Resources & Development

Resource
↓
Everything available in our environment which can be used to satisfy our needs
↓
is called a "Resource"
↓
Provided:
- Technologically Accessible
- Economically feasible
- Culturally Acceptable

Classification of Resources
- On the basis of origin
  - Biotic
  - Abiotic
- On the basis Exhaustibility
  - Renewable
  - Non-Renewable
- On the basis Ownership
  - * Individual
  - * Community
  - * National
  - * International
- On the basis of status and development
  - * Potential
  - * Developed stock
  - * Reserves

Development of Resources

Resource = vital for human

(a) (triangle)
- Indiscriminate use by human
- (b) Belief: Resources are free gifts of nature.

⇓
Outcomes:—
1. Depletion of resources due to greed of few individuals.
2. Accumulation of resources — Society: Rich ⟷ Poor
3. Global Ecological Crisis — Global warming, Ozone layer depletion, Envt. Pollution, land degradation.

Need:—
⇓
Equitable distribution of resources
⇓
Resource Planning.
⇓
[Sustainable Development.

Development should take place without damaging the environment. Development in the present should not compromise with needs of future generations.

Rio de Janeiro Earth Summit, 1992
- → Brazil
- 100 heads ←
- 1st international Earth Summit
- → for addressing urgent problems
  - Envt. Protection
  - Socio-Eco Develop.
- Endorsed:—
  - Forest Principles
  - Agenda 21
- Outcome:— Signed: Declaration on Global Climatic Change and Biological Diversity.

AGENDA-21
- ← UN Conference on Envt. and Develop. (UNCED)
- → 1992 (Rio de Janeiro) BRAZIL
- ↓ Aim: Sustainable Development
- Combat Environmental Damage, poverty, disease
- Every local govt. should draw its own local Agenda 21.

Resource Planning → for judicious use
- ← Necessary for country like India — Diversity of Resources
- Resource rich regions
  - * Arunachal: Abundance of Water
  - * Rajasthan: solar & wind energy
  - * Jharkhand, Chattisgarh, M.P.: Minerals
- Resource deficient regions
  - lacks infrastructural development
  - water resources.

⇓
∴ calls for balanced resource planning at
- National
- State
- Regional
- Local

Resource Planning in India

(a) Surveying, identifying, mapping resources
(b) Planning structure — Technology, skill, institution
(c) Matching resource development plans with overall national development plan

India = Five Year Plan / Resource Planning. } after independence.
↓
Why Five Year Plan? ⇒ for planning.
1. Mere availability of resource is of no use.
2. Resource + Technology + Institutions
3. Regions rich in resource but lack technology to extract & hence those regions remain economically backward.
4. Some regions lack resource but economically developed.

Remember
Resource + Technology + Skill + Institution
(Tabhi Kuch Hoga Bhai)

[History of colonization]
↓
Resources attracted foreign invaders.
↓
Technology helped them to exploit it.
↓
established supremacy

At the international level, the Club of Rome advocated resource conservation for the first time in a more systematic way in 1968. Subsequently, in 1974, Gandhian philosophy was once again presented by Schumacher in his book **Small is Beautiful**. The seminal contribution with respect to resource conservation at the global level was made by the Brundtland Commission Report, 1987. This report introduced the concept of 'Sustainable Development' and advocated it as a means for resource conservation, which was subsequently published in a book entitled **Our Common Future**. Another significant contribution was made at the Earth Summit at Rio de Janeiro, Brazil in 1992.

Resource Conservation
- → 1968: Club of Rome
- → 1974: Schumaker: Small is Beautiful
- → 1987: Bruntland Report
- → Our Common Future.
- → Rio de Janerio 1992

Land Resource

[Land] ⇒ Natural Resource
⇒ supports vegetation, wildlife, economic activity, transport and communication, human life.
⇒ asset
∴ important to use land carefully.

India = Land
- 43% = plain = agriculture, industry
- 30% = mountain = perennial flow of rivers = tourism
- 27% = plateau = rich reserves of minerals, fossil fuels and forest.

LAND UTILISATION

Land resources are used for the following purposes:
1. Forests
2. Land not available for cultivation
   (a) Barren and waste land
   (b) Land put to non-agricultural uses, e.g. buildings, roads, factories, etc.
3. Other uncultivated land (excluding fallow land)
   (a) Permanent pastures and grazing land,
   (b) Land under miscellaneous tree crops groves (not included in net sown area),
   (c) Cultruable waste land (left uncultivated for more than 5 agricultural years).
4. Fallow lands
   (a) Current fallow-(left without cultivation for one or less than one agricultural year).
   (b) Other than current fallow-(left uncultivated for the past 1 to 5 agricultural years).
5. Net sown area the physical extent of land on which crops are sown harvested is known as net sown area.
   Area sown more than once in an agricultural year plus net sown area is known as *gross cropped area*.

Land use pattern in India
↓
- * Total Geog. Area of India = 3.28 million sq km.
- * Land use data = available for only 93% of geog. area
⇓
Why?
- Land use reporting for most of N-E states except Assam has not been done.
- Areas of Jammu & Kashmir occupied by Pak & China not surveyed.

- * Land under permanent pasture ↓
- * Most of the other than current fallow lands — either poor quality or cost of cultivation ↑
- * Pattern of Net Sown Area varies state to state. Punjab & Haryana > 80% & Arunachal, Mizoram, Manipur < 10%
- * Forest area — lower than 33% of geog. area.

∴ Continous use of land over a long period of time without taking appropriate measures to conserve and manage it,
↓
Resulted in Land Degradation.

Land Degradation
Reason:
- ← Deforestation
- → Over grazing
- ↓ Over-mining (Mining sites are abandoned after excavation work is complete)

- * Jharkhand, Chattisgarh, Madhya Pradesh, Odisha → Mining
- * Gujarat, Rajasthan, Madhya Pradesh, Maharashtra → Over-Grazing.
- * Punjab, Haryana, Western UP → Over Irrigation due to water logging
  ↓ increasing salinity & alkalinity in soil.
- * Industrial effluents as waste — pollution.
- * Mineral processing ← like grinding of limestone for cement industry, grinding of calcite and soapstone for ceramic industry.
  → generate dust in atm.
  ↓
  dust settles on land.
  ↳ it retards the infiltration of water in soil.

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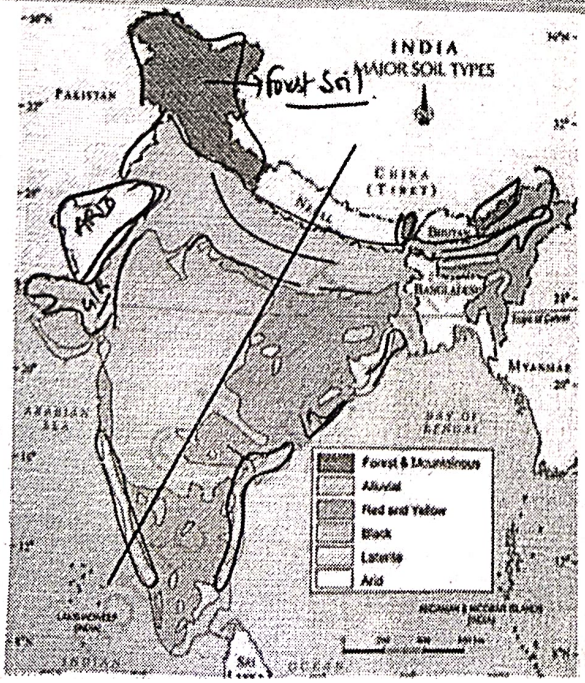
Ways to solve problem of land degradation

1. Afforestation.
2. Proper management of grazing.
3. Planting of shelter belts
4. Control over-grazing.
5. Stabilizing sand dunes by growing thorny bushes
6. Proper management of waste lands
7. Control mining activities
8. Proper discharge and disposal of industrial effluents and waste treatment.

Alluvial	• Northern plains (Ganga, Indus, Brahmaputra) • Eastern Coastal Plains (Mahanadi, Godavari, Krishna, Kaveri) • Rajasthan and Gujarat	• Very Fertile • Sand, silt and clay • Potash, phosphoric acid and lime • Found in piedmont plains such as Duars, Chos and Terai	sugarcane, paddy, wheat, cereals, pulse crops	Regions intensively cultivated and densely populated Soils- on the basis of their age: • Old alluvial (Bangar- more kankar) and New alluvial (Khadar- more fertile)
Black (Regur Soil)	• Deccan Trap • Maharashtra, Saurashtra, Malwa, M.P, Chhattisgarh • Godavari and the Krishna valleys	• Black in colour • Clayey, soils are sticky • calcium carbonate, magnesium, potash, lime • poor in phosphoric contents (Imp)	Cotton	• Hold moisture • Develops deep cracks • Deccan trap (Basalt) region • Made up of lava flows
Laterite (Latin: lateres Brick)	Western Ghats region of Maharashtra Odisha, West Bengal, North-east regions	acidic (pH<6.0) deficient in plant nutrients	Tea, Coffee, Cashew nut (TN, AP, Kerala)	• develops under tropical and subtropical climate • It is result of intense leaching due to heavy rain.
Red and Yellow	• Eastern and southern parts of the Deccan plateau. • Parts of Odisha, Chhattisgarh • Southern parts of the middle Ganga plain • Along the piedmont zone of the Western Ghats	• Develops areas of low rainfall • Reddish colour due to diffusion of iron • It looks yellow when it occurs in a hydrated form • Develops in crystalline and metamorphic rocks		
Arid	Western Rajasthan	Sandy (saline) lacks humus and moisture red to brown in colour	Common salt is obtained by evaporating the water Due to the dry climate, high temperature evaporation is faster	The lower horizons of the soil are occupied by Kankar because of the increasing calcium content downwards The Kankar layer formations in the bottom horizons restrict the infiltration of water
Forest	• Mountainous Areas	• Loamy and silty in valley sides and coarse grained in the upper slopes • Snow covered areas, soils experience denudation and are acidic with low humus content	• where sufficient rain forests are available. • Fertile on valley and river terraces	



Soil Erosion and Conservation

Denudation of soil cover ⇐ Soil Erosion ⇒ washing away Top soil

Process of soil formation / Soil erosion ⇓ GO HAND-IN-HAND.

Wind, glacier, water ↑ Natural Forces + Human Activities { Deforestation / Over-grazing / Construction and Mining

↓ [Soil Erosion]

Soil Erosion and Soil Conservation

- The denudation of the soil cover and subsequent washing down is described as soil erosion.
- The processes of soil formation and erosion, go on simultaneously and generally there is a balance between the two.
- Sometimes, this balance is disturbed due to human activities like deforestation, over-grazing, construction and mining etc., while natural forces like wind, glacier and water lead to soil erosion

The running water cuts through the clayey soils and makes deep channels as **gullies**.

The land becomes unfit for cultivation and is known as **bad land**.

In the Chambal basin such lands are called **ravines**.

Sometimes water flows as a sheet over large areas down a slope. In such cases the top soil is washed away. This is known as **sheet erosion**.

Wind blows loose soil off flat or sloping land known as **wind erosion**.

Soil erosion is also caused due to defective methods of farming. Ploughing in a wrong way i.e. up and down the slope form channels for the quick flow of water leading to soil erosion.

Ploughing along the contour lines can decelerate the flow of water down the slopes. This is called **contour ploughing**.

