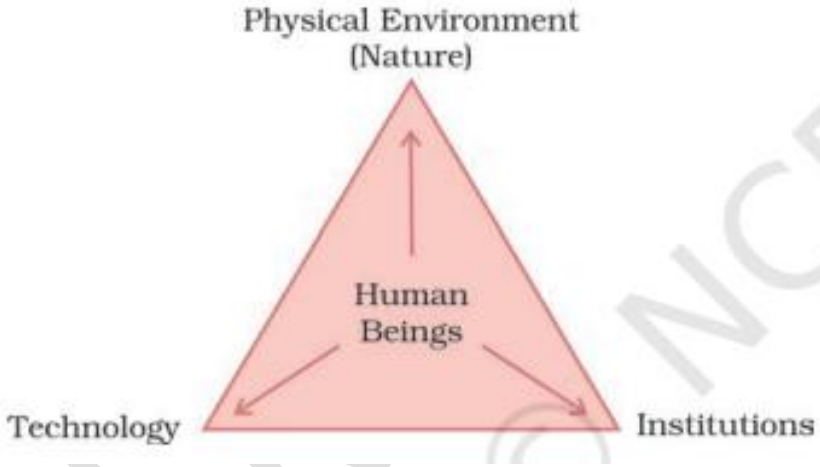
Resource and development

A **resource** is **anything in our environment** that can be used to **satisfy human needs**, but it must meet **three important conditions**:

1. **Technologically accessible**
   - We must have the **technology or knowledge** to use it.
   - Example: Petroleum existed underground for millions of years, but it became a resource only after humans developed drilling technology.
2. **Economically feasible**
   - It should be **affordable and practical to extract or use**.
   - Example: If extracting a mineral costs more than its value, it is not economically feasible.
3. **Culturally acceptable**
   - Society must **accept its use according to cultural values and practices**.
   - Example: Some communities may not consume certain animals as food due to cultural beliefs.



1. Transformation of Things into Resources

Things present in our environment become **resources** through the interaction of three factors:

- **Nature** – provides materials (water, soil, minerals, forests, etc.)
- **Technology** – helps humans use these materials effectively
- **Institutions** – systems like governments, laws, and organizations that manage and develop resources

Humans use **technology to interact with nature** and create **institutions** to speed up **economic development**.

2. Are Resources Free Gifts of Nature?

Many people think resources are **free gifts of nature**, but this is **not completely true**.

- Materials in nature become **resources only when humans use them**.
- **Human knowledge, skill, and technology** turn natural materials into useful resources.

Example:

- Coal underground is just a material.
- When humans mine it and use it for energy, it becomes a **resource**.

So, **human beings themselves are an important resource**.

❖ Classification of Resources

(a) On the Basis of Origin

1. Biotic Resources

- Obtained from living organisms
  Examples:
- Forests
- Animals
- Fisheries

2. Abiotic Resources

- Obtained from non-living things
  Examples:
- Rocks
- Minerals
- Metals

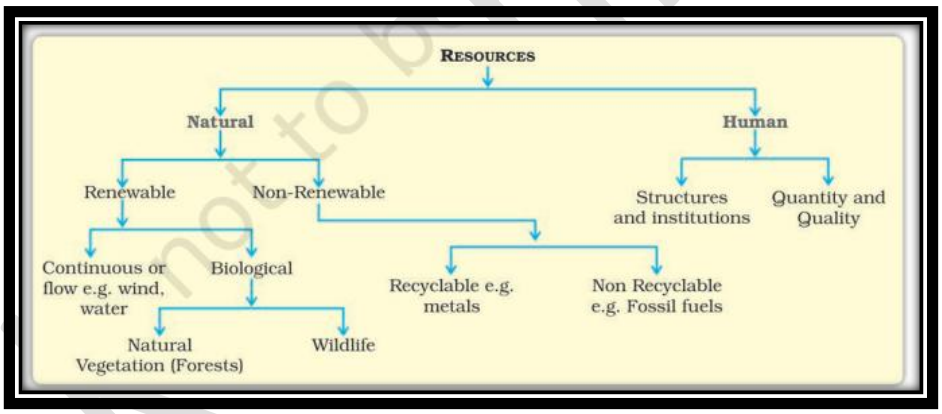
(b) On the Basis of Exhaustibility

1. Renewable Resources

- Can be renewed or reproduced naturally.
  Examples:
- Solar energy
- Wind energy
- Water
- Forests (if managed properly)

