Unit 1 : Water Education

Chapter 2 : River System

We have all understood the water cycle in the previous chapter.

Let's recall.

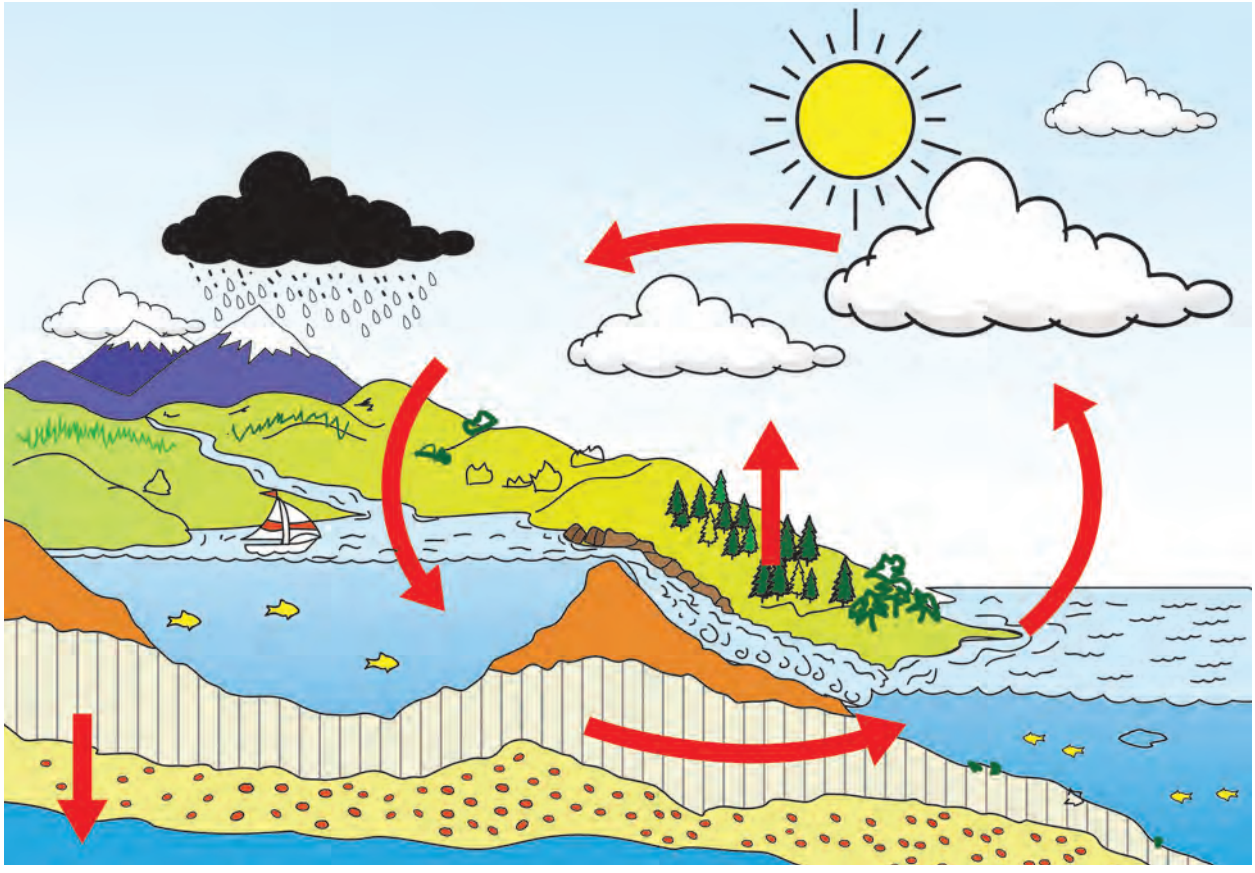
In the water cycle, water travels through which stages? Observe the diagram and write the name of each step.

This water cycle runs uninterrupted in nature. The river is a part of this water cycle.

Origin of the River :

When it rains, the water does not flow away from the ground immediately. Just as it falls on plane land, it also falls on reservoirs like mountain slopes, lakes and the sea. Some parts of the water evaporate immediately as the soil warms, some parts are absorbed by the plants and some parts of the water seep into the rocks and go underground. When more rain falls in a short period of time, it exceeds the limit of seepage or accumulation in one place, this water is seen flowing from the ground for some time, it is called runoff or flow of water. Such a stream of water then flows continuously downhill. In some places it is obstructed, water can accumulate in low lying areas and water seeping into the soil continues to flow through cracks and crevices. This natural flow of water is seen in various forms like brooklets (Odhe), runnels (nale), rivulets (Ohol), tributary (upnadi) and rivers etc.

