

The Hydrological Cycle

The hydrological cycle is the continuous movement of water on, above, and below the Earth's surface. This fundamental process sustains life and regulates our climate, making it a crucial component of our planet's ecosystem.



Dr. Jagdish Chand
Asst. Prof, Geography
Govt. College Sangrah



Evaporation

1

Heat-Driven Process

Evaporation occurs when the sun's heat causes water to turn into water vapor, which rises into the atmosphere.

2

Affects Surface Water

Evaporation depletes water sources like lakes, rivers, and oceans, affecting the availability of surface water.

3

Vital for Precipitation

The water vapor generated through evaporation is essential for the formation of clouds and eventual precipitation.

Transpiration

Plant Perspiration

Transpiration is the process by which plants release water vapor into the atmosphere through their leaves.

Regulates Plant Temperature

Transpiration helps plants maintain a comfortable temperature by releasing excess water.

Contributes to Precipitation

The water vapor released through transpiration eventually condenses and falls as precipitation.



Condensation

1

Water Vapor Cools

As water vapor rises in the atmosphere, it cools and condenses into tiny water droplets or ice crystals.

2

Cloud Formation

The condensed water droplets and ice crystals form clouds, which are visible in the sky.

3

Precipitation Potential

The water droplets or ice crystals in clouds can continue to grow in size, eventually leading to precipitation.

Precipitation

Different Forms

Precipitation can take various forms, such as rain, snow, sleet, or hail, depending on atmospheric conditions.

Replenishes Water Sources

Precipitation is the primary source of water for rivers, lakes, and groundwater, maintaining the balance of the hydrological cycle.

Nourishes Ecosystems

Precipitation is essential for the growth and survival of plants and animals, supporting the overall health of ecosystems.

Affects Climate

The distribution and patterns of precipitation play a crucial role in shaping the Earth's climate and weather patterns.



Surface Runoff

1

Excess Precipitation

Precipitation that cannot be absorbed by the soil or groundwater flows on the surface as surface runoff.

2

Collects in Water Bodies

Surface runoff collects in streams, rivers, lakes, and other water bodies, replenishing these natural resources.

3

Transports Sediments

Surface runoff can also carry soil, nutrients, and other materials, shaping the landscape and supporting ecosystems.

Groundwater Flow



Infiltration

Precipitation seeps into the ground, replenishing groundwater supplies.



Aquifer Storage

Groundwater is stored in porous rock formations called aquifers, which can be tapped for various uses.



Discharge

Groundwater eventually discharges into streams, lakes, and the ocean, completing the hydrological cycle.

Importance of the Hydrological Cycle

Water Supply

The hydrological cycle replenishes and maintains the Earth's water resources, ensuring a consistent supply for various human and ecological needs.

Climate Regulation

The transport and distribution of water through the cycle plays a crucial role in regulating the Earth's climate and weather patterns.

Ecosystem Support

The hydrological cycle sustains the delicate balance of aquatic and terrestrial ecosystems, supporting the life and growth of diverse plant and animal species.