

Population Distribution

- ❖ **Population distribution** refers to the way people inhabit and occupy the earth's surface.
 - ✓ Generally, the distribution of population in the world is **uneven**.
- ❖ **Population density** is a measurement of the number of people in an area. It is an average number. Population density is calculated by dividing the number of people by the area. Population density is usually shown as the number of people per square kilometer.

Factors of population distribution

The major factors of population distribution can be classified in to two groups. These are:

- ✓ Physical factors and
 - ✓ Human factors.
1. **Physical Factors:** The most significant physical factors affecting the distribution of population are:
 - ✓ Natural resources (water, soil, vegetation and minerals etc.)
 - ✓ The nature of topography (slope and altitude)
 - ✓ Climate condition (mainly rainfall and temperature)
 - ❖ So, if there is available natural resource, gentle slope and medium altitude like plateau land and areas with sufficient rainfall and moderate temperature an area will have **high population density** and areas with least available natural resource, extremely high and low lands, and very harsh climate with lack of water and extremely high and low temperature are **Sparsely populated areas**.
 2. **Human factors:** The major factors affecting distribution of population includes:
 - ✓ Socio-economic factors (job opportunities, availability of technology)
 - ✓ Political factors (civil war, political unrest)
 - ✓ Type of farming and transportation facilities,
 - ✓ Social organization
 - ❖ So areas with good job opportunity, availability of technology, political stability, good transportation facilities, mechanized of modern farming have high population concentration and if there is political instability, unemployment, lack of infrastructures make the population concentration sparse.

Spatial distribution of world population

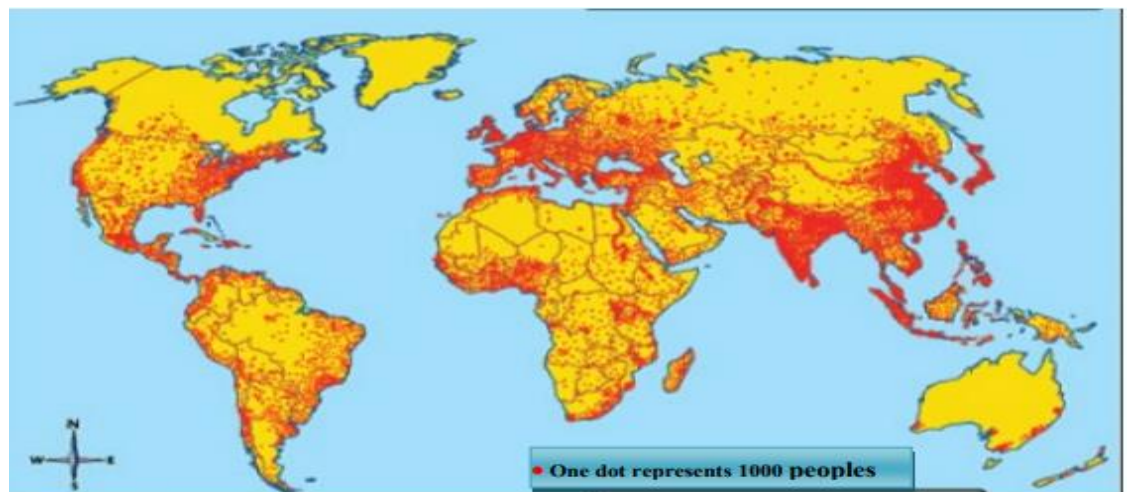
1. Densely Populated Regions

- ✓ There are three main belts of high population density and concentration in the world.
- ✓ These areas are also called “**Population Clusters**”.
- ✓ These regions are:
 - Asiatic population belt
 - Peninsular Europe
 - North-eastern North America

- a) **Asiatic Population Belt**: The region accounts for about 60% of the world's total population. The belt includes:
 - ✓ **East Asia**- Japan and China are the most populous in the sub-region.
 - ✓ **South Asia**- India, Pakistan and Bangladesh are densely populated.
- b) **Peninsular Europe**: Europe makes up 10.8% of the world's total population.
- c) **North-eastern North America**: It accounts for about 5% of the world's total population. This part of North America (mainly the USA) is highly urbanized and industrialized.

