesson and invite your students to forward experience related to local planning performances

Example – It there any change in the expansion of infrastructural services?

#### b) Body of the lesson

- Explain thoroughly what PASDEP is its, target and accomplishments
- Mention about GTP which is the continuation of PASDEP.
- Assign students to write a report on the distinction between the development plans launched before and after 1991.

#### c) Stabilization

Complete your presentation with a review of key ideas of the lesson such as:

- PASDEP is a document that describes the Plan for Accelerated and Sustained Development to End Poverty.
- PASDEP carries forward important strategies related to human development, rural development, food security and capacity building.

### 4.5 Evaluation and Follow up

#### a) Evaluation

- Check the assignments given and grade them to realize how much your students are interested and appreciated the lesson.
- Give a list or a quiz.

**b) Follow up**

- Identify the students who are able to make appreciation and are not able to do.
- Descries with those who are not able
- Try to identify the problem
- Take immediate correction and collect feed-back.

**c) Additional Activities**

1. Describe the major activities upon which the PASDEP is based.
2. Discuss the need for PASDEP.

**Answers for Additional Activities**

1. The PASDEP program is based on the following nine activities.
  - A massive push to accelerated growth
  - Focusing on Ethiopia's very different agro-ecological area
  - A renewed look at several-urban linkages and the urban agenda.
  - Unleashing the potential of Ethiopian women.
  - Strengthening infrastructural development of the country
  - Managing risk and volatility
  - Reaching the MDGs
  - Creating jobs
2. PASDEP is generally needed to alleviate poverty and bring about sustainable economic development. In particular it is needed to promote human development, rural development, food security, and capacity building.

**Answers for the Unit Review Exercises****I. True or False**

1. F    2. T                    3. T    4. F                    5. T

**II. Matching**

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

**III. Choice**

1. B    2. B                    3. D    4. D                    5. C  
6. B    7. D

**IV. Short answer question**

1. Coffee, hide and skin, pulses, chat, flower, etc.
2. The major problems that hindered agricultural development in Ethiopia are:
  - Shortage of farmlands
  - Backward agricultural practices
  - Soil erosion
  - Climatic change
  - Rapid population growth and so o

## Check List

Check the student's performance according to the given competencies referring the questions under the check list for every unit. Put a tick (✓) mark against each task whether they are able to perform in the competencies of each unit. The students are expected to respond saying Yes or No. then, you can make your own evaluation whether the competencies are met or not.

**Can you:**

	Yes	No
1. Discuss economic growth and development trend in Ethiopia? -----	<input type="checkbox"/>	<input type="checkbox"/>
2. Characterize major features of Ethiopia economy? -----	<input type="checkbox"/>	<input type="checkbox"/>
3. Reflect links among different economic sectors of Ethiopia? -----	<input type="checkbox"/>	<input type="checkbox"/>
4. Generalize the present features of Ethiopian socio-economic development? -----	<input type="checkbox"/>	<input type="checkbox"/>
5. Analyze indicators of development in Ethiopia context? -----	<input type="checkbox"/>	<input type="checkbox"/>
6. Predict the challenges and prospects of socio-economic development for Ethiopia? -----	<input type="checkbox"/>	<input type="checkbox"/>
7. Show appreciation for economic relations of Ethiopia with its neighbouring countries and other continents? -----	<input type="checkbox"/>	<input type="checkbox"/>
8. Show interest for the realization of PASDEP? -----	<input type="checkbox"/>	<input type="checkbox"/>

## Assessment

Students' performance has to be assessed continuously over the whole unit. The assessment will be made by comparing students' performance with the specified level of competencies. Besides, the teacher has to recognize the level of performance of each student and provide assistance accordingly. Thus:

- A student at a minimum requirement level will be able to discuss economic growth and development trend in Ethiopia; characterize major features of Ethiopian economy; reflect links among different economic sectors of Ethiopia; generalize the present features of Ethiopian socio-economic development; analyze indicators of development in Ethiopian context; predict the challenges and prospects of socio-economic development for Ethiopia; show appreciation for economic relations of Ethiopia with its neighboring countries and other continents and show interest for the realization of PASDEP.
- In addition, a student working above the minimum requirement level and considered as higher achiever should be able to:- evaluate major features of Ethiopian economy, select two economic sectors and show their fundamental linkages, evaluate the present features of Ethiopian socio-economic development, state indicators of development in the Ethiopian context, and justify how economic relations could help sustainable development.
- Students working below a minimum requirement level will require extra help if they are to catch up with the rest of the class.
- Students reaching at the minimum requirement level but achieved a little bit higher should be supported so that attain the higher achiever competencies students who fulfill the higher achiever competencies also need in special support to contribute and achieve more.