Steps can be cut out on the slopes making terraces. Terrace cultivation restricts erosion. Western and central Himalayas have well developed **terrace farming**.

Large fields can be divided into strips. Strips of grass are left to grow between the crops. This breaks up the force of the wind. This method is known as **strip cropping**.

Planting lines of trees to create shelter also works in a similar way. Rows of such trees are called **shelter belts**. These shelter belts have contributed significantly to the stabilization of sand dunes and in stabilizing the desert in western India

What is Agenda 21? List its two principles. [2017]

Agenda 21 was adopted at first International Earth Summit held in 1992 at Rio de Janerio Brazil. The two principles are as follows:

- To combat environmental damage, poverty, disease through global cooperation on common interests, mutual needs and shared responsibilities.
- Every local government should draw its own local Agenda 21.

Why is it essential to have resource planning? Explain any three reasons. [2017]

If the present trend of resource depletion by few individuals continues, the future of our planet is in danger.
Planning is essential for sustainable existence of all forms of life.
Indiscriminate exploitation of resources has led to global ecological crises.

"In India, some regions are rich in certain types of resources but deficient in some other resources". Do you agree with the statement? Support your answer with any three examples. [2017]

Yes, there are regions which are rich in certain types of resources but are deficient in some other resources.

1. Jharkhand, Chhattisgarh and Madhya Pradesh are rich in minerals and coal deposits.
2. Arunachal Pradesh has abundance of water resources but lacks in infrastructural development.
3. Rajasthan is endowed with solar and wind energy but lacks in water resources.
4. Ladakh has rich cultural heritage but lacks in water resources and infrastructure.

Forest and Wildlife Resources

Mahaul Samjho Pehle

We share this planet with millions of other living beings

Micro-organisms and bacteria, lichens to banyan trees, elephants and blue whales.

This entire habitat that we live in has immense biodiversity.

We humans along with all living organisms form a complex web of ecological system in which we are only a part and very much dependent on this system for our own existence

Humans → Plants, Animals, Micro-Organisms

Impacts the air, water, soil around us

Forests

Biodiversity or Biological Diversity

is immensely rich in wildlife and cultivated species,

diverse in form and function but closely integrated in a system through multiple network of interdependencies.

Ab Flora and Fauna in India ko Samjho

There are so many animals and plants which are unique.
In fact, India is one of the world's richest countries in terms of its vast array of biological diversity.

These diverse flora and fauna are so well integrated in our daily life that we take these for granted.

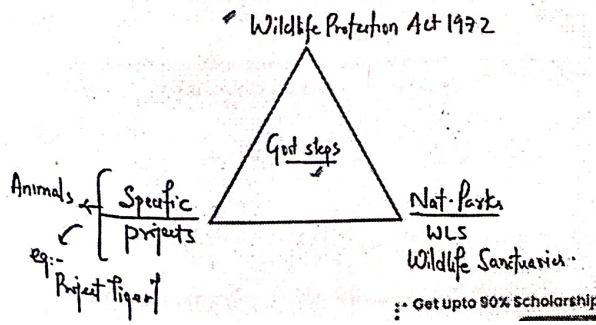
But, they are under great stress mainly due to insensitivity to our environment.

Conservation of Forest and Wildlife in India

Rapid decline in wildlife population and forestry has become made conservation essential.

But why do we need to conserve our forests and wildlife?

1. Preserves the ecological diversity and our life support systems – water, air and soil.
2. Preserves the genetic diversity of plants and animals for better growth of species and breeding



Government efforts to preserve conservation of species

1. Indian Wildlife (Protection) Act, 1972
2. Establishment of national parks and wildlife sanctuaries by central & state governments.
3. Several projects for protecting specific animals, which were gravely threatened, like Project tiger

Government efforts to preserve conservation of species

1. In the 1960s and 1970s, conservationists demanded a national wildlife protection programme.
2. The Indian Wildlife (Protection) Act was implemented in 1972 for protecting habitats of animals.
3. An all India list of protected species was also published.
4. Objective: Protecting population of certain endangered species by banning hunting, giving legal protection to their habitats and restricting trade in wildlife.
5. Establishment of national parks and wildlife sanctuaries by central & state governments.
6. The central government also announced several projects for protecting specific animals, which were gravely threatened, including the tiger, the one-horned rhinoceros, hangul

Now the conservation projects are focusing on biodiversity rather than on a few of its components.

Insects are beginning to find a place in conservation planning.

Several hundred butterflies, moths, beetles, and one dragonfly have been added to the list of protected species under Wildlife Protection Act.

In 1991, for the first time plants were also added to the list, starting with six species.

Project Tiger

Tiger- a key wildlife species

In 1973, the authorities realized that the tiger population had fallen down to 1,827 from an estimated 55,000 at the turn of the century.

The major threats to tiger population are:

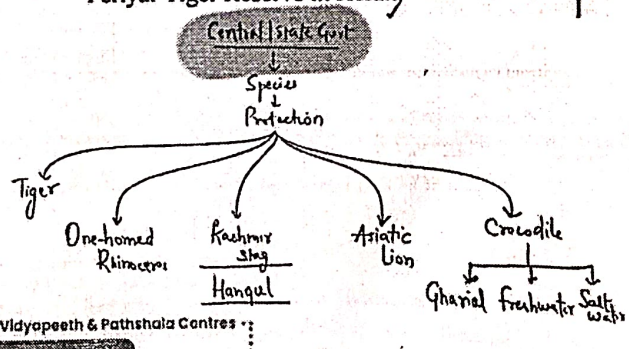
1. poaching for trade
2. shrinking habitat
3. depletion of prey base species
4. growing human population
5. The trade of tiger skins and the use of their bones in traditional medicines

India and Nepal provide habitat to about two-thirds of the surviving tiger population in the world, these two nations became prime targets for poaching and illegal trading.

"Project Tiger" was launched in 1973.

Some Tiger Reserves of India:

- Corbett National Park in Uttarakhand
- Sunderbans National Park in West Bengal
- Bandhavgarh National Park in Madhya Pradesh
- Sariska Wildlife Sanctuary in Rajasthan
- Manas Tiger Reserve in Assam
- Periyar Tiger Reserve in Kerala



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Types and distribution

- maintain = timber
- Madhya Pradesh (75% of total forest area)

Reserved forest → Permanent Forest Estates ← **Protected forest**

Reserved forest
- → Strict regulation of activities
- → Prohibition for doing activities
- → [J&K, Andhra, Kerala etc]

Protected forest → Bihar, Haryana, Punjab, H.P
- → Not so stricter regulation
- → Certain activities allowed
  - * Cattle grazing
  - * Collect fuelwood
  - * Collecting timber

Unclassed forest
- → forest and wastelands
- ↓ govt + Locals
- conservation
- → {North-eastern states, Gujarat}

Community and Conservation

Govt Reserve = Efforts
↓
But they sometimes fail
↓
["Community Preserve"] → Alwar, Rajasthan, 1200 Ha
↓
{"Bhairodev Dakav Sonchuri"}

Alwar, Rajasthan → Community has given its own guidelines.

[Sariska Tiger Reserve "Mining"]
↓
Community is fighting
↳ Wildlife Protection Act

Conservation Movements

Chipko Movement
- * Sundarlal Bahuguna
- * community fighting against cutting down of trees.
- * Not only stopped deforestation but also ⇒ community afforestation.

Beej Bachao Andolan ← "ecological farming"
- {traditional seeds, Tehri ↓ farming} {farmers, citizen}

Navdanya
- No synthetic fertilizers usage

Joint Forest Management (JFM) → (1988) = odisha
- Govt + Local community
- ↓ conservation
- (In Return ⇒ share in timber after successful harvest)

Sacred Groves

Santhal, Mundas

Sacred Groves
↓
Nature worship = old age [tribal belief] → custom/faith

- Mahua / Kadamba (Santhal, Mundas)
- * Tribals of Odisha/Bihar 'Tamarind'
- forest → untouched ↓ tribals
- forest of God and Goddesses ← Sacred Groves
- Temples → Langurs / Macaques ↑ (feed)

Water Resources

Water

3/4th Earth's Surface = Water

- Little : Little freshwater
  - Surface Run-off
  - Ground Water
- which is continuously changed by Hydrological Cycle

Chalo Gaye Na?? Still Water Scarcity?

When we say water scarcity, we think:

- Low Rainfall — Rajasthan → Women → Matka → water collect.
- Drought

TRUE, availability of water resources varies from place to place, season to season different Rainfall pattern

But, Reality kuch aur bhi Bawa....

- Over Exploitation / Excessive Use
- Unequal access to water to different people.

Is it possible that an area may have ample water resources but is still facing water scarcity?

YES

Quantity ↑

Exploitation ↑

- * Industrialization ↑ (Industries ↑) Urbanization ↑ (Urban Centres ↑)
- * Dense Population & Urban lifestyle
- * Housing societies / Colonies (own water pumps)

∴ Exploitation & depletion because of Growing Demand

Quality ↓

Not Usable.

- * Bad Quality of Water
- * Polluted by domestic & industrial wastes
- * Chemicals, Pesticides & fertilizers used in Agriculture — hazardous for human.

Need to conserve Water / Manage Water Resources

- to safeguard from health hazards
- To ensure food Security
- Continuation of livelihood / productive activities
- Prevent degradation of Natural Ecosystem

Over Exploitation + Mismanagement of water resources → ECOLOGICAL CRISIS

How to conserve water?

Multipurpose Projects

* Construction of Dams
  - Sutlej-Beas River Basin
  - Bhakra-Nangal Project
  - Hirakud Project
  - → Irrigation
  - → Electricity
  - → to control floods

New Problems —

- * Soil erosion
- * flooding
- * Sedimentation
- * water-borne disease etc.

Rainwater Harvesting

- → Mountainous Region = Gul or Kul
- → Rajasthan = Rooftop Rainwater Harvesting
- → Bengal = Inundation channels to Irrigate fields
- → Arid & Semi-arid = Khadins in Jaisalmer, Johads
- → Bikaner, Phalodi, Barmer → Tankas.

Step taken by Government

⇓

Jal Jeevan Mission

↓

Enable every rural household get assured supply of potable piped water

55 litres per capita per day

⇓

By ensuring tap water Connections

Irrigation ↑ — objective

Pradhan Mantri Krishi Sinchaee Yojana

Some of the broad objectives of this programme are to (1) enhance the physical access of water on the farm and (2) expand cultivable area under assured irrigation (har khet ko pani), (3) improve on-farm water use efficiency to reduce wastage and (4) increase availability both in duration and extent (Irrigation and other water saving technologies) (per drop more crop) and introduce (5) sustainable water conservation practices etc.

1. Physical Extent ↑
2. Cultivable Area ↑
3. On-farm = water wastage → water efficient
4. Water ↑ → D & E
5. Technology ↓ Water conserve

How do we conserve and manage water?

- **Ancient times:** People constructing hydraulic structures like dams built of stone rubble, reservoirs or lakes, embankments and canals for irrigation.
- Today also we are building dams in most of our river basins.

