

Resources And Development

What are Resources?

- Anything in our environment that we can use to meet our needs.
- Must be:
 - **Technologically accessible:** We have the technology to use it.
 - **Economically feasible:** Using it makes economic sense.
 - **Culturally acceptable:** Our culture allows us to use it.

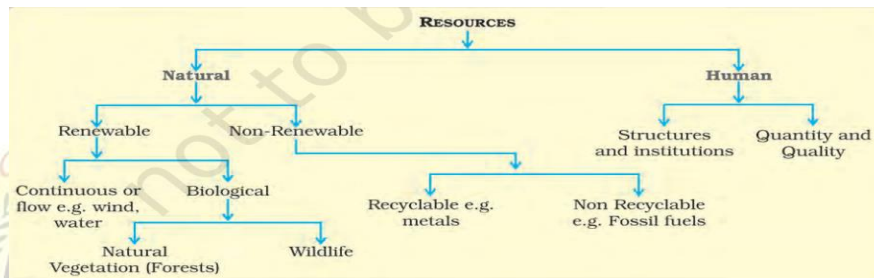
How are Resources Created?

- Resources are not simply "free gifts of nature".
- They are a result of human interaction with nature.
- This interaction involves:
 - **Technology:** Tools and methods used to extract and process resources.
 - **Institutions:** Organizations and systems that manage resource use.

Classifying Resources:

Resources can be grouped in different ways:

- **Origin:**
 - **Biotic:** Derived from living things (e.g., plants, animals).
 - **Abiotic:** Derived from non-living things (e.g., rocks, minerals).
- **Exhaustibility:**
 - **Renewable:** Can be replenished naturally (e.g., solar energy, wind).
 - **Non-renewable:** Limited supply and cannot be easily replaced (e.g., fossil fuels).
- **Ownership:**
 - **Individual:** Owned by a single person (e.g., private land).
 - **Community:** Owned by a group of people (e.g., village commons).
 - **National:** Owned by the country (e.g., national parks).
 - **International:** Beyond national jurisdiction (e.g., oceans).
- **Development Status:**
 - **Potential:** Exist but not yet utilized (e.g., undiscovered oil fields).
 - **Developed:** Surveyed and available for use (e.g., operating mines).
 - **Stock:** Available but current technology limits use (e.g., hydrogen fuel).
 - **Reserves:** Subset of stock that can be extracted economically with existing technology.



Why Resource Development Matters

- **Essential for life:** Resources are crucial for human survival and well-being.
- **Past mistakes:** The belief that resources were unlimited led to overuse and problems like:
 - Resource depletion to benefit a few.
 - Unequal distribution of resources, creating social divides.
 - Environmental crises like global warming and pollution.
- **Sustainable future:** We need to use resources responsibly to ensure a good quality of life for everyone and protect the planet.

Resource Planning

- **What it is:** A strategy to use resources wisely.
- **Why it's important:** Especially crucial in countries like India with diverse resource distribution. Some areas are rich in certain resources but lack others.
- **Examples:**
 - Jharkhand, Chhattisgarh, Madhya Pradesh: Rich in minerals and coal.
 - Arunachal Pradesh: Abundant water, but lacks infrastructure.
 - Rajasthan: Plenty of solar and wind energy, but scarce water resources.
 - Ladakh: Rich cultural heritage, but limited water and infrastructure.
- **Planning levels:** Resource planning is needed at national, state, regional, and local levels.

How Resource Planning Works in India

- **Step 1: Resource assessment:** Identify and inventory resources through surveys, mapping, and quantifying them.
- **Step 2: Planning structure:** Develop the technology, skills, and institutions to carry out the plan.
- **Step 3: Integration:** Align resource plans with national development goals.

Important Considerations

- **Resources and development:** Just having resources isn't enough for development. Technology, institutions, and human skills are also crucial.

- **Colonialism's impact:** History shows that colonizers exploited resource-rich regions. India's own experience highlights the importance of technology and institutions in resource development.

Resource Conservation

- **Why it matters:** Overuse can lead to social, economic, and environmental problems.
- **Gandhiji's wisdom:** "There is enough for everybody's need and not for anybody's greed." He emphasized responsible consumption and sustainable production.

Land as a Resource

- **Vital for life:** We live, work, and depend on land for various needs.
- **Limited resource:** Land is finite, so careful planning is essential for its use.
- **Diverse landscape:** India has mountains, plateaus, plains, and islands, each with unique characteristics and uses.
 - **Plains (43%):** Good for agriculture and industry.
 - **Mountains (30%):** Water source, tourism, ecological benefits.
 - **Plateaus (27%):** Rich in minerals, fossil fuels, and forests.

Land Utilization in India

Land is used for various purposes:

1. **Forests**
2. **Non-cultivable land:**
 - Barren/wasteland
 - Land for buildings, roads, factories, etc.
3. **Other uncultivated land:**
 - Pastures and grazing land
 - Land with trees (not for crops)
 - Cultivable wasteland (left unused for over 5 years)
4. **Fallow land:**
 - Current fallow (unused for one year or less)
 - Other fallow (unused for 1 to 5 years)
5. **Net sown area (NSA):** Land used for growing crops.
 - **Gross cropped area:** NSA plus any land sown more than once a year.