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## Minimum Learning Competency of Geography for Grade 12

<i>Theme</i>	<i>Competencies</i>
	<i>Grade 12</i>
I. The Science of Geography & research	<ul style="list-style-type: none"> <li>• Differentiate the definitions of research given by different scholars and reach at acceptable generalization.</li> <li>• Justify the significance of research.</li> <li>• Confirm the functional importance of the two research approaches to study geographical research.</li> <li>• Follow the basic research elements to examine problems by employing the step by step methods.</li> </ul>
II. Map Interpretation & Map Work	<ul style="list-style-type: none"> <li>• Interpret the information depicted on topographic map based on the conventional signs &amp; symbols used.</li> <li>• Compare &amp; contrast the relationship between globe &amp; map based on their property.</li> <li>• Recognize the various map projections and how longitude/latitude patterns differ.</li> <li>• Construct sketch map of their locality.</li> </ul>
III. Physical features of Africa & Ethiopia	<ul style="list-style-type: none"> <li>• Express the position, size, &amp; shape of Ethiopia and their economic, political and social implications compared to its neighbors.</li> <li>• State the geological history of Ethiopia &amp; the resulting landforms.</li> <li>• Differentiate the characteristics of major rivers, lakes, &amp; drainage systems of Ethiopia.</li> <li>• Evaluate the significance of major rivers &amp; lakes of Ethiopia and evaluate water resource conservation &amp; management of Ethiopia.</li> </ul>
IV. Population-socio-economic interface of Africa & Ethiopia	<ul style="list-style-type: none"> <li>• Predict how different population theories affect the population growth trend in Ethiopia.</li> <li>• Justify the factors that affect spatial distribution of population and its structure.</li> <li>• Classify settlement patterns of Ethiopia and the Horn using various criteria (e.g. population size, economic base, shape, etc....)</li> <li>• Compute data of population variables and discuss the results to show socio</li> </ul>

<i>Theme</i>	<i>Competencies</i>
	<i>Grade 12</i>
	<p>economic and environmental implications.</p> <ul style="list-style-type: none"> <li>• State the process and level of urbanization of Ethiopia and the Horn and evaluate the effect of technology in modifying physical as well as cultural environment of the region.</li> <li>• Discuss economic growth and development of Ethiopia using relevant indicators.</li> <li>• Analyze the level and distribution of major economic activities and their specific contribution to development of Ethiopia.</li> <li>• Analyze challenges and prospects of socio economic development for Ethiopia and the Horn.</li> <li>• Present mutual economic relation of Ethiopia with other countries.</li> <li>• Recognize Plan for Accelerated and Sustained Development to End Poverty (PASDEP) as guiding document for development of Ethiopia.</li> </ul>

Federal Democratic Republic  
of Ethiopia  
Ministry of Education

**Geography Syllabus**

**For**

**Grade 12**



## Introduction

Students at second cycle secondary education have already decided the broad stream-natural science/social science – in which their future area of study to be.

The purpose of second cycle secondary education are enabling learners choose subjects/areas of training to be attended in higher education within the framework of their respective preparatory stream, and preparing students for the world of work. Within these context students of social science stream at preparatory (11 and 12) level are expected to study one of the specialized fields of social sciences, language, business and management and law faculties.

Geography, as one of the offered subjects in social science stream of preparatory education, aims at providing learners with necessary foundations of knowledge, attitudes, and skills to manage future higher education academic carrier and world of work. This is possible by:-

- elaborating spatial relationships and peoples interaction with their natural and social environment through deeper understanding of such relationship;
- understanding of population resource balance in relation to sustainable development and poverty reduction;
- facilitating conditions to create citizens who have the attitude of informed appreciation and the understanding of the world as man's habitat within the context of global interdependence;
- fostering certain skills like map reading and interpretation, observation, gathering and recording data, and analysing data, and problem solving.

The provision of quality education has become the first line issue at present time of Ethiopia. Assessment and other feedback reports demanded the improvement of curriculum materials. Besides, the curriculum revision made at lower education levels subsequently demanded revision of curriculum at this level.

In addressing these issues the current grades 11 and 12 geography curriculum is founded on outcome based learning which is defined in the new curriculum framework and in line to the international standards. Thus, the present curriculum is organized in such a way that it is suitable to realize active learning methods and equate learner's performance with the specified competencies.

To enable users of this curriculum document understand it fully, it is made to contain:

- Profile of geography student at the end of grade 12 which reflects the contribution of attending geography lesson in bringing the desired general profile of learners at the end of second cycle secondary education.
- Minimum learning competencies for geography education of grades 11 and 12.
- Content flow chart of the cycle.
- Grade level learning outcomes of each grades (11 and 12) and
- Respective syllabuses.

The competencies and content flow charts are organized around four themes – the science of geography and research, map interpretation & map work, physical features of Africa and Ethiopia, and population-socio-economic interface of Africa and Ethiopia. Using these themes, the syllabuses of each of grades (11 and 12) have been arranged in four units.

Thirty four weeks are allotted in a year to cover the lesson of each grade with four periods per week.

