



# Freshwater: A Precious Resource



**Developed by the  
Global Precipitation  
Measurement mission  
Education and Public  
Outreach Team**





# Floods submerge 475 Assam villages

**Blue Gold: Have the Next Resource Wars Begun?**

# Many states in state of worry over late rains



# Drought situation is serious, says Centre

New Delhi: Rejecting members' demand for full central control over calamity relief, the government on Friday announced in the Lok Sabha it would provide all possible assistance, including postponement of farm loan recovery in 12 drought-affected states, to mitigate the plight of people.

Replying to a two-day debate on drought and floods in various parts of the country, agriculture minister Ajit Singh said the government was controlling, managing and executing such relief as it was possible. He said the areas worst affected by natural calamities.

Terming the drought situation as "very serious", he said among the badly hit were western Uttar Pradesh, Bundelkhand area, Rajasthan, Haryana and Andhra Pradesh.

farmers in affected areas. The minister said the Centre was also ready to release the next instalment of CRF, which would be due only in October, if states utilised it properly. If CRF is inadequate, steps would be taken to provide help under the National Calamity Contingency Fund, he said.

Regarding the demand for waiving and writing off loans, he said he was in the process of discussing the matter with the finance minister as it involved much wider arena and different authorities.

Singh said the Centre had already held a stock-taking meeting with 12 drought-affected states and it was decided to set up a co-ordination committee.

## Flights delayed



Flights delayed

...dwellers to nearby areas... and temporarily... in a school building... commissioner K.C. S... who visited the accident... said. The storm-dwellers... possibly ignored... warnings about the danger... in this landslide-prone area... will not tolerate encroach... in any more.

The Panchamahal municipal corporation (MNC), however, drew fire from residents of... where a concrete wall fell on a... or citizen, Donald Elbert... claimed that despite several... letters to the MNC's garden depart... ment stating it respects the trees... the civic officers refused to act.

In another incident, a three... year-old boy Vashishth Bhatnagar... was crushed to death when the... brick crumbled over him in Chan... choli Bunder in Mumbai.

While suburban trains contin... ued to ferry commuters across... the length of the city after 10... and 30 minutes, the... roads in Andheri, Chembur and... and other parts of the... city saw traffic snarls as a result... of rain. Vehicular traffic has been... affected since Tuesday evening... with flooding reported at P... and other areas.

A number of... flights were... to the airport with... the approach area...

## Daily Times-News

### Little Rain Seen In Near Future

#### 3-Months Prediction Pessimistic



NEW DELHI: METEOROLOGICAL DEPARTMENT... predicted that there will be... little rain in the near future... 3-months prediction is... pessimistic.

## The Daily Times-News

### Pros And Cons Presented On Solving City's Water Problem

#### Large Crowd In Present Meeting



ARRANGEMENTS ARE UNDERWAY FOR EMERGENCY WATER

## The Daily Times-News

### Emergency Water Lines Available

#### Civil Defense Proposes Offer For Lines, Pumps



CITY OFFICIALS THIS MORNING WERE INVESTIGATING THE... of... water supply...

### 'Waterless Tuesday' Project Is Planned

...waterless Tuesday... project...

### Flon College Mayor Asks Residents To Begin Conservation Of Water

...Flon College Mayor... asks residents to begin conservation of water...

## Relief pledge to farmers

Emergency services flooded with calls for help

## Rain rewrites record books

## THE BIG WET

## Film fans hit by elements

## Wow! What a washout

## Damage bill mounts as rain goes on

## Wow! What a washout

## Damage bill mounts as rain goes on

## Wow! What a washout

...rain... washout...

## Grim task for farmers after big downpour

...farmers... grim task...

## Film fans hit by elements

...film fans... hit by elements...

## Wow! What a washout

...wow! what a washout...

## Damage bill mounts as rain goes on

...damage bill... mounts as rain goes on...

## Wow! What a washout

...wow! what a washout...







