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APPSC GROUP 1 PRELIMS

GEOGRAPHY

PRELIMS VISUAL EDGE

FACTS • DATA • CONCEPTS



Dr Ravi Kumar Reddy

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PAPER I

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1,000-TOPIC PROGRAMME

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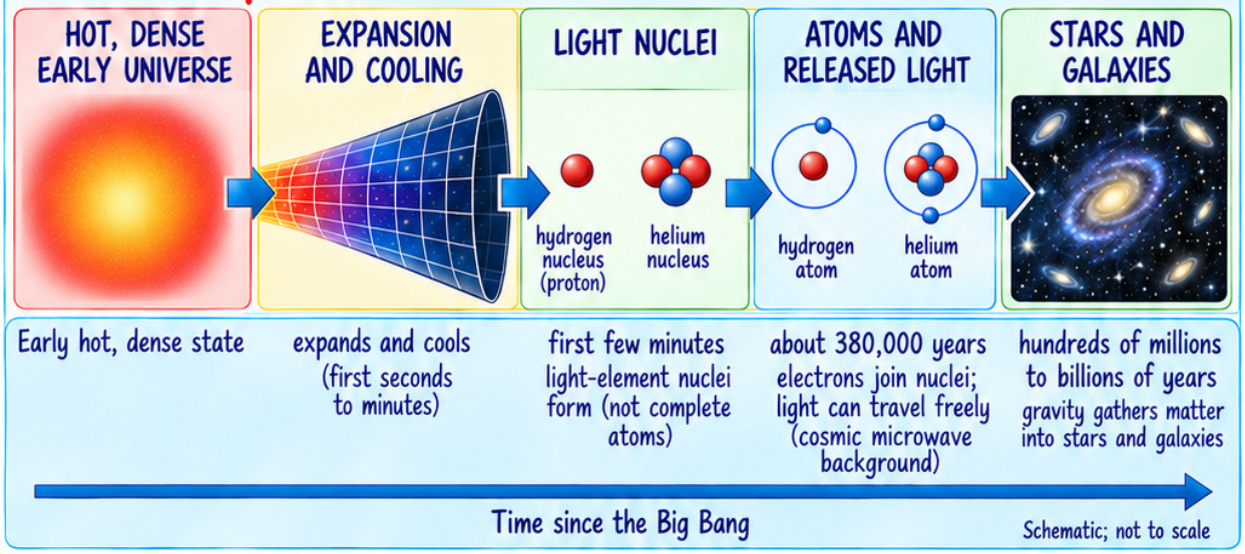
Scan to learn and revise

BIG BANG: EXPANSION, NOT AN EXPLOSION INTO EMPTY SPACE

Two different questions

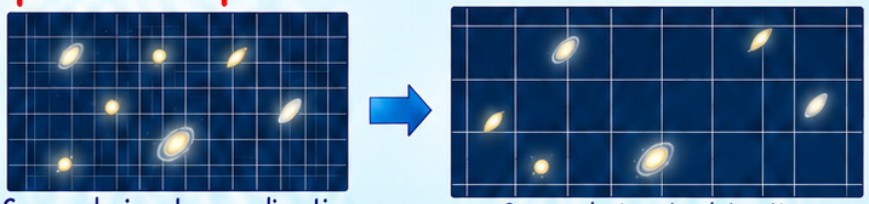
- Big Bang cosmology explains the early hot, dense universe and its expansion.
- Solar-nebula theory explains the much later formation of our Sun and planets.
- Universe: about 13.8 billion years old. Solar system: about 4.6 billion years old.

Read the sequence



- Light-element nuclei formed in the first few minutes; this was not the formation of complete atoms.
- About 380,000 years later, electrons joined nuclei. Light could travel freely; we observe its stretched remnant as the cosmic microwave background.
- Gravity later gathered matter into stars and galaxies. Our solar system formed much later within the Milky Way.

Expansion of space



Distances grow; galaxies do not simply swell with the grid.

Three lines of evidence

1. **Large-scale expansion:** distant galaxies generally recede, with greater distances associated with greater recession speeds.
2. **Cosmic microwave background:** the relic glow of the hot early universe.
3. **Light-element abundances:** observed hydrogen, helium and deuterium support early-universe nucleosynthesis.