2. Sparsely Populated Regions

- ❖ Sparsely populated areas contain few people because of physical and human factors which are **not suitable** for peoples living.
- ❖ These regions include the following areas.
 - ✓ **Tundra**
 - ✓ **Hot-wet-land**
 - ✓ **Hot-dry- land**
 - ✓ **High relief**
 - ✓ **Areas with poor soil.**



Dot map of world-population Distribution, 2000 (Source: Maps.com)

Figure 2.4 spatial distribution of world population

Self evaluation questions

1. Why are some part of the world so crowded and others so sparsely populated?
2. What does population distribution mean?
3. What is population density?
4. List some natural and human factors that affect population distribution in your locality?
5. Mention areas with dense and sparse population.

Population movement(Migration)

- ❖ **Migration** is defined as the movement of people over some distance to another and from one “usual place of residence” to another.

Types of human migration

- 1 **Internal (intra national) migration:** International migration is the movement from one country to another. People who leave their country are said to emigrate. Moving within a state or country. Example. movement an individual or people from one side of Ethiopia to the other parts of Ethiopia.
- ❖ Internal (Intra –national) migration classified in to **four types**. These are::
 - ✓ **Rural-urban:** it refers migration from rural areas to towns and cities in search of job and good infrastructures. It is the most common migration in Ethiopia and other developing countries.
 - ✓ **Urban-rural :** migration from urban areas(cities or towns to rural areas in search of good climate, fertile soil and like.
 - ✓ **Rural-rural :** migration between different rural areas either in search of fertile land ,water or other natural resources.
 - ✓ **Urban-urban:** it is migration between different cities or towns. Example Addis Ababa to Bahir Dar.
- 2 **External (international) migration:** moving to a different state, country, or continent. Example: Migration of peoples from Ethiopia to China and Kenya to South Africa republic.
- 3 **Emigration:** leaving one place to move to another.
- 4 **Immigration:** moving into a new place.
- 5 **Return migration:** moving back to where you came from.



Types of migration

Population settlement

A **settlement** is defined as a place in which people live, carrying out a variety of activities, to make their livings, such as trade, agriculture and manufacturing.

- ❖ Based on the density of human-made structures and dominant economic activity, settlements can be divided into **rural** and **urban**.
- 1) **Rural settlement** refers to peoples live in **villages** and **dispersed (scattered) settlements** in areas far from urban centers.
In rural settlements, peoples are mainly engaged in **agriculture**.
- 2) **Urban settlement** refers to peoples live in **town or city** and they are engaged on **non-agricultural activities(trade, manufacturing and service giving)**.
- ❖ All settlements are a part of settlement hierarchy, but it differs in **size, number of population and range of goods and services provision**.
 - ✓ For instance, small settlements, like hamlet and village, are found in rural areas with isolated homesteads and less service provision.
 - ✓ Whereas town and cities are urban areas with higher population and wider range of goods and service provision. See figure 2.5, that show hierarchy of settlement and the range of goods and services which provides.

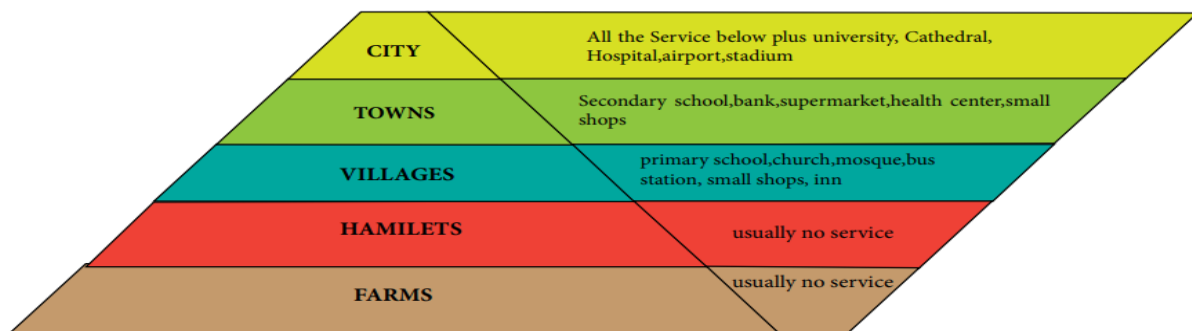


Figure 2.5 Hierarchy of settlement



Why do most people prefer to live in cities?