Hydraulic Structures in Ancient India

- In the first century B.C., **Sringaverapura near Allahabad** had sophisticated water harvesting system channeling the flood water of the river Ganga.
- During the time of **Chandragupta Maurya**, dams, lakes and irrigation systems were extensively built.
- Evidences of sophisticated irrigation works have also been found in Kalinga, (Odisha), Nagarjunakonda (Andhra Pradesh), Bennur (Karnataka), Kolhapur (Maharashtra), etc.
- In the 11th Century, **Bhopal Lake**, one of the largest artificial lakes of its time was built.
- In the 14th Century, the tank in **Hauz Khas, Delhi** was constructed by Iltutmish for supplying water to Siri Fort area

A dam is a **barrier across flowing water** that **obstructs, directs or retards the flow**, often creating a reservoir, lake or impoundment.

"Dam" refers to the reservoir rather than the structure.

Most dams have a section called a spillway or weir over which or through which it is intended that water will flow either intermittently or continuously.

Dams are classified according to structure, intended purpose or height.

Based on structure and the materials used, dams are classified:

1. timber dams
2. embankment dams or masonry dams

Based on height:

1. low dams
2. medium height dams and
3. high dams

What are dams and how do they help us in conserving and managing water?

- Dams were traditionally built to impound rivers and rainwater that could be used later to irrigate agricultural fields.

Dams are built for:
- Irrigation
- electricity generation
- water supply for domestic and industrial uses
- flood control
- Recreation
- inland navigation
- fish breeding.

Hence, dams are now referred to as multi-purpose

For example, in the **Sutluj-Beas river basin**, the **Bhakra – Nangal project** water is being used both for hydel power production and irrigation. Similarly, the **Hirakud project** in the Mahanadi basin integrates conservation of water with flood control.

Jawaharlal Nehru proudly proclaimed the dams as the 'temples of modern India'

Why????

Because it would integrate development of agriculture and the village economy with rapid industrialization and growth of the urban economy.

Do you know?

Sardar Sarovar Dam has been built over the Narmada River in Gujarat. This is one of the largest water resource projects of India covering four states—Maharashtra, Madhya Pradesh, Gujarat and Rajasthan. The Sardar Sarovar project would meet the requirement of water in drought-prone and desert areas. Sardar Sarovar Project will provide irrigation facilities to 18.45 lakh hectare of land, covering 3112 villages in 15 districts of Gujarat. It will also irrigate 2,46,000 hectare of land in the strategic desert districts of Barmer and Jalore in Rajasthan and 37,500 hectare in the tribal hilly tract of Maharashtra through lift. About 75 per cent of the command area in Gujarat is drought prone while entire command in Rajasthan is drought prone. Assured water supply will soon make this area drought proof.

Source: Sardar Sarovar Narmada Nigam Ltd. https://www.sardarsarovar.org.in/

Do you know?

Atal Bhujal Yojana (Atal Jal) is being implemented in 8220 water stressed Gram Panchayats of 229 administrative blocks/ tahukas in 80 districts of seven states viz. Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, and Uttar Pradesh. The selected States account for about 37 per cent of the total number of water stressed (over-exploited, critical and semi-critical) blocks in India. One of the key aspects of Atal Jal is to bring in behavioural changes in the community, from the prevailing attitude of consumption to conservation and smart water management.

Source: *Annual Report, Ministry of Jal Shakti, Government of India 2022-23*

Problems with Multi-Purpose Projects:

1. Regulating and damming of rivers affect their natural flow.
2. Excessive sedimentation at the bottom of the reservoir results in rockier stream beds and poorer habitats for aquatic life.
3. Dams also fragment rivers making it difficult for aquatic fauna to migrate.
4. The reservoirs submerge the existing vegetation and soil leading to its decomposition of soil
5. Dams that were constructed to control floods have failed due to sedimentation in the reservoir.
6. These floods caused extensive soil erosion
7. These induce earthquakes, cause water-borne diseases.
8. Pests and pollution resulting from excessive use of water

RAINWATER HARVESTING

Because of disadvantages and rising resistance against the multipurpose projects, water harvesting system is good alternative.

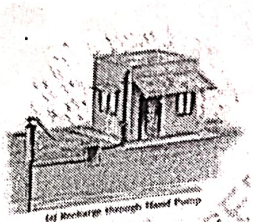
In ancient India, people had in-depth knowledge of rainfall regimes and soil types and developed wide ranging techniques to harvest rainwater, groundwater, river water and flood water.

In the semi-arid and arid regions of Rajasthan- **Bikaner, Phalodi and Barmer**, almost all the houses traditionally had underground tanks or tankas for storing drinking water. The tanks could be as large as a big room.

Ye Kaise Kaam Karta hai?

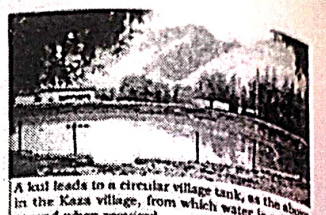
- The tankas are part of rooftop rainwater harvesting system
- Built inside the main house or the courtyard.
- Connected to the sloping roofs of the houses through a pipe
- Rain falling on the rooftops would travel down the pipe and was stored in these underground 'tankas'

The first spell of rain was usually not collected as this would clean the roofs and the pipes. The rainwater from the subsequent showers was then collected



(a) Recharge through Hand Pump

(b) Recharge through Abandoned Dugwell



A kul leads to a circular village tank, as the above in the Kaza village, from which water is released as and when required.

Practice of rooftop rainwater harvesting is on the decline. Why?

- Availability of perennial Indira Gandhi Canal in western Rajasthan but some houses still maintain the tankas since they do not like the taste of tap water
- But there are certain places where rooftop rainwater harvesting still adapted to conserve water.
- Example: Gendathur, a remote backward village in Mysuru, Karnataka.
- Nearly 200 households have installed this system and the village has earned the rare distinction of being rich in rainwater.

Interesting Fact

Tamil Nadu is the first state in India which has made rooftop rainwater harvesting structure compulsory to all the houses across the state. There are legal provisions to punish the defaulters.

Interesting Fact

Rooftop rainwater harvesting is the most common practice in Shillong, Meghalaya. It is interesting because Cherapunjee and Mawsynram situated at a distance of 55 km. from Shillong receive the highest rainfall in the world, yet the state capital Shillong faces acute shortage of water. Nearly every household in the city has a rooftop rainwater harvesting structure. Nearly 15-25 per cent of the total water requirement of the household comes from rooftop water harvesting.

Explain how water becomes a renewable resource?

Answer

- Fresh water is mainly obtained from surface run off and ground water. This is continually being renewed and recharged through the hydrological cycle.
- All the water moves within the hydrological cycle making water a renewable resource.

Write three sources of fresh water

Answer

Three sources are:
1. Precipitation — from rainfall.
2. Surface water — in rivers, lakes, etc.
3. Ground water — water stored in underground aquifers which gets recharged by rainfall.

What is water scarcity? Write the main reasons for water scarcity. (2015)

Water scarcity means shortage of water. It is usually associated with regions having low rainfall or drought prone areas. There are many other reasons which lead to scarcity of water:

1. Large growing population—means more water required for domestic use and also to produce more food.
2. In the agricultural sector, water resources are being over-exploited to expand irrigated areas and dry-season agriculture.
3. More water required for irrigation purposes to facilitate higher food production, i.e., for doing multiple cropping and for HYV seeds.
4. There is greater demand for water with growing urbanisation and industrialisation.
5. An unequal access to water among different social groups.
6. The quality of water is deteriorating, i.e., getting polluted by domestic and industrial wastes, chemical fertilizers and pesticides used in agriculture.
7. Excessive use of water by industries which also require water to generate hydro-electric power to run them.
8. Over exploitation of water in the urban areas. Housing societies and colonies have their own ground-water pumping devices. This causes depletion of fragile water resources in the cities

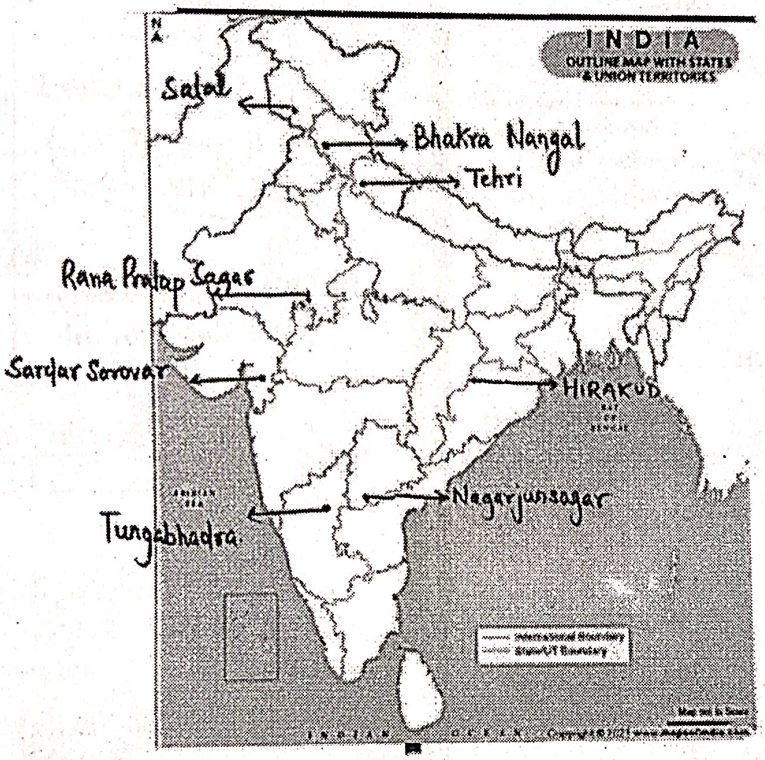
How intensive industrialisation and urbanisation have posed a great pressure on existing fresh water resour India? Explain with two examples for each. (2012)

Intensive industrialisation and urbanisation have put greater pressure on existing fresh water resources. With the ever growing number of industries, the demand for water has grown tremendously:

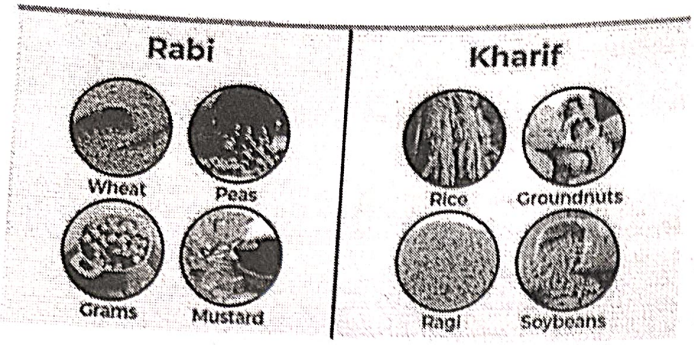
1. Industries are heavy users of fresh water as water is required for cooling the machines as well as for the processing of goods.
2. Machines run on the power supplied by the hydel power plants.
3. Rapid urbanisation has led to expansion of industries which increased the requirement of water.
4. The untreated industrial effluents which are discharged into water bodies are polluting the water and making it hazardous for human consumption. This is responsible for creating water scarcity.