2. Non-Renewable Resources

- Take millions of years to form and cannot be quickly replaced.
  Examples:
- Coal
- Petroleum
- Natural gas



(c) On the Basis of Ownership

1. Individual Resources

Owned by private individuals.
Example: houses, farmland.

2. Community Resources

Used by the whole community.
Example: parks, public playgrounds.

3. National Resources

Owned by the nation.
Example: rivers, forests, minerals within a country.

4. International Resources

Belong to all countries.
Example: ocean resources beyond **200 nautical miles** of the Exclusive Economic Zone.

(d) On the Basis of Status of Development

1. Potential Resources

Resources found in a region but not yet fully used.
Example: solar and wind energy in Rajasthan and Gujarat.

2. Developed Resources

Resources that have been **surveyed, measured, and are currently used**.

3. Stock

Resources available but **cannot be used due to lack of technology**.

4. Reserves

Part of stock that **can be used with existing technology but is saved for future use**.

- ❖ **Importance of Resources and Need for Resource Planning**
- ❖ **Importance of Resources**

Resources are **very important for human survival and quality of life**.
They provide things like:

- Food
- Water
- Shelter
- Energy
- Raw materials for industries

Earlier, people believed that **resources were free gifts of nature**, so they used them **without thinking about the future**.

❖ Problems Caused by Overuse of Resources

Because of **indiscriminate (careless) use**, several major problems have developed.

1. Depletion of Resources

- Resources are being **used too quickly**.
- Often they are used to satisfy the **greed of a few individuals**, not the needs of everyone.

Example: excessive mining, overuse of fossil fuels.

2. Unequal Distribution of Resources

- Resources are **concentrated in the hands of a few people or countries**.
- This creates two groups in society:
  - **Haves (rich)**
  - **Have-nots (poor)**

This leads to **economic and social inequality**.

3. Environmental Problems

Careless exploitation of resources has caused **global ecological crises**, such as:

- **Global warming**
- **Ozone layer depletion**
- **Environmental pollution**
- **Land degradation**

These problems threaten **life on Earth**.

Need for Equitable Distribution

For a better future:

- Resources must be **shared fairly among people and countries**.
- Equal access to resources helps maintain:
  - **Quality of life**
  - **Global peace**

If only a few people keep using most of the resources, the **future of the planet will be at risk**.

Resource Planning

Because of these problems, **resource planning is necessary**.

Resource planning means:

- **Careful use**
- **Proper management**
- **Protection of resources for future generations**

❖ Sustainable Development

Sustainable development means **economic development that happens without harming the environment** and **without reducing the ability of future generations to meet their needs**.

In simple words:.

❖ Key Points of Sustainable Development

1. **Protection of Environment**
   - Natural resources like forests, water, and soil must be protected.
2. **Meeting Present Needs**
   - Development should improve people's lives today.
3. **Saving Resources for the Future**
   - Resources should not be overused or wasted.
4. **Balanced Development**
   - Economic growth and environmental protection should go together.

❖ Earth Summit (Rio de Janeiro, 1992)

- The **Earth Summit** was held in **June 1992 in Rio de Janeiro**, where **more than 100 heads of state** from around the world gathered.
- The summit was organized by the **United Nations** to discuss **global environmental protection and socio-economic development**.

❖ **Main Objectives**

The conference aimed to:

- Address **serious environmental problems** affecting the Earth.
- Promote **sustainable development** around the world.
- Encourage countries to **cooperate in protecting natural resources**.

➢ **Important Outcomes of the Summit**

1. Declaration on Global Climatic Change

World leaders agreed to take steps to reduce problems related to **climate change**.