A river is a natural body of water that flows over a large area of land. These different types of streams are collectively called "River Systems".



1.2.1 Water Cycle

The shape of the River:

The river is also a natural wide stream but such a river does not form at once. The small amount of rain water that flows from the ground is called Brooklet (Ohol). Many such brooklets come together and flow through the low lying areas on the ground, they form Rivulets (Odhe). The "River" is the one that is formed due to combining of many such rivulets. Near the origin the river basin is narrow and the slope is steep. Where it meets the sea, its width increases and its slope decreases.

Rivers and Landforms :

The upper reaches of the river are near the origin of the river. The flow of water in a certain direction from a low-lying area to a certain width is called a river basin. The river basin can be deep, shallow, wide, narrow. Usually it is single but sometimes the river basin is divided. In some places, islands are also formed in the river basin.

Types of River :

Natural flow of water also depends on the topography of the place, climate change, human barriers for water use. Accordingly the types of river, are-

Noisy River :

Usually immediately after origin, if the water flows rapidly from the steep mountain slope and the river basin in that area is narrow and deep, then such a river is called a noisy river or a fiery river. This river is constantly eroding its bed. Such rivers are found in the highlands.

1.2.2 Noisy river

Slow River : Where the slope of the land surface decreases and the basin widens, the river water starts flowing slowly, hence it is called slow river. The river basin can be deep in this place so the water level in the river basin is also high. Such rivers are found in the plateau region.

1.2.3 Slow river

Old Rivers :

Rivers which have a very low slope and have no weathering capacity fall into old river category. Such rivers are most likely found near the sea.

Revived River :

A river that dries up due to various reasons and starts flowing again when the surface is lifted due to topographical movements is called revived river.

Living River :

River basin gets water in different ways. Due to direct rains, streams and groundwater from other places flow into the river basin in the form of springs. But this is not always the case. When the rains stop, some rivers stop flowing and some can flow for twelve months. A river that flows into a river basin in the form of springs even in the absence of rain is called a living river. A river that stops flowing when the rains stop is called a dead river.

Do you know ?

The velocity of a river is determined by its flowing volume in cusecs - how many cubic meters of water flowed in a second. (Cusec = 1 ft^3 of water = 28.31 Litre/sec) Also sometimes measured in gallons.

The edges built at the river banks are useful to control the speed of the river. Such wide stone banks are called ghats. All the major rivers considered sacred in India have ghats.

Landforms created by the River :

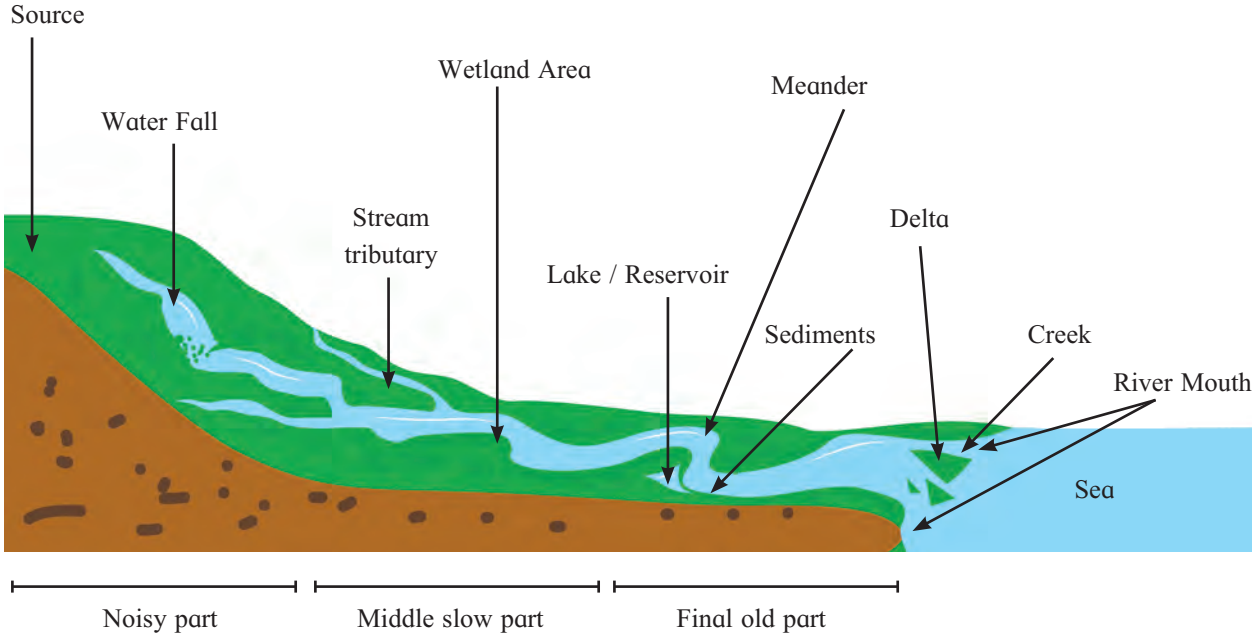
Mining of the river creates landforms like V-shaped valleys (ghalai), furrow or trenches (ghals), waterfalls, Pot-holes (ranjan khalge).