People and the development of transportation

The concept and historical development of transport

- ❖ **Transportation** refers to the movement of people, animals, and goods from one place to another.
- ❖ Various means of transportation exist, including human-powered and pack animal transports. Early development involved walking, but later, animals were used for land transport. The invention of wooden carts with four legs allowed humans to travel farther. Advances in technology have allowed people to travel farther and invented modern means of transport after the industrial revolution.

The role of transport for socio economic development

- ❖ Effective transportation systems provide economic and social benefits, such as better accessibility to markets, employment, and investment opportunities.
- ❖ Good public transportation systems are essential for:
 - ✓ Moving goods within and abroad
 - ✓ Spreading healthcare and education benefits
 - ✓ Providing mobility
 - ✓ Access to employment
 - ✓ Community resources, and recreational opportunities.
 - ✓ Important driver in economic growth in rural areas.
- ❖ However, deficient systems can lead to reduced opportunities and lower quality of life.

Modes of transport

Modes of transport are classified into three categories:

- 1 land transport (road, railway, pipelines),
 - 2 water transport (shipping), and
 - 3 air transport.
- I. **Land transport** is accomplished either by **rail or by road**, including buses, cars, bicycles, and railways.

Types of land transport

- a) **Road transport** is the most common and oldest mode of transportation, offering **door-to-door services** and operating on public highways without expensive terminals.
 - Road transport includes animal transport such as mules, donkey, and horses and transports including vehicles such as trucks and buses. Domestic animals like donkey, horses, mules and camels are widely used in Ethiopia to transport goods and peoples from place to place.
- b) **Railway transport** involves the use of trains to transport **large quantities of goods**, such as iron ore, coal, and petroleum, over long distances.
 - However, construction is **challenging and expensive**, especially in mountainous countries like Ethiopia, a train cannot climb steep hill sides.
 - The Addis Ababa-Djibouti railway is the main route in Ethiopia, covering 784 km.
 - The Addis Ababa light train, **the first in eastern Africa**, launched in the city on 20 September 2015 covers 31.6 km in two lines:
 - ✓ the **East-West** line from **Ayat village to Torhayloch**
 - ✓ the **North-south** line from **Menilik Square to Kality**. These lines are essential for carrying vast quantities of goods at any time.
 - ✓ It is important to **reduce traffic congestion, air pollution, and increase mobility in the city**.
- c) **Pipelines** are specialized form of transport used to transport **liquids and gases**. For example a pipeline can be used to transport oil deposits from Sudan to Ethiopia.
- ❖ The other modes also includes **cable** (internet, energy supply), and **space**,(satellite).

II. Water transport

- ❖ Water transport is the **cheapest** form of transport **for bulky goods over long distance**.
- ❖ Water transport involves the use **of shipping** to transport various goods from place to place. Water transport does not require heavy construction like road and railway lines. It needs ports and canals construction.
- ❖ Water transport is not well developed in many parts of Ethiopia. Because of:

- ✓ Fluctuation of rivers during summer and winter season.
- ✓ Many rivers are flow from highland to lowland in speedy manner.
- ✓ Absence of good transportation and other infrastructures.
- ✓ Presence of disease like malaria.
- ❖ However, in some parts of the country, rivers and lakes are use for water transportation like,
 - **Lake Tana, (Gojjam to Gonder)**
 - **Lake Abaya, Arba Minch to Dilla**
 - **River Baro, (Ethiopia to Sudan)**

III. Air transport

- ❖ **Air transport is the latest and fastest** mode of transport. Planes can carry only a certain types of cargo because of size and shape limitation.
- ❖ **It is the least dependable and most expensive** form of transportation.
- ❖ It is **speedy(fastest)** transport.
- ❖ It is suitable to transport **perishable products and electronic materials**.
- ❖ Aero planes (Air planes) helicopter e.t.c are examples of air transport that travel by air ways.

