

Types of Water

B.Sc. III

Paper - 1

Unit - 1

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Introduction

- Water is the elixir of life.
- It is essential part of protoplasm.
- It creates a state for metabolic activities to occur smoothly.
- It provides unique physical environment that favors the existence of many types of micro organisms that are not common in soils.

Types of water

- Natural water is commonly grouped into four well marked classes:
- Atmospheric water
- Surface water
- Stored water
- Ground water

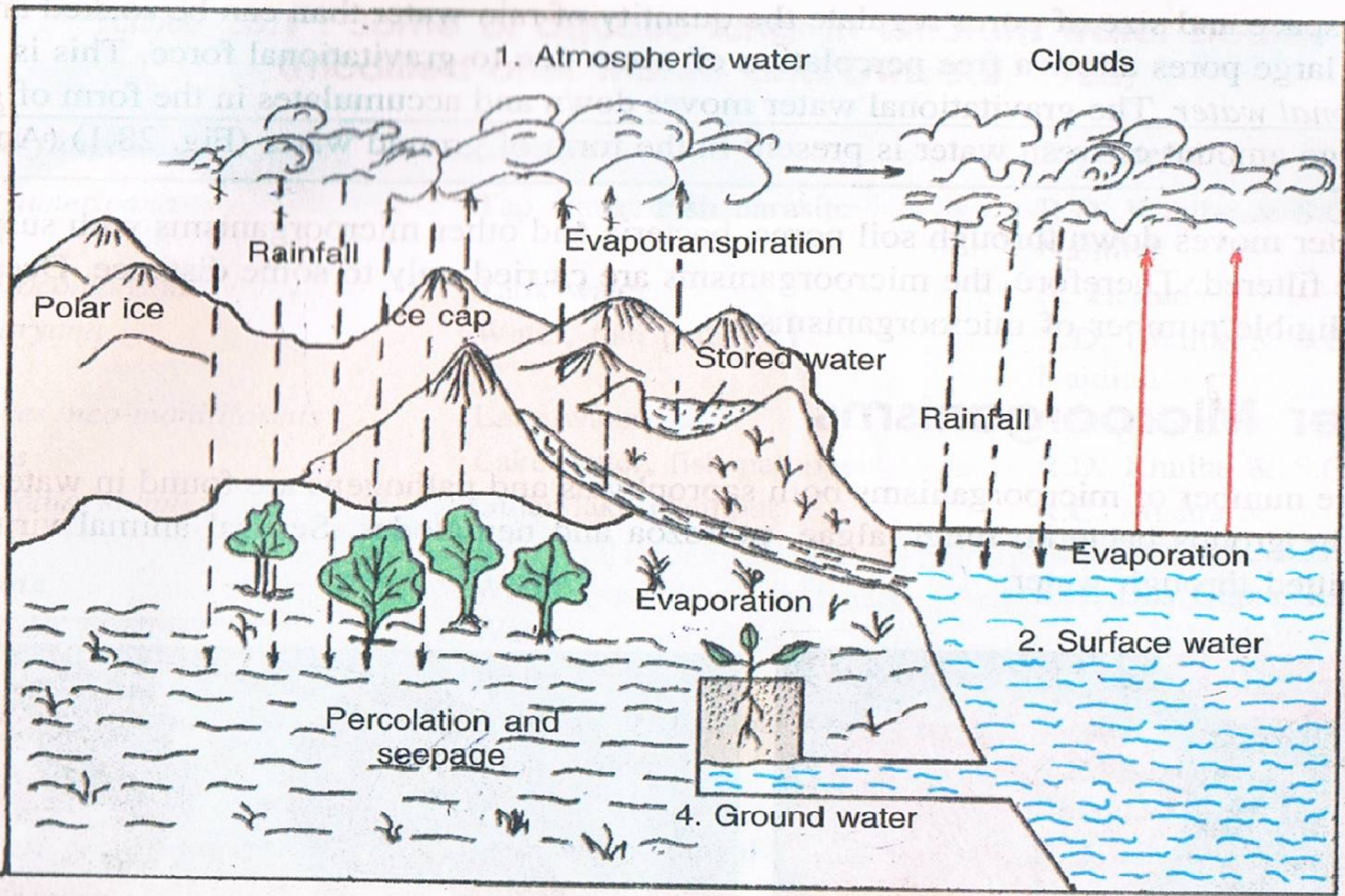


Fig. 28.1 : Hydrological cycle (based on Ambasht, 1984).

Atmospheric water

- Moisture contained in the clouds
- Precipitation as snow, sleet, hail and rain
- The microbial flora of this water is contributed by the air.
- The air is washed by atmospheric water which carries with it dust particles to which microbes are attached.
- These microbes carrying dust particles are removed during the early stages of precipitation.

Surface water

- Water present on earth surface
- Found in the form of rivers, streams, lakes, oceans
- These are susceptible to contamination with microbes from atmospheric water, the surface run off from soil and any wastes deliberately dumped into them

Surface water (Contd.)

- Total microbial number in water depends on microbial population of soil, types of soil, types of organic matter present in soil and also types of microbes and their activities.
- Microbes of water are governed by climatic, chemical and biological conditions.
- Microbial population is influenced by anthropogenic activities.

Stored water

- The stagnant land water present in pond , lake etc. are called stored water.
 - During storage generally the number of microorganism get reduced which establishes the purity and stability of water to some extent .
1. **Sedimentation** :- microorganisms have specific gravity slightly more then the distilled water , therefore they slowly settle down the bottom of water bodies .

Interaction Of Other Microorganisms:- Predatory protozoa are present in water that need living or dead bacteria for their food. If sufficient amount of oxygen is present, a large number of these microorganisms are engulfed by the predatory protozoa, but in absence of oxygen and bacteria protozoa will not be present in water.

Light Rays :-Both the vegetative cell and spores of microorganisms are killed in the prolonged exposure of direct sunlight.

However toxicity of UV radiations is inversely proportional to turbidity.

Temperature :-

- Increasing temperature is harmful to microorganisms.
- But some pathogenic microorganisms multiply well with increasing temperature .

Food Supply :-The number of microorganisms is likely to increase with increased food supply in water. Several waste materials present in water act as food bases.

Ground Water

- Subterranean water that occurs where all pores in the soil or rock containing materials are saturated. Bacteria and suspended particles are removed by filtration, in varying degrees, depending on the permeability characteristics of the soil and the depth to which water penetrates
- Springs consist of ground water that reaches the surface through a rock fissure or exposed porous soil

Wells are made by sinking a shaft into the ground to penetrate the ground water level

Bacteriologically speaking wells and springs that are properly located produce water of very good quality and if precautions are taken to avoid contamination, the microbial content is negligible.