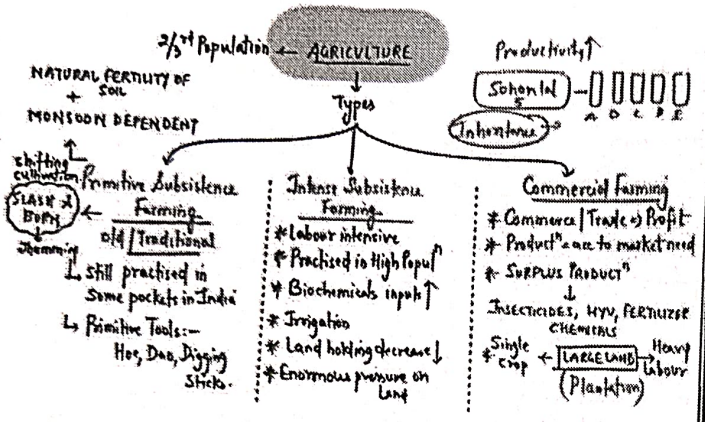
On the other hand, multiplying urban centres with:

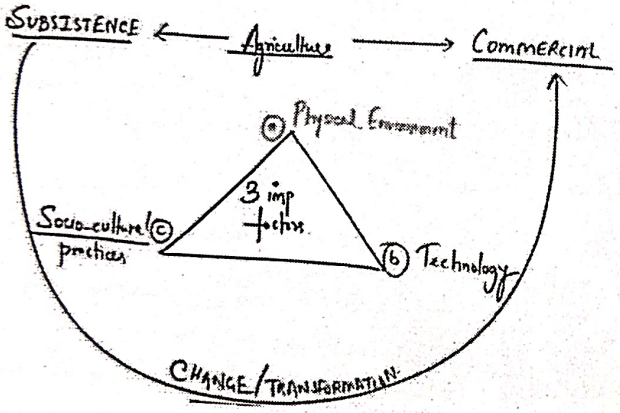
- Large urban populations and
- urban lifestyles have not only added to water and energy requirements but have further aggravated the problem by over-drawing the groundwater by using their own groundwater pumping devices for meeting their water needs for domestic purposes such as cleaning, cooking, washing, etc.

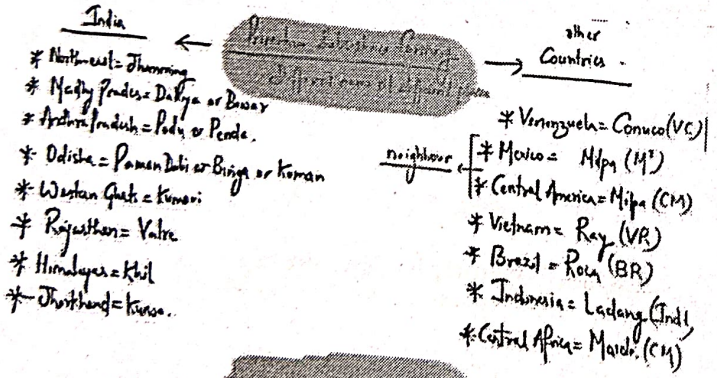


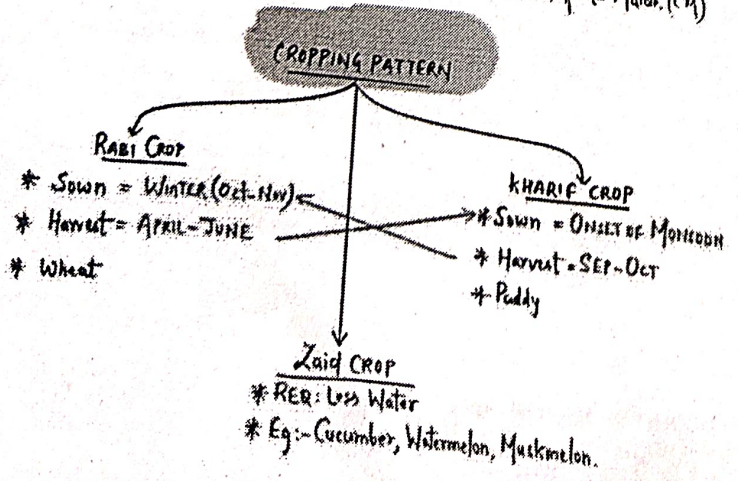
Agriculture

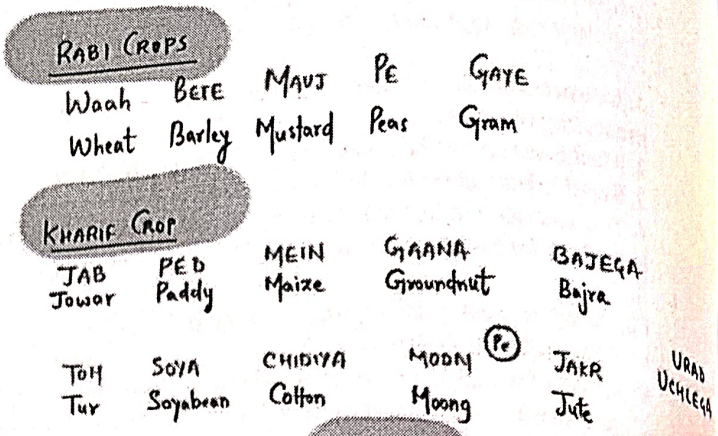


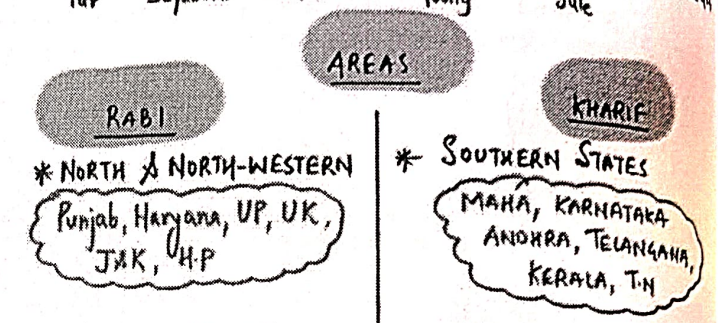


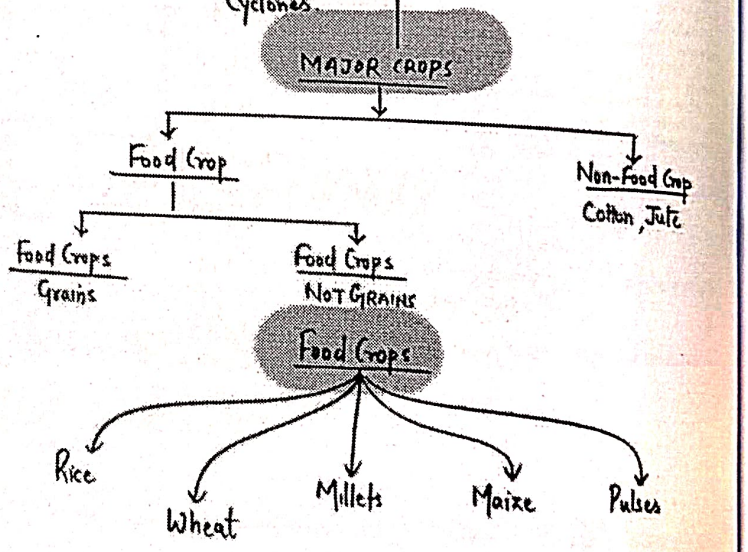


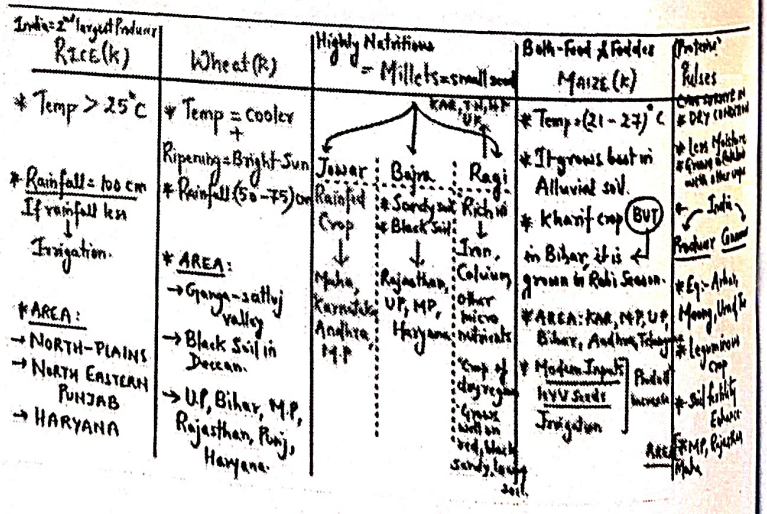












Food Crop other than Grains

SUGARCANE	COFFEE (PLANTATION)	TEA (2018: 2nd: 2nd largest Producer in China)	Oil Seeds
* Tropical/Sub-tropical * Temp: (21-27)°C * Rainfall (75-100) cm * Low rainfall in Region = Irrigation * Requires manual labour from sowing to harvesting * Main source of Sugar, Gur * World: - ① Brazil ② India * India - UP, Maha, etc	* Indian Coffee — worldwide known * Arabica variety initially brought from Yemen — produced in country * Initially = Cultivation confined to "Baba Budan Hills" * Still cultivation confined to Nilgiri in Karnataka, Kerala, Tamil Nadu.	* Plantation crop * Beverage crop * Introduced by British * Climate: Tropical & Sub-tropical * Soil: Fertile and well drain * WARM & MOIST — FROST-FREE climate * LABOUR-INTENSIVE * Cheap & skilled labour * Area: Assam W.B (DARJEELING, JALPAIGURI) T.N, Kerala Meghalaya, Andhra, Tripura	↳ Groundnut (K) — accounts for about half of major oil seeds produced in India * Gujarat (largest producer) ↳ Linseed & Mustard (R) ↳ Sesamum (K) — in north (R) — in south ↳ Castor Seed — grown as both Rabi and Kharif. ↳ Coconut, Soybean, Sunflower etc ↳ Oil seeds = castings. Used as raw materials for products — Soap, cosmetics, ointments.

Vegetables ← HORTICULTURE → Fruits

MANGO	UP, Andhra, Telangana, Maharashtra
ORANGE	NAGPUR
LITCHI / GUAVA	UP, Bihar
GRAPES	MAHARASHTRA, ANDHRA, TELANGANA
PINEAPPLE	MEGHALAYA
APPLE / WALNUT	Jammu & Kashmir, Himachal Pradesh.

Non-food Crop

- Rubber
- Fibre Crop
  - Cotton
  - Jute
  - Silk — 'Sericulture' — Rearing of Silk

RUBBER

EQUITORIAL CROP

Area	TEMPT
Kerala, Karnataka, T.N, Meghalaya, A.N Isl.	more than 25°C

Rainfall — more than 200 cm.

Cotton

* Regur Soil, Black Soil
* 210 frost-free days
* Req:- High Tempt, Low Rainfall
* Area:-
  - ↳ Maha, South Gujarat,
  - ↳ Karnataka, Andhra, Telangana
  - ↳ MP

(Golden Fibre) Jute

* At the time of growth — High Tempt is required.
* Well-drained fertile soil Soil are renewed every year.
* Areas — WB
  - Odisha
  - Assam
  - Meghalaya
  - Bihar
* loosing market because of high cost / Gain the
* Alternative [Synthetic] Nylon

Technological and Institutional Reforms

Introduct°:-

- Sustained uses of land without compatible techno-institutional changes have hindered the pace of agricultural development.
- In spite of development of sources of irrigation most of the farmers in large parts of the country still depend upon monsoon and natural fertility in order to carry on their agriculture.
- For a growing population, this poses a serious challenge.
- Agriculture which provides livelihood for more than 60 per cent of its population, needs some serious technical and institutional reforms.