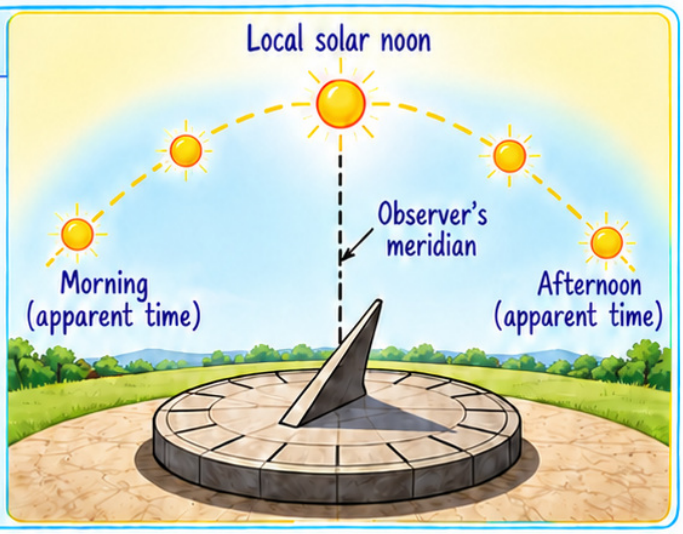
Remember: the Big Bang is not the formation of the Sun, and Earth is not the centre of expansion. Evolution of space, not an explosion into surrounding space.

THE SUN'S CLOCK IS NOT EVERYONE'S CIVIL CLOCK

LOCAL SOLAR TIME

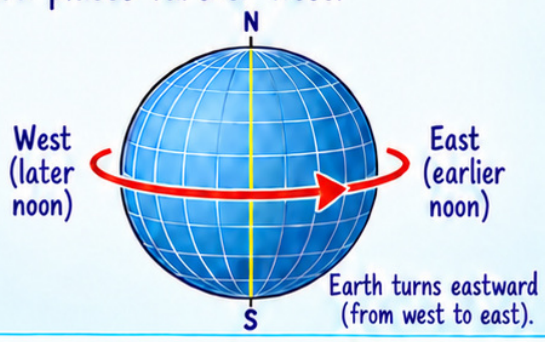
Local apparent solar time follows the observed Sun. Local solar noon occurs when the Sun crosses the observer's meridian.

Local mean solar time averages the Sun's uneven apparent motion through the year. A sundial and a uniform clock therefore need not agree exactly, even at the same longitude.



WHY LONGITUDE MATTERS

Earth turns eastward. Places farther east reach local solar noon earlier than places farther west.



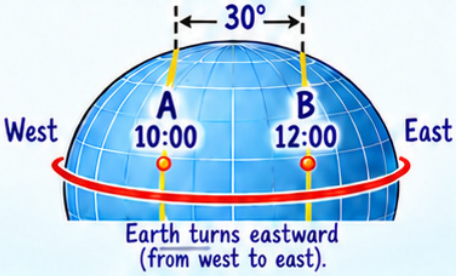
For elementary mean-solar-time calculations:

360° of longitude ↔ 24 hours
15° ↔ 1 hour
1° ↔ 4 minutes

East: add time. West: subtract time.

These relationships concern differences in longitude and mean solar time, not every political time-zone boundary.

WORKED EXAMPLE



Point B is 30° east of point A.

Time difference = 30 × 4 minutes = 120 minutes = 2 hours.

When A's local mean solar time is 10:00, B's is 12:00.

A and B are hypothetical points, not named cities or official time zones.

Schematics; not to scale.

REMEMBER

A place farther east is ahead in local solar time. 'Noon' need not occur at 12:00 on its standard civil clock.



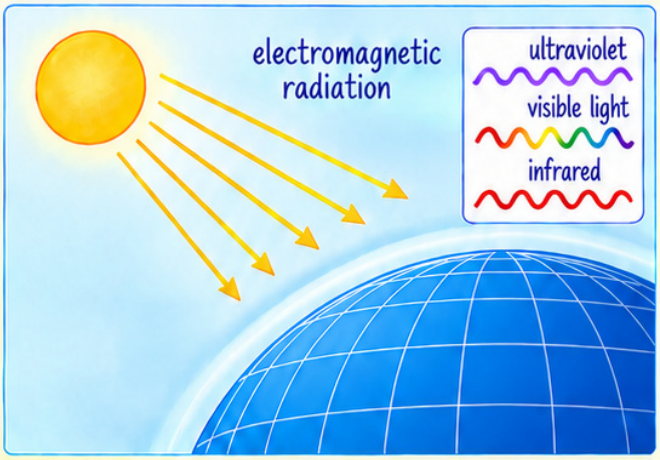
Insolation, heat budget and albedo

SUNLIGHT RECEIVED IS NOT THE SAME AS HEAT ABSORBED

WHAT INSOLATION MEANS

Insolation is incoming solar radiation. The amount received depends on the surface and time interval considered: a local surface, the top of the atmosphere and a whole-planet average are not interchangeable measurements.

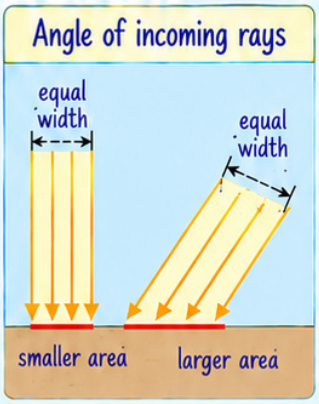
Solar energy reaches Earth as electromagnetic radiation. It includes visible light as well as ultraviolet and infrared wavelengths; sunlight is not exclusively visible light.