Road safety, road traffic accidents and its socio economic implication

- **Road traffic safety** refers to the method and measures used to prevent road users from being killed and injured.
- Typical road users include pedestrians, cyclists, motorists, vehicle passengers, and passengers of on-road public transport (mainly buses and trains).

The most important road safety rules for pedestrians

- ✓ Know your safety signal.
- ✓ Take extra care in crossing curve road.
- ✓ Be careful while crossing the road.
- ✓ Always use sidewalks.
- ✓ Never jump over the divider railings.
- ✓ Wait a suitable gap in the traffic flow before crossing the road.



Fig. Road traffic signs for pedestrians

The most important road safety rules for drivers

- Never drink and drive
- Never break red signal
- Always drive within speed limit
- Understand and follow the road signs
- Keep the left while driving vehicle from opposite direction.

Road traffic accidents and its socio economic implication

- ❖ A road traffic accident occurs when a vehicle that is moving along a roadway crashes with another vehicle or object.
- ❖ Road accident is most unwanted thing which happens to road user.
- ❖ Road accident causes loss of lives, increase of dependency, and destruction of property, increase of poverty, injuries and permanent disability.
- ❖ Road traffic injuries caused significant economic losses to individuals their family and countries all over the world.
- ❖ These losses may be associated with cost of treatment, loss of productivity, and valuable working time for victims and relatives, loss of skilled labor force.
- ❖ More than half of all road traffic deaths and injuries involve vulnerable road users such as pedestrians, cyclists and motorcyclists and their passengers.



S.E.Q

1. Write down the means of transport used in your locality and compare and contrast based on uses, accessibility and compatibility
2. Think the advantage and disadvantage of modes of transport along with land, air and water transportations you could do this in the form of table
Modes of transport
Advantage Disadvantage of land, water and air.
3. Observe your locality, and explain the socioeconomic impact of road traffic accident
4. Discuss about the basic road safety rules.

Self- Evaluation Questions

True or False Direction: Write “True” if the statement is correct and write “False” if it is incorrect

- _____ 1. Archeology is the science in which archeologists dig out material objects and fossils of the past.
- _____ 2. The distribution of population in the world is uniform in all countries.
- _____ 3. Migration is a biological factor that determines the size of population.
- _____ 4. Air transport is a very latest and fastest form of transport.

II. Multiple choices Direction: Choose the correct answer from the given options

- _____ 1. The graphical representation of age distribution of a given population by sex is:
- A. Age structure
B. Population pyramid
C. Age dependency ratio
D. None
- _____ 2. Which one of the following is **Not** the feature of modern human beings?
- A. Large brains
B. Large jaws
C. Bi-pedal
D. Transmitting knowledge
- _____ 3. The cheapest form of transport for bulky goods over long distance is
- A. Air transport
B. Land transport
C. Road transport
D. Water transport

4. Which of the following is **Not** a factor that contributes for rapid population growth in the world?

- A. Human ability to control disease
- B. improved vaccinations
- C. Improvement in knowledge
- D. Increase in illiteracy

____ 5. Which of the following region is **Not** sparsely populated?

- A. Peninsular Europe
- B. High relief areas
- C. Tundra
- D. Hot dry land areas

III. Fill in the blank: Direction: Fill the following blanks with appropriate word(s)

1. The remains of dead plants, animals and human beings are called _____
2. The actual reproductive performance of a population is called _____
3. Human beings belong to the species called _____
4. A person who is leaving one country to live in another is _____
5. A Mode of transport which is accomplished either by road or rail way is called _____.

IV. Short answer Direction: Give short answers for the following questions.

1. What are the main factors that control the change in population size?
2. Write down some factors affecting fertility distribution?
3. Describe the two important statistical tools to understand age structure.
4. Explain the difference between urban and rural settlement.
5. Explain the socio economic implication of road traffic accidents.