2. Convention on Biological Diversity

Countries agreed to **protect plants, animals, and ecosystems** and prevent the loss of biodiversity.

3. Forest Principles

The summit approved guidelines for the **sustainable management and conservation of forests** across the world.

4. Agenda 21

- A **global action plan for sustainable development in the 21st century**.
- It encourages countries, governments, and organizations to work towards **environmental protection and sustainable use of resources**.

❖ **Agenda 21** is an important international plan for **sustainable development**.
It was signed by world leaders in **1992** at the **United Nations Conference on Environment and Development** held in **Rio de Janeiro**.

The main aim of Agenda 21 is to **promote sustainable development across the world** through cooperation between countries, governments, and communities.

Objectives of Agenda 21

1. **Achieve Global Sustainable Development**
   Ensure development that protects the environment and supports future generations.
2. **Combat Environmental Damage**
   Reduce problems like pollution, deforestation, and climate change.
3. **Reduce Poverty and Disease**
   Improve living conditions and health worldwide.
4. **Promote Global Cooperation**
   Countries work together based on **common interests and shared responsibilities**.

❖ **Resource Planning**

Resource planning means the **careful and systematic use of resources** so that they are used wisely and remain available for the future.
Planning is considered the **best strategy for the proper (judicious) use of resources**.

Importance of Resource Planning in India

A country like **India** has a **great diversity of resources**.
Some regions have **plenty of certain resources**, while others **lack them**. Because of this imbalance, **resource planning becomes very necessary**.

- **Examples of Uneven Distribution of Resources**

- **Jharkhand**, **Chhattisgarh**, and **Madhya Pradesh**
  - Rich in **minerals and coal deposits**.
- **Arunachal Pradesh**
  - Has **abundant water resources**, but **poor infrastructure development**.
- **Rajasthan**
  - Rich in **solar and wind energy**, but **lacks water resources**.
- **Ladakh**
  - Known for **rich cultural heritage**, but has **shortage of water, infrastructure, and some minerals**.

- **Need for Balanced Resource Planning**

Because resources are **not evenly distributed**, proper planning is needed at different levels:

- **National level**
- **State level**
- **Regional level**
- **Local level**

Balanced resource planning helps:

- Use resources **efficiently**
- Reduce **regional inequalities**
- Support **sustainable development**

- **Resource Planning in India**

Resource planning in India is a **complex process** that ensures proper identification, development, and use of resources for national growth.

- **Steps Involved in Resource Planning**

1. Identification and Inventory of Resources

- First, resources in different regions of the country are **identified and recorded**.
- This process includes:
  - **Surveying**
  - **Mapping**
  - **Qualitative and quantitative estimation** of resources.

2. Creating a Planning Structure

- A proper planning system is developed with:
  - **Advanced technology**
  - **Skilled manpower**
  - **Institutional support**

This helps in **implementing resource development plans effectively**.

3. Matching with National Development Plans

- Resource development plans must be **coordinated with overall national development plans** so that resources contribute to the country's progress.

- **Resource Planning After Independence**

After India gained independence in **1947**, the government began systematic resource planning through the **First Five Year Plan**.
Since then, India has made continuous efforts to **use resources wisely and promote balanced development**.

- **Important Idea**

The **availability of resources alone does not guarantee development**.

For development to occur, a region must also have:

- **Technology**
- **Infrastructure**
- **Skilled human resources**

❖ Conservation of Resources

Resource conservation means the **careful use and protection of resources** so that they are not wasted and remain available for the future. 🌱
Resources are essential for **development**, but **irrational consumption and over-utilisation** can cause serious **social, economic, and environmental problems**. Therefore, conserving resources at different levels is very important.

❖ Gandhiji's View on Resource Conservation

Mahatma Gandhi believed strongly in conserving resources.
His famous statement was:
"There is enough for everybody's need and not for anybody's greed."
Meaning:

- Nature provides **enough resources for everyone's needs**.
- But **greed and overuse** lead to **resource depletion**.