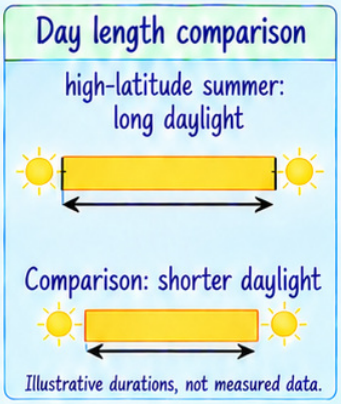


ANGLE AND DURATION BOTH MATTER

A beam striking a surface at a low angle spreads its energy over a larger area than an equally strong beam striking more directly. A longer atmospheric path also allows more absorption and scattering before radiation reaches the ground.

Day length affects the total received during a day. A high-latitude summer day can be very long even though the Sun remains relatively low. Therefore, instantaneous intensity and daily total must be distinguished.

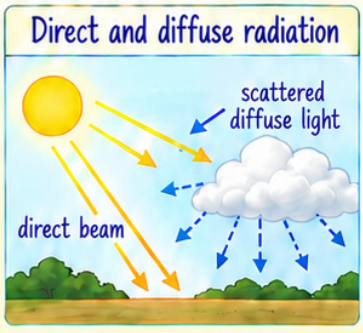




THE ATMOSPHERE MODIFIES THE BEAM

Clouds, gases and particles can absorb, scatter or reflect radiation. Some sunlight reaches the surface directly; some arrives as diffuse light from the sky. Cloudy conditions need not mean zero incoming solar energy.

Slope and aspect change a surface's orientation to the Sun. Nearby shade can reduce receipt even at the same latitude.





REMEMBER

First ask: received where, over what area, and for how long? Then distinguish receipt from absorption.



D1.044 | World climate classification: Koppen and Thornthwaite | Card 1 of 3

World climate classification: Koppen and Thornthwaite

KÖPPEN READS TEMPERATURE AND RAINFALL PATTERNS

WHY CLASSIFY?

A climate classification groups places with comparable long-term conditions. It simplifies comparison; it does not imply that boundaries are sharp or that every year follows the average.

KÖPPEN'S APPROACH

The system uses temperature and precipitation, including their seasonal distribution. Its categories were developed with attention to relationships between climate and vegetation.

FIVE MAIN GROUPS

A – Tropical

Warm conditions throughout the year.



B – Dry

Aridity is central; desert and steppe subdivisions.



C – Temperate

Comparatively mild cold season.



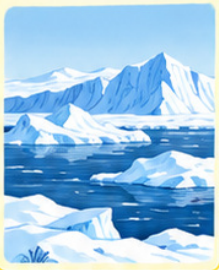
D – Continental or cold snow-forest

More severe cold season.



E – Polar

Summer warmth is strongly limited.





Highland climate is often treated separately in school classifications because elevation creates strong local variation; it is not a sixth equivalent group in every Köppen version.

LETTER LOGIC

In relevant codes, **f** means no dry season, **s** a dry summer and **w** a dry winter.

In the dry group, **W** indicates desert and **S** steppe.

Additional letters refine thermal conditions.

REMEMBER

Do not classify a place using annual rainfall alone. Temperature, rainfall timing and the rules of the chosen classification all matter.

ONE CONNECTED OCEAN, FIVE NAMED BASINS

THE GLOBAL OCEAN

Pacific, Atlantic, Indian, Southern and Arctic are named basins within one connected body of seawater.

Their boundaries organise geographical study; water, heat and dissolved materials move between them.

RELATIVE SIZE

Pacific → Atlantic → Indian → Southern → Arctic is the order from largest to smallest basin.

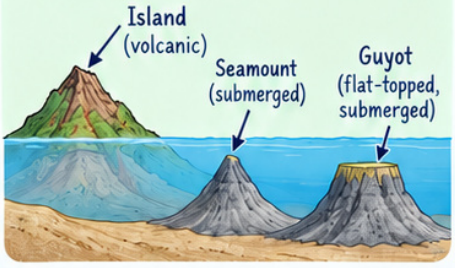
1. Pacific
2. Atlantic
3. Indian
4. Southern
5. Arctic

Do not confuse a basin's area with its average depth or deepest point.