Institutional Reforms → Land Reforms

- 'Land reform' was the main focus of our First Five Year Plan
- Collectivisation ①
- Consolidation of holdings- The right of inheritance had already lead to fragmentation of land holdings necessitating consolidation of holdings. ①
- Cooperation and abolition of zamindari ②
- The laws of land reforms were enacted but the implementation was lacking or lukewarm.
- The Government of India embarked upon introducing agricultural reforms to improve Indian agriculture in the 1960s and 1970s.
- The Green Revolution based on the use of package technology and the White Revolution (Operation Flood) were some of the strategies initiated to improve the lot of Indian agriculture.
- But, this too led to the concentration of development in few selected areas. Therefore, in the 1980s and 1990s, a **Comprehensive Land Development Programme** was initiated, which included **both institutional and technical reforms**
- Provision for ① crop insurance against drought, flood, cyclone, fire and disease.
- Establishment of ② Grameen banks, ③ cooperative societies and banks for providing loan facilities to the farmers at lower rates of interest were some important steps in this direction.
- → ④ Kisan Credit Card (KCC), ⑤ Personal Accident Insurance Scheme (PAIS) are some other schemes introduced by the Government of India for the benefit of the farmers.
- Special ⑥ weather bulletins and agricultural programmes for farmers were introduced on the radio and television.
- The government also announces ⑦ minimum support price, remunerative and procurement prices for important crops to check the exploitation of farmers by speculators and middlemen.

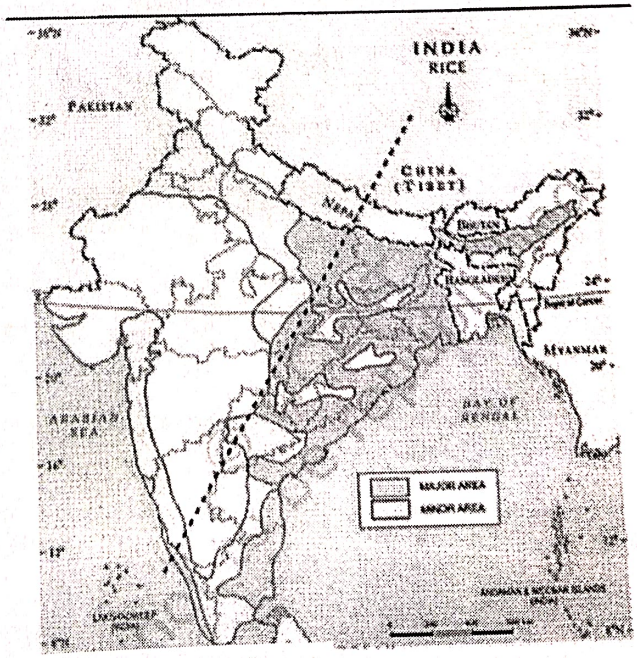
Bhoodan Movement

- Gram Swarajya ← Gandhi ji → spiritual heir = Vinoba Bhave
  - village
  - After Gandhi ji's death = Padyatra ⇒ spreading Gandhi ji's ideas.
- Shree Ram Chandra Reddy offered 80 acres of land ← Pochampalli, Andhra. → landless village demanded land.

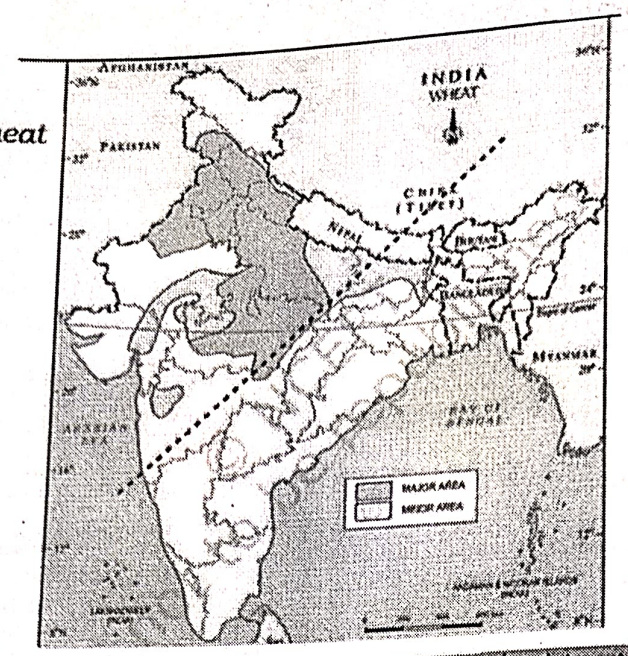
Map Work

Agriculture — Identify:
- Major areas of Rice and Wheat
- Largest/Major producer states of Sugarcane, Tea, Coffee, Rubber, Cotton and Jute

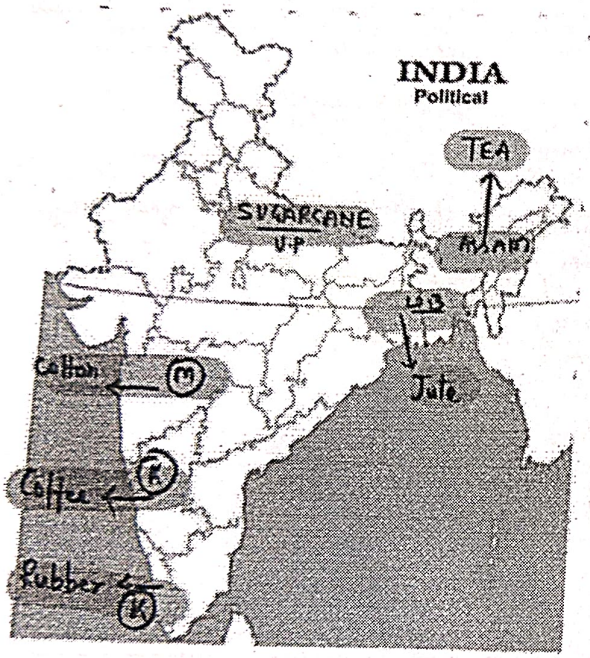
India: Distribution of Rice

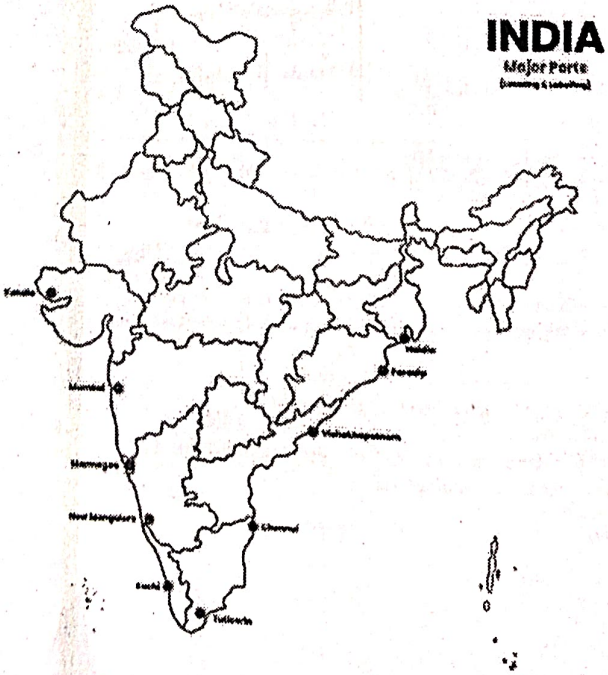


India: Distribution of Wheat



Lifelines of National Economy
(Only MAP WORK)





Minerals and Energy Resources

Geologists define mineral as a "homogenous, (1) naturally occurring (2) substance with a definable internal structure." (3)

Rocks are combinations of homogenous substances called minerals.

Some rocks, for instance limestone, consist of a single mineral only, but majority of the rock consist of several minerals in varying proportions.

Although, over 2000 minerals have been identified, only a few are abundantly found in most of the rocks.

Minerals

- Homogenous (b)
- Naturally Occuring (b)
- Definite Internal structure (c)

Rock ⟶ (Homogenous) Minerals, Metals, Metals ⟶ ORE

A particular mineral that will be formed from a certain combination of elements depends upon the physical and chemical conditions under which the material forms.

This, in turn, results in a wide range of colours, hardness, crystal forms, lustre and density that a particular mineral possesses.

Geologists use these properties to classify the minerals

Phy / Chem → * { MINERAL; ROCK → MINERAL; → ORES } L.H.S.

Minerals are usually found in "ores".

The term ore is used to describe an accumulation of any mineral mixed with other elements.

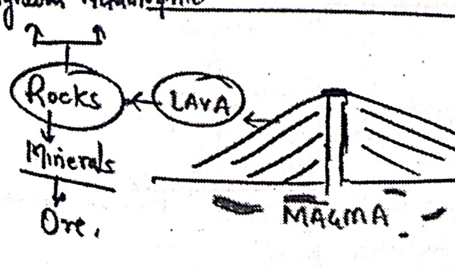
The mineral content of the ore must be in sufficient concentration to make its extraction commercially viable.

The type of formation or structure in which they are found determines the relative ease with which mineral ores may be mined. This also determines the cost of extraction.

Where Mineral Occurs?

- (a) IGNEOUS / METAMORPHIC → CRACKS, CERVICES, FAULTS, Joints
  - Vein = Small
  - Lodes = Large
  - eg:- Tin, Cu, Zn etc.
- (b) Sedimentary — Bed or layers → Coal, Gypsum
- (c) [Residual Mass of Weathered Material] ← decomposition of surface rocks; → Bauxite is formed in this way.
- (d) Alluvial deposits — in sands of valley floors & base of hill → 'Placer Deposits' → eg:- Gold, Silver, Tin
- (e) Ocean Beds

Igneous Metamorphic



MINERALS

- Metallic Minerals
  - Ferrous
    - > IRON
    - > MANGANESE
    - > Nickel
    - > Cobalt
  - Non-Ferrous
    - > Copper
    - > Bauxite
    - > Lead
    - > Tin
- Non-Metallic
  - > MICA
  - > Limestone
- Energy Mineral
  - > Coal
  - > Petroleum
  - > Natural Gas.

3/4th of total value of production of metallic mineral : **Ferrous Minerals** : Strong base Metallurgical industries.

IRON ORE

- * Basic Mineral
- * Backbone of industrial development
- * India = Rich in Iron ores

MAGNETITE
- Finest ore
- 70% Iron content.
- Magnetic qualities excellent
- Valuable in Electrical Industry

HAEMATITE
- Imp industrial iron-ore in terms of quantity used.
- 50-60% Iron content.

97% Product — Odisha, CG, Jharkhand, KARNATAKA.

MANGANESE

Steel — MANUFACTURE — Insecticides, Paints, Bleaching Powder

IRON ORE BELTS

- ODISHA-JHARKHAND BELT
  - ← Badampahar mines (Haematite) → MAYURBHANJ, KENDUJHAR
  - → SINGBHUM DIST → Gua; → Noamundi
- BED: DURG-BASTAR-CHANDRAPUR → Chattishgarh, Maharashtra
  - → Bailadila Range → Haematite → Export → S.KOREA, Japan
- Maharashtra-Goa Belt → Ratnagiri district
  - Iron ORE obtained is NOT of very good quality.
- (BCCT) Ballari-Chitradurga-Chikkamangaluru-Tumakuru
  - KARNATAKA → Kudremukh mines
  - ← Export — MANGALORE PORT

Non-Ferrous Minerals

Reserves & Production NOT satisfactory.

