



BPSC

Prelims & Mains

Bihar Public Service Commission

General Studies

Paper 2 – Volume 3

Indian Geography Part - 2



G.S. PAPER – 2 VOLUME – 3

INDIAN GEOGRAPHY PART - 2

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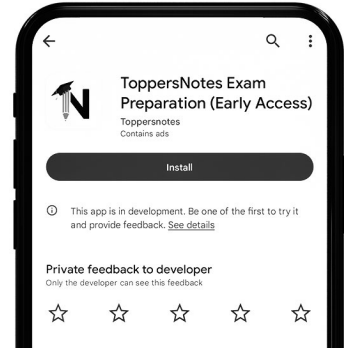
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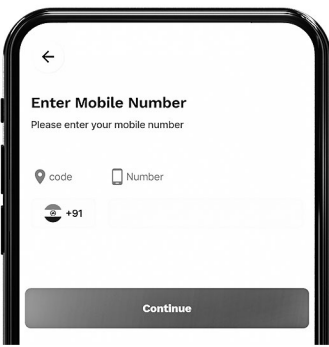
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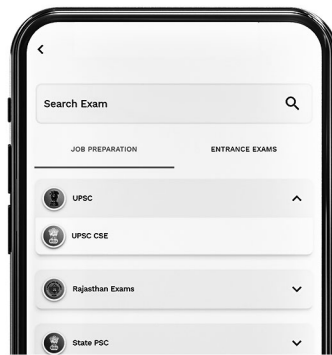
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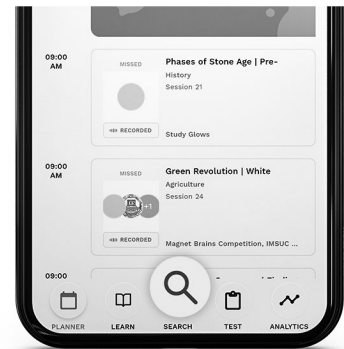
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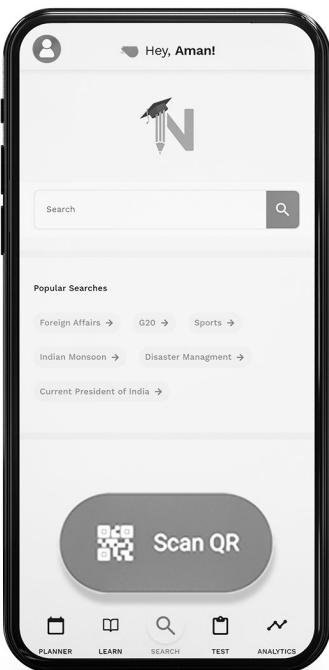
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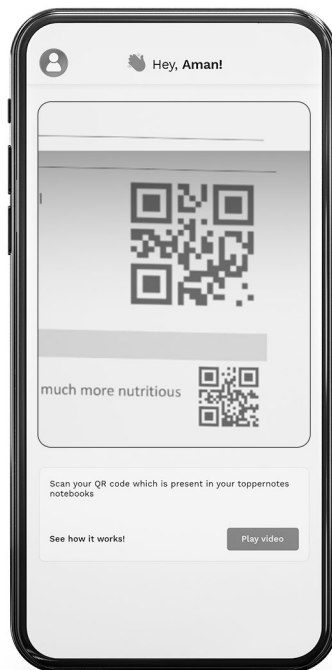
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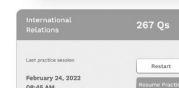
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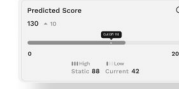
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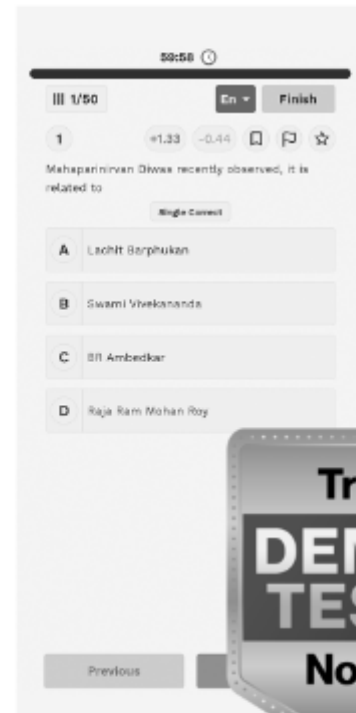
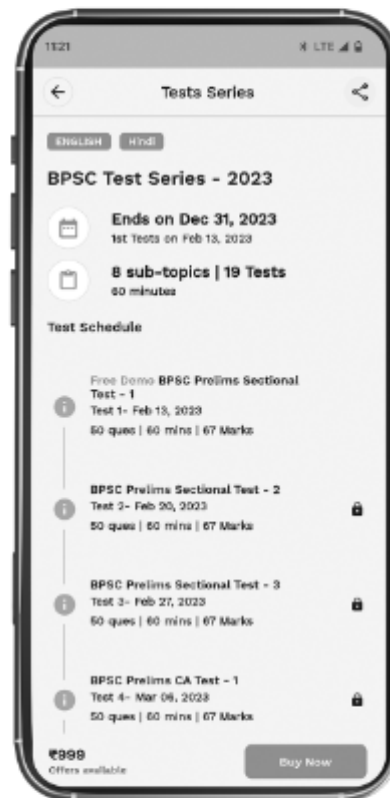
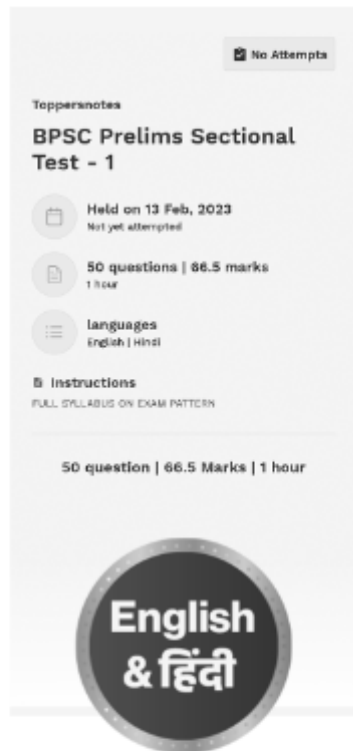
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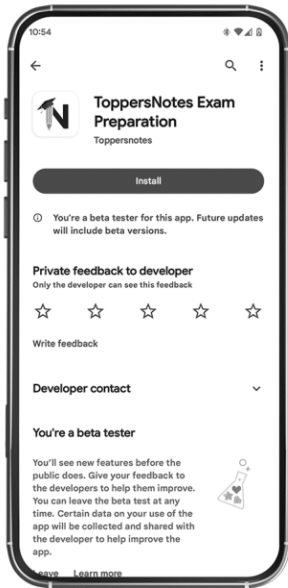


