

# Water Resources

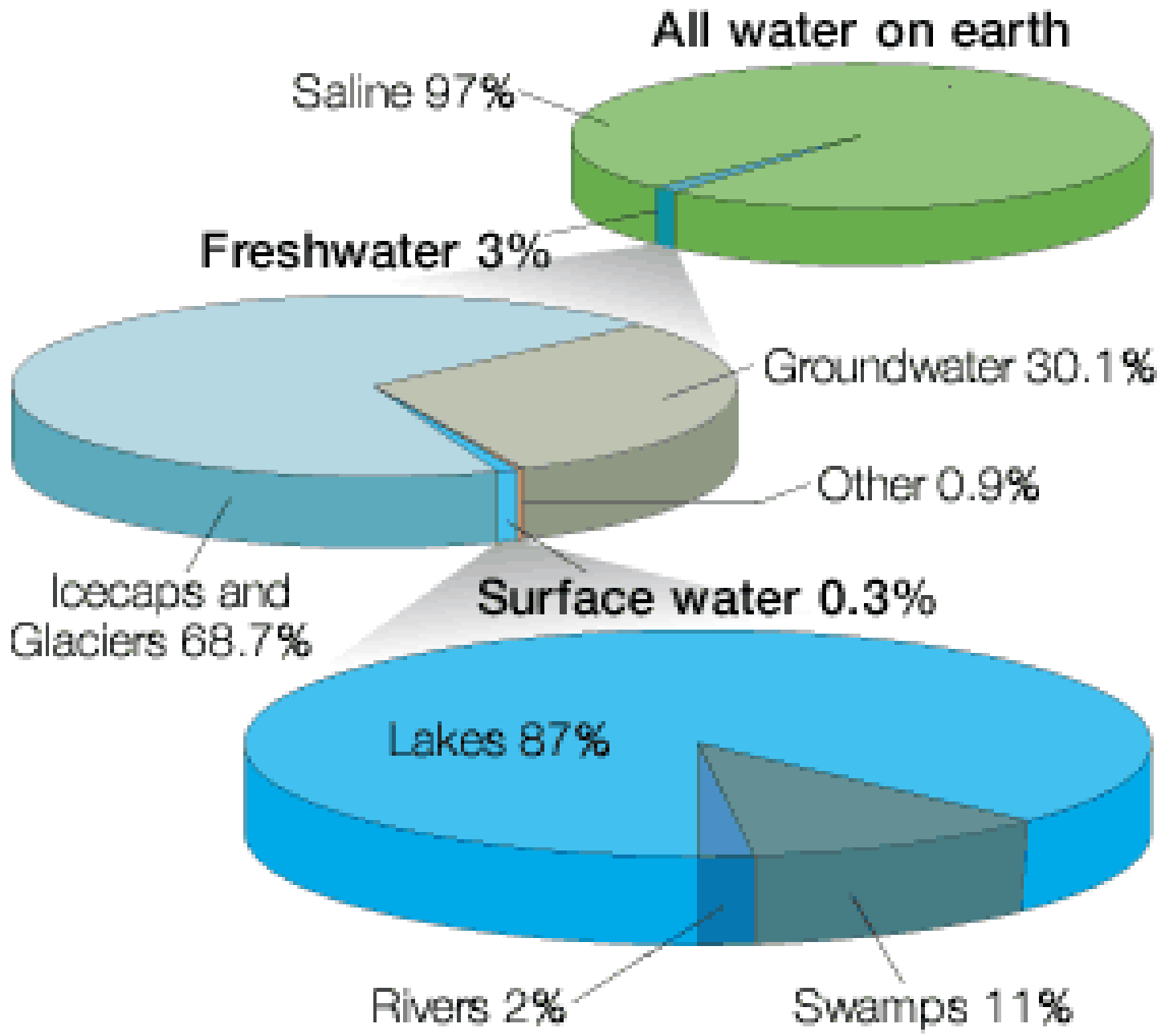
By:  
Dr. Parveen Kumar  
Asst. Professor

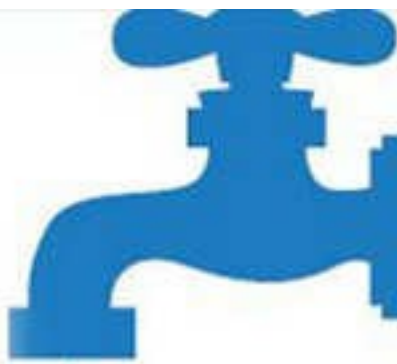
# Contents

- **Introduction**
- **Earth's water resources**
- **Hydrologic cycle**
- **Sources of fresh water**
- **Uses of water**
- **Problems**
- **Water conflicts**
- **Water resources management**
- **Further readings**