Non-Ferrous Minerals → Copper, Bauxite, Lead, Zinc, Gold.

Usage in:- Metallurgical, Engineering, Electrical

NON-FERROUS

Copper

- Reserves / Production ← Copper → Deficient
- Good Conductor : Properties → Malleable, Ductile
- Area → Balaghat Mines, Singbhum Jharkhand, Khetri Mines Rajasthan.
- Usage → Electric Cable, Electronic, Chemical Industries

Bauxite

- * Bauxite —clay→ Alumina —Smelting→ Aluminium
- * Bauxite Deposits formed by decomposition → Rock rich in Alumina Silicates.
- * Properties :- Light weight, Malleability, Conductivity.
- * AREA: Amarkantak Plateau, Maikal hills, Bilaspur-Katni, Panchpatmali (Odisha)

Non-Metallic Minerals

MICA

Composed: made up of series of plates or leaves

* splits → thin sheets
* can be → black, green, red, yellow, brown

Used: Electric and Electronic Industry

Properties:
- Excellent dielectric strength
- low power loss factor
- insulating properties
- resistance to high voltage

That is why, MICA considered indispensible MINERAL

AREA: Chhota Nagpur
: Nellore belt (Andhra)
: Koderma-Gaya-Hazaribagh (Jharkhand)
: AJMER (RAJASTHAN)

LIMESTONE (ROCK MINERAL)

Composed: Calcium carbonate OR Calcium-Magnesium carbonate.

Rocks: Sedimentary

Raw Material: for cement industry.

* Essential for smelting iron ore in blast furnace.

Energy Minerals

* Industry + Agriculture → depend upon Mineral deposits.
* total volume of workable mineral deposits = 1% of Earth's Crust.

Consumption ↑ (Fast) | Mineral formation ↓↓ (Slow) | Replenishment Rate ↓ (Slow)

Continued extraction → cost of extraction ↑, Quality of Mineral ↓

Need for Conservation → Sustainable use, Planned Manner; Improved Technologies; Recycling of metals

Usage ← Energy Resource → classification

Usage: cooking, provide light/heat, Run Vehicles, Run Industries

Conventional Source	Non-Conventional Source
* Coal	* Nuclear or Atomic Energy
* Petroleum	* Solar Energy
* Natural Gas	* Wind Power
* Electricity	* Biogas
	* Tidal Energy
	* Geo-thermal Energy.

It fulfils energy demand ← Coal → most abundant fossil fuel

Power Generation ← Usage → Supply Energy → Industry, Domestic Goods.

Formation ← (Due to compression of plant material over million years)

Factors on which formation of coal depends:
- Degree of Compression
- Depth
- Time Period of Burial.

Peaty | Woody | Sooty

Types:

Peat	Lignite	Bituminous	Anthracite
Decaying plants in swamps			
* Quality ↓	* Low grade brown coal	* Depth ↓	* Highest Quality ↑ Hard Coal
* Carbon ↓	* Moisture ↑	* Temp ↑	
* Moisture ↑	* TIN (Neyveli)	* Commercial use	
	* Used for Generation of power		

Temp ↑

Coal location

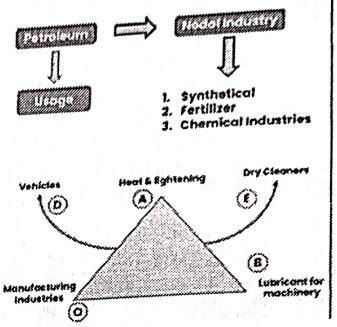
Gondwana

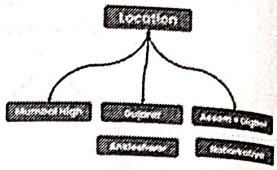
* 200 MY Age
* Peninsular States
* Metallurgical coal: Damodar valley (W.B, Jharkhand)
* Jharia, Raniganj, Bokaro
* Mahanadi, Son Wardha.

Tertiary deposit

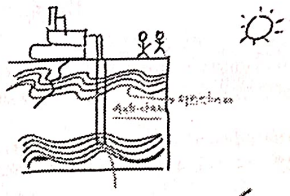
* 55 MY Age
* North-Eastern
* Meghalaya, Assam, Arunachal, Nagaland.

Remember, Coal is bulky material, which loses weight on use as it is reduced to ash. Hence, heavy industries and thermal power stations are located on or near the coalfields





Digboi, Naharkatiya and Moran- Hugrijan are the important oil fields in the state.



Most of the petroleum occurrences in India are associated with anticlines and fault traps in the rock formations of the tertiary age.

In regions of folding anticlines or domes, it occurs where oil is trapped in the crest of the upfold.

The oil bearing layer is a porous limestone or sandstone through which oil may flow.

The oil is prevented from rising or sinking by intervening non-porous layers.

Petroleum is also found in fault traps between porous and non-porous rocks.

Gas being lighter usually occurs above the oil

It is Released When Crude Oil is Brought To Surface ← Natural Gas → Found With Petroleum Deposits

Natural Gas → Can Be Used

As Domestic Fuel | Usage | On Industrial Fuel

Usage:
- As Fuel in Power Sector: To Generate Electricity
- For Heating Heating Purposes: In Industry
- As Raw Material: In Chemical Industry; In Petrochemical Industry; In Fertilizer Industry
- As Transport Fuel (CNG)
- As Cooking Fuel (CNG)

Reserves

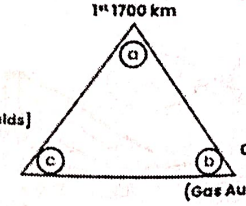
Mumbai High	along East coast
along west coast	Krishna-Godavari basin
+	
In Cambay Basin	

Hazira-Vijaipur-Jagdishpur Gas Pipeline

India Gas Infrastructure
1700 km → 18500 km

1st 1700 km

Links
[Mumbai High + Bassin Fields]
With Various:
- Fertilizer
- Power
- Industrial Complexes



Constructed by GAIL (Gas Authority of India Ltd)

Get upto 80% Scholarship with PW SAT at Vidyapeeth & Pathshala Centres

Electricity

per capita consumption is so important, that electraty is considered.

"Index of Development"

(Electricity Generation)

Hydro Electricity

Fast flowing water → to drive through turbines → electricity produced

Ex-Bhakra Nangal, Damodar Valley Kopili Hydel Projet

Thermal Electricity

by burning fossil fuels → Coal, Petroleum, Natural Gas

production of thermal power

Non-Conventional Sources of Energy

Increasing dependence on forsil fuels

- Coal, oil, Gas Prices
- Security of energy supply in danger
- Serious environmental concerns.

Hence, need for Renewable Energy

Types

Nuclear or Atomic Energy

Solar Energy

Wind Energy

Bio Gas

Tidal Energy

Geo-thermal Energy

Nuclear or Atomic Energy

when alteration is made → energy is released

obtained by alteration of structure or atoms

this is used to generate

Electric Power

Example

Monazite sands of Kerala → Rich in Thorium

Uranium & Thorium

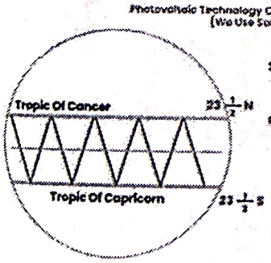
Jharkhand, Rajasthan

to generate electricity

Solar Energy

Enormous Potential ← Solar Energy → India is Tropical Country

Photovoltaic Technology Converts Sunlight Directly into Electricity (We Use Solar Panels, Solar Cooker)



Solar Energy → getting popular → In rural areas

Reduction in Dependence of Rural Housaholds on Firewood and Dung cake

WIND POWER

India has Potential

Locations

Largest Wind Farms Clusters

Tamil Nadu

From nagarcoil to madurai

NAGARCOIL & JAISALMER

↓

with Known locations

Other States

1. Andhra Pradesh
2. Karnataka
3. Gujarat
4. Kerala
5. Maharashtra
6. Lakshadweep

BIO GAS

3. Animal Waste
4. Human Waste

→ Production →

1. Shrubs
2. From Waste

Decomposition Of organic matter → India has Potential

Produces Bio Gas

It has higher thermal efficiency in comparison to KEROSENE, DUNG CAKE, CHARCOAL

Bio Gas Plants

Set-up at 3 levels

Municipal level, Cooperative levels, Individual levels

Note → Plants using "Cattle dung" are known as "Gobar Gas Plants"

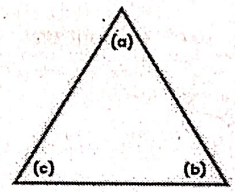
Twin Benefits:

Creating form of energy

Improved quality of manure

Bio Gas Advantage

Biogas is most efficient use of cattle dung



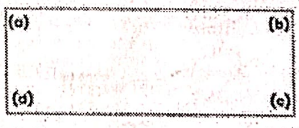
Prevent loss of tree due to burning of fuelwood and cow ching cakes

Improves quality of manure

Tidal Energy

Ocean tides Used to generate electricity

Floodgate dams are built across inlets



After tide falls → Retained water flows back to sea via pipe that carries it through a power-generating turbine

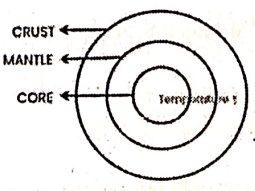
During high tide → water flows into inlet

Regions

Gulf of Khambhat	Gulf of kutch	Gangetic delta
Gujarat	Gujarat	Sundarbans

Geothermal Energy → Earth

Heat & Electricity produced by using heat from interior of the Earth is called Geo-thermal energy.