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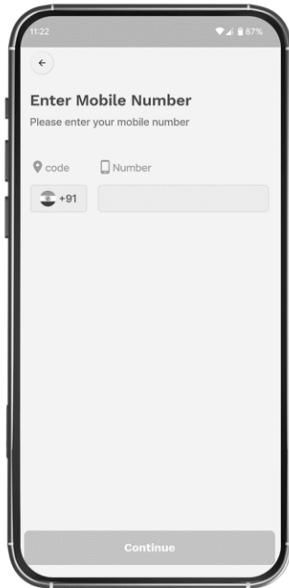
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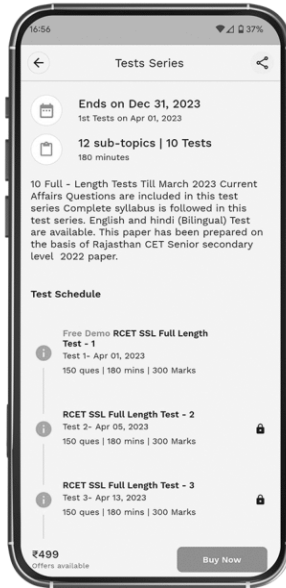
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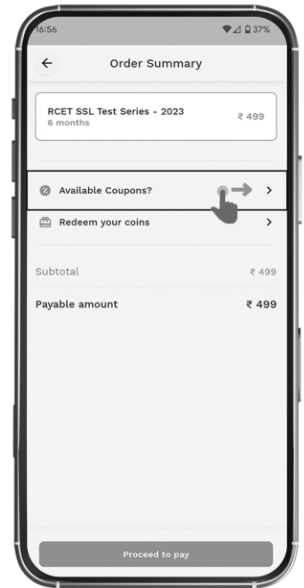
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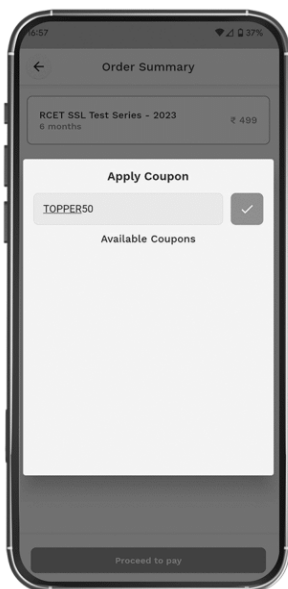