UNIT THREE

Human and Natural Resources

Human-Environment relationships (reciprocal relationship)

- Living organisms rely heavily on their surrounding environment for various necessities. Humans, for instance, depend on the environment for essential resources like food, water, fuel, medicines, and building materials. Factors like climate, relief, and soil composition significantly shape human societies and their histories. The influence of the environment is crucial in explaining the differences between societies and their development over time. Moreover, favorable conditions such as a pleasant climate, fertile soil, and ample water supply contribute positively to population concentration.
 - The environment significantly influences population distribution, with areas with unfavorable climates, infertile soil, and inadequate water displacing large human settlements.
- However, **humans can modify** their environment with skill, knowledge, and experience, and advancements in technology can create conducive environments.
- Generally, there is an inseparable bond between human beings and nature. The relationship between the two is highly **reciprocal** (both affect each other).

Population-resource relationship

- ♥ **Human population** refers to the number of people living in a definite area.
- ❖ **Natural resources** are resources that occur in **nature**. These cannot be produced by human kind, but they are derived from the environment.
- ❖ Natural resources **include soil, water, minerals, wildlife, vegetation, and energy sources**.
- ♥ Population and resources have a strong relationship with each other.
- ♥ The growth and decline of population affects the availability of natural resources. At the same time, the availability of natural resources affects the trends of population.

I. Overpopulation (population > resource)

- ❖ **Overpopulation** refers to an **excess of population** in an area in relation to the available resources. When the carrying capacity of an area exceeds by its population the area is said to be **over- populated** because the area has more population than what it can comfortably support.
- ❖ Overpopulation is characterized by:
 - ✓ Low per capita income,
 - ✓ High unemployment,
 - ✓ Malnutrition and famine,
 - ✓ Low standards of living, and
 - ✓ Outward migration(Emigration).

II. Under population (population < available resource)

- ❖ Under population occurs when the population of an area is too small for full utilization of its resources.
- ❖ In these circumstances an increase in population would mean a more effective use of resources and increased living standards for all of the people.
- ❖ Under population is characterized by
 - ✓ low unemployment and
 - ✓ inward migration (immigration).

III. Optimum population (population = resource)

- ❖ The term optimum population refers to the balanced population - resource relationship in an area.

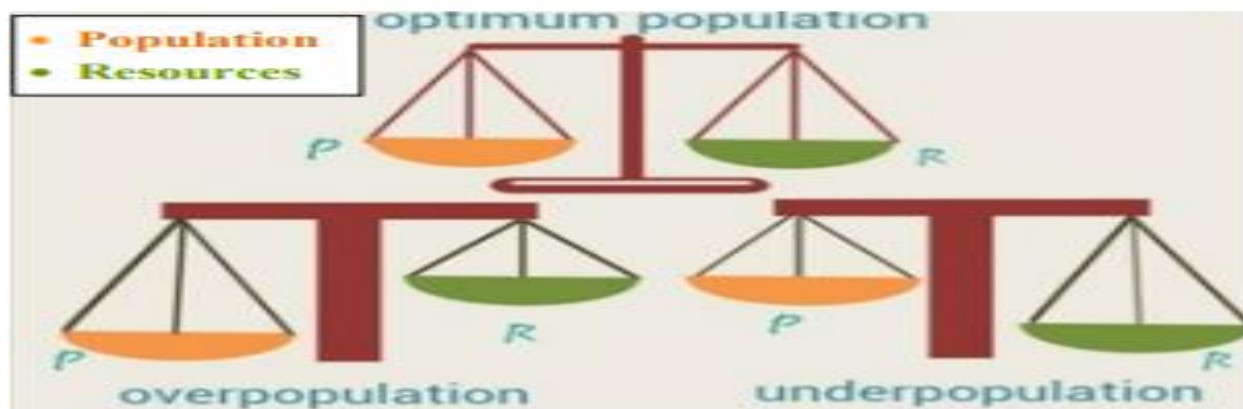


Figure 3.1 Population-resource relationships

- ◆ Generally, overpopulation and under population refers to **an imbalance in the relationship between the level of population and the actual resources in an area.**
- ◆ Several countries have attempted to introduce population policies aimed at managing or balancing this relationship.
- ◆ The population policies are classified into two categories. These are;
 - a. Anti natalist population policy
 - b. Pro- natalist population policy
- A. **Anti natalist population policy:**
- ◆ **Anti natalist population policy** is a policy which aims to **reduce birth rate** and **slow population growth.**
- ◆ This can be done through education on family planning and increased access to contraception, or by law.
- ◆ **China (but not now), Ethiopia** and many developing countries of the world are anti natalist countries.