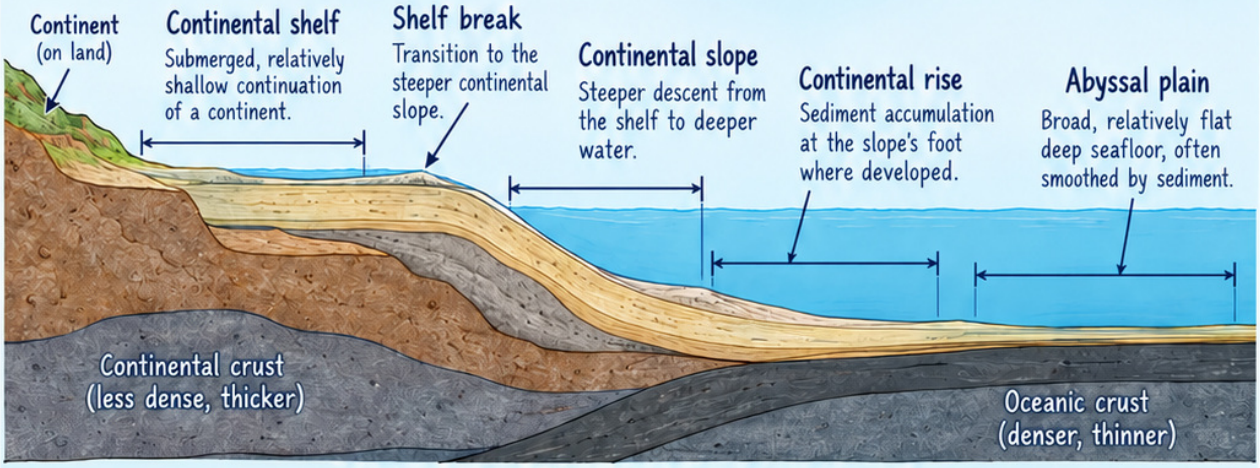
RELIEF IS NOT A FLAT BATHTUB

The seafloor contains continental margins, plains, ridges, isolated volcanic mountains and deep trenches.

Tectonics builds relief; erosion, sediment transport and deposition modify it.



FROM LAND TOWARD THE DEEP SEA



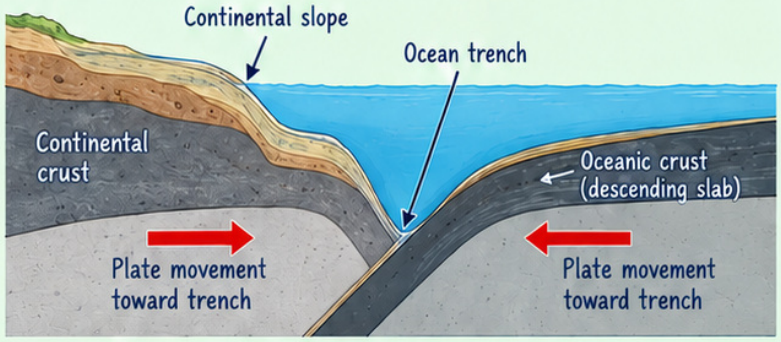
Passive continental margin (*schematic, not to scale*)

IMPORTANT QUALIFIER

Not every margin has the same sequence.

At active margins a trench may occur near the slope; a broad continental rise need not be present.

ACTIVE MARGIN WITH TRENCH

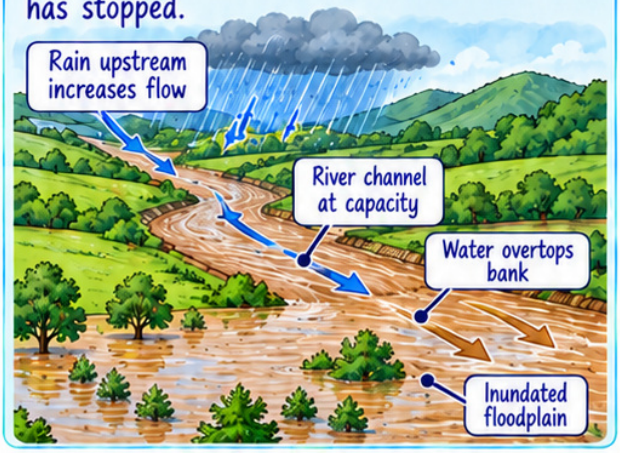


Active continental margin (*schematic, not to scale*)

FLOODS HAVE DIFFERENT PATHWAYS

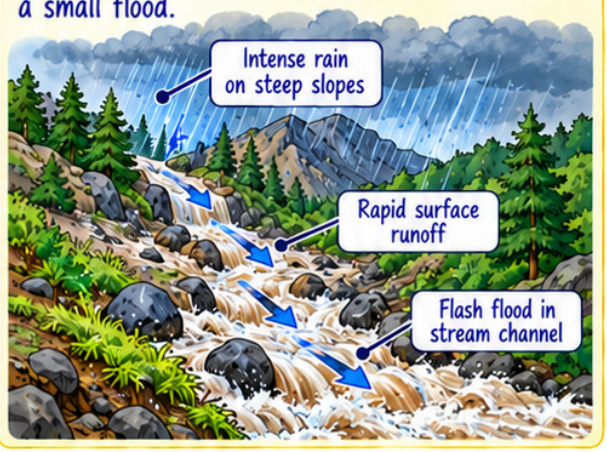
RIVERINE FLOOD

A river overtops its banks or inundates its floodplain when flow exceeds local channel capacity. Rain upstream can produce downstream flooding even when local rain has stopped.