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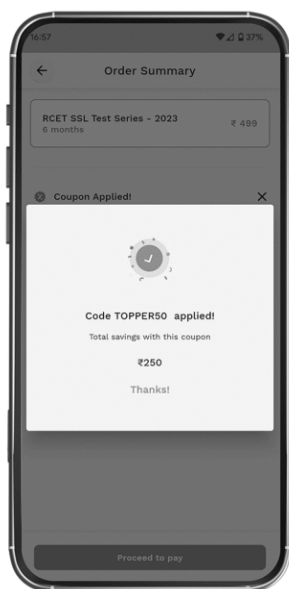
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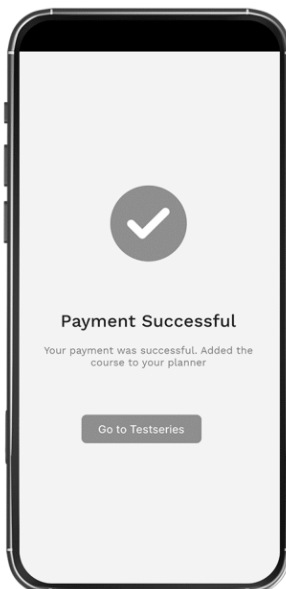
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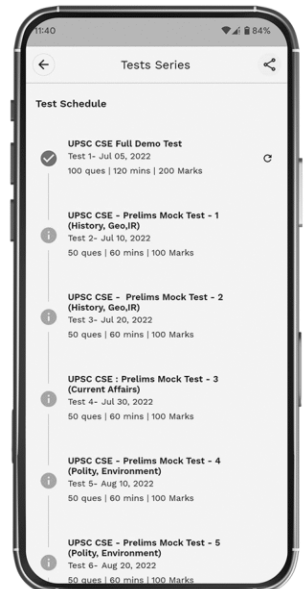
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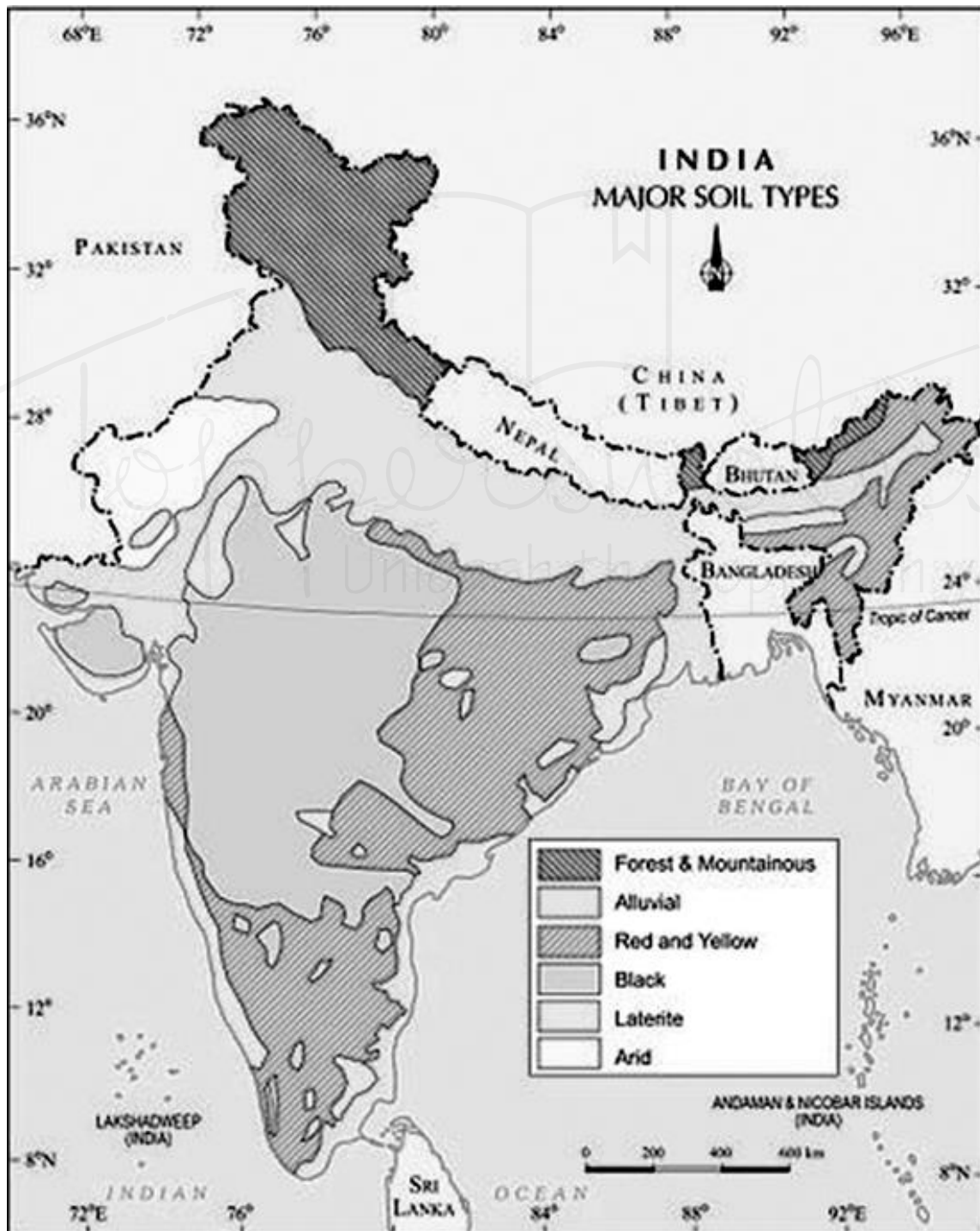
1 CHAPTER