Due to the accumulation of river, flood plains, flood banks, triangular regions, winged plains, serpentine turns, horseshoe shaped lakes are formed.

The rapid flow of water in the highlands can also cause erosion of hard rocks. This creates sand having fine pieces of rock. The river basin becomes deeper. In some places, a flow that falls from a height (waterfall) is formed.

Sometimes the strength of the flow in the plateau changes the course of the river and makes the path shorter. Sometimes the rivers pull the silt from the banks into the stream, sometimes the river releases the silt from its basins to the banks. This silt accumulates in the middle of the stream and forms an island. Parts made of such silt are very fertile for agriculture. Such islands are also found in Maharashtra in the river basins of Godavari, Bhima and Krishna.

Triangular regions are the areas of fertile silt formed near the mouth of a river. E.g. Many such triangular regions have been formed in the river Ganga and the river Brahmaputra.



1.2.4 Landforms created by the river

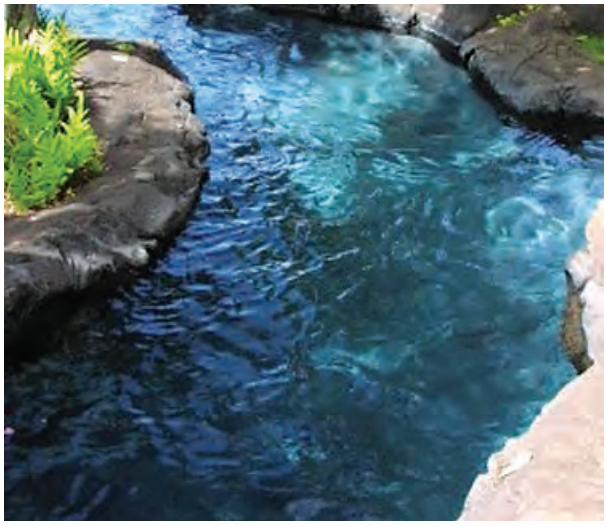
In a river basin, if there is a sudden downpour or a cliff, the water picks up speed or gets a circular motion. This is called a river vortex.

1.2.5 River Vortex.

The water stored in certain rocky areas of the river basin for a long time is called river pond / pool.

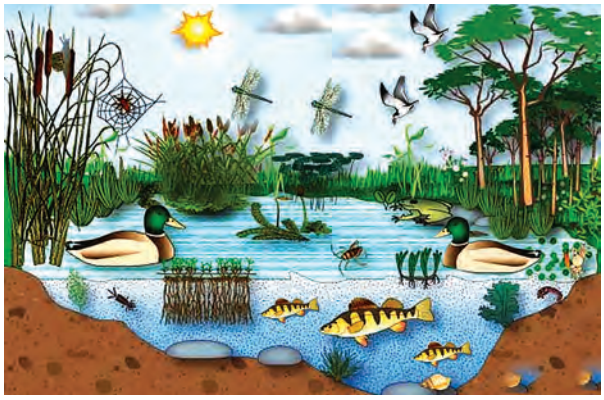
In the rainy season, when a large amount of water enters the river basin, it extends to a certain distance that exceeds the width of the basin. Almost all rivers flow on the surface. But some rivers flow through caves below the surface. Many caves are enlarged by such rivers. Often such rivers erode salt rocks and form caves.

Many miraculous shapes formed due to this are found.



1.2.6 Salt rocks and Formed caves

River Ecosystems : The organisms, plants and animals living in the river water use only the naturally occurring resources and habitat of the river. The existence of an independent cycle of life that depends on the river, is called the river ecosystem. It consists of many plants, animals and parasites. Most of the living things in the river are freshwater, but some can live in brackish water also.