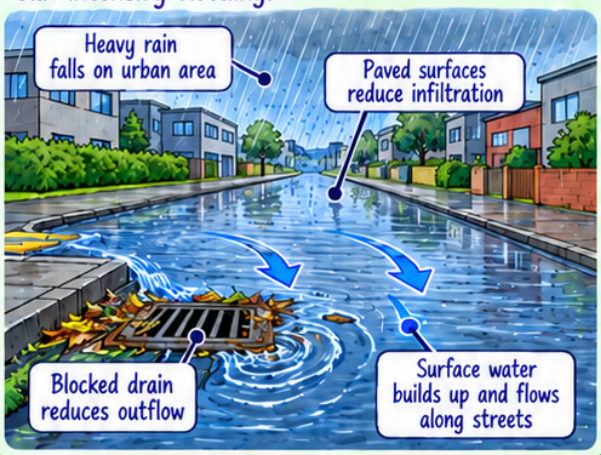
FLASH FLOOD

A rapid rise of water leaves little response time. Intense rain, steep terrain, sudden releases or failure of a natural barrier can contribute. Flash flooding is about rapid onset, not simply a small flood.



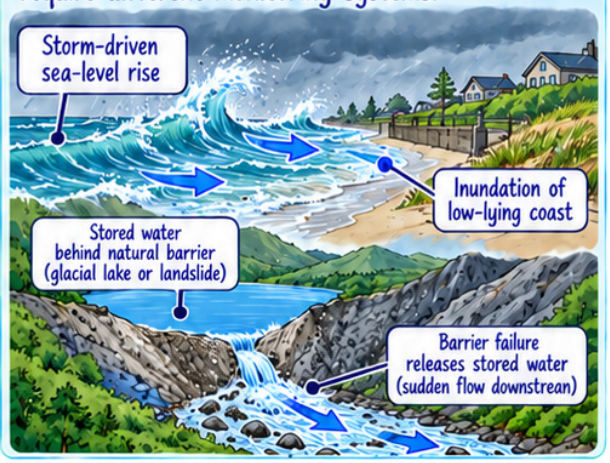
URBAN OR PLUVIAL FLOOD

Rainfall overwhelms infiltration and drainage. Paved surfaces, blocked drains, lost water-storage areas and construction across natural flow paths can intensify flooding.



COASTAL AND OUTBURST FLOODS

Storm-driven sea-level rise can inundate low coasts. Failure of a glacial-lake or landslide barrier can suddenly release stored water. Different origins require different monitoring systems.



CONNECT THE MECHANISM

Rainfall amount alone does not determine damage. Antecedent wetness, catchment slope, channel capacity, drainage and settlement exposure shape the outcome.

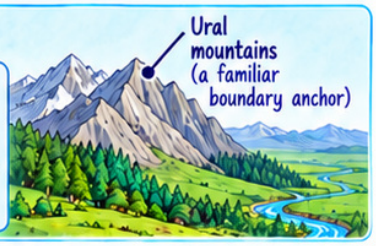


Physiography of Asia and Europe

EURASIA IS CONTINUOUS; PHYSICAL REGIONS CROSS THE DIVISION

THE BIG PICTURE

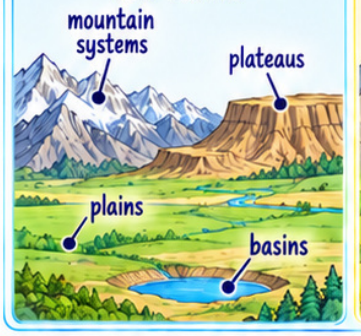
Asia and Europe are conventionally separated parts of the Eurasian landmass. The Urals are a familiar boundary anchor, but exact Europe-Asia boundary conventions vary. River basins, mountain systems and climate regions do not stop at the conventional continental line.



READ PHYSIOGRAPHY THROUGH FOUR LAYERS

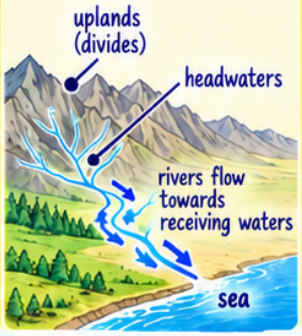
Relief

plains, plateaus, mountain systems and basins.



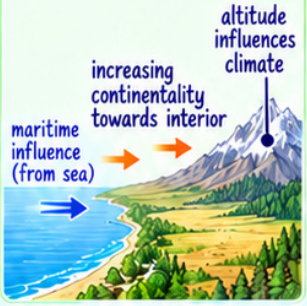
Drainage

divides, river directions and receiving waters.