Soil in India



Soil types in India

- First scientific classification of soil was done by Vasily Dokuchaev.
- Indian Council of Agricultural Research (ICAR) has classified soils into 8 categories.
 - Based on colour and resource significance of soils.



1. Alluvial Soils



- **Formation:**
 - **Silt deposited** by Indo-Gangetic-Brahmaputra rivers.
 - **Coastal regions** - due to **wave action**.
 - **Parent material**- **Himalayan rocks**.
- **Largest soil group** covering about **15 lakh sq km (46 % area)**.
- **Characteristics:**
 - **Immature** and have **weak profiles**.
 - Most soil is **sandy** and **clayey soils not uncommon**.
 - **Vary from loamy to sandy-loam** in **drier regions** and **clayey loam** towards **delta**.
 - **Rare pebbly** and **gravelly soils**.
 - **Kankars present** in some regions along river terraces.
 - **Good porosity** and **texture** provide **good drainage** and other conditions favorable for agriculture.
 - **Constantly replenished** by recurrent floods.
- **Chemical properties:**
 - **Poor in nitrogen**.
 - **Adequate Potash, phosphoric acid, and alkalies**.
 - **Iron oxide** and **lime vary** within a wide range.
- **Distribution:**
 - Occur all along **Indo-Gangetic-Brahmaputra plains** except where top layer is covered by desert sand.
 - Also occur in **deltas** of **Mahanadi, Godavari, Krishna, and Cauvery** k/a **deltaic alluvium**.
- **Crops:**
 - Best suited for agriculture.
 - **Rice, wheat, sugarcane, tobacco, cotton, jute, maize, oilseeds, vegetables, and fruits** grown.
 - **Rainfall:**
 - **> 100cm** – Suitable for **paddy**
 - **b/w 50-100cm** – Suitable for **wheat, sugarcane, tobacco, and cotton**
 - **< 50cm**– **Coarse grains** (millets)

Geological divisions:

- **Bhabar**
 - **8-16 km wide** running **along Shiwalik foothills**.
 - A **porous, northern most stretch** of **Indo-Gangetic plain**.
 - **Rivers descending** from Himalayas **deposit load along foothills** as **alluvial fans** - **merged together** to build up **bhabar belt**.
 - **Extremely porous** due to deposition of huge number of pebbles and rock debris across the alluvial fans.
 - **Streams disappear** because of porosity.
 - So, **marked by dry river courses** except in rainy season.
 - **Not suitable for agriculture** and only big trees with large roots thrive.
- **Terai**
 - An **ill-drained, damp and thickly forested narrow tract** (15-30 km wide) to **south of Bhabar** running parallel to it.

- **Underground streams** of the Bhabar belt **re-emerge** in this belt.
- So, a **swampy lowland** with **silty soils**.
- **Rich in nitrogen** and **organic matter** but **deficient in phosphate**.
- Generally **covered by tall grasses and forests**.
- **Crops** - wheat, rice, sugarcane, jute, etc.
- **Bhangar**
 - **Older alluvium** along the river beds **forming terraces higher** than the **flood plain** (about 30 meters above the flood level).
 - **Clayey composition** - dark-colored.
 - **Kankar** - Beds of lime nodules below terrace of bhanga.
- **Khadar**
 - **Newer alluvium** and **forms flood plains** along river banks.
 - **Banks flooded every year** - new layer of alluvium is deposited regularly.
 - **Most fertile soils** of Ganges.
 - **Sandy clays and loams**, drier and leached, less calcareous and carbonaceous.

2. Black Soils

- **Formation**
 - **Weathering of basaltic rocks** formed due to **fissure eruption** of **Cretaceous** period.
 - **Parent material** -volcanic rocks (Deccan and Rajmahal trap).
- **Region of high temperature and low rainfall.**
- **Covers 15 % area**
- **Black colour** - due to **titani-ferrous magnetic compounds** in basalt.
- **Characteristics:**
 - **Highly argillaceous** (relating to, or containing > 62% clay or clay minerals).
 - **Highly retentive of moisture** - swells greatly on accumulating moisture.
 - **Summer** - **moisture evaporates** - **soil shrinks** - **broad and deep cracks** -**oxygenation** of soil to sufficient depths - **extraordinary fertility**.
- **Chemical Composition:**
 - **Alumina**- 10 %,
 - **Iron Oxide** - 9-10 %,
 - **Lime and magnesium carbonates** - 6-8% ,
 - **Potash** - variable (< 0.5 %)
 - **Poor in phosphates, nitrogen, and humus.**
- **Distribution:**
 - **Deccan lava plateau region.**
 - **States**- Maharashtra, Madhya Pradesh, parts of Karnataka, Telangana, Andhra Pradesh, Gujarat, and Tamil Nadu.
- **Crops:**
 - **Best suited for cotton**- also known as regur and black cotton soils.
 - **Other** - wheat, jowar, linseed, virginia tobacco, castor, sunflower, & millets.
 - **Rice** and **sugarcane** where **irrigation** facilities are available.
 - **Vegetables** and **fruits** also grown.



