CHAPTER THREE
THE TOPOGRAPHY OF ETHIOPIA AND THE HORN

- Topography refers to the elevation and relief of the Earth's surface.
- Landforms are the topographic features on the Earth's surface.
- The topography of Ethiopia is largely determined by the geologic activities of the Cenozoic Era.

General Characteristics of the Ethiopian Physiography

- The Ethiopian landform is characterized by great diversity.
- Altitude ranges from 125 m.b.s.l (Kobar Sink) - 4,620 m.a.s.l (Mount Ras Dashen the highest mountain in Ethiopia, and the fourth highest mountain in Africa.
- Ethiopia has the **largest proportion of elevated landmass** in the African continent.
- It is sometimes described as the Roof of East Africa.

- More than 50% of the Ethiopian landmass is above 1,000m.
- 44% of the country has an elevation of 1,500m.
- Most of the Ethiopian Highlands are part of ***central and northern Ethiopia,*** and its northernmost portion extends into Eritrea.
- The highland core, on the other hand, is ***encircled by semi-arid lowlands.***
- Most of the country consists of high plateau and mountain ranges that are sources of many rivers and streams that made the country to be described as the ***"Water Tower of East Africa".***
- The diversity in topography is accompanied by differences in other natural features such as ***soil, climate, vegetation and wild life.***
- Socio-cultural and economic phenomena are also affected by the topography.

Characteristics of Ethiopian highlands

- Moderate and high amount of rainfall (>600 mm per year).
- Lower mean annual temperature (<20C).
- Favorable climate for biotic life.
- Rain-fed agriculture is possible.
- Free from tropical diseases.
- Attractive for human habitation and densely settled.

✪As a result, the highlands have been ***significant*** throughout Ethiopian history in the **economic, cultural and political life of the people.**

✪These highlands make up nearly 56% of the area of the Ethiopia.

✪*Characteristics of Ethiopian lowlands*

- Fewer amounts of rainfall and higher temperature.
- High prevalence of tropical diseases.
- Lower population densities.
- Nomadic and semi-nomadic economic life.
- Vast plain lands favorable for irrigation agriculture along the lower river basins.

The Physiographic Divisions of Ethiopia

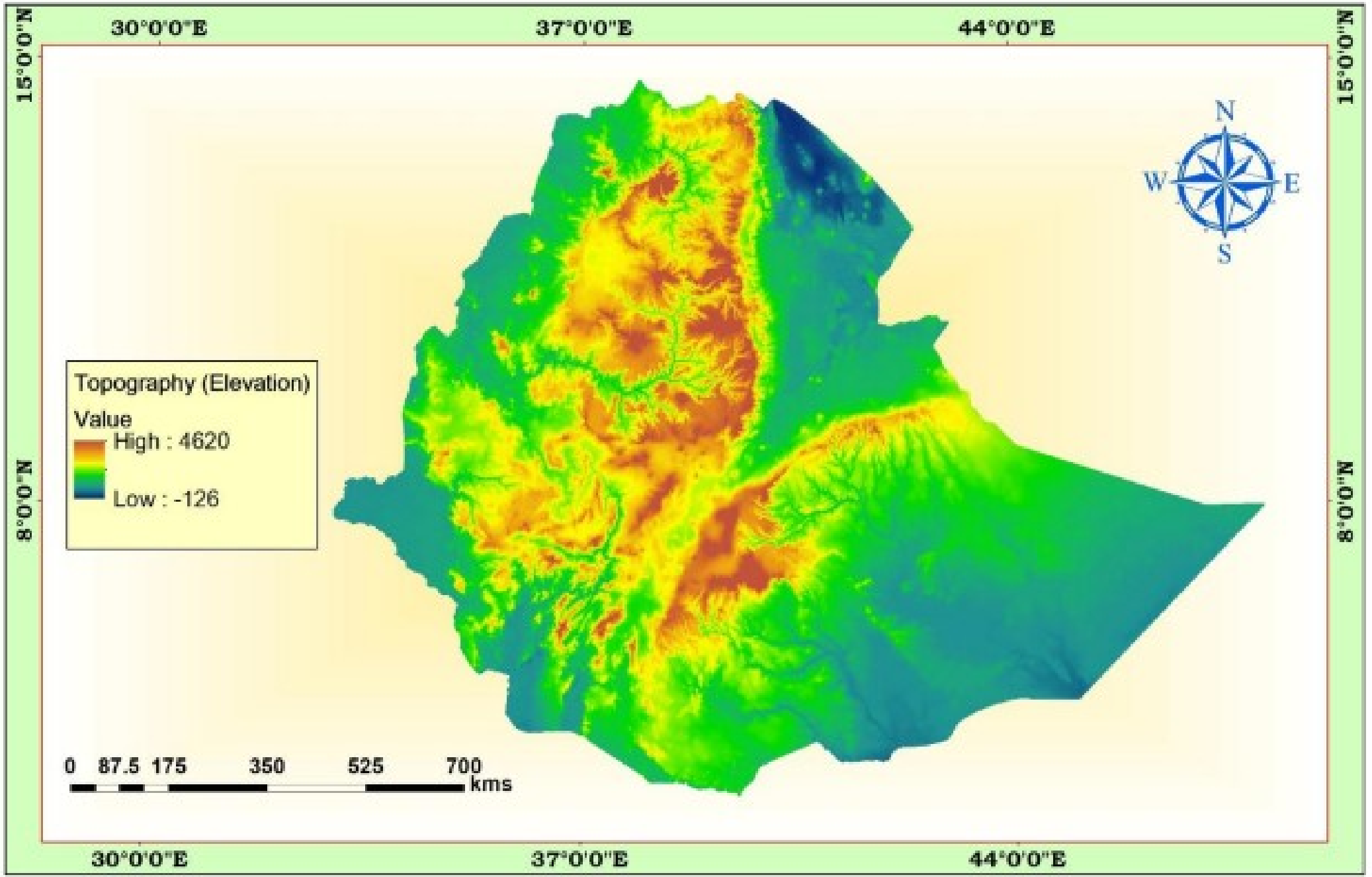
Three major physiographic units can be identified in Ethiopia.