# Introduction

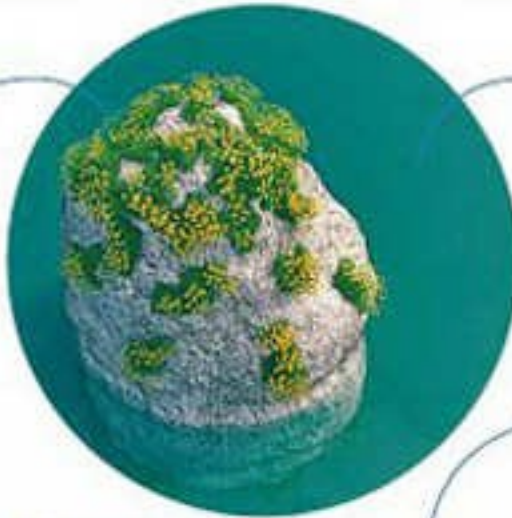
- An essential element for life on Earth.
- **Precious resource** –
  - Water 71% & Land 29%
  - Salt water – 97%
  - Freshwater – 3%
- **Animals and plants** – 60-65% of body weight is water.
- **High Specific Heat** – warm and cool slowly as compared to land.
- **High Latent Heat of Vaporization** – Produce cooling effect by evaporation.
- **Excellent solvent** for many nutrients as well as **pollutants**.
- **Expands after freezing** – ice is light and float.