B. Pro natalist population policy

- ◆ **Pro natalist population policy** is a policy which aims to **increase birth rate and rate of population growth**. This can be done through the use of **incentives**.
- ◆ **France, Sweden, Romania, Singapore and Canada** are pro natalist countries.

Do you know?

The Chinese one child policy

One of the most documented population control policies has been the Chinese one child policy. The Chinese government became concerned about population growth. The government realized that the Chinese people could only have a rising living standard if the population was controlled.

Between 1974 – 1979 the people were encouraged to reduce the birth rate by the slogan '*Wan- xi- shao*' (later, longer, fewer):

- ⇒ **Later** marriage
- ⇒ **Longer** gap between children
- ⇒ **Fewer** children

The '*Wan- xi- shao*' policy did not work well and the population went on increasing.

In 1979 the government introduced the **one child policy**. Strong pressure was put on women to use contraception. This policy was very successful in urban areas than rural areas. In 1990 onwards the one child policy has been relaxed slightly. This is partly because it was so difficult to enforce, and because the Chinese government was concerned about the economic implications of a population in which there were far older people than younger ones.

SELF EVALUATION QUESTIONS

- 1) What is population?
- 2) What is natural resource?
- 3) How do you explain the relationship between population and resources?
- 4) Define the following terms:
 - A. Over population
 - B. Under population
 - C. Optimum population.
- 5) What is the difference between pro natalist and Anti natalist population policies?
- 6) How the population policies help in solving problems caused by the imbalance between population and resources?

Types of Natural Resource

- ◆ Based on **renewability**, natural resources can be categorized in to two. These are;
 - ✓ Renewable and
 - ✓ Non-renewable resources.

i. Renewable resources(Infinite or Non- Exhaustible)

- ♥ **Renewable resources** are resources that **can be replace** (renew) themselves naturally after used.

✚ For instance, forest is a renewable resource that can produce timber and other forest products year after year if it is carefully and scientifically managed.

- ❖ Examples: **air, water, soil,sunlight, wind, forest (plant)** etc.

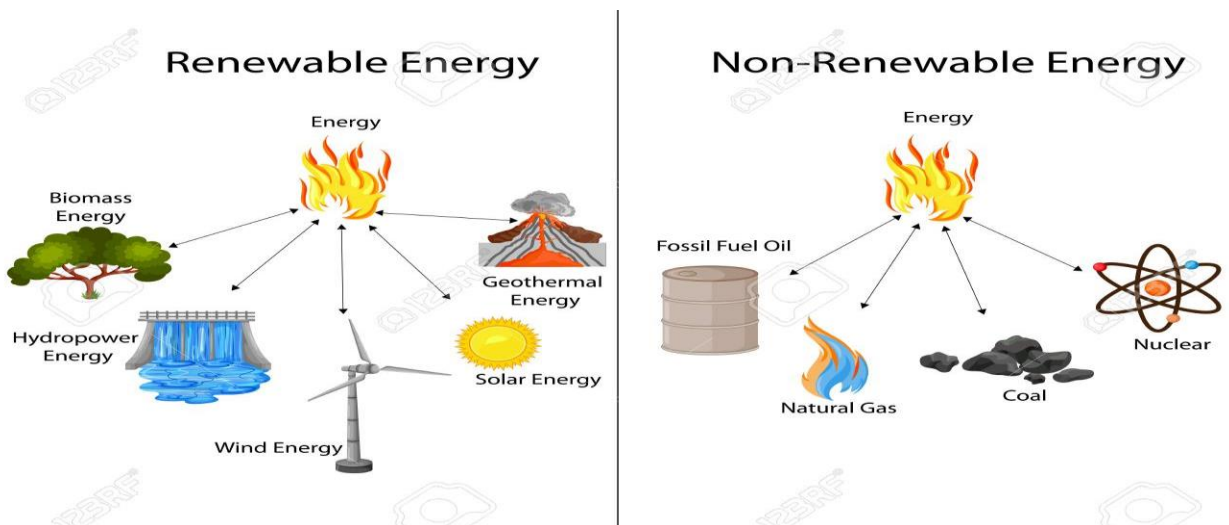
ii. Non-renewable resources (finite or Exhaustible)

- ◆ **Non- renewable resources** are resources that exist in **limited supply** and **cannot be replaced** if they are once used.