3. Red Soil

- **Formation:**
 - Weathering of **ancient crystalline and metamorphic rocks**.
 - Developed on **Archean granite**.
- Occupies **2nd largest area** in the country (**18.5 %**).
- **Color-** due to **ferric oxides** (Top layer - red and horizon - yellowish).
- **Texture: Sandy to clay and loamy**.
- Also known as **omnibus group**.
- **Characteristics:**
 - **Rainfall highly variable**.
 - **3 subtypes:**
 - **Red & Yellow soil** – Nagaland, Mizoram, Manipur Hills, parts of Malabar coast,
 - **Red Sandy Soil** – Drier plateaus like Karnataka, TN, Telangana, Rayalseema.
 - **Red Alluvial Soil** – Along river valleys
- **Chemical Composition :**
 - Poor in **phosphate, lime, magnesia, humus and nitrogen**.
 - Rich in **iron and potash**
- **Distribution:** From **Tamil Nadu** in south to **Bundelkhand** in north and **Raj Mahal** in east to **Kathiawad** in west.
- **Crops:**
 - **Rice, sugarcane, cotton** cultivation with **proper irrigation**.
 - **Millets and pulses** are grown in **drier areas**
 - **Rubber and coffee plantation farming** (Karnataka and Kerala).



4. Laterite Soil

- **Formation**
 - **Laterite rock or structure** (Laterites - rich in iron & aluminium content)
 - **Alternating dry and wet periods**.
- **Characteristics:**
 - **Brown** in colour
 - Composed of a **mixture of hydrated oxides of aluminium and iron**.
 - **Iron oxides in nodules** form
- **Chemical composition:**
 - **Rich in iron and aluminium**.
 - **Poor in Nitrogen, Phosphorous, Potash, Lime, and Magnesia**.
 - **Moderate to low humus** (leached due to high bacterial activity and heavy precipitation) and water-retaining capacities.
- **Distribution**
 - **Western Ghats** (Goa and Maharashtra).
 - In **Belgam** district of **Karnataka** and in laterite plateau of **Kerala**
 - **Odisha** - Eastern Ghats,
 - **Amarkantak plateau** region, MP



- **Panchmahal** district, **Gujarat**;
- **Santhal Pargana** divisions, **Jharkhand**
- **Crops:**
 - **Groundnut, cashew nut**, etc.
 - **Karnataka** - **coffee, rubber**, and **spices** farming.

5. Forest Soil/ Mountain Soil

- **Formation:** On mountains with steeper slopes, high relief, shallow profiles.
- **Characteristics:**
 - **Thin layered and profiles and horizons poorly developed**
 - **Fast drainage** - vulnerable to soil erosion
- **Chemical composition:**
 - **Adequate humus** content
 - **Deficient in other nutrients.**
- **Distribution**
 - Found **over 900m altitude**
 - **Himalayas, Himalayan foothills, mountain slopes of Western Ghats, Nilgiri, Annamalai, and Cardamom hills**
- **Crops:**
 - **Rubber** plantation, **bamboo** plantation and **tea, coffee**, and **fruits** farming
 - Large area also given to **shifting agriculture**
 - **Silvi pastoral farming** also sustained.



6. Desert Soil

- **Formation:** Deposition by **wind action**.
- **Characteristics:**
 - **Lacks moisture** content.
 - **Sandy** with low organic matter.
 - **Less microorganisms.**
- **Chemical composition:**
 - **Low Humus & Nitrogen** (but some available as nitrates).
 - **Rich in iron, lime and bases** .
 - **Sufficient phosphorous** .
 - **Low soluble salts.**
- **Distribution:** Arid and semi-arid areas of Rajasthan, West Aravallis, Northern Gujarat, Saurashtra, Kutch, Western parts of Haryana, and southern part of Punjab.
- **Crops:**
 - **High agricultural return** if irrigated.
 - **Bajra, pulses, fodder**, and **guar**.



7. Saline and Alkaline Soil

- **Formation:**
 - **Decomposition of primary minerals.**

- **Drainage restricted** and excess water evaporates in arid regions -**neutral soluble salts** move upward - accumulate on surface as **white crust**.
- **Characteristics:**
 - **Infertile**
 - Also known as **Reh, Usar, Kallar, Rakar, Thur, and Chopan**.
 - **Lack of moisture, humus, and living microorganisms**
- **Chemical composition:**
 - **Contains** large amounts of **Sodium chloride** and **sodium sulphate**.
 - **Poor** in **potash and phosphate**.
- **Distribution:** Rajasthan, Haryana, Punjab, Uttar Pradesh, Bihar, and Maharashtra.
- **Crops:** Mainly **leguminous**

8. Peaty, and Marshy Soil/ Bog Soil

- **Formation:** **Incomplete decomposition of remains of plants** growing in **waterlogged conditions** in standing water or under consistently high rainfall .
- **Characteristics –**
 - Heavy due to **dominance of clay and mud**.
 - **Rich** in **moisture** content.
 - **Infertile** due to :
 - **Greater** content of **salt**.
 - **Regular inundation** by high tide.
 - **No organic activity**.
- **Chemical composition:**
 - **Rich** in **organic matter**.
 - **Poor** in **potash and phosphate**.
- **Distribution:** **Delta** region of **India, Alleppey(Kerala) , Almora (Uttaranchal)**
- **Crops:**
 - **Bengal delta-** jute and **rice**.
 - **Malabar -** spices, **rubber, big sized rice**