1.2.7 River Ecosystems

Uses of River :

Basic uses :

Rivers are the main source of water for living things. Man uses river water for drinking, for industry, for transportation, for power generation, and for running large machinery. The river is also used as a border between the country and the state, ensuring territorial boundaries.

The river has been used as a means of transportation and direction for centuries. The first evidence of river navigation has been found in Indus culture since 3300 BC. River basin transportation is very cheap. Today such transport is carried on the most important and largest rivers in the world. Rivers are also used to transport of cut trees (wood) in forest areas.

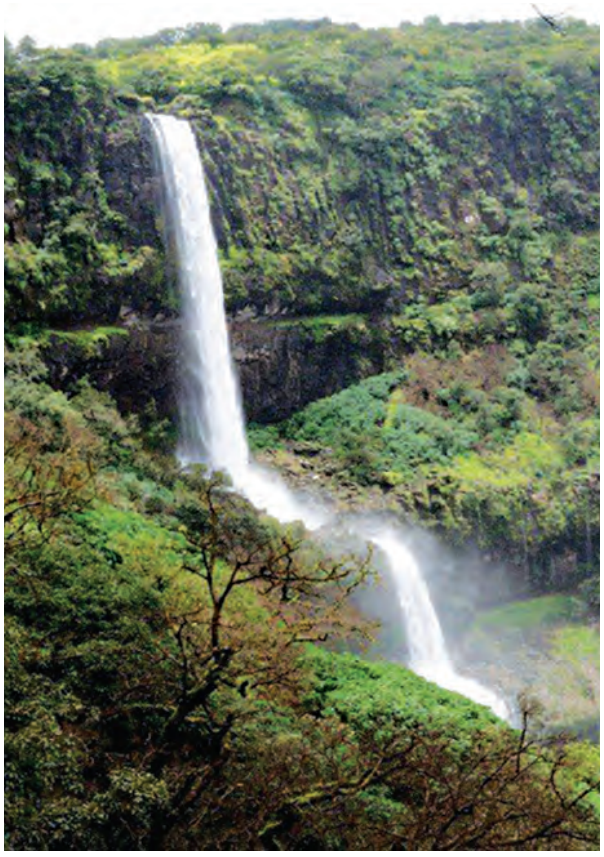
Rivers have been used for food since eternal time. There is a cycle of life in rivers. It produces many kinds of fish. River water is being used not only for fishing but also for agriculture and food production.

Most of the rivers in India have ghats for recreation and access to the river.

River sand is used for construction. The beautified riverbanks attract more tourists, and give the local community the opportunity to serve cruises. Sometimes rivers flowing in mountainous areas form waterfalls.

Such places become the center of travel. Sometimes a fast sailing boat called 'kayaking' is used in the rushing waters.

1.2.8 Rafting



1.2.9 Bhambavli-Vajrai Water fall, Satara : A favourite destination

Religious significance of the river :

The life of the whole village/city takes place on the banks of the river. Culture is developed on the banks of the river. Therefore, the daily activities of the people are more related to the contact of the river. Therefore, religious activities (Dharmacharan) such as daily bathing, prayers (sandhya), chanting (japa), tarpan, etc., started on the banks of the river from ancient times. Therefore, the river is considered to be the major social and religious center of the village/city. So various festivals are held along the river banks to express the gratitude one feels for the river.

1.2.10 Religious significance of the river

Exercise

1. Which main river flows through your taluka?
2. What is the type of this river? What will be the average length, width, depth of its basin ?
3. What landforms are created by the river in your area?
4. How many tributaries or springs-brooklets-rivulets meet that river?
5. Which river flows next to that river? OR This river meets which major river ?
6. What are the major check dams, lakes, dams on the river?

   (Seek the help of your parents.)
7. What are the uses of river?
8. Identify the factors that harm the river.
9. If you find any type of river pollution, what will you do ? bring it to the notice of adults.
10. Present the information of the nearest river that you have visited or studied.
11. Discuss whether it is right or wrong to perform religious activities on the river bank.
12. Visit the nearest river and observe the ecosystem there. See which plants and animals are found there, make notes and explain to others.
13. What are the main types of rivers?
14. What landforms are formed by rivers?
15. Explain the difference between a living river and a dead river.
16. Make a chart of the names of rivers and tributaries in Maharashtra.
17. Get a map of the river system in your district.