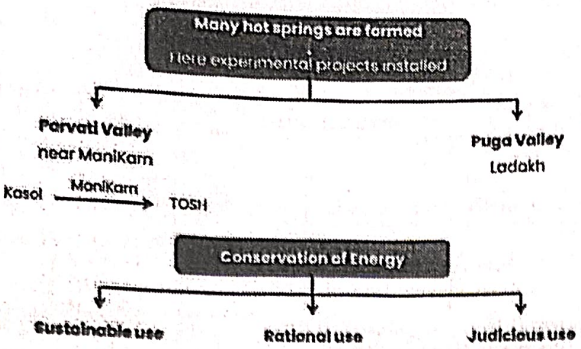


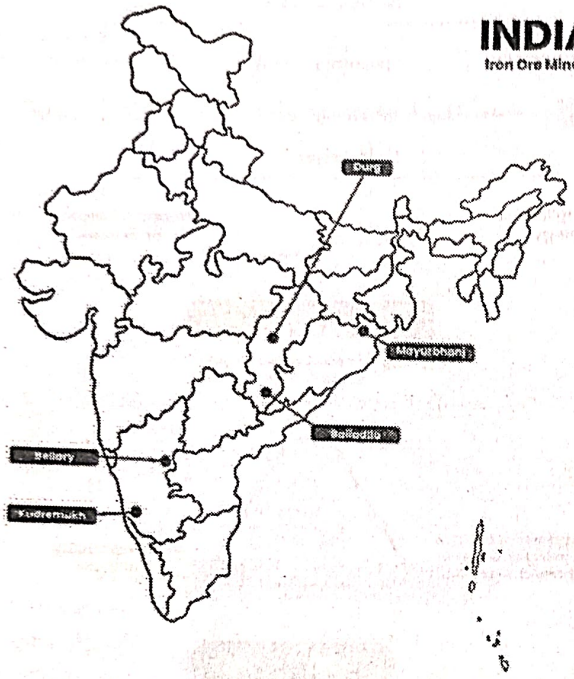
Water:

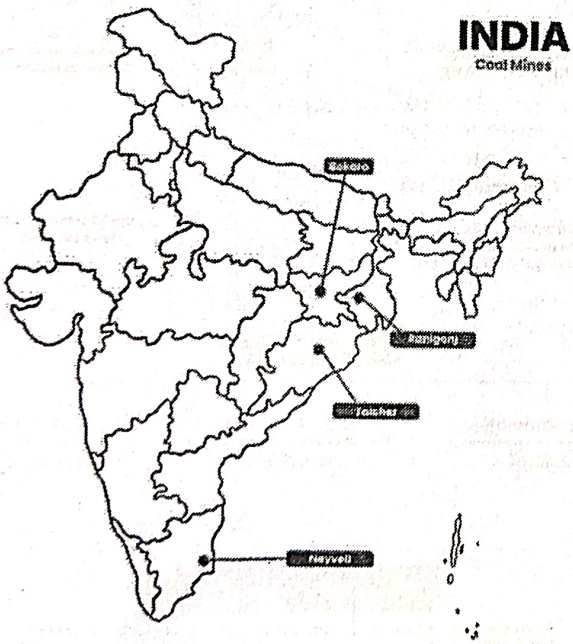
- absorbs heat from rocks

Hot water:

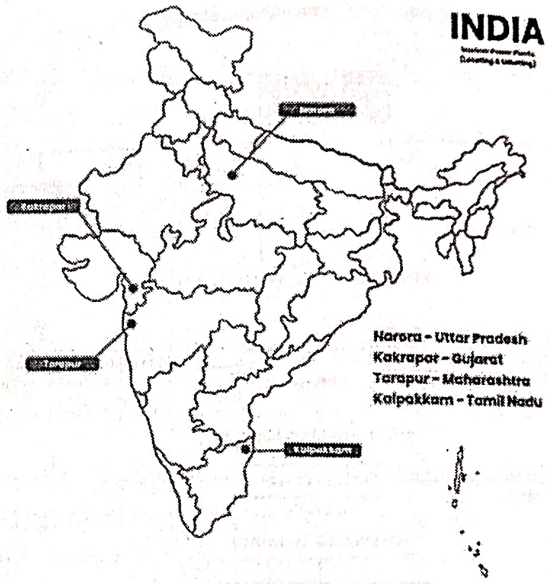
- gets converted into steam
- It rises to the surface of Earth
- This steam is used to drive turbines & generate electricity.

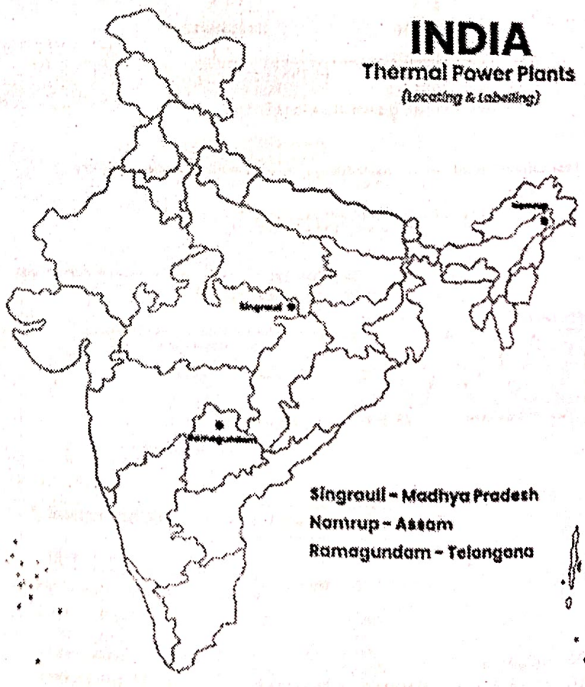

Many hot springs are formed
Here experimental projects installed
Parvati Valley
near Manikarn
Puga Valley
Ladakh
Kasol
Manikarn
TOSH
Conservation of Energy
Sustainable use
Rational use
Judicious use


INDIA
Iron Ore Mines
Bellary
Kudremukh
Mayurbhanj

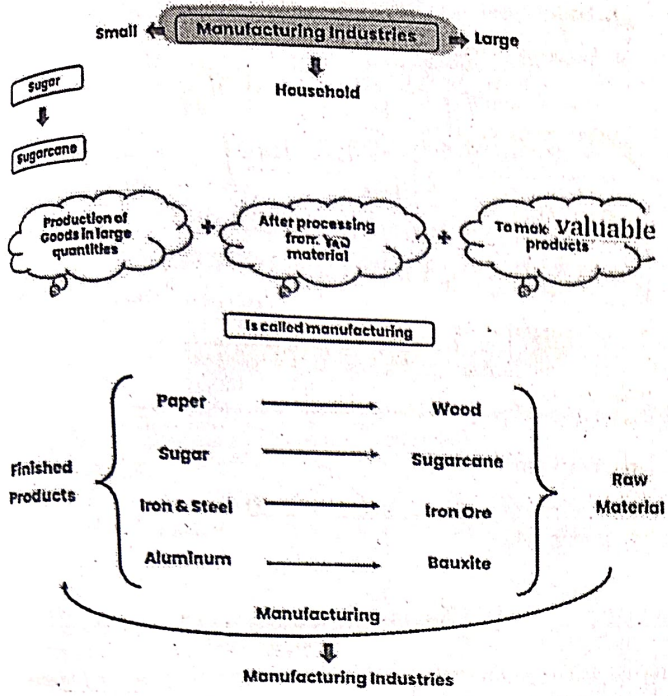

INDIA
Coal Mines
Raniganj
Talcher
Neyveli

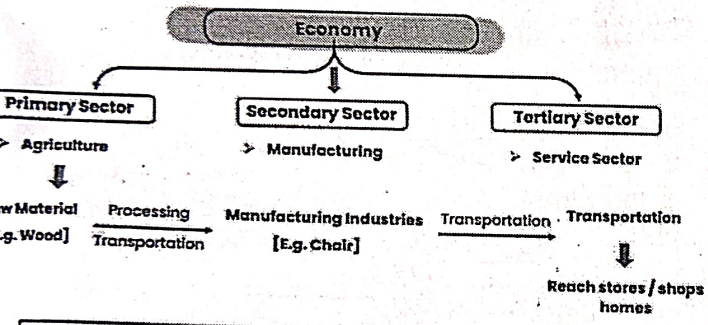

INDIA
Oil Fields
Kalol
Ankleshwar
Nahorkatia
Digboi
Bassein
Mumbai High


INDIA
Narora - Uttar Pradesh
Kakrapar - Gujarat
Tarapur - Maharashtra
Kalpakkam - Tamil Nadu


INDIA
Thermal Power Plants
(Locating & Labelling)
Singrauli - Madhya Pradesh
Namrup - Assam
Ramagundam - Telangana

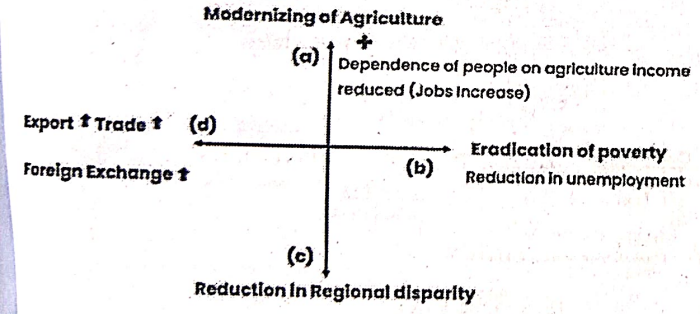
Manufacturing Industries



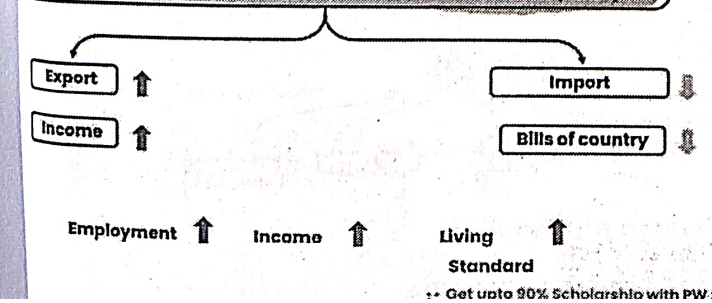


❖ The economic strength of a country is measured by the development of manufacturing industries.

Topic : What is the Importance of manufacturing Industries?

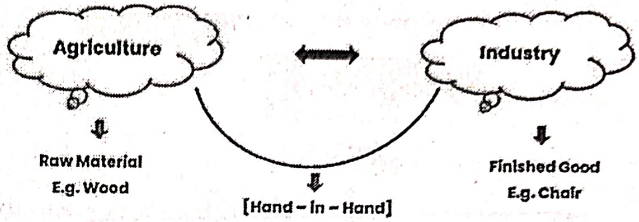


Manufacturing sector is the backbone of the Economy. Why?



Topic : What is the Importance of manufacturing Industries?

- Manufacturing Industries not only help in modernizing agriculture, which forms the backbone of our economy.
- They reduce the heavy dependence of people on agricultural income by providing them jobs in secondary and tertiary sectors.
- Industrial development leads eradication of unemployment and poverty from our country.
- It is aimed at bringing down regional disparities by establishing industries in tribal and backward areas.
- Export of manufactured goods expands trade and commerce, and brings in much needed foreign exchange.



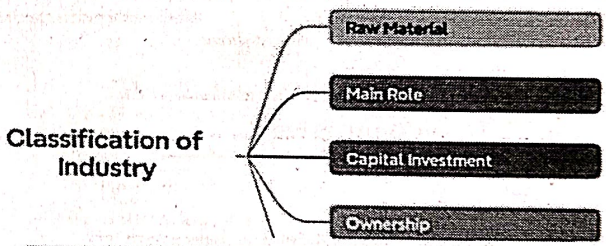
In the present day world of globalization, our industry needs to be more efficient and competitive.

Self-sufficiency alone is not enough.

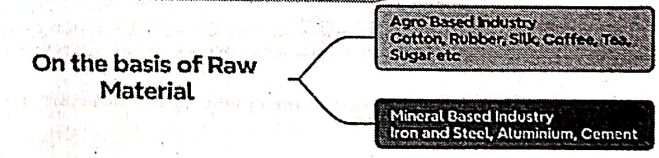
Our manufactured goods must be at par in quality with those in the international market.

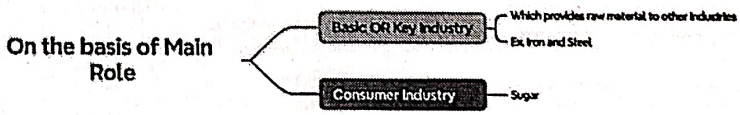
Only then, will we be able to compete in the international market.