Profile of Geography students at the end of Preparatory Secondary School Grade (11 and 12)

Students:

- Can be capable to continue their education for further academic carrier in different human and business economics sciences using their geographical knowledge.
- Can conduct simple geographical research that demands data collection, organization, analysis, and evaluation.
- Can be active participants in collective works.
- Respect democratic values, rules and regulations.
- Become ready to participate in various citizenship activities by recognizing and appreciating:-
  - Cultural aspects (including languages and religions) and livelihood of various places.
  - Peaceful world co-existence in respect to territory and resources.
  - Sovereignty of states of the world.
- Become knowledgeable in the relationship of production-distribution-consumption.
- Are ready to find solution for problems using enquiry skills.

## **Second Cycle Secondary Education 12 Learning Outcomes in Geography**

After completing Geography Education of Grades 12

Students will be able to:

- Show an appreciation for the importance of geography as a field of study by examining the various definition and scope of Geography and its relationship with other disciplines.
- Practice basic research methodologies of Geography to examine problems by employing the methods step by step.
- Use methods and procedures of reading and constructing various types of maps such as contour maps, maps representing settlement and human activities, distribution maps and topographic maps.
- Realize the impact of natural and human-made influences on sustainable development both in Ethiopia and Africa.
- Identify major economic activities of Ethiopia and Africa and be able to examine natural as well as human-made factors that affect their development.
- Aware the roles and responsibilities of international organizations in planning developmental programmes both for Ethiopia and Africa.
- Develop and use basic geographic knowledge and skills that are prerequisite for further education.
- Understand the many challenges and prospects Ethiopian and Africans face in the effort of socio economic development.
- Identify how and why conflicts are triggered around resources in Africa and assess ways of conflict resolution.

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## Learning outcomes of Grade 12

### 1. To develop understanding and acquire knowledge of:

- Research
- How to read topographic map and the difference between qualitative and quantitative distribution maps.
- Map projection and sketch map.
- Location, size, and shape of the Horn of Africa and Ethiopia.
- Geological structure and landform of the horn of Africa and Ethiopia.
- Drainage pattern and lakes of Ethiopia.
- Climate, climatic regions, natural vegetation, wild animals and soils of the Horn of Africa with particular emphasis to Ethiopia.
- Theories, growth, structure, distribution and settlement of population in Ethiopia.
- Impacts of rapid population growth on natural environment, socio - economic development and urbanization in Ethiopia.
- Economic growth and major feature of Ethiopian economy.
- Socio-economic development.
- Demonstrate conical, cylindrical and zenital map projections.

### 2. To develop skills and abilities of:

- Conducting action research.
- Constructing statistical diagrams to represent data on distribution maps.

### 3. To develop the habits and attitudes of:

- Appreciating the significance of research in tackling social problems and reflecting the distinctive nature of geographic research.
- Showing interest for the implementation of water resource conservation and management policy of Ethiopia.
- Conforming to participate in conservation programs.
- Adhere to the realization of the Ethiopian population policy.
- Generalizing the present features of Ethiopian socio-economic development.
- Appreciating the economic relations of Ethiopia with its neighboring countries
- Showing interest for the realization of Plan for Accelerated Sustained Development to End Poverty (PASDEP).

**Unit One: Basic Research Methodologies in Geography (22 periods)**

**Unit Out comes:** The students will be able to:

- Acquire basic research skills to enable them conduct action research.
- Understand the significance research and its nature in geography.
- Know different approaches used in geographic research.

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested activities</i>
<p><i>Students will be able to:</i></p> <ul style="list-style-type: none"> <li>• Explain the concept of research.</li> <li>• Show appreciation to the significance of research in tackling social problems.</li> <li>• Use different geographic research approaches in action research.</li> <li>• Reflect the distinct nature of geographic research from other disciplines.</li> <li>• Use basic elements of research in their action research.</li> <li>• Conduct action research on selected problems.</li> </ul>	<p><b>1. Basic research methodologies in Geography.</b></p> <p><b>1.1. Definition &amp; concept</b></p> <p><b>1.2 The significance of research (2 periods)</b></p> <p><b>1.3 Approaches of research (qualitative and quantitative) (4 periods)</b></p> <p><b>1.4 The nature of geographic research (4 periods)</b></p> <p><b>1.5 Basic research methodology in Geography (2 periods)</b></p> <ul style="list-style-type: none"> <li>• Basic elements of research</li> </ul> <p><b>1.6 Conducting action research (10 periods)</b></p>	<ul style="list-style-type: none"> <li>• Ask students what they know about research and assist them to arrive at correct definition and finally organize them in small groups to discuss on what makes research significant and how its significance is realized.</li> <li>• Arrange peer discussion focusing on the difference between qualitative and quantitative research (emphasize on how data are collected, analyzed and interpreted). Then help them to arrive at correct conclusion. At the same time provide a short explanation on the distinctive nature of geographic research.</li> <li>• Give a brief explanation about basic research methodology and let them know basic research methodologies and elements of research.</li> <li>• Prepare students to perform action research. Be sure that the students have their own research in which every activity has to be recorded. The activities may start by:             <ul style="list-style-type: none"> <li>– Selecting problems to be studied (3 problems might be presented from which one is selected). Then formulate hypothesis and guide students step by step to perform research.</li> </ul> </li> </ul>