- ❖ Examples: **petroleum oil, natural gas, coal, and fossil fuels and minerals.**

➤ The following table shows the difference between renewable and non-renewable Resources.

Renewable Vs.	Non-renewable
➤ Can be used more than once	➤ Can be used one time
➤ exist in an Unlimited amount	➤ exist in a limited supply
➤ Results in Lower carbon emission	➤ brings higher relative carbon emission
➤ Have environmental impact Example: wind energy, sun light	➤ Have environmental impact Example: natural gas, opal



Do you know Opal?

The meaning of the word Opal comes from a Greek word ‘**Opallios**’ which means ‘**to see a change of color**’, which is connected with the way precious opal diffracts light.

It is a hydrated amorphous form of silica and chemically similar to quartz, and its water content may range from 3%-20%. Opal is first discovered in Ethiopia in the early 1990’s. Ethiopian Opal is the newest variety of precious opal gemstone resourced from *Wollo* (Amhara region), of northern Ethiopia.

What rock is opal found in?

Because of its amorphous character, it is deposited at a relatively low temperature and may occur in the fissures of almost any kind of rock, being most commonly found with limonite, sandstone, rhyolite, marl, and basalt.

It is currently economically valuable and one of the main export mineral resource in Ethiopia.

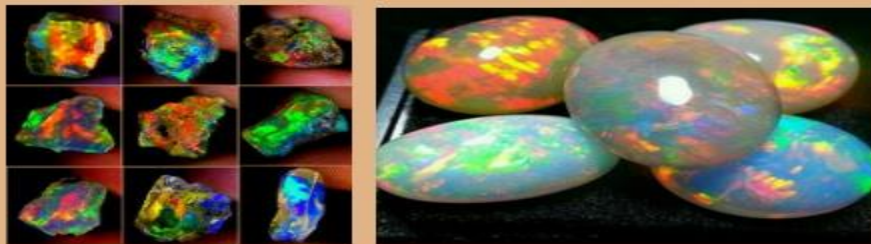


Figure 3.3 Ethiopian Opal

SELF EVALUATION QUESTIONS

- 1) What are renewable natural resources? Give examples.
- 2) What are non -renewable resources? Give examples.
- 3) Explain the difference between renewable and non- renewable resources?
- 4) Which category of resource is better to conserve our environment?

Factors affecting natural resource in Ethiopia

- ❖ Ethiopia is gifted with abundant natural resources of adequate landmass, fertile soil, favorable climate, water, wildlife, natural vegetation and various minerals. Many of these resources are not properly identified, well managed, and fully exploited. In Ethiopia,

natural resources are under the influence of various interconnected factors. These are:

- a) Population pressure
- b) Resettlement,
- c) Agricultural expansion
- d) Rapid urbanization

a. **Population pressure**

- ❖ Population pressure is a significant factor in natural resource degradation, leading to waste production, arable land pressure, biodiversity loss, and pollution.
 - This results in:
 - ✓ soil fertility loss,
 - ✓ low vegetation cover,
 - ✓ unsustainable farming practices,
 - ✓ overgrazing,
- ✓ wildlife migration, and environmental consequences like biodiversity decline and socio-economic problems.
- ◆ The process ends with amplified environmental consequences such as:
 - ❖ Decline biodiversity
 - ❖ Occurrence of natural hazards
 - ❖ Water quality deterioration
 - ❖ Diverse socio-economic problems
 - ❖ Imbalance ecosystem service
 - ❖ Poverty, famine and starvation.

b. **Resettlement**

- ❖ **Resettlement** is a process of moving a group of people to a new place or settlement to live in. Resettlement programs in Ethiopia have been considered as a viable solution to the rural communities which face different problems.
- ❖ However, it causes significant impacts on natural resources of the environment specifically at the destination areas. The main objective of Ethiopian government resettlement program was to support households get access to productive farmlands, and achieve food self-sufficiency. This strategy, in most cases, was taking place through the **clearing of natural vegetation particularly in the areas covered by dense forests.**
- ❖ These households had settled by clearing areas which were originally covered by forests
Causing:
 - Deforestation,
 - Land degradation, and
 - Associated environmental problems.