He also:

- Criticised **mass production**.
- Supported **"production by the masses"** (small-scale, local production).

❖ Global Efforts for Resource Conservation

1. Club of Rome (1968)

- First organisation to **systematically advocate resource conservation** at the international level.

2. E. F. Schumacher – Book *Small Is Beautiful* (1974 discussion widely spread)

- Promoted **Gandhian philosophy of sustainable and small-scale development**.

3. Brundtland Commission Report (1987)

- Introduced the concept of **Sustainable Development**.
- Published in the book *Our Common Future*.

4. Earth Summit

- Held in **Rio de Janeiro**.
- Promoted **global cooperation for sustainable development**.

❖ Land Resources in India

India has different **relief features**, which influence how land is used.
Distribution of Land

- **Plains – about 43%**
  - Suitable for **agriculture and industries**
- **Mountains – about 30%**
  - Help in **river flow, tourism, and ecological balance**
- **Plateaus – about 27%**
  - Rich in **minerals, fossil fuels, and forests**

❖ Land Utilisation

Land resources are used for different purposes:
1. Forests
Land covered with natural vegetation and forests.
2. Land Not Available for Cultivation

- **Barren and waste land**
- **Land used for non-agricultural purposes** (buildings, roads, industries)

3. Other Uncultivated Land (excluding fallow land)

- **Permanent pastures and grazing land**
- **Land under miscellaneous tree crops and groves**
- **Culturable waste land** (unused for more than 5 years)

4. Fallow Lands

- **Current fallow** – left uncultivated for **1 year or less**
- **Other than current fallow** – left uncultivated for **1–5 years**

5. Net Sown Area

- Land where **crops are actually grown during the agricultural year**.

Gross Cropped Area

- **Net sown area + area sown more than once in a year**

❖ **Land Use Pattern in India**

Land use depends on:

Physical Factors

- Topography
- Climate
- Soil type

Human Factors

- Population density
- Technology
- Culture and traditions

❖ **Land Resources**

Land is one of the most important **natural resources** because all human activities take place on it. It supports:

- Natural vegetation
- Wildlife
- Human settlements
- Agriculture and economic activities
- Transport and communication

However, land is **limited (finite)**, so it must be used **carefully and efficiently**.

❖ **Land Area of India**

- Total geographical area: **3.28 million sq km**.
- Land-use data is available for about **93% of the area**.

Some regions are not fully surveyed, such as:

- Many **North-Eastern states** (except **Assam**)
- Some parts of **Jammu and Kashmir** occupied by **Pakistan** and **China**.

Net Sown Area (NSA)

Net Sown Area means the **total area of land on which crops are actually grown during an agricultural year**.

- In India, the **NSA is about 54% of the total reporting area** (if some temporarily cultivated lands are included).

❖ **Variation among States**

- **More than 80%** of land is cultivated in
  - **Punjab**
  - **Haryana**
- **Less than 10%** cultivated land in
  - **Arunachal Pradesh**
  - **Mizoram**
  - **Manipur**
  - **Andaman and Nicobar Islands**

❖ **Reasons for low Net Sown Area:**

- Hilly terrain
- Dense forests
- Poor soil conditions
- Lack of infrastructure

❖ Forest Area in India

The **National Forest Policy** recommended that **33% of India's land** should be under forests to maintain **ecological balance**.
However, the actual forest area is **much lower than this target**.
Forests are important because:

- They maintain **ecological balance**
- They support the **livelihood of millions of people**

❖ Land Degradation

Land degradation means the **decline in the quality and productivity of land**.
Continuous use of land without conservation measures causes serious **environmental and social problems**.