**Assessment**

- Students' performance has to be assessed continuously over the whole unit. The assessment will be made by comparing students' performance with the specified level of competencies. Besides, the teacher has to recognize the level of performance of each student and provide assistance accordingly, Thus:
- A student at a minimum requirement level will be able to explain the concept of research, show appreciation to the significance of research in tackling social problems, use different geographic research approaches in action research; reflect the distinct nature of geographic research from other disciplines; use basic elements of research in their action research and conduct action research on selected problems.
- In addition, a student working above the minimum requirement level and considered as higher achiever should be able to: discuss the findings of various research works, explain how problems of a research are identified, justify why various methods are implemented to conduct a research, evaluate the strength and weakness of research works of their classmates.
- Students working below a minimum requirement level will require extra help if they are to catch up with the rest of the class.
- Students reaching at the minimum requirement level but achieved a little bit higher should be supported so that attain the higher achiever competencies. Students who fulfill the higher achiever competencies also need special support to contribute and achieve more.

**Unit Two: Map Use and Map Work** (34 periods)

**Unit Out comes:** The students will be able to:

- Recognize, meaning, uses, conventional signs and symbols and distribution of topographic maps.
- Distinguish the properties of globe and map.
- Analyze the meaning, significance, properties and classification of map projection.
- Acquire basic skills to draw sketch in maps.

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested activities</i>
<p><i>Students will be able to:</i></p> <ul style="list-style-type: none"> <li>• Define topographic map.</li> <li>• Identify the uses of topographic map.</li> <li>• Interpret conventional signs and symbols on topographic map.</li> <li>• Realize the difference between qualitative and quantitative distribution maps.</li> <li>• Translate different data into distribution map using various diagrammatic methods.</li> <li>• Compare and contrast the properties of globe and map.</li> <li>• Define map projection.</li> <li>• Discuss the significance of map projection.</li> <li>• Identify properties of map</li> </ul>	<p><b>2. Map use and Map work</b></p> <p><b>2.1 The study of topographic maps</b> (10 periods)</p> <ul style="list-style-type: none"> <li>• Meaning and use of topographic maps.</li> <li>• Conventional signs and symbol on topographic map.</li> <li>• Distribution maps                             <ul style="list-style-type: none"> <li>– Types</li> <li>– Representing data on maps</li> </ul> </li> </ul> <p><b>2.2 Globe and map</b> (2 periods)</p> <p><b>2.3. Map Projection</b> (12 periods)</p> <ul style="list-style-type: none"> <li>• Meaning &amp; significance of map projection</li> <li>• Properties of map projection</li> <li>• Geometrical map projection                             <ul style="list-style-type: none"> <li>–Cylindrical</li> <li>– Conical</li> <li>– Zenithal</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Provide students with topo-sheets of different areas and let them identify both human made and natural features in groups and so that they can list and categorize the features depicted on the maps. In addition students could be assisted to explain the concept and uses of to topographic maps.</li> <li>• Assist students to compare and contrast the properties of globe and map. This activity might be completed through group work.</li> <li>• Give maps that are produced by different projections such as cylindrical, conical and zenithal, and let students explain the use of each projection and discuss their properties. At the end ask students which projection best suits to the different parts of the world.</li> </ul>

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested activities</i>
<p>projection.</p> <ul style="list-style-type: none"> <li>• Demonstrate cylindrical, conical and zenithal map projection</li> </ul> <ul style="list-style-type: none"> <li>• Define what sketch map is.</li> <li>• Explain the purpose of drawing sketch map.</li> <li>• Discuss the guidelines for making good sketch maps.</li> <li>• Draw a sketch map of a given area.</li> </ul>	<p><b>2.4 Drawing sketch map</b> (10 <i>periods</i>)</p> <ul style="list-style-type: none"> <li>• The meaning &amp; purpose of sketch map</li> <li>• Some guidelines for making good sketch maps</li> <li>• Producing sketch map</li> </ul>	<ul style="list-style-type: none"> <li>• Ask students what they know about sketch maps and what makes them different from conventional maps and then assist them to know the procedures included in making sketch maps. Ask them to justify why and when it is important. In addition give them group works to produce sketch maps of their localities/schools.</li> </ul>