c. Agricultural expansion

- ❖ **Agricultural expansion** is the conversion of **non-arable land** to **arable land**. For instance, conversion of forest land to arable land.
- ❖ Agriculture is the backbone of Ethiopian economy, because more than 80% of the populations are engaged in agricultural activities. But, today in Ethiopia an agricultural sector is a major cause of environmental pollution and affects natural resources.
- ❖ These impacts include the following
 - ✓ Deforestation (for expanding arable land)
 - ✓ Using of chemical fertilizer and pesticides easily contaminate living organisms, soil, air, and water, etc.
- ❖ The recently established large-scale horticulture and floriculture activities are extensively using chemicals. These chemicals mostly leave a pollutant within the environment, causing adverse effect on soil, air, and water quality.

d. Rapid Urbanization

- ❖ **Rapid urbanization** is the process of population shifts from **rural to urban**, or **an increasing number of people living in town or cities**.
- ❖ Peoples in many rural areas have been migrating towards urban centers in search of better livelihood, job opportunities, education, and other services.
- ❖ This leads to an unplanned and rapid expansion of small cities and creation of huge pressure on natural resources.
- ❖ Generally, rapid urbanization in Ethiopia has always been related to remarkable environmental problems such as,
 - ◆ degradation of land,
 - ◆ deforestation,
 - ◆ large scale quarrying and excavation of sand, gravel, and other building materials.

Methods of conserving natural resources

The Ethiopian government has taken several steps to address these problems like tree planting programs, launching soil and water conservation campaign.

The major methods of conserving natural resources includes:

- ♥ Agro forestry
- ♥ Afforestation or reforestation
- ♥ Social forestry and
- ♥ Apply upward growing of urban centers.

.SELF EVALUATION QUESTIONS

True or False

Direction: Write “True” if the statement is correct and write “False” if it is incorrect

- _____ 1. Forest and water resources are non-renewable resources.
- _____ 2. Rapid increasing of population number does not affect natural resource.
- _____ 3. Chemical fertilizers used in agricultural activities are major sources of water pollution.
- _____ 4. Humans and the environment are strongly inter-related.
- _____ 5. Agricultural expansion does not affect natural resources.

II. Matching

Direction: Match the items in column “A” with items in “B” and write the answer in the space provided.

A	B
___ 1 Overpopulation	A. Permanent removal of trees.
___ 2 Under population	B. Increased number of people living town
___ 3 Optimum population	C. The available resources exceeds the population
___ 4 Deforestation	D. Population exceeds the available resources.
___ 5 Urbanization	E. Balanced population- resource relationship
	F. Group of the same species

III. Multiple choices

Direction: Choose the correct answer from the given options.

- _____ 1. Which one of the following is different from the others?
- A. Natural gas B. Petroleum oil C. Fossil fuel D. wind energy
- _____ 2. Which of the following factor is not the causes for deforestation?
- A. Agricultural expansion B. Resettlement C. population pressure D. Agro forestry

_____ 3. Which of the following country adopts anti-natalist population policy in managing or balancing human and resource relationship?

- A. France B. Sweden C. Ethiopia D. Romania

_____ 4. One of the following is not a method of conserving natural resources?

- A. Deforestation C. Social forestry
B. Agro forestry D. Reforestation

IV. Fill in the blank:

Direction: Fill the following blanks with appropriate word(s)

1. _____ is the conversion of non-arable land to arable land.
2. The process of moving a group of people to new place or settlement to live is known as _____
3. Resources that cannot replace themselves after use is known as. _____
4. The number of people a region can support without environmental degradation is called Carrying capacity

V. Short answer:- Direction: Give short answers for the following questions.

1. Write down some methods of conserving natural resources in Ethiopia?
2. Explain the reciprocal relationship existing between humans and the environment?
3. How does population growth affect a country's natural resources?
4. Explain the difference between renewable and non-renewable resources?
5. What are the roles of renewable and non-renewable resources in sustainable economy?