Climate controls

latitude, continentality, maritime influence, circulation and altitude.



Coastal form

peninsulas, marginal seas, islands and passages.



A USEFUL CONTRAST

Asia

Asia has extensive high plateaus and mountain systems, enormous interior distances and major lowland basins.



Europe

Europe has a strong peninsular and maritime setting, but also substantial continental interiors and high mountain regions.



These are broad patterns, not a claim that all Asia is mountainous or all Europe is low and maritime.
All landscape sketches are conceptual, not exact geographic views.

REVISION METHOD



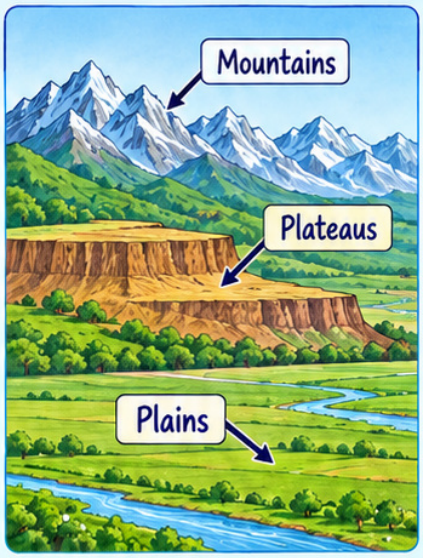
Relief shares are not land-use shares

NCERT's broad relief breakdown

In Resources and Development, reprint 2026-27:

Type of relief	Share of area
Plains	about 43 per cent.
Mountains	30 per cent.
Plateaus	about 27 per cent.

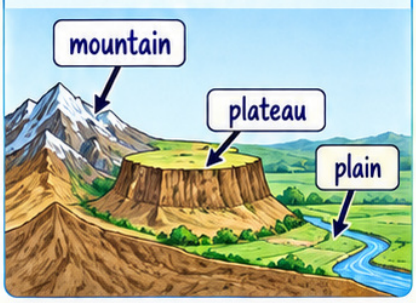
These are the textbook's broad relief shares, not the percentages of cropland, forest or urban land.



Check the classification

Relief

asks what the land surface is like.



Land cover

asks what physically covers it.



Land use

asks how people use it.



A forest can grow on a plateau; crops can be grown on plains or terraces. These categories overlap and should not be added as if they were one exclusive list.

Interpret, do not overclaim

A broad national proportion does not describe every state or district. Nor does it establish that every plain is fertile, every plateau mineral-rich, or every mountain inaccessible.

The physical setting creates possibilities and constraints; water, climate, infrastructure and management influence actual use.

All illustrations are conceptual, not actual site views.

SLOW STRAIN BUILD-UP, SUDDEN FAULT SLIP

THE TECTONIC MECHANISM

Plate motion deforms rocks. A fault segment may remain locked while strain accumulates. When resistance is overcome, sudden slip releases stored elastic energy as seismic waves. The ground shakes; the entire plate does not jump as one rigid block.



Strain accumulates as the fault remains locked.

Rocks are deformed and store elastic energy.

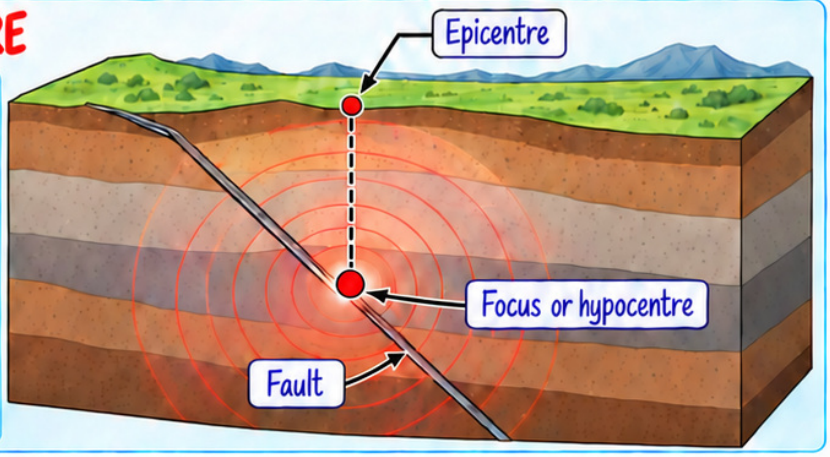
When resistance is overcome, sudden slip releases stored elastic energy as seismic waves. The ground shakes.

FOCUS AND EPICENTRE

Focus or hypocentre: the point where rupture begins within Earth.

Epicentre: the point on the surface directly above the focus.