Problems of Indian soil

1. Soil erosion:

- **Mainly by water.**
- **Other agents** - Wind, Waves, Glaciers
- **Largest area** affected by soil erosion- **Rajasthan** followed by **Madhya Pradesh**.
- **Consequences:**
 - **Reduced fertility** of topsoil.
 - **Decline** in **nutrient** content.
 - **Reduced underground water level**.
 - **Loss of vegetation** and **habitat**.
 - **Frequent droughts** and **floods**.
 - **Rivers** get **dried off**.



2. Decline of soil fertility: Especially in **Punjab, Haryana, and U.P.**

3. **Water logging:** Results in the saturation of crops- NO normal circulation of air - amount of oxygen will decline.
4. **Salinity**
 - **Eg. in Rajasthan.**
 - **Calcium carbonate beneath (kankar) soil - impermeable to water and water gets logged.**
 - **If the soil contains salt, it will spread to the whole land.**
5. **Shifting / jhum cultivation**
6. **Desertification**
7. **Faulty Agricultural Practices**
 - **Excessive tilling of land + lack of crop rotation** makes the soil weak.
 - **Monocropping of cereals** such as rice and wheat denudes the soil of essential nutrients.
8. **Overgrazing by cattle**
9. **Deforestation**

Soil Conservation

- Prevention of soil from erosion or reduced fertility caused by overuse, acidification, salinization or other chemical soil contamination.
- **Methods for soil conservation:**
 - **Crop Rotation**
 - To grow a different crop on a piece of land each year.
 - Conserves soil fertility as different crops require different nutrients from the soil.
 - **Strip Cropping**
 - Crops cultivated in alternate strips, parallel to one another.
 - Some strips allowed to lie fallow while other crops sown in other strips.
 - Various crops harvested at different intervals - entire area is never left bare or exposed.
 - Tall growing crops - wind breaks
 - Strips - increasing water absorption by slowing down run off.
 - **Early Maturing Varieties:** Put lesser pressure on the soil.
 - **Contour Ploughing:** Ploughing done at right angles to hill slope such that ridges and furrows break water flow down the hill.
 - **Checking Shifting Cultivation:** By persuading tribal people to turn to settled agriculture .
 - **Ploughing in Right Direction:** Ploughing the land in a direction perpendicular to wind direction reduces wind velocity ; protects top soil from erosion.
 - **Mulching:** Bare ground between plants covered with a protective layer of organic matter like grass clippings, straw, etc.
 - **Contour barriers**
 - Stones, grass, soil used to build barriers along contours.
 - Trenches made in front of barriers to collect water which intercept downslope flowing water and soil particles.
 - **Rock dam**
 - Rocks piled up across a channel to slow down the flow of water.
 - Prevents gullies and further soil loss.



- **Terrace farming**
 - Terraces cut along the hill slope.
 - Made on the steep slopes.
 - Can reduce surface run-off and soil erosion.
- **Contour Bunding:** Involves construction of banks along contours.
- **Intercropping:** Different crops grown in alternate rows & sown at different times to protect the soil from rain wash.
- **Shelter belts or Windbreaks:** Coastal and dry regions - rows of trees planted to check wind movement to protect soil cover.
- **Sand fences**
 - Barriers made of small, evenly spaced wooden slabs.
 - Reduce wind velocity and trap blowing sand.
 - Can be used as perimeter controls.
- **Afforestation:** Prevention of forest destruction along with growing new forests or increase area under forests.
- **Dams:** Constructing dams across rivers in proper places checks speed of water and saves soil from erosion.

2 CHAPTER

Agriculture



- **Agriculture - 2 words** – ‘Ager’ + ‘culture’
 - ‘Ager’ - soil
 - ‘culture’ - cultivation.
- **Art, science and business of producing crops and livestock** for economic purpose.
- **Importance of Agriculture in India:**
 - **2/3rd of livelihood** of Indians is **directly or indirectly dependent** on Agriculture.
 - **55% of labour force** is **directly or indirectly involved** in Agriculture.
 - Accounts for **15% of export earnings** and **14%-17% of India’s GDP**.
 - **Provides raw material** for - textiles, sugar, flour mills, Jute, Apparel etc.
 - **Flourishing Agricultural production- main factor** behind **food security** of large Indian population.
 - **Allied sectors-** horticulture, animal husbandry, dairy, fishing etc.
 - Vital role in **providing nutrition and livelihood** to **huge population** in India.
- **Salient features of Indian Agriculture**
 - **Subsistence agriculture:**
 - **Most prevalent** in India.
 - **Agricultural produce** is for **self-consumption** only - **no surplus production** to sell.
 - **Commercial agriculture:**
 - **Eg. tea plantation** in Assam, coffee in Karnataka, coconut in Kerala, etc.
 - **Large agricultural produce** is **sold in market** by **firms** for making profits.
 - **Mechanization:**
 - An **increasing trend** in use of **machines** in farm operations.
 - **Major mechanized areas-** Punjab, Haryana, Western Uttar Pradesh, River valleys of Andhra, and Tamil Nadu.
 - **Monsoon dependent:**
 - **Lack of irrigation facilities**
 - **2/3rd** of Indian agriculture is **dependent on monsoon rains**.
 - **Variety of crops:**
 - **Different** types of **topography, diverse soil** (like alluvial, red, black cotton soil, etc), and **different** types of **climate** facilitate **production** of **different** varieties of **crops** in different regions.
 - **Eg,** hilly areas suitable for tea cultivation, plains rice cultivation
 - **Predominance of food crops:**
 - **Food crops** are mainly **grown** in order **to keep** with the **food security demands** of the **huge Indian population**.