Causes of Land Degradation

1. **Deforestation**
2. **Overgrazing**
3. **Mining and quarrying**
4. **Over-irrigation**
5. **Industrial waste and pollution**

Examples

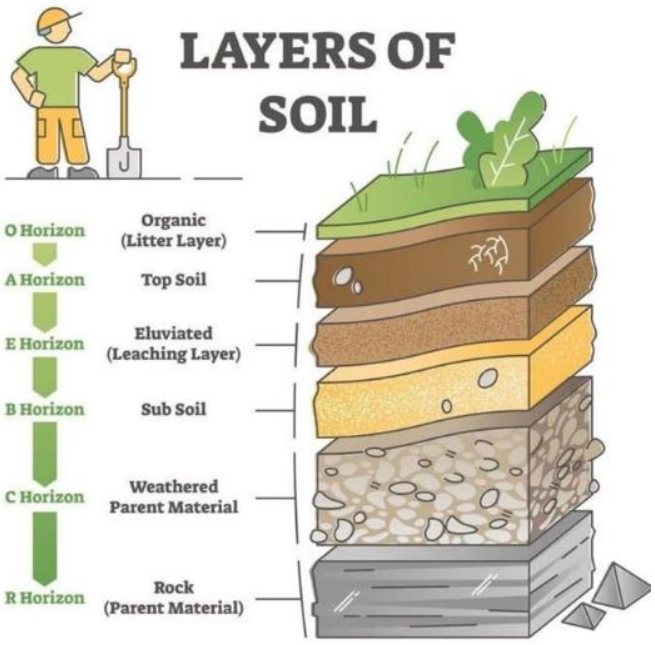
- Mining causes degradation in
  - **Jharkhand**, **Chhattisgarh**, **Madhya Pradesh**, **Odisha**
- Overgrazing causes degradation in
  - **Gujarat**, **Rajasthan**, **Maharashtra**
- Over-irrigation causes salinity in
  - **Punjab**, **Haryana**, **Uttar Pradesh**

❖ Measures to Control Land Degradation

Several steps can help protect land:

- **Afforestation** (planting more trees)
- **Controlled grazing**
- **Stabilising sand dunes** by planting thorny bushes
- **Proper waste land management**
- **Regulating mining activities**
- **Treating industrial wastes before disposal**

These measures help **restore land productivity and protect the environment**.



SOIL AS A RESOURCE

Soil is a **renewable natural resource** and is **vital for plant growth and sustaining life** on Earth. It is a **living system**, taking **millions of years to form a few centimeters of topsoil**.

Factors Influencing Soil Formation

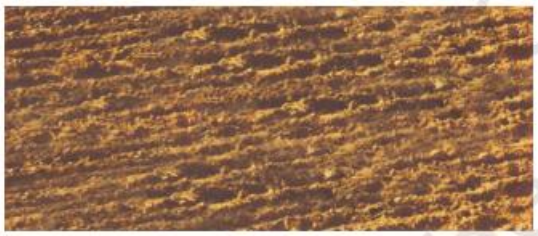
1. **Relief (landform)**
2. **Parent rock or bedrock**
3. **Climate**
4. **Vegetation and other life forms**
5. **Time**

Natural forces like temperature changes, running water, wind, glaciers, and decomposers also help in forming soil.
Soil composition: Organic material (**humus**) + Inorganic material (sand, silt, clay).

Types of Soils in India
India has **diverse soil types** due to varied **relief, climate, vegetation, and geology**.

1. Alluvial Soil

- **Most widespread and fertile soil**.
- Formed by **deposition of sediments by rivers**: Indus, Ganga, Brahmaputra.
- Found in **northern plains**, parts of **Rajasthan, Gujarat**, and eastern coastal plains (Mahanadi delta).



Alluvial Soil

Characteristics:

- Composition: **Sand, silt, clay**
- **Grain size:** Coarser near river origin (piedmont plains like Duars, Chos, Terai), finer in floodplains
- Classified by age:
  - **Old Alluvial (Bangar):** Contains kankar nodules, fine particles, less prone to flooding
  - **New Alluvial (Khadar):** More fertile, found near riverbanks, replenished regularly

Fertility: Rich in **potash, phosphoric acid, lime**
Crops grown: Wheat, rice, sugarcane, pulses
Human use: Densely populated, intensively cultivated
Note: In drier areas, soils may be **alkaline** and need **irrigation/treatment** to be productive.