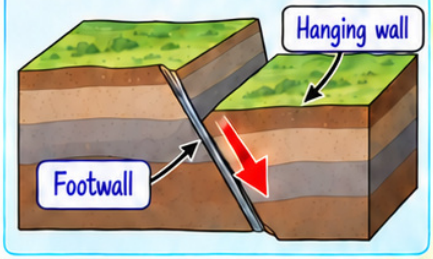
The rupture can spread along a fault; an earthquake source is not merely a permanent point-sized hole.



FAULT MOTION

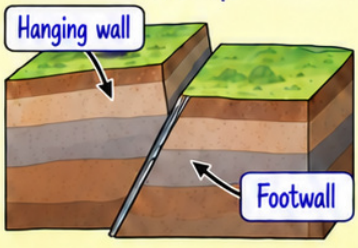
Normal fault

extension, hanging wall moves down relative to footwall.



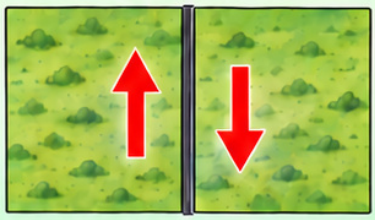
Reverse fault

compression, hanging wall moves up.



Strike-slip fault

mainly horizontal displacement along the fault.



Real events can combine vertical and horizontal components.

TAKEAWAY

The fault is the rupture surface; the seismic waves carry energy away from the source.

CLASSIFY A LAKE ON MORE THAN ONE AXIS

ORIGIN

- Tectonic movement
- Glaciation
- River processes
- Coastal barriers
- Volcanic processes
- Impact
- Human impoundment (reservoir)

WATER CHEMISTRY

Fresh
low dissolved salt concentration

Brackish
intermediate dissolved salt concentration

Saline
high dissolved salt concentration

OUTLET TYPE

Outflowing
water leaves via a river or channel

Endorheic (internally drained)
no surface outflow

Through-flow
both inflow and outflow

ORIGIN

A lake basin may result from tectonic movement, glaciation, river processes, coastal barriers, volcanic processes or impact. A reservoir is created or enlarged through human impoundment. Do not assume all round lakes are volcanic.

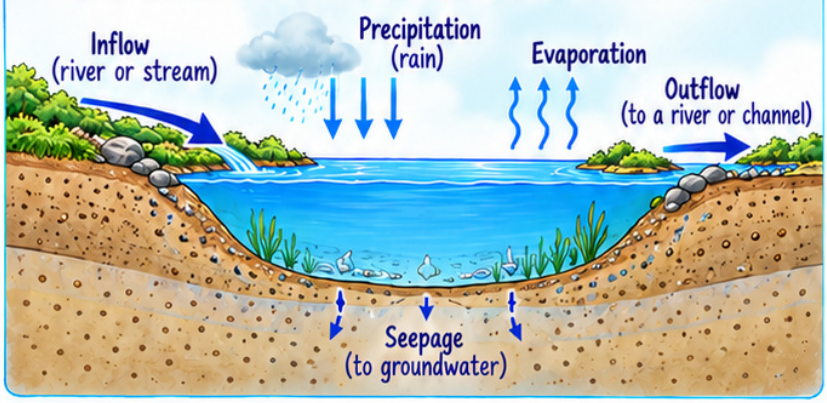
WATER CHEMISTRY

Fresh, brackish and saline describe dissolved-salt conditions, not the origin of the basin. A coastal lagoon can receive both river water and seawater; salinity can vary by season and location.

WATER BALANCE

Inflow, precipitation, outflow, seepage and evaporation influence lake level. In an internally drained basin, evaporation can concentrate salts left behind, but each lake requires its own hydrological explanation.

WATER BALANCE IN A LAKE (GENERAL EXAMPLE)



A CLEAR INDIAN EXAMPLE

Lonar in Maharashtra is a meteorite-impact lake in basaltic terrain and has saline water. 'Crater lake' does not automatically mean 'volcanic crater'.