1. The Western highlands and lowlands
2. The South-eastern (Eastern) highlands and lowlands
3. The Rift Valley

1. The Western Highlands and Lowlands

- Includes all the area ***west of the Rift Valley.***
- Extends from north to south encompassing nearly the whole **western half of Ethiopia.**
- It makes up about 44% of the area of the country.

❖This region is further subdivided into four groups of highlands (76.3%) and four groups of lowlands (23.7%)


30°0'0"E
37°0'0"E
44°0'0"E
15°0'0"N
8°0'0"N
N
W
E
S
Topography (Elevation)
Value
High : 4620
Low : -126
0 87.5 175 350 525 700
kms

1. The Western Highlands (4 Groups)

A. *The Tigray Plateau*

B. *North Central Massifs*

C The Shewa Plateau/central highlands

D. The Southwestern Highlands

2. The Western Lowlands (4 Groups)

1. Tekeze lowland,
2. Abay-Dinder lowland,
3. Baro lowland, and
4. Ghibe lowland

1. The Western Highlands

A. The Tigray Plateau

- Extends from the Tekeze gorge in the south to central Eritrean highlands.
- The Tigray plateau is separated from the Eritrean plateau by the ***Mereb River.***
- It constitutes about 13% of the area of the region.
- Most of the land being in between 1,000 and 2,000 meters
- Mount Tsibet (3988m), Mount Ambalage (3291m), and Mount Assimba (3248).

❑ The famous monastery at Debre-Damo, a tableland that can only be climbed by a rope pulley is also located in this plateau region.

B. North Central Massifs

- **Largest** in the western highlands.
- Much of its northern and southern limit follows the **Abay and Tekeze gorges.**
- In its central part, the physiographic unit also accommodates the Lake Tana basin
- 58% of the region is at an altitude of more than 2,000 meters, making it, next to the Shewan Plateau, the second highest physiographic division.

- The region consists of the **Gonder, Wello and Gojjam Massifs.**
- Out of the 26 mountain peaks with altitude of more than 4,000m in Ethiopia, 19 mountain peaks are found in this physiographic region.

- Mt. Ras Dashen (4,620m), Mt. Weynobar (4462m), Mt. Kidis Yared (4453m), Mt. Bwahit (4437m), Mt. Guna (4,231m) Abune Yoseph (4,260m) Mt. Birhan (4,154m)

C. The Shewa Plateau/central highlands

- Occupies **Central geographical position** in Ethiopia.
- The smallest of the Western highlands (11%).
- Nearly three-fourth of its area is at an altitude of more than 2,000 meters above sea level.
- It has, therefore, the largest proportion of elevated ground.
- The Shewa plateau is drained, outward in all directions by the tributaries of Abay, Omo, and Awash.
- Mount Abuye-Meda (4,000m) and Mount Guraghe (3,721m)

D. The Southwestern Highlands

- ✓ Consists of the highlands of Wellega, Illuababora, Jimma, Kaffa, Gamo and Gofa.
- ✓ This region is separated from the adjacent highlands by the Abay and Omo river valleys.
- ✓ It accounts for 22.7% of the area of the region and it is the second largest in the Western highlands.
- ✓ The southwestern plateau is the ***wettest in Ethiopia.***
- ✓ It is drained by Dabus, Deddessa, Baro, Akobo and the Ghibe/Omo rivers.
- ✓ With a height of 4,200 meters above sea level, Guge Mountain is the highest peak in this physiographic subdivision.

2. The Western Lowlands

- The general elevation ranges between 500 and 1000 meters above sea level.

1. Tekeze lowland, 2. Abay-Dinder lowland, 3. Baro lowland, and 4. Ghibe lowland

- With the exception of the Baro lowland, the region is generally characterized by ***arid or semi-arid conditions.***
- ***Pastoral or semi-pastoral*** economic activities dominate the area.
- As one moves northwards, the degree of aridity increases, making **rain-fed agriculture** more difficult.
- Since one or two rivers cross all of these lowlands, **irrigation agriculture** is highly feasible. For example, the Baro lowland has an extensive flat area suitable for mechanized agriculture.