**Assessment**

- Students' performance has to be assessed continuously over the whole unit. The assessment will be made by comparing students' performance with the specified level of competencies. Besides, the teacher has to recognize the level of performance of each student and provide assistance accordingly, Thus:
- A student at a minimum requirement level will be able to define topographic map; identify the uses of topographic map; realize the difference between qualitative and quantitative distribution maps; translate different data into distribution map using various diagrammatic methods; compare and contrast the properties of globe and map; define map projection; discuss the significance of map projection; identify properties of map projection; define what sketch map is, explain the purpose of drawing sketch map; discuss the guidelines for making good sketch maps and draw a sketch map of a given area.
- In addition, a student working above the minimum requirement level and considered as higher achiever should be able to: compare and contrast the definition of topographic map with other definition of map, justify why and when they use qualitative and quantitative distribution map, explain the appropriate map projection for different part of the earth, discuss why and how map projections differ in shape and content, compare and contrast sketch map with conventional map.
- Students working below a minimum requirement level will require extra help if they are to catch up with the rest of the class.
  - Students reaching at the minimum requirement level but achieved a little bit higher should be supported so that attain the higher achiever competencies students who fulfill the higher achiever competencies also need special support to contribute and achieve more.



### Unit Three: Physical Geography of Ethiopia and the Horn (48 periods)

**Unit Out comes:** The students will be able to:

- Describe the location, size and countries of the Horn of Africa.
- Recognize geological history structure and relief of the Horn of Africa.
- Discuss drainage, systems of Ethiopia and the Horn characteristics and their significant.
- Appreciate water resource conservation and management policy.
- Identify factors influencing the spatial and seasonal distribution of elements of climate in Ethiopia.
- Realize natural vegetation and wild animals of Ethiopia.
- Describe soil types problems and conservation in Ethiopia.

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested Activities</i>
<p><i>Students will be able to:</i></p> <ul style="list-style-type: none"> <li>• Indicate the location of Horn of Africa.</li> <li>• Compare the size of countries of the horn.</li> <li>• Demonstrate the relative and absolute location of Ethiopia.</li> <li>• Discuss the shape of Ethiopia.</li> <li>• Explain geological structure of the Horn of Africa.</li> <li>• Discuss major geological events of Ethiopia &amp; the Horn .</li> <li>• Describe major land forms of the Horn of Africa.</li> <li>• Explain major landforms of Ethiopia</li> </ul>	<p><b>3. Physical Geography of Ethiopia and the horn.</b></p> <p><b>3.1. Location of the Horn of Africa and sizes of member countries. (2 periods)</b></p> <p><b>3.2. Location, size and shape of Ethiopia (1 period)</b></p> <p><b>3.3. Geological structure and relief of the Horn of Africa.</b></p> <p><b>3.3.1. Geological history and major events of Ethiopia &amp; the horn of Africa (8 periods)</b></p> <ul style="list-style-type: none"> <li>• Geological history</li> <li>• Major geological events</li> <li>• Geological structure</li> </ul> <p><b>3.3.2. Land forms of Ethiopia and the Horn (8</b></p>	<ul style="list-style-type: none"> <li>• Provide students with a map of Africa, so that they can identify the countries of the Horn.</li> <li>• Give them a table consists the sizes of each country of the Horn, so that they can justify the advantages of having large sizes.</li> <li>• Ask students to distinguish the shape of Ethiopia, at the same time they can identify different types of shape and explain the significance of having a compact shape like that of Ethiopia.</li> <li>• Ask students what they know about the concept of geology and remind the geological structure of Africa.</li> <li>• Provide them with the relief map of the Horn of Africa, so that they can describe how major land forms are formed and located in the places where they are.</li> <li>• Give them a summary of the major geological events that took place in Ethiopia according to their chronological orders.</li> <li>• By using the drainage map of Ethiopia students would justify why and how Ethiopian rivers possessed the existing patterns and general</li> </ul>