2. Black Soil (Regur Soil)

- **Colour:** Black
- Also called **Black Cotton Soil** – ideal for **cotton cultivation**
- Formed from **basaltic lava flows of the Deccan Trap**

- Found in **Maharashtra, Saurashtra, Malwa, Madhya Pradesh, Chhattisgarh**, and along **Godavari & Krishna valleys**

Black Soil

Characteristics:
- Fine, clayey texture
- Excellent **moisture retention**
- Rich in nutrients: **calcium carbonate, magnesium, potash, lime**
- Fertile and suitable for crops like **cotton, sorghum, wheat, and pulses**

Soil Classification in India
India's soils are classified based on:
- **Factors of formation:** Climate, parent rock, relief
- **Colour and texture**
- **Thickness and age**
- **Chemical and physical properties**

3. Red and Yellow Soils
- **Colour:** Red due to iron diffusion; yellow when hydrated
- **Formation:** From **crystalline and metamorphic rocks**
- **Texture:** Loamy to coarse; varies with terrain
- **Nutrients:** Generally poor in nitrogen, phosphorous, and humus

- **Location:** Odisha, Chhattisgarh, parts of the middle Ganga plain, piedmont zones of Western Ghats
- **Crops:** Cereals, pulses, groundnut, millets (with proper irrigation and treatment)

4. Laterite Soil
- **Origin of name:** Latin "later" meaning brick
- **Formation:** Tropical/subtropical climate; intense leaching due to heavy rainfall
- **Characteristics:** Deep, acidic (pH<6), nutrient-poor; humus-rich under forests, humus-poor in semi-arid areas
- **Prone to:** Erosion and degradation
- **Location:** Western Ghats, southern states (Kerala, Karnataka, Tamil Nadu), Odisha, parts of West Bengal, North-east India
- **Crops:** Tea, coffee, cashew nut (after soil management)

5. Arid Soil
- **Colour:** Red to brown
- **Texture:** Sandy, saline
- **Characteristics:** Low humus and moisture; high salt content in some areas
- **Problems:** Kankar layer restricts water infiltration
- **Location:** Western Rajasthan and other arid zones

