# *CHAPTER* 2 KARST (LIMESTONE) TOPOGRAPHY/REGION

## Objectives

- identify and define karst/limestone region.
- list the characteristics of limestone region.
- state the surface and underground features of karst region.
- mention the importance of limestone region to man.

### 2.1 Identification and Characteristics of Karst Region

Limestone and chalk are sedimentary rocks of organic origin derived from the accumulation of corals and shells in the sea. Limestone region refers to a large stretch of limestone which possesses a very distinct type of topography. It is often termed a KARST region, a name derived from the Karst district of former Yugoslavia.

Chalk is a very pure form of limestone, white and rather soft. Limestone consists of calcium carbonate, which is slightly soluble in the rain water which percolates through it.

**Characteristics of limestone region**

1. Absence of surface drainage: There is general absence of surface drainage as most of the surface water has gone underground.
2. Dry surface valleys: The surface valleys are dry as a result of easy penetration of water in limestone region.

3. Solubility: Limestone is insoluble but is made soluble by the action of rain water which dissolves carbon dioxide to make it soluble.
4. Well jointed: Limestones are well jointed and its way through these joints and cracks that rain water find it into the underlying rock.
5. Presence of swallow holes: Limestone region contains numerous swallow holes which are small depression carved out by solution when rain water sinks into the limestone at a point of weakness.

## 2.2 Surface features of Karst Region

The peculiar surface limestone regions are:

1. Grikes: The enlarged joints are called grikes. It is formed as a result of progressive widening and deepening of cracks or joints from the dissolved limestone carried underground through the joints. E.g. Kuala Lumpur.
2. Clints: The grikes in turn carve and divide up the limestone surface into blocks called clints. The isolated, rectangular blocks are termed clints e.g. Kentucky region of the United State.
3. Swallow holes or sink holes: They are small depressions carved out by solution where rain water sinks into the limestone at a point of weakness. These holes grow in size through continuous solvent action. Examples can be found in Gaping Ghyll in Yorkshire.
4. Limestone pavement: It refers to flat and dry surface of several kilometers made up of bare dry rocks, grikes and clints with a rugged topography devoid of soil and vegetation; Gaping Ghyll in Yorkshire is an example.
5. Limestone scars: It is the outcrop of limestone works on steep slope break off by disintegration and exposes limestone scars with fallen trees at the bottom e.g. the limestone hills of Perlis.

6. Doline: A number of swallow holes joined together to form a large depression is called Doline. E.g. Postojina caves in former Yugoslavia.
7. Uvala: Several dolines may merge as a result of subsidence to form a larger depression called an uvala. e.g. Kuala Lumpur.
8. Polje: It refers to some very large depressions that may be as large as 160 square kilometers which are partly due to faulting. E.g. North West of former Yugoslavia.

## 2.3 Underground Features of Karst Region

Some of the features formed underground are as follows:

1. Caves and caverns: It occurs where streams descend through swallow holes to underground passages, the region may be honeycombed with caves and caverns, some containing ponds and lakes. Examples are stalactites, stalagmites and pillars. For example, district of southern France.
2. Limestone gorge: This is formed when the root of an underground tunnel/cave collapses e.g. Cockpit country of Jamaica.
3. Spring or resurgence: It occurs when the water penetrates to the base of the limestone and meets non-porous rocks it re-emerges onto the surface as a spring or resurgence e.g. Peninsula of Mexico.
4. Stalactites: They are sharp, slender, downward growing pinnacles that hang from the cave roots. They are precipitates of calcium carbonate in solution, for example, Postojna caves in former Yugoslavia.
5. Stalagmites: They are formed when water drips down stalactite to the floor where calcium is deposited to form stalagmites e.g. Yucatan peninsula of Mexico.

6. Pillar: The stalactite hanging from the roof is eventually joined to the stalagmite growing from the floor to form a pillar e.g. Kuala Lumpur.

## 2.4 Importance of Limestone Regions to Man

Its importance include:

1. It provides grazing land for animals like cattle, sheep and goats.
2. Limestone region is a good site for tourist attractions.
3. It provides limestone for cement production.
4. It is used in smelting tin and iron.
5. Limestone region is a source of underground water.

*Fig 2.1: Limestone scenery*

**Summary**

Limestone and chalk are sedimentary rocks of organic origin derived from the accumulation of corals and shells in the sea. Chalk is a very pure form of limestone white and rather soft.

Characteristics of limestone region include absence of surface drainage, dry surface valleys, solubility, well jointed and presence of swallow holes.

Surface features of karst region include grikes, clints, swallow holes, limestone pavement, limestone scars, doline, uvalia and polje.

Some of the underground features of karst region are pillar, stalagmites, stalactites, spring or resurgence, limestone gorge, caves and caverns.

The importance of limestone regions to man include provision of grazing land for animals, good site for tourist attractions, provision for limestone for cement production.

## Revision Questions

## Objectives

1. All the following are characteristics of a limestone region except
   A. stony and broken surface
   B. rugged topography
   C. adequate luxuriant vegetation cover
   D. absence of surface drainage
2. Which of the following is a feature of limestone regions?
   A. Batholith
   B. Ginder cone
   C. Crater
   D. Stalagmite
3. The process of weathering in limestone region is mainly
   A. hydration
   B. exfoliation
   C. solution
   D. oxidation
4. Marble is a metamorphic rock formed from

A. clay
B. limestone
C. granite
D. coal

5. An example of organically formed sedimentary rock is

A. sandstone
B. rock salt
C. grit
D. limestone

6. Downward – growing pinnacles that hang from the roofs of caves in limestone regions are called

A. stalactites
B. clints
C. zeugen
D. grikes

7. Swallow holes are also known as _____

A. doline
B. uvala
C. sink holes
D. poljes

8. A number of swallow holes joined together to form a larger depression is known as

A. Doline B. Clints C. Sink holes D. Grikes

9. One of the following is not an underground feature of a karst region.

A. Stalagmites
B. Stalactites
C. Polje
D. Caves

10. One of these is not a surface feature of a karst region?
    A. Resurgence
    B. Polje
    C. Stalactites
    D. Stalagmites

***Answers***

1. C 2. D 3. C 4. B 5. D 6. A 7. C 8. A 9. C 10. A

**Essay**

1(a.) Define limestone region.

(b.) State the characteristics of limestone region.

2(a.) What is a water table?

(b.) Enumerate the factors which affect the depth a of water table.

3. Write short notes on any four of the following:
    (a) Swallow hole (b) Grikes (c) Doline (d) Polje (e) Clints

4(a.) Name three features of underground water.

(b.) Explain any two of them.

5(a.) Using suitable diagrams, describe the appearance and mode of formation of any two of the following landforms:
    (i) Swallow hole (ii) Stalagmite (iii) Cave

(b.) Explain with examples any two ways in which limestone regions are important to man.