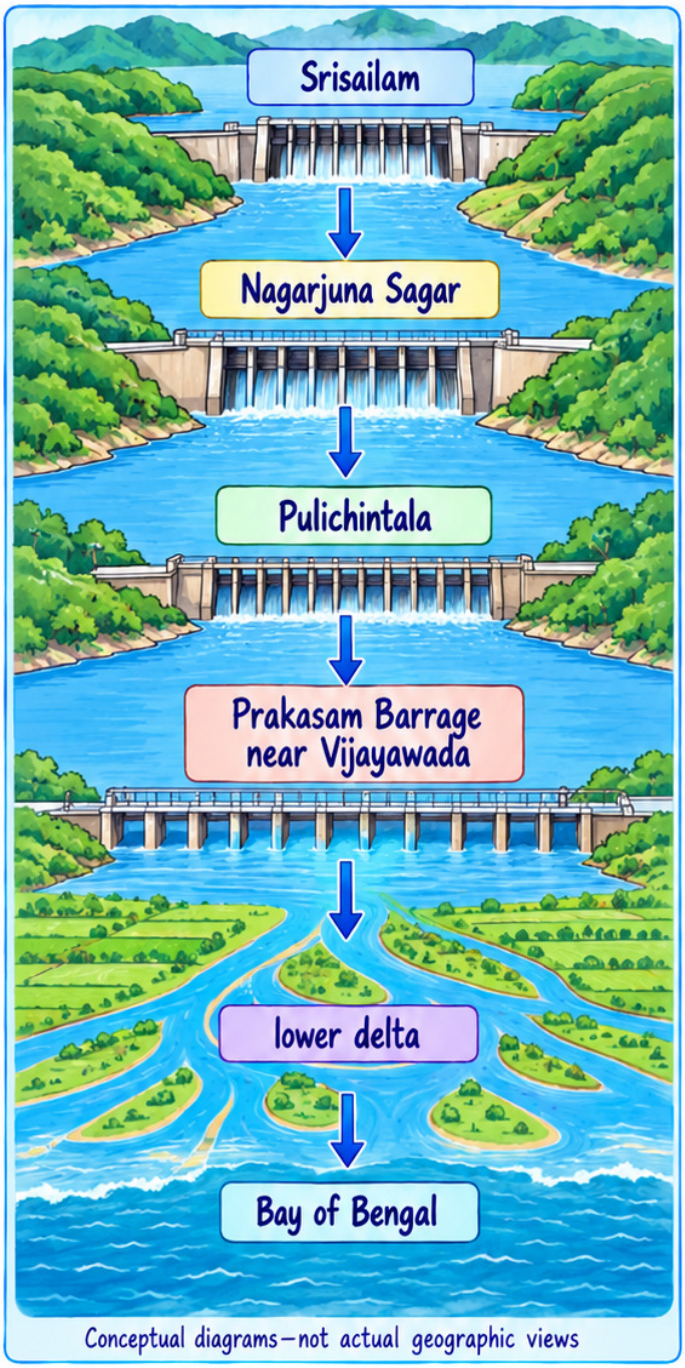
Conceptual illustration; not actual site geometry.

TRACE THE PROJECTS IN DOWNSTREAM ORDER

A USEFUL RIVER SEQUENCE

Srisailam → Nagarjuna Sagar → Pulichintala → Prakasam Barrage near Vijayawada → lower delta → Bay of Bengal

This is the order of selected major river structures, not a list of every tributary or every project.



Conceptual diagrams—not actual geographic views

SOURCE OF CONFUSION

Srisailam and Nagarjuna Sagar are associated with the shared Andhra Pradesh–Telangana river system. Avoid assigning every structure or both power stations exclusively to one state from an old undivided-Andhra Pradesh description.

RELIEF CONNECTION

The river moves from plateau and gorge settings towards the lower coastal plain. The purposes of storage, power generation, regulation and delta irrigation are connected through downstream flow.

MEMORY METHOD

Learn each project's river first, then its position relative to the next project. A correct name on the wrong river or in reversed upstream order loses the geographical meaning.

A SEASONAL FORECAST IS NOT TOMORROW'S WEATHER

WHAT IS BEING PREDICTED?

A seasonal outlook concerns rainfall accumulated over a stated season and area. It does not specify the rain at every village on every day.



Rainfall accumulated over a stated season and area.



It does not specify the rain at every village on every day.

IMD'S FORECAST TOOLKIT

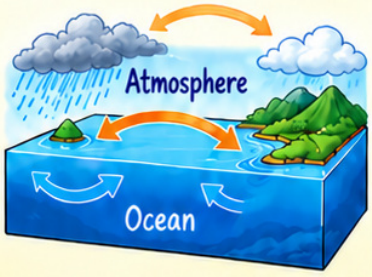
Statistical methods

Statistical methods use relationships found in past observations.



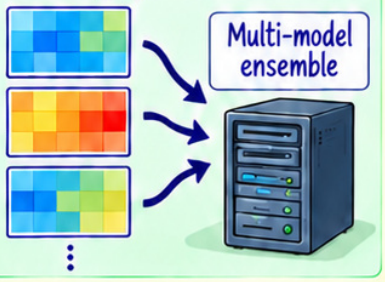
Dynamical models

Dynamical models simulate the coupled atmosphere–ocean system.



A multi-model ensemble

A multi-model ensemble combines information from several climate models rather than relying on one model alone.



ISSUE DATE MATTERS

IMD's operational southwest-monsoon outlook has an April stage and an update around the end of May. Monthly and regional outlooks add different information.



KEEP THE PRODUCTS SEPARATE

Seasonal total



Seasonal total → broad water and agricultural planning.

Shorter-range weather forecasts



Shorter-range weather forecasts → nearer-term weather decisions.



A favourable national seasonal outlook cannot guarantee a dry harvesting day or rule out a local flood.

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