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested Activities</i>
<ul style="list-style-type: none"> <li>• Discuss the general characteristics of Ethiopian rivers and drainage patterns.</li> <li>• Classify lakes of Ethiopia as highland and river valley lakes.</li> <li>• Show appreciation for the significance of rivers and lakes of Ethiopia.</li> <li>• Show interest for the implementation of water resource conservation and management policy.</li>   <li>• Discuss the factors influencing the spatial distribution of the elements of climate in Ethiopia and the horn</li> <li>• Describe the spatial and temporal variation of temperature in Ethiopia and the Horn</li> <li>• Explain the spatial &amp; temporal variation of rainfall in Ethiopia and the Horn.</li> </ul>	<p style="text-align: center;"><i>periods)</i></p> <ul style="list-style-type: none"> <li>• Landforms of the Horn of Africa</li> <li>• Landforms of Ethiopia</li> </ul> <p><b>3.3.3. Drainage systems and water resource of Ethiopia</b> <i>(11 periods)</i></p> <ul style="list-style-type: none"> <li>• General characteristic of Ethiopian rivers</li> <li>• Drainage pattern</li> <li>• Lakes</li>   <li>• Significance of rivers and lakes of Ethiopia</li> <li>• Water resource conservation and management policy in Ethiopia</li> </ul> <p><b>3.4. Climate of Ethiopia and the Horn</b> <i>(10 periods)</i></p> <p><b>3.4.1 Factors influencing the spatial distribution of the elements of climate in Ethiopia and the horn</b><i>(2 periods)</i></p> <p><b>3.4.2 Spatial and temporal variation of temperature in Ethiopia and the Horn</b> <i>(3 periods)</i></p> <p><b>3.4.3 Spatial and</b></p>	<p>characteristics. They are also asked to indicate the lakes and describe their major characteristics. In addition, they gather information on the contribution of Ethiopian rivers and lakes.</p> <ul style="list-style-type: none"> <li>• Provide the policy of water resource conservation and management and let them discuss how to implement it in their community and what should be their contribution in the implementation process.</li>   <li>• Ask students to remind the concept of weather and climate and then let them list the major elements of weather and climate.</li> <li>• Provide the climate map of Africa and students discuss how varied factors influencing the spatial and temporal distribution of temperature and rainfall in Ethiopia and the Horn.</li> </ul>

Competencies	Main Contents	Suggested Activities
<ul style="list-style-type: none"> <li>• Compare rainfall regions in Ethiopia.</li>   <li>• Relate types of natural vegetations to climatic regions.</li> <li>• Identify wild animals of Ethiopia.</li> <li>• Discuss human intervention on forest land.</li> <li>• Show interest to participate in the conservation of natural vegetation and wild animals.</li>   <li>• Relate formation of soils of Ethiopia with geological events of the past</li> <li>• Distinguish major soil types in Ethiopia.</li> <li>• Realize soils problems and its conservation in Ethiopia.</li> </ul>	<p style="text-align: center;"><b>temporal variation of rainfall in Ethiopia &amp; the Horn</b> (3 periods)</p> <p><b>3.4.4 Rainfall regions in Ethiopia and the Horn</b>(2 periods)</p> <p><b>3.5 Natural vegetation and wild animals of Ethiopia</b> (4 periods )</p> <ul style="list-style-type: none"> <li>• Types of natural vegetation</li> <li>• Wild animals of Ethiopia</li> <li>• Human intervention on forest</li> <li>• Conservation of natural vegetation and wild animals</li> </ul> <p><b>3.6 Soils of Ethiopia</b> (4 periods )</p> <ul style="list-style-type: none"> <li>• Formation of soils in Ethiopia</li> <li>• Types of soils in Ethiopia</li> <li>• Soils problem and conservation in Ethiopia</li> </ul>	<ul style="list-style-type: none"> <li>• Finally provide the map that shows the rainfall regimes of Ethiopia and arrange the class in different groups to closely examine the rainfall regimes of Ethiopia.</li>   <li>• Invite students to infer the types of natural vegetation found in different parts of the country and let them associate the wild animals with their respective habitat. At the end, give them maps that show natural vegetation and wild animals distribution. Then ask them to cross check whether they were right or wrong. In addition, let students discuss the magnitude of human intervention on forest land and wild animals. At the same time they can discuss the methods of conserving these key resources.</li>   <li>• Ask students to describe what soil is and how it is formed. Provide the soil map of Ethiopia and arrange group discussion on the major soil types of Ethiopia. Let them identify soil problems in Ethiopia and methods of conserving these key resources.</li> </ul>

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**Assessment**

- Students' performance has to be assessed continuously over the whole unit. The assessment will be made by comparing students' performance with the specified level of competencies. Besides, the teacher has to recognize the level of performance of each student and provide assistance accordingly, Thus
- A student at a minimum requirement level will be able to indicate the location of Horn of Africa; compare the size of countries of the Horn; demonstrate the relative and absolute location as well as the shape of Ethiopia; explain geological structure and major events of the Horn of Africa; describe major landforms of Ethiopia and the Horn; discuss the general characteristics of Ethiopian rivers and drainage patterns; classify the Ethiopian lakes as high land and rift valley; show appreciation for the significance of rivers and lakes of Ethiopia; show interest for the implementation of water resource conservation and management policy; discuss the factors influencing the spatial distribution of the elements of climate in Ethiopia; describe the spatial and temporal variation of temperature in Ethiopia; explain the spatial and temporal variation of rainfall in Ethiopia; compare the rainfall regions in Ethiopia; relate types of natural vegetation to climatic regions; discuss human intervention on forest land; show interest to Participate in the conservation of natural vegetation and wild animals; identify wild animals of Ethiopia; distinguish major soil types in Ethiopia and realize soils problems and its conservation in Ethiopia.
- In addition, a student working above the minimum requirement level and considered as higher achiever should be able to:- discuss the opportunities and the challenges Ethiopia faced due to its location in the Horn of Africa, explain how land forms affect the drainage patterns and climate of Ethiopia, describe the impact of Ethiopian rivers and lakes on the livelihood and culture of the people, analyze the purpose of each elements incorporated in the water resource conservation and management policy of Ethiopia, justify why wild animals fiercely attack human being in varied places, compare and contrast the strength and weakness of each soil conservation methods.
- Students working below a minimum requirement level will require extra help if they are to catch up with the rest of the class.
  - Students reaching at the minimum requirement level but achieved a little bit higher should be supported so that attain the higher achiever competencies. Students who fulfill the higher achiever competencies also need special support to contribute and achieve more.