2. The Southeastern Highlands and Lowlands

- The **second largest** in terms of area.
- It accounts for 37% of the area of Ethiopia.
- The highlands make up 46% while the rest is lowland.
- These are further subdivided into two units of highlands and two units of lowlands.

1. The Southeastern Highlands (2-Groups)	2. The Southeastern Lowlands (2-Groups)
A. The Arsi-Bale-Sidama Highlands	A. Wabishebelle plain (60%)
B. The Hararghe Plateau	B. The Ghenale Plain (40%).

1. The Southeastern Highlands

A. The Arsi-Bale-Sidama Highlands

- Found to the east of the Lakes Region.
- ✓ The well-known mountains in Arsi are Mount Kaka (4,180m), Mount Bada (4,139m) and Mount Chilalo (4,036m).

- ✓ The Bale highlands are separated from the Arsi highlands by Wabishebelle.

- The highest mountain peaks in Bale are Tulu-Demtu (4,377m) and Mount Batu (4,307m).
- The Arsi-Bale Highlands are ***important grains producing areas***
- The Sidama Highlands are separated from the Bale Highlands by the **Ghenale river valley.**
- The prominent feature here is the Jemjem plateau, an ***important coffee growing area.***

- Rivers Wabishebelle and Ghenale along with their tributaries have dissected this physiographic region.
- Specially, **Weyb River**, tributary of Ghenale, has cut an underground passage **(Sof Omar cave)** through the Mesozoic Limestone rocks.
- The cave is found near Bale Mountains. It is one of the **World's most spectacular** and **extensive underground cave** creating a magnificent view accessible only by an underground stream.

B. The Hararghe Plateau

- North-easterly extension of the south-eastern highlands.
- It extends from the Chercher highlands in the south-west to Jigjiga in the east.
- It has the smallest proportion of upper highland (>2,000 meters).
- The left-bank tributaries of Wabishebelle drain it.
- The highest mountain here is Mount Gara-Muleta (3,381 m.a.s.l).

2. The Southeastern Lowlands

- Located in the **southeastern part** of the country
- The **most extensive lowlands** in Ethiopia.
- Divided into Wabishebelle plain (60%) and the Ghenale Plain (40%).
- Include the plains of Ogaden, Elkere, and Borena.

❖ Because of the harsh climatic conditions, They are **sparsely inhabited** by pastoral and semi-pastoral communities.

❖ The economic potential for this region includes animal husbandry, irrigation, agriculture and perhaps exploitation of petroleum and natural gas.

3. The Rift Valley

- The Rift Valley is a tectonically formed **structural depression.**
- It extends from the Afar triangle in the north to Chew Bahir for about 1,700 km.
- It covers 18% of the area of Ethiopia.
- Altitude in the floor ranges from 125 meters below sea level at Dallol Depression, to as high as 2,000m above sea level in the Lakes region.

❖ Further subdivided into three physiographic sub-regions.

1. Afar Triangle,
2. Main Ethiopian Rift, and
3. Chew Bahir Rift.

The Afar Triangle

- The **largest and widest** part of the Rift Valley (54% of the Rift Valley area).
- Triangular-shape lowland, elevation=1,000m to 125m below sea level (Danakil depression) represent the **lowest subaerial point of the African continent.**
- Characterized by faulted depressions (grabens), volcanic hills, active volcanoes

The Main Ethiopian Rift/Central Rift

- **Narrowest and the highest** with the elevation of 1,000-2,000 meters above sea level.
- The prominent features are the **numerous lakes** formed on tectonic sags and fault depressions.

The Chew Bahir Rift

- This is the **smallest and the southern-most** part of the Rift Valley.
- Broad and shallow depression, which is a marshy area covered by tall grass, into which the Segen and Woito streams empty.

The Impacts of Relief on Biophysical and Socioeconomic Conditions

Highly dissected character of the landscape over much of the country's territory along with the limited extent to which flat surfaces are present influence the various socioeconomic aspects of Ethiopia

1. Agricultural practices

- Relief influences farm size and shape
- Choice of farming techniques (in rugged terrain mechanized farming techniques are difficult to practice.)
- Crop production and animal husbandry

2. **Settlement pattern**

✓ Highlands of Ethiopia (densely settled)

✓ The highlands of Ethiopia are characterized by sedentary life and permanent settlements while lowlands that are inhabited by pastoralists have temporary settlements.

3. Transportation and communication

- The highly dissected nature of the landscape is a barrier to the development of internal surface transportation
- Rugged topography rendered rivers less navigable

4. Impacts on climate

- The climate of Ethiopia is a result of the tropical position of the country and the great altitudinal variation of the general topography.

5. Impacts on soil

- Steep mountain slopes provide low angle of rest, unstable surface materials and subject to degradation

6. Impacts on natural vegetation

End of the chapter