**SOLID**



**LIQUID**

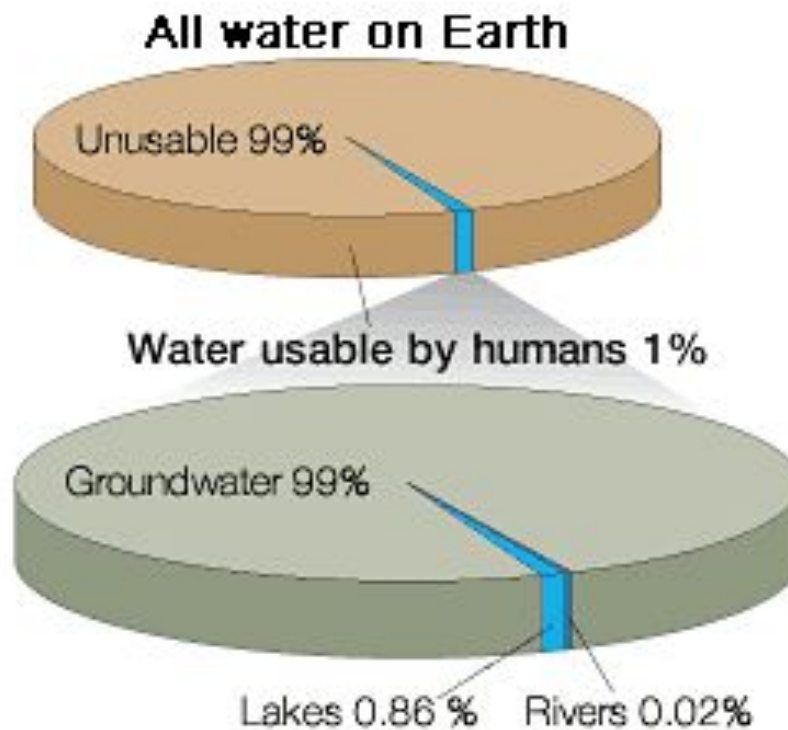


**GAS**

## How much of Earth's water is freshwater?

*We will make a model of Earth's freshwater.*

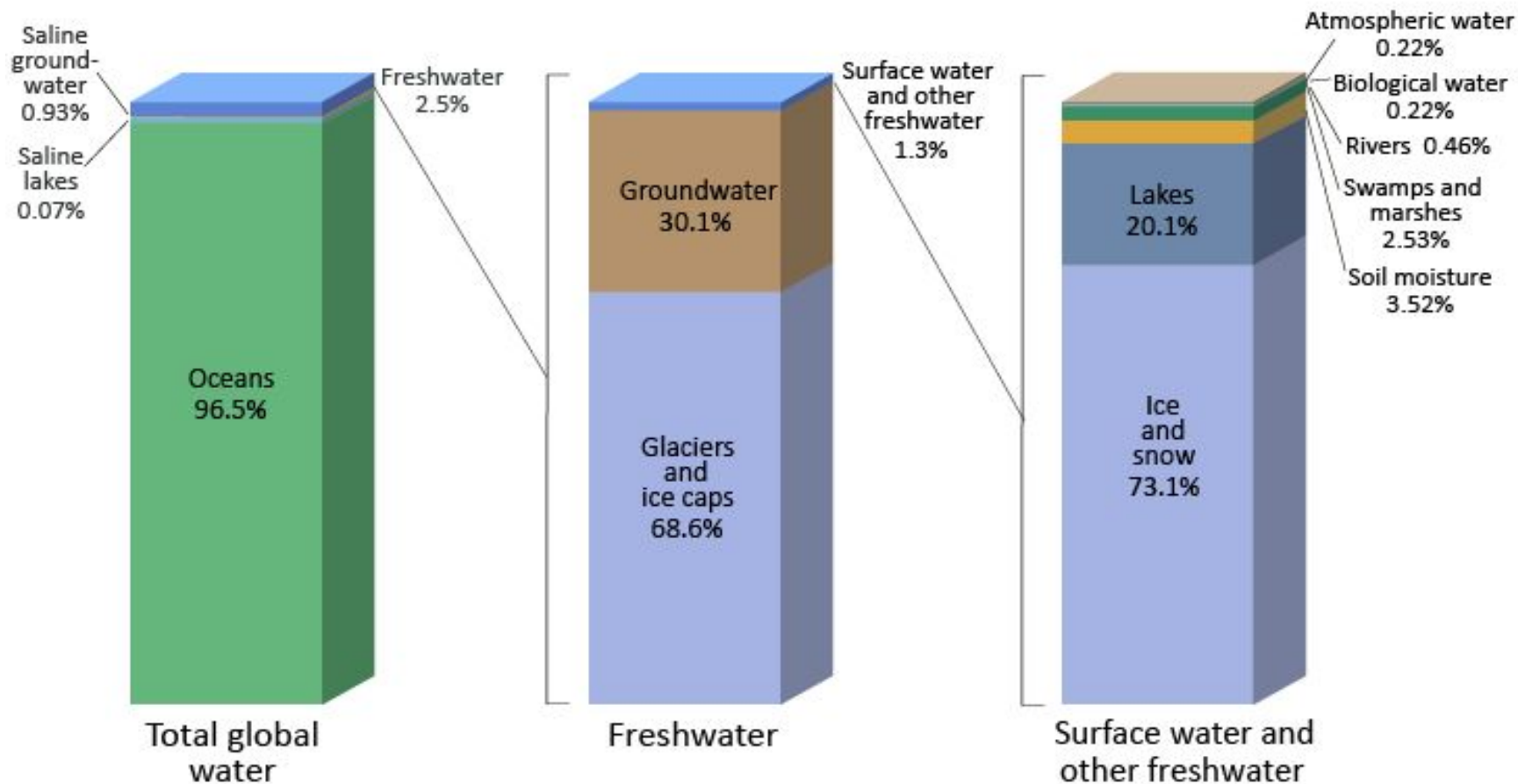
1. Take the plastic cup, and imagine that the cup is a model of Earth's surface.
2. Fill up ~ 75% with water. This represents how much of Earth's surface is covered with water.
3. Take out one eye-dropper of water, and place it in the small medicine cup. This represents how much of Earth's water is freshwater- ~ 2.5%
4. Take one drop of this water- this represents how much freshwater is easily accessible to us!



<http://ga.water.usgs.gov/edu/earthwherewater.html>



## Distribution of Earth's Water



Source: Igor Shiklomanov's chapter "World fresh water resources" in Peter H. Gleick (editor), 1993, *Water in Crisis: A Guide to the World's Fresh Water Resources*.





- <http://pmm.nasa.gov/education/videos/gpm-freshwater-connection>



Why are freshwater resources important to us throughout the world? For more information on the many societal applications of freshwater resources, go to:

- <http://pmm.nasa.gov/education/societal-applications>

In addition to home use, freshwater is used for transportation, agriculture, heating and cooling, industry, livestock, and many other purposes. That one percent of water is primarily used in eight different ways, or categories:

- *Domestic.* Residential home indoor and outdoor use, such as drinking, cleaning, and watering lawns
- *Public supply.* Public and commercial buildings, such as schools and restaurants
- *Irrigation.* Watering systems for farms that grow food



- *Livestock*. Watering systems for animals on ranches and farms
- *Aquaculture*- Watering systems for fish farms and hatcheries
- *Industrial* -Water used for manufacturing products, including food, paper, and petroleum products
- *Mining*- Water used for extracting natural resources such as metals, minerals, natural gas, and oil
- *Thermoelectric*- Water used for generating electricity using steam-driven generators