Types of Agricultural Revolution in India



Revolution	Product related	Person associated with
Protein Revolution	Higher Production (Technology driven 2nd Green revolution).	Coined by PM Narendra Modi and FM Arun Jaitley.
Yellow Revolution	Oilseed Production (Especially Mustard & Sunflower).	Sam Pitroda
Black Revolution	Petroleum products.	
Blue Revolution	Fish Production	Dr. Arun Krishnan.
Brown Revolution	Leather / Cocoa / Non-Conventional Products.	
Golden Fiber Revolution.	Jute Production	
Golden Revolution	Fruits / Honey Production / Horticulture Development	Nirpakh Tutej.
Grey Revolution	Fertilizers.	
Pink Revolution	Onion Production / Pharmaceuticals / Prawn Production.	Durgesh Patel.
Evergreen Revolution	Overall Production of Agriculture.	Started in 11th 5 year Plan.
Silver Revolution	Egg Production / Poultry Production	Indira Gandhi.
Silver Fiber Revolution	Cotton.	
Red Revolution	Meat Production / Tomato Production.	Vishal Tewari.
Round Revolution	Potato.	
Green Revolution	Food Grains.	Norman Borlong, M.S. Swaminathan, William Goud (UK).
White Revolution (or, Operation Flood)	Milk Production.	Verghese Kurien.

Cropping System and Cropping Pattern in India

Cropping system

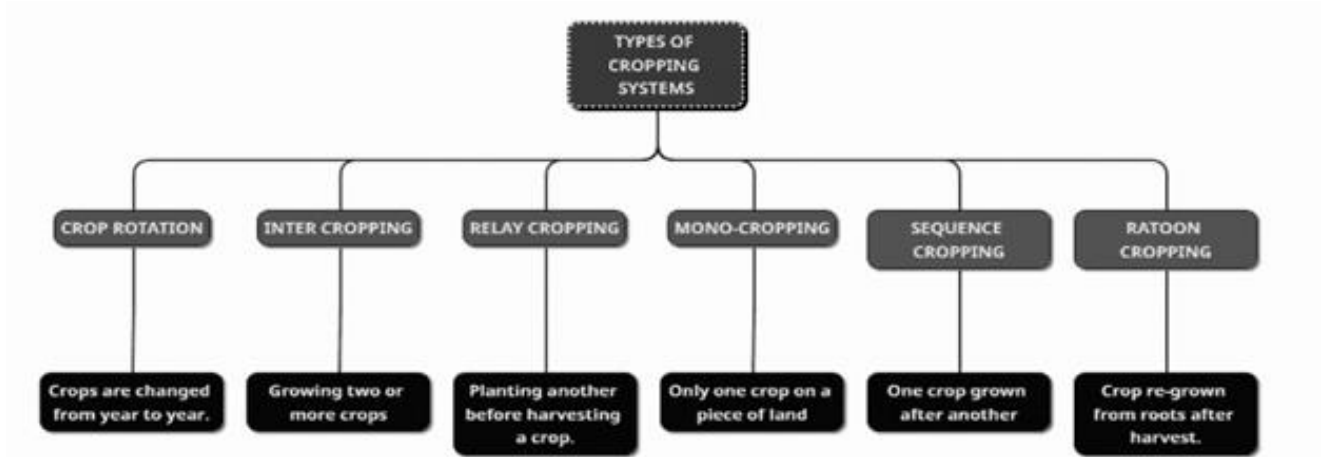
- **Crops, crop sequences, and management techniques** used on a particular agricultural field over a period of years.

Cropping System = Cropping Pattern + Management

- A set of **elements/ components** that are **interrelated** and **interacting** among them.
- **Objectives:**
 - **Efficient utilization of all resources** viz. Land, water, and solar radiation.
 - **Maintaining stability in production** and obtaining higher net returns.



● **Types :**



Cropping Pattern

- A **dynamic concept** - changes over space and time.
- Defined as the **proportion of area under various crops** at a point of time.
- A **yearly sequence** and **spatial arrangement of sowing and fallow** on a given area.
- **Determined by** rainfall, climate, temperature, soil type and technology.