### Unit Four: Population of Ethiopia and the Horn (22 periods)

**Unit Out comes:** The students will be able to:

- Discuss population theories, trends, growth, structure, spatial distribution and factors affecting population distribution in Ethiopia.
- Explain settlement patterns, determinants of population changes, impacts of rapid population growth and urbanization in Ethiopia.

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested Activities</i>
<p><i>Students will be able to:</i></p> <ul style="list-style-type: none"> <li>• Analyze population theories of Malthusian and Anti-Malthusian.</li> <li>• Explain trends of population growth and structure in Ethiopia.</li> <li>• Discuss the spatial distribution of population in Ethiopia.</li> <li>• State factors affecting population distribution in Ethiopia</li> <li>• Realize settlement patterns of Ethiopian population.</li> <li>• Compare fertility and mortality rate from a given data.</li> <li>• Analyze impacts of rapid population growth on natural environment and socio-economic development of Ethiopia.</li> </ul>	<p><b>4. Population of Ethiopia and the Horn</b></p> <p><b>4.1. Population theories</b></p> <ul style="list-style-type: none"> <li>• Malthusian</li> <li>• Anti-Malthusian (4 periods)</li> </ul> <p><b>4.2 Trends of population growth and structure in Ethiopia</b> (2 periods)</p> <p><b>4.3 The spatial distribution of population in Ethiopia</b> (2 periods)</p> <p><b>4.4 Factors affecting population distribution in Ethiopia</b> ( 2 periods)</p> <p><b>4.5 Settlement patterns of Ethiopian population</b> (4 periods)</p> <p><b>4.6 Determinants of population change in Ethiopia</b> (2 periods)</p> <p><b>4.7 Impacts of rapid population growth in Ethiopia</b></p>	<ul style="list-style-type: none"> <li>• Provide students Malthusian and anti-Malthusian population theories and let them debate whether Malthus was right or wrong.</li> <li>• Assign students a group discussion on the trends and structure of Ethiopian population. In addition they can discuss fertility and mortality patterns as determinants of population change and impacts of rapid population growth.</li> <li>• Provide population map of Ethiopia and assist them to identify the densely and sparsely populated areas of Ethiopia and let them relate to the factors affecting the spatial distribution of population in the Ethiopian context.</li> <li>• Ask students what they know about the concept settlement and arrange a group discussion to reason out why the settlement patterns differ from region to region.</li> <li>• Ask students to mention the major variables of population change, and make them discuss and compare to show how these variables act as population dynamics. Give them data showing fertility and mortality rates of a given place and assist them to interpret the data given.</li> <li>• Take two places in Ethiopia, one with</li> </ul>

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested Activities</i>
<ul style="list-style-type: none"> <li>• Adhere to the realization of population policy of Ethiopia.</li> <li>• Compare rate of urbanization in Ethiopia in regional level.</li> </ul>	<p style="text-align: center;"><i>(3 periods)</i></p> <p><b>4.8 Population policy of Ethiopia</b> (1 period)</p> <p><b>4.9 urbanization in Ethiopia</b> (2 periods)</p>	<p>dense population and the other with sparse population. Then ask students to justify the place where land degradation is very serious and relate this to more developed areas having high population pressure with less environmental degradation.</p> <ul style="list-style-type: none"> <li>• Give a brief description on the population policy of Ethiopia and ask them to express their role in the realization of the policy. The teacher is expected to facilitate class discussion and give a brief summary on the topic.</li> <li>• Ask students to explain the concept of urbanization and assign them to prepare a short essay on the origin and development of urbanization Ethiopia and present it to the class. They can discuss on the rate of urbanization and its regional variation in Ethiopia.</li> </ul>

**Assessment**

- Students' performance has to be assessed continuously over the whole unit. The assessment will be made by comparing students' performance with the specified level of competencies. Besides, the teacher has to recognize the level of performance of each student and provide assistance accordingly, Thus
- A student at a minimum requirement level will be able to analyze Malthusian and anti-Malthusian population theories; explain trends of population of growth and structure in Ethiopia and compare fertility and mortality rate from given data; discuss the spatial distribution of population in Ethiopia and state factors affecting population distribution in Ethiopia. Realize settlement patterns of Ethiopian population and analyze impacts of rapid population growth on natural environment and socio-economic development of Ethiopia. Adhere to the realization of population policy of Ethiopia and compare rate of urbanization in Ethiopia in regional level.
- In addition, a student working above the minimum requirement level and considered as higher achiever should be able to: evaluate why countries select Malthusian or anti-Malthusian population theories, compare and contrast population pyramids of different levels of development, compute population growth rates, and justify Ethiopia's rate of urbanization and development.
- Students working below a minimum requirement level will require extra help if they are to catch up with the rest of the class.
  - Students reaching at the minimum requirement level but achieved a little bit higher should be supported so that attain the higher achiever competencies students who fulfill the higher achiever competencies also need special support to contribute and achieve more.