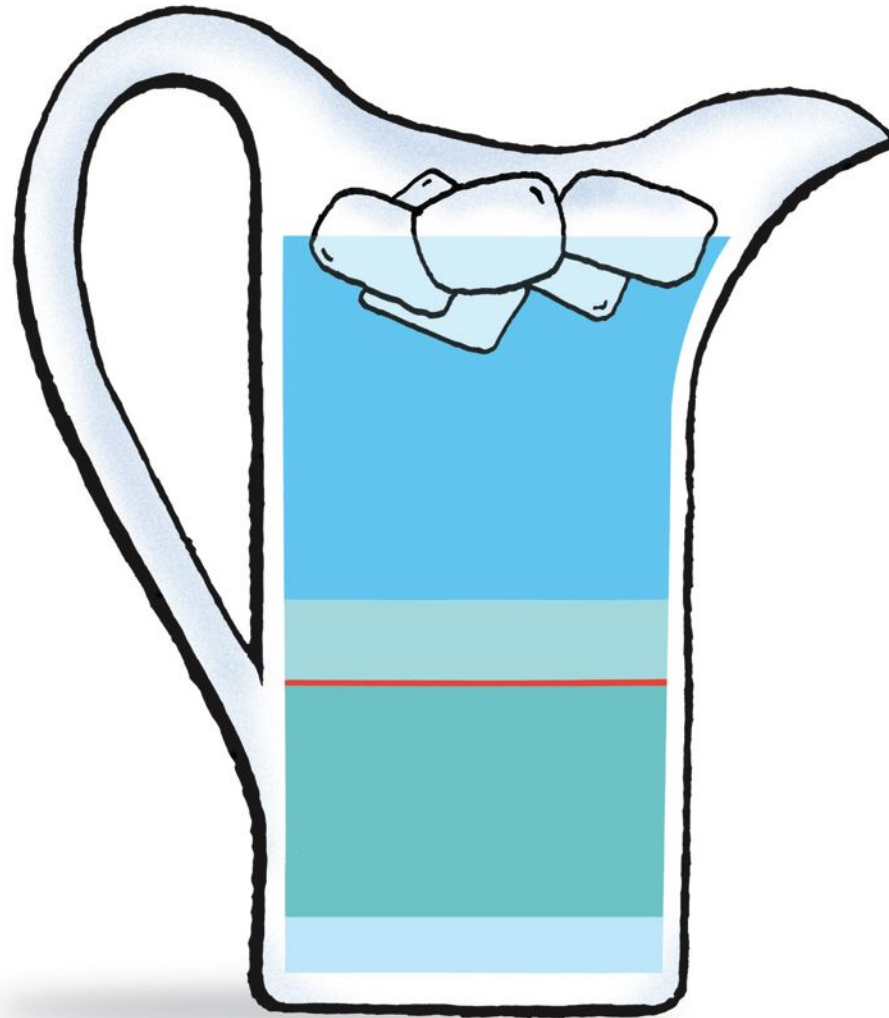
Thermoelectric 49%

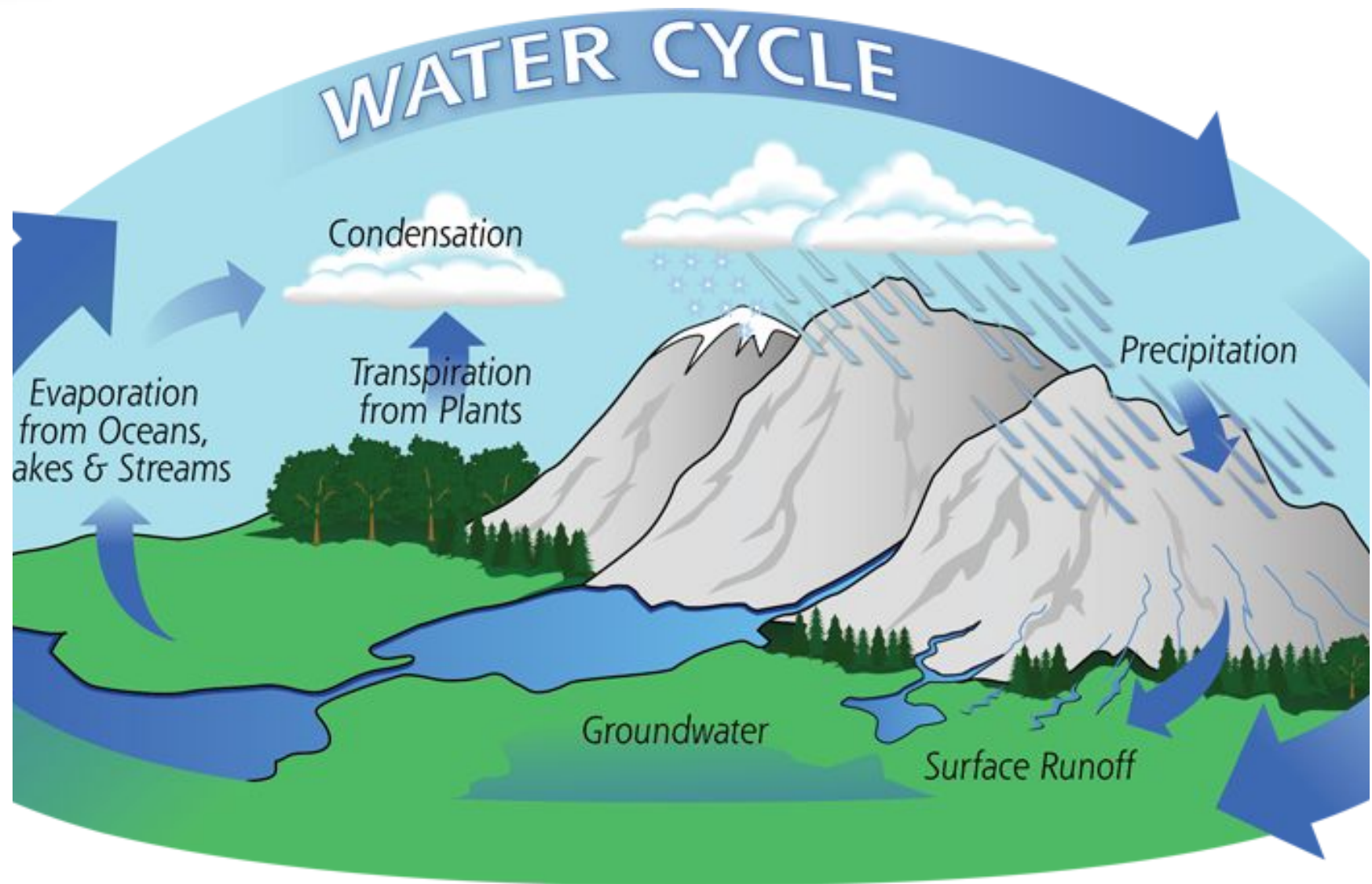
Public Supply 11%

Domestic 1%

Irrigation 31%

Other- 8%: Mining 1%, Industrial 4%, Aquaculture 2%, Livestock 1%







- Rain gauges- not evenly distributed, none over oceans, measures at local level which varies widely
- Weather radar- ground-based, not evenly distributed, not over oceans, measures at local level
- Satellites: operational and research, global level  
NOAA, NWS- operational: predicting, forecasting  
NASA- research:
  - Impact of climate change on freshwater availability
  - Impact of global rainfall on natural disasters: drought, tropical cyclones, landslides, etc...
  - World health concerns: water-borne disease, water availability, etc...

- NASA's GPM mission will set the standard for how we measure precipitation across the globe. In this short video, you will learn how GPM will be able to accomplish this-
- <http://pmm.nasa.gov/education/videos/for-good-http://pmm.nasa.gov/education/videos/for-good-measure>