Topic : Classification of Industry

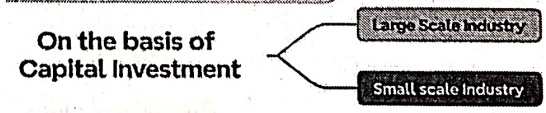


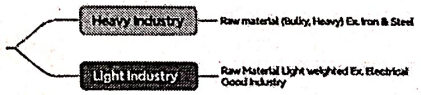
Topic : Classification of Industry





Topic : Classification of Industry





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Topic : Classification of Industry

On the basis of Ownership

- Public Industry — Government Owned Ex. BHEL
- Private Industry — Owned & Operated by private Individual E. TATA
- Joint Industry — Govt + Private Individual Owned E. Oil India Limited (OIL)
- Cooperative Industry — Producers & Suppliers of raw material + Workers

Agro-Based Industry

- Cotton Textile
- Sugar Industry
- Jute Textile

Textile Industry

Contribution

- Industrial Production
- Employment Generation
- Foreign Exchange

- Only Industry which is self Reliant
  - High value added products
  - Ex. Cotton - Yarn - Spinning - Weaving
- Raw material

Cotton Textile

- Ancient — Technique: Hand Spinning, Hand Weaving; Tradition method
- Modern — Technique: Power-loom

Traditional Industries suffered ← Outcome → They could not compete with British made mill made cloth

Quality & Quantity - Suffered

1st successful textile mill was established in Mumbai in 1854.

Location of Cotton textile industry

Earlier	Presently
❖ Industries located in cotton growing belts (Raw Material, market, transport, labour Available)	❖ Spinning: Continued to be in cotton growing belts ❖ Weaving Decentralized → to inculcate other traditional skills

This industry has close links with agriculture and provides a living to farmers, cotton boll pluckers and workers engaged in ginning, spinning, weaving, dyeing, designing, packaging, tailoring and sewing.

The industry by creating demands supports many other industries, such as, chemicals and dyes, packaging materials and engineering works.

Spinning: Turning raw cotton into thread

Weaving: Using Thread to make fabric

World Scenario

- Spinning mills = world class
- Weaving, knitting and processing units ≠ World class
  - ❖ Because weaving supplies low quality of fabric

Jute Industry

* Largest producer = India
* Largest exporter = Bangladesh (India at 2nd)
* Location = Mainly in West Bengal
  Mainly along the banks of Hooghly
* 1st Jute Mill near Kolkata = 1855.
  Rishwa
* After Partition in 1947, → Jute mills remained in India,
  BUT → 3/4th of Jute Producing area went to Bangladesh (earlier East Pakistan)

Factors responsible for location along Hooghly

- Cheap labour
- close to Jute Producing area
- Kolkata — urban centre providing banking & insurance facilities for exporting Jute Goods
- Abundant water for preparing raw jute
- Cheap water transport
- Transportation services DP! (allowing smooth movement of Raw material to mills)

Kolkata as a large urban centre provides banking, insurance and port facilities for export of jute goods

Sugar Industry

Seasonal in nature → ideally suited to cooperative sector

* India is 2nd in Production of Sugar.
* India is 1st in production of Gur and Khandsari

Material Used = Sugar Production

- Bulky Raw Material (भारी)
- In transportation, its sucrose content reduces. (जो चीनी sugar को मीठा बनाता है)

Location

* 61% of sugar mills → UP & Bihar
* other areas → Maharashtra, Karnataka, TN, Andhra Pradesh, Gujarat, Punjab, Haryana, HP

Recently:

It is noticed that Sugar industries has been shifting → in southern & western states (Especially Maharashtra)

Why?
1. Cane produced — High Sucrose contents
2. Cooler climate — ensures longer crushing period

Sucrose: Sucrose is simply the chemical name for sugar.

★ Cooperatives are more successful in this area

Mineral Based Industry

* Industries which use Minerals & Metals as their raw material is called Mineral-Based Industry

Classification

- Iron & Steel Industry
- Cement Industry
- Aluminium Industry
- Chemical Industry
- Fertilizer Industry
- Information Technology & Electronic Industry

Topic: Iron and Steel Industry

Use of Steel:

1. to manufacture a variety of engineering goods
2. construction material
3. Defense
4. Medical
5. Telephonic
6. scientific equipment
7. a variety of consumer goods.

- Basic industry. Why???
- All the other industries depend on it for their machinery.

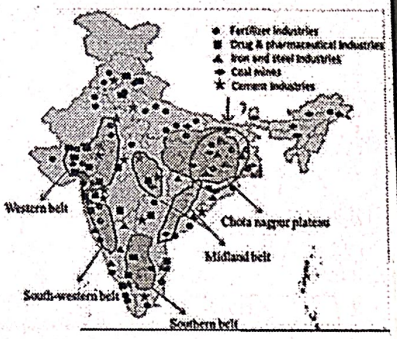
"Iron and steel is a heavy industry". Why?

Because all the raw materials as well as finished goods are heavy and bulky entailing heavy transportation costs

Composition: Iron ore, coking coal and lime stone are required in the ratio of approximately (4): (2): (1)

Some quantities of manganese are also required to harden the steel

Chotanagpur plateau region has the maximum concentration of iron and steel industries.



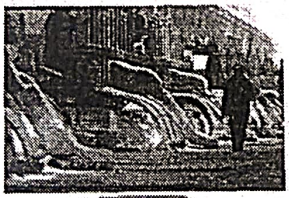
Why??

Reason:

1. Low cost of iron ore
2. high grade raw materials in proximity.
3. cheap labour
4. vast growth potential in the home market.

ALUMINUM SMELTING

2nd most important metallurgical industry in India



Characteristics

- Light
- resistant to corrosion
- good conductor of heat
- Malleable
- becomes strong when it is mixed with other metals

Uses of Aluminium:

- ✓ Manufacture of aircraft
- ✓ Manufacture of utensils
- ✓ Manufacture of wires.
- ✓ Substitute of steel, copper, zinc and lead in a number of industries

Location:

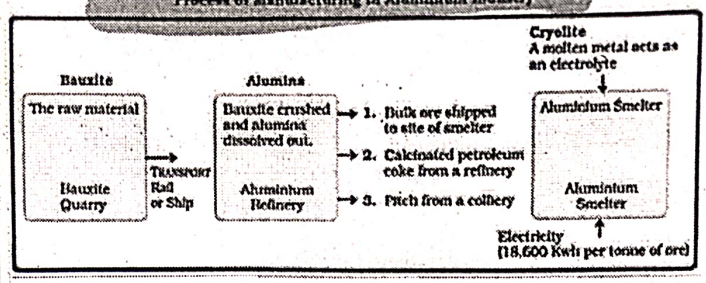
- ✓ Odisha
- ✓ West Bengal
- ✓ Kerala
- ✓ Uttar Pradesh
- ✓ Chhattisgarh
- ✓ Maharashtra
- ✓ Tamil Nadu

✓ **Bauxite** the raw material used in the smelters is a very bulky, dark reddish colored rock

✓ Factors for location of industry:

1. Regular supply of electricity
2. Assured source of raw material at minimum cost

Process of Manufacturing in Aluminium Industry



Chemical Industries:

✓ Comprises both large and small scale manufacturing units.

✓ **Inorganic chemicals** include Sulphuric acid (used to manufacture fertilizers, synthetic fibres, plastics, adhesives, paints, dyes stuffs) nitric acid, alkalies, soda ash (used to make glass, soaps and detergents, paper) and caustic soda.

✓ **Organic chemicals** include petrochemicals, which are used for manufacturing synthetic fibers, synthetic rubber, plastics, dye-stuffs, drugs and pharmaceuticals

- Organic Chemical Plants are located near oil refineries or petrochemical plants.
- The chemical industry is its own largest consumer.
- Basic chemicals undergo processing to further produce other chemicals that are used for industrial application, agriculture or directly for consumer markets.

Fertilizer Industry

✓ The fertilizer industries are centred around the production of

1. nitrogenous fertilizers (mainly urea)
2. phosphatic fertilizers and
3. ammonium phosphate (DAP) and
4. complex fertilizers which have a combination of nitrogen (N), phosphate (P), and potash (K). (potash is entirely imported as the country does not have any reserves of commercially usable potash)

✓ Gujarat, Tamil Nadu, Uttar Pradesh, Punjab and Kerala contribute towards half of the fertilizer production.

Cement Industry

✓ Cement is essential for(construction activity) such as building houses, factories, bridges, roads, airports, dams and for other commercial establishments.

✓ This industry requires bulky and heavy (raw materials like limestone, silica and gypsum.

✓ The first cement plant was set-up in Chennai in 1904.

Information Technology and Electronics Industry

✓ The electronics industry include

1. Products from transistor sets to television
2. Telephones
3. cellular telecom
4. Telephone exchange
5. Radars
6. computers and
7. Many other equipment required by the telecommunication industry.

✓ Good amount of Employment Generation

✓ Bengaluru is known as the Electronic Capital of India.

✓ Electronic Capital → Bengaluru

✓ Industry Concentration: Bengaluru, Noida, Mumbai, Chennai, Hyderabad and Pune.

✓ The continuing growth in the hardware and software is the key to the success of IT industry in India.

Automobile Industry

- provide vehicle for quick transport of good services and passengers
- The industry is located around Delhi, Gurugram, Mumbai, Pune, Chennai, Kolkata, Lucknow, Indore, Hyderabad, Jamshedpur and Bengaluru

Industrial Pollution and Environmental Degradation

Industries are responsible for 4 types of pollution.

1. Air
2. Water
3. Land
4. Noise

Air Pollution

Causes:

1. presence of undesirable gases, such as sulphur dioxide and carbon monoxide
2. Air borne particulate materials contain both solid and liquid particles like dust, sprays mist and smoke.
3. Smoke is emitted by chemical and paper factories, brick kilns, refineries and smelting plants
4. burning of fossil fuels in big and small factories that ignore pollution norms
5. Toxic gas leaks

Water Pollution

- Caused by organic & inorganic industrial waste and effluents discharged into rivers.
- Industries – primarily responsible – water pollution

  Eg – Paper, pulp, chemical, tolie, dying, petroleum refineries, etc.

- Fly ash, phospo- gypsum and iron and steel slags are the major solid wastes in India.

Thermal Pollution

- It occurs when hot water from the factory is discharged into rivers and ponds / before cooling

  ⇩

  It effects the biological life of species of water.

Noise Pollution

- Propagation of noise with harmful impact on human or animal life.
- Impact irritation, anger, causing hearing impairment, heart rate & blood pressure.
- Industrial and construction activities, machinery, factory equipment, generators, saws and pneumatic and electric drills also make a lot of noise

Control of Environmental Degradation

Here are some ways through which industrial pollution can be reduced:

1. Minimising the use of water by reusing and recycling it.
2. Harvesting rainwater to meet water requirements.
3. Treating hot water and effluents before releasing them in rivers and ponds.
4. Particulate matter in the air can be reduced by fitting smoke stacks to factories with electrostatic precipitators, fabric filters, scrubbers and inertial separators.
5. Smoke can be reduced by using oil or gas instead of coal in factories.
6. Machinery can be redesigned to increase energy efficiency and reduce noise.

National Thermal Power Corporation (NTPC)

Approach $\frac{\text{Environmental degradation}}{\text{Industrial Pollution}}$

1. Optimum utilization of latest technique & equipment's.
2. Minimizing waste generation by maximizing ash utilization
3. Providing green belts for ecological balance
4. Reduce environmental pollution by → Ash Pond management, → Ach water recycling
5. Ecological Monitoring, review online database, for all power-stations.