Land Use Pattern

- **Influencing factors:** Physical (topography, climate, soil) and human (population, technology, culture).
- **Data limitations:** Land use data is not complete for all of India.
- **Key observations:**

- Pasture land has decreased, raising concerns about how we feed our large cattle population.
- Much of the fallow land is of poor quality or expensive to cultivate.
- NSA varies greatly among states (over 80% in Punjab/Haryana, under 10% in some Northeastern states).
- Forest area is below the desired 33% needed for ecological balance.

Land Degradation

- **Causes:**
 - Human activities: Deforestation, overgrazing, mining.
 - Natural forces: Accelerated by human actions.
- **Examples:**
 - Mining: Leaves scars and waste.
 - Overgrazing: A problem in Gujarat, Rajasthan, Madhya Pradesh, Maharashtra.
 - Over-irrigation: Causes waterlogging and soil problems in Punjab, Haryana, and parts of Uttar Pradesh.
 - Industrial pollution: Effluents and dust harm land and water.

Land Conservation

- **Solutions:**
 - Afforestation and grazing management.
 - Shelter belts and sand dune stabilization.
 - Wasteland management.
 - Controlling mining and industrial pollution.

Soil as a Resource

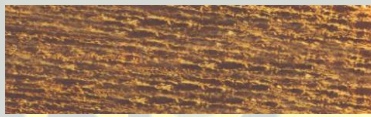


- **Essential for life:** Supports plant growth and various organisms.
- **Formation:** Takes millions of years and is influenced by relief, parent rock, climate, vegetation, and time.
- **Composition:** Contains organic (humus) and inorganic materials.
- **Classification:** Indian soils are categorized based on formation factors, color, texture, age, and properties.

Classification of Soils in India

India's diverse geography has led to a variety of soil types, each with unique characteristics.

1. Alluvial Soils



- **Most common:** Found in the entire northern plains (Indus, Ganga, Brahmaputra rivers), parts of Rajasthan, Gujarat, and eastern coastal plains.
- **Formation:** Deposited by rivers.
- **Texture:** Varies in proportion of sand, silt, and clay. Coarser near the foothills, finer in the lower valleys.
- **Types:**
 - **Bangar (old alluvial):** Higher concentration of kanker nodules, less fertile.
 - **Khadar (new alluvial):** More fine particles, more fertile.
- **Fertility:** Generally very fertile, ideal for sugarcane, paddy, wheat, and other crops.
- **Characteristics:** Rich in potash, phosphoric acid, and lime. Intensively cultivated and densely populated regions.

2. Black Soils



- **Also known as:** Regur soils or black cotton soils.
- **Ideal for:** Growing cotton.
- **Formation:** Climatic conditions and parent rock material (basalt) contribute to its formation.
- **Location:** Deccan plateau (Maharashtra, Saurashtra, Malwa, Madhya Pradesh, Chhattisgarh) and along the Godavari and Krishna river valleys.
- **Texture:** Clayey, known for moisture retention.
- **Fertility:** Rich in calcium carbonate, magnesium, potash, and lime. Poor in phosphorus.

- **Characteristics:** Develop cracks in hot weather (good aeration). Sticky when wet.

3. Red and Yellow Soils

- **Formation:** Develops on crystalline igneous rocks in low rainfall areas.
- **Location:** Eastern and southern Deccan plateau, parts of Odisha, Chhattisgarh, and the Western Ghats.
- **Color:** Reddish due to iron in the rocks. Yellow when hydrated.

4. Laterite Soils



- **Meaning:** 'Later' (Latin) means brick.
- **Formation:** Intense leaching due to heavy rain in tropical and subtropical climates.
- **Location:** Southern states, Western Ghats, Odisha, parts of West Bengal and Northeast India.
- **Fertility:** Generally acidic and low in nutrients. Humus-rich in forested areas, humus-poor in semi-arid regions.
- **Characteristics:** Prone to erosion. Suitable for tea, coffee, and cashew nut with proper soil conservation.

5. Arid Soils



- **Color:** Red to brown.
- **Texture:** Sandy.
- **Characteristics:** Saline, often with high salt content. Lack humus and moisture due to dry climate and high evaporation.
- **Kankar:** Calcium carbonate layer restricts water infiltration.
- **Cultivation:** Can be made productive with irrigation (e.g., western Rajasthan).

6. Forest Soils

- **Location:** Hilly and mountainous areas with rainforests.
- **Texture:** Varies with the environment - loamy and silty in valleys, coarse-grained on upper slopes.
- **Fertility:** Acidic with low humus in snow-covered areas. Fertile in lower valleys and river terraces.

Soil Erosion

- **What it is:** The loss of soil cover due to natural forces or human activities.
- **Natural causes:** Wind, glaciers, water.
- **Human causes:** Deforestation, overgrazing, construction, mining.
- **Types of erosion:**
 - **Gully erosion:** Running water creates deep channels (gullies), making land unusable (e.g., ravines in the Chambal basin).
 - **Sheet erosion:** Water washes away topsoil from slopes.
 - **Wind erosion:** Wind removes soil from flat or sloping land.

Soil Conservation Measures

Soil conservation methods aim to prevent soil erosion and protect this valuable resource.

- **Contour ploughing:** Ploughing along the contour lines of a slope to slow down water flow.
- **Terrace farming:** Creating steps on slopes to reduce erosion (common in the Himalayas).
- **Strip cropping:** Planting strips of grass between crops to break the force of wind.
- **Shelter belts:** Planting lines of trees to act as windbreaks, helping stabilize sand dunes and deserts (effective in western India).



Soil Erosion



Gully Erosion



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