**Unit Five: Economic Growth and Development Trend in Ethiopia (10 periods)**

**Unit Out comes:** The students will be able to:

- Realize economic growth, development trend, major features and present socio-economic development and its indicators.
- Analyze the challenges and prospects of socio-economic development for Ethiopia.
- Appreciate the economic relation with its neighboring countries and other continents.
- Recognize plan for accelerated and sustainable development to end poverty (PASDEP) as guiding document for development of Ethiopia.

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested Activities</i>
<p><i>Students will be able to:</i></p> <ul style="list-style-type: none"> <li>• Discuss economic growth and development trend in Ethiopia.</li> <li>• Characterize major features of Ethiopian economy.</li> <li>• Reflect links among different economic sectors of Ethiopia.</li> <li>• Generalize the present features of Ethiopian socio-economic development.</li> <li>• Analyze indicators of development in Ethiopia context.</li> <li>• Predict the challenges and prospects of socio-economic development for Ethiopia.</li> <li>• Show appreciation for economic relations of</li> </ul>	<p><b>5. Economic growth and development trend in Ethiopia</b></p> <p><b>5.1 An overview of growth and development trend in Ethiopia (1 period)</b></p> <p><b>5.2 Major features of Ethiopian economy (1 period)</b></p> <p><b>5.3 present features of Ethiopian socio-economic development (2 periods)</b></p> <ul style="list-style-type: none"> <li>• Indicators of development</li> </ul> <p><b>5.4 Challenges and prospects of socio-economic development for Ethiopia (2 periods)</b></p>	<ul style="list-style-type: none"> <li>• Ask students the difference between economic growth and economic development. Then organize the class in group to discuss the trend of Ethiopian economy. In addition, let each group present the major features of Ethiopian economy and explain how the economic sectors are linked. At the end, encourage them to discuss what the present features of Ethiopian socio-economic development looks like. They are also expected to show indicators of development in Ethiopian context. Finally give a brief summary of all points raised in the discussion.</li> <li>• Invite students to predict challenges and prospects of socio-economic development of Ethiopia and let them reason out for their prediction. The discussion should be backed in pros and cons and arrive at concrete conclusions</li> </ul>



<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested Activities</i>
<p>Ethiopia with its neighboring countries and other continents.</p> <ul style="list-style-type: none"> <li>Show interest for the realization of PASDEP</li> </ul>	<p><b>5.5 Economic relation</b> (2 period)</p> <ul style="list-style-type: none"> <li>With neighboring countries</li> <li>With other continents</li> </ul> <p><b>5.6 PASDEP</b> (2 periods) (Plan for Accelerated and Sustained Development to End Poverty)</p>	<ul style="list-style-type: none"> <li>Give an assignment for students to work on Ethiopian economic relations with its neighboring countries and other continents. They also identify the advantages of having economic relations.</li> <li>Provide a brief information on the objectives and the need of the plan for accelerated and sustained development to end poverty (PASDEP)</li> </ul>

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**Assessment**

- Students' performance has to be assessed continuously over the whole unit. The assessment will be made by comparing students' performance with the specified level of competencies. Besides, the teacher has to recognize the level of performance of each student and provide assistance accordingly, Thus
- A student at a minimum requirement level will be able to discuss economic growth and development trend in Ethiopia; characterize major features of Ethiopian economy; reflect links among different economic sectors of Ethiopia; generalize the present features of Ethiopian socio-economic development; analyze indicators of development in Ethiopian context; predict the challenges and prospects of socio-economic development for Ethiopia; show appreciation for economic relations of Ethiopia with its neighboring countries and other continents and show interest for the realization of PASDEP.
- In addition, a student working above the minimum requirement level and considered as higher achiever should be able to:- evaluate major features of Ethiopian economy, select two economic sectors and show their fundamental linkages, evaluate the present features of Ethiopian socio-economic development, state indicators of development in the Ethiopian context, and justify how economic relations could help sustainable development.  
Students working below a minimum requirement level will require extra help if they are to catch up with the rest of the class.  
Students reaching at the minimum requirement level but achieved a little bit higher should be supported so that attain the higher achiever competencies students who fulfill the higher achiever competencies also need in special support to contribute and achieve more.