- **Crops:** Cultivable after **irrigation**

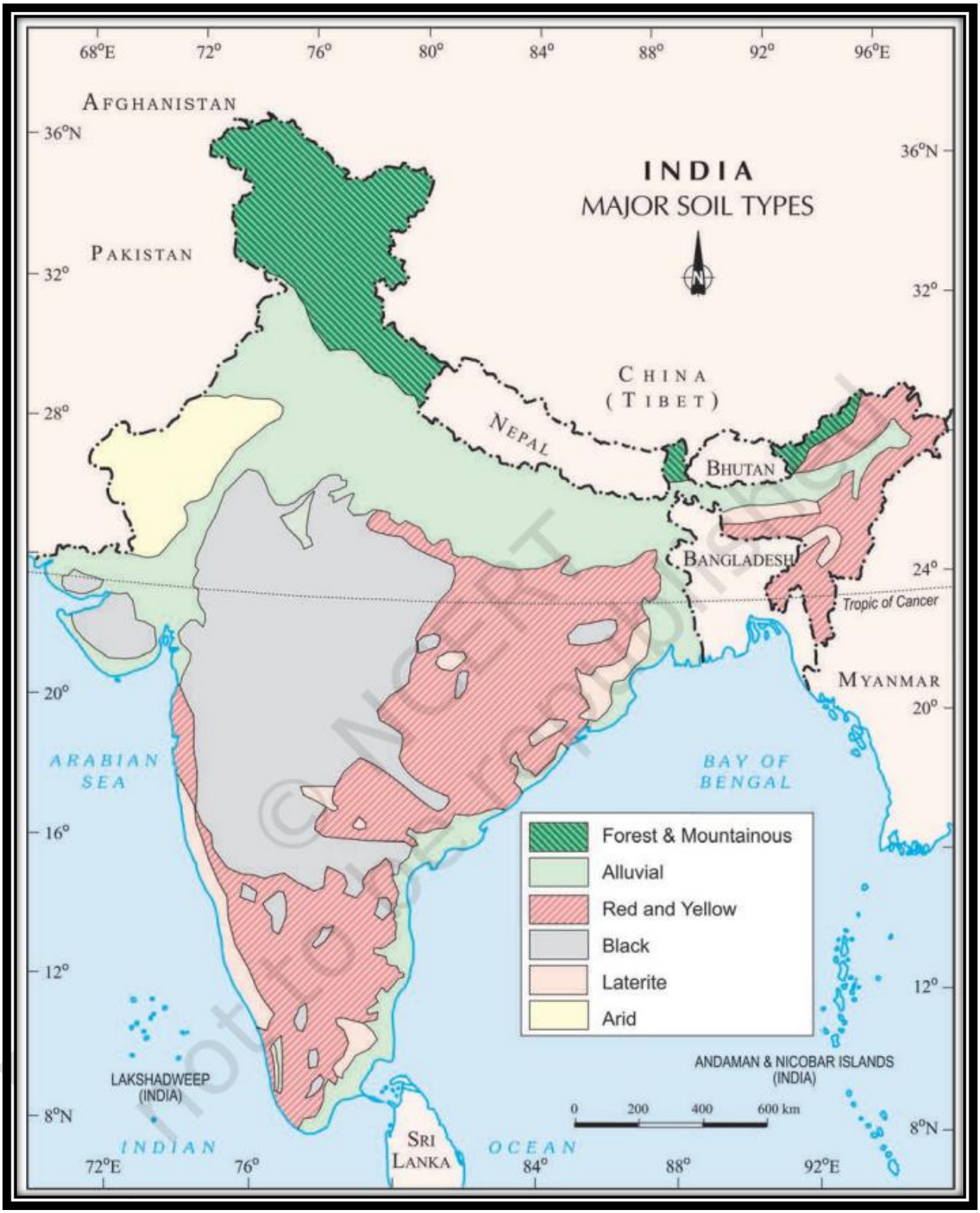
6. Forest Soil
- Found in **hilly and mountainous areas** with heavy rainfall
- **Texture:** Loamy and silty in valleys, coarse-grained in upper slopes
- **Characteristics:** Fertility varies; snow-covered Himalayan soils are acidic and low in humus
- **Importance:** Supports dense forests and biodiversity

❖ **Soil Erosion and Conservation**

Soil erosion: Removal of topsoil by **water, wind, glaciers, and human activity** (deforestation, overgrazing, mining, poor farming methods).

Types of Erosion:
- **Gully erosion:** Running water cuts deep channels (ravines in Chambal basin)
- **Sheet erosion:** Thin layer of topsoil washed away over large areas
- **Wind erosion:** Loose soil blown away in dry regions

Soil Conservation Methods:
1. **Contour ploughing:** Plough along the slope contour to reduce water flow
2. **Terrace cultivation:** Steps cut on slopes to prevent runoff
3. **Strip cropping:** Leave strips of grass between crop fields to break wind and water flow
4. **Shelter belts:** Planting rows of trees to protect soil from wind and sand
5. **Stabilisation of sand dunes** with thorny bushes
6. **Proper waste management, controlled mining, afforestation**


INDIA
MAJOR SOIL TYPES
AFGHANISTAN
PAKISTAN
CHINA (TIBET)
NEPAL
BHUTAN
BANGLADESH
MYANMAR
Tropic of Cancer
ARABIAN SEA
BAY OF BENGAL
INDIAN OCEAN
SRI LANKA
LAKSHADWEEP (INDIA)
ANDAMAN & NICOBAR ISLANDS (INDIA)
Forest & Mountainous
Alluvial
Red and Yellow
Black
Laterite
Arid
0 200 400 600 km
68°E
72°
76°
80°
84°
88°
92°
96°E
36°N
32°
28°
24°
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