# India Trails the World in Water Availability

**2.4%**  
Share of  
global  
land area



**4%**  
Share of  
water  
resources

**17%**  
Share of  
world  
population



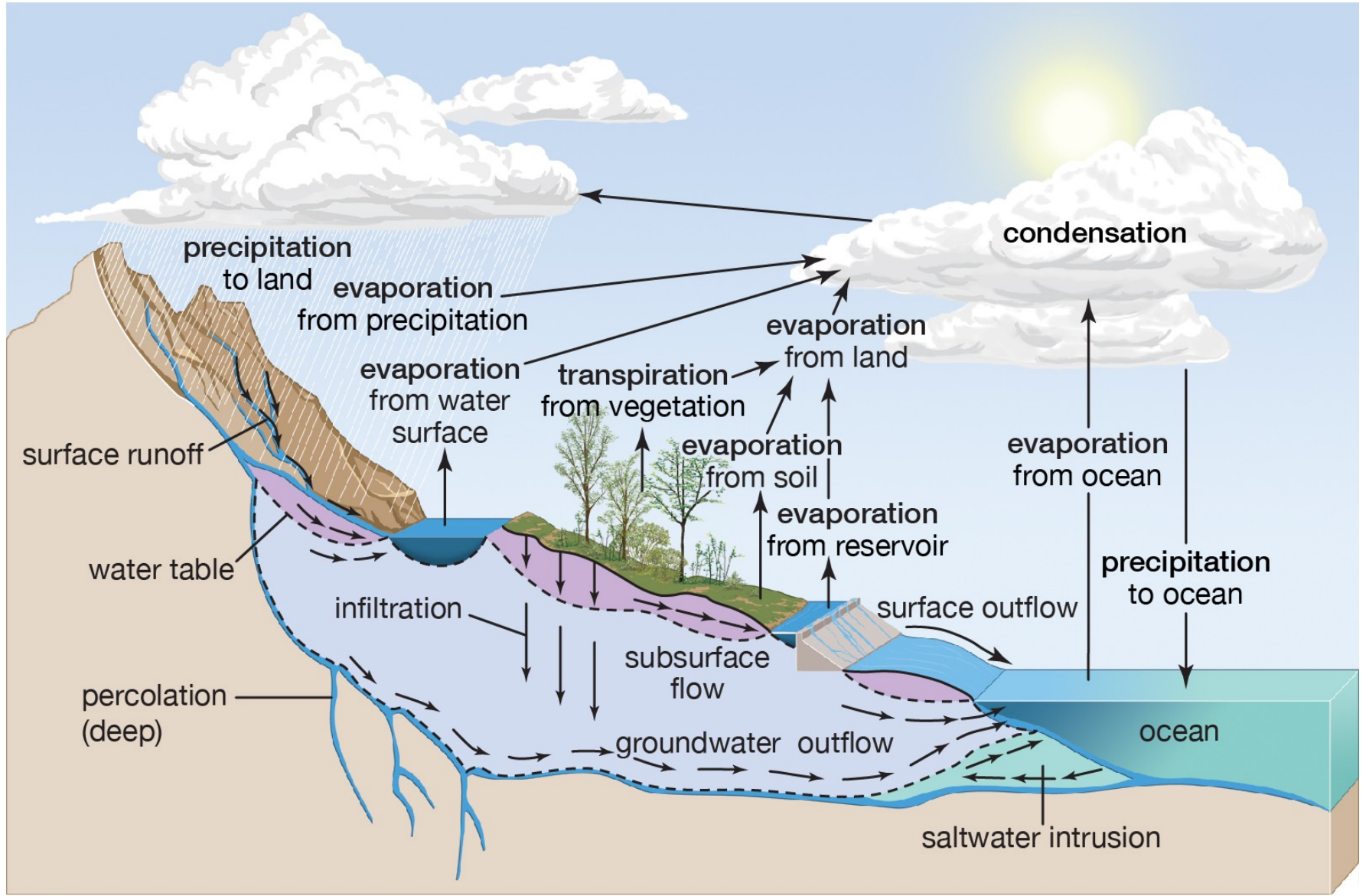
**132**  
Rank in water  
availability

**122**  
Rank in water  
quality

**1,545**  
cubic metres  
Per capita  
availability

Source: Water Resources Information System of India

# Hydrologic Cycle



soil moisture

groundwater

ocean covers 71 percent of Earth's surface  
196,950,000 sq mi (510,000,000 sq km)



# Sources of Fresh Water

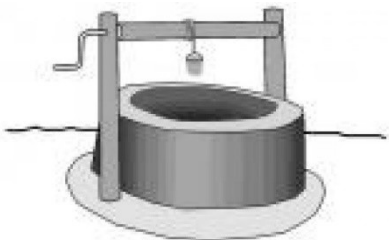
- **Surface Water**

- ✓ Lakes
- ✓ Ponds
- ✓ Streams
- ✓ Rivers
- ✓ Storage reservoirs
- ✓ Glaciers and Polar ice sheets



- **Ground Water - Aquifers**

- ✓ Open wells
- ✓ Tube wells
- ✓ Springs



## Uses of Water

<b>S. No.</b>	<b>Water Use</b>	<b>Global (%)</b>	<b>National (%)</b>
<b>1</b>	<b>Agricultural</b>	70	<b>90</b>
<b>2</b>	<b>Industrial</b>	25	<b>7</b>
<b>3</b>	<b>Domestic</b>	5	3
<b>4</b>	<b>Aesthetic</b>	Nil	Nil
<b>5</b>	<b>Environmental</b>	Negligible	



# Problems

- **Over-exploitation**
  - ✓ Ground subsidence
  - ✓ Lowering of water table
  - ✓ Water logging
  - ✓ Salt water intrusion
- **Pollution**
  - ✓ Agrochemicals – Fertilizers & Pesticides
  - ✓ Sewage
  - ✓ Industrial waste
- **Climate change**
  - ✓ Floods
  - ✓ Droughts
  - ✓ Extreme weather
- **Water scarcity**

# Water Conflicts

Conflict between countries, states, or groups over an access to water resources. These conflicts occur over both freshwater and saltwater, and between international boundaries.

## Causes:

- **Economic issues:** fishing, agriculture, and tourism etc.
- **Territorial disputes & Strategic advantage**
- **Fight for resources**
- **Pollution:** The polluted water make its way across international boundaries.

## Notable Conflicts:

- **Nile River** - Egypt, Ethiopia, and Sudan (Africa)
- **The Ganges river** - India and Bangladesh
- **Kosi River** - Nepal and India

Water conflicts will become more common in the near future due to rising demand of water.

# Water Resources Management

- **Reduce water use**
  - Tiered water rates
  - Outdoor water use restriction
  - Low-flow shower
  - Low-flush & composting toilets
  - Weather based irrigation
  - Drip & sprinkle irrigation
- **Rainwater harvesting & Groundwater recharge**
- **Rain** – Capture water where it falls
- **Wastewater:**
  - Treatment and recycling
  - Zero wastewater discharge
  - Decentralized wastewater treatment

## Further Readings

1. Water distribution on Earth, [https://en.wikipedia.org/wiki/Water\\_distribution\\_on\\_Earth](https://en.wikipedia.org/wiki/Water_distribution_on_Earth).
2. **WORLD WATER RESOURCES BY COUNTRY**, <http://www.fao.org/3/y4473e/y4473e08.htm>
3. **Water resources in the future: problems and solutions**, [http://www.scielo.br/scielo.php?pid=S0103-40142008000200002&script=sci\\_arttext&tlng=en](http://www.scielo.br/scielo.php?pid=S0103-40142008000200002&script=sci_arttext&tlng=en)
4. Integrated water Resources Management IWRM, <https://www.youtube.com/watch?v=ZTMvMLzDZ8E>

The image features a blue gradient background that transitions from a lighter blue at the top to a darker blue at the bottom. The text "Thank you for attention!!!" is centered in a white, sans-serif font. The entire image is framed by a thin white border with rounded corners.

Thank you for attention!!!