Difference between cropping pattern and cropping system

Cropping pattern	Cropping System
Crop rotation practiced by a majority of farmers in a given area or locality.	Cropping pattern and its management to derive benefits from a given resource base under specific environmental conditions.
Type and management of crops in time and space.	The cropping patterns used on a farm and their interaction with farm resources, other farm enterprises and available technology which determine their make up.
Yearly sequence and spatial arrangement of crops or crops and fallow on a given area. The proportion of area under various crops at a point of time in a unit area.	Pattern of crops taken up for a given piece of land, or order in which crops are cultivated on a piece of land over a fixed period, associated with soil, management practices such as tillage manuring and irrigation.

Factors Affecting Cropping Pattern

1. Geographical Factors

A. Relief

- Plays **important role in deciding the cropping pattern** of a region.
- **Eg.**
 - Rice - main crop on irrigated hill terraces (terraced cultivation).
 - Tea and coffee - only on well drained slopes getting good rainfall.
 - Sugarcane dominates well irrigated regions with fairly warm climate.
 - Wheat (temperate crop) - plain regions with moderate temperature and rainfall.

B. Temperature

- **Most crops require lower temperature** at the time of **sowing** and **higher temperature** at the time of **ripening**.
- Some crops **require higher temperatures** - sown in **summer**.
- Other crops **require lower temperature & moisture** - sown in **winter**.

C. Rainfall

- **Major determinant** of cropping pattern of a region.
- **Variation in rainfall - different cropping patterns:**
- **Areas of Heavy Rainfall**
 - **> 150 cm** of annual rainfall.
 - **Includes** east India and west coastal plains.
 - **Animal population - high** (large fodder and grazing area).
 - **Major crops** - rice, tea, coffee, sugarcane, jute etc.
- **Areas of Medium Rainfall**
 - **75-150 cm** of annual rainfall
 - Rich in **natural resources**.
 - **Includes** Eastern part of Uttar Pradesh, Bihar, Odisha, eastern parts of Madhya Pradesh and Vidarbha region of Maharashtra.
 - **Major crops**- Wheat, maize, cotton, soybean, millets, etc. .
- **Areas of Low Rainfall**
 - **25- 75 cm** (Semi-arid stretches of India) of annual rainfall.
 - **Major crops:** millets, jowar, and bajra in the northern, jowar in central and ragi in the southern part.
 - **Mixed cropping is very common** - pulses are mixed with cereals.
 - **Dry land farming** -common.

D. Soil

- **Different crops** require **different edaphic conditions** for growth and development.
 - **Rice**- in clayey soils while wheat- loamy soils.
 - **Cotton**- regur soil of Deccan Plateau.
 - **Jute**- Delta soils of West Bengal.

2. Economic Factors

Majorly irrigation, power, size of land holdings, sale price of crops, income of farmers, insurance, and investment .

A. Irrigation

- **Eg. Rice** - In regions with reliable irrigation and a warm climate.

B. Size of Land Holdings

- **Small holdings**- priority of farmers would be to grow food grains for subsistence.
- **Large holdings** - Farmers can opt for crop diversification, leading to changes in the cropping pattern.

C. Insurance against Risk

- **Eg.** in Southern states plantation crops grown due to availability of suitable crop insurance schemes.

D. Availability of Inputs:

- Like **seeds, fertilizers, water storage, marketing, transport**, etc. .

E. Value

- **Eg.** Millets in the hilly areas of Himachal Pradesh and Uttarakhand are replaced by high-value horticulture crops like apple.

F. Demand:

- **Rice - preferred crop in densely populated regions** as there is a **ready market and high demand**.

3. Government Policies

- **Food Crops Acts, Land Use Acts, intensive schemes** for paddy, for cotton and oilseeds, subsidies affect the cropping pattern.
- Government can **encourage or discourage certain crops** due to **various reasons** like **drought, flood, inflation** etc.
- **Minimum Support Price (MSP):**
 - **Rice and wheat -high MSP** -preferred by farmers over other food crops.

4. Historical Factors

- **Eg.** tea plantation by British Kangra valley in Uttarakhand.
- **Sugarcane grown** more extensively in **North India** (even though conditions are most favourable in South India) because it was **encouraged by British** as an alternative to indigo.
- **Diversification of crops** due to **surplus food grain production** post Green Revolution - **changes in cropping pattern**.
 - Now **new crops in prominence** are rice, wheat, oilseeds & pulses.

Types of Cropping patterns

1. Multiple Cropping

- **Involves growing of two or more crops** on the same field in a year.
- **Intensification of cropping** in **time** and **space** dimensions **without deteriorating soil fertility** i.e. more number of crops within a year and more no of crops on the same piece of land at any given period.
- **Characteristics:**
 - Growing **2 or more crops on same** piece of **land at same time** or at different times in a year.
 - Help in **rejuvenating soil fertility**.
 - **Eg.** Sowing of pulses after rice increases nitrogenous components of soil.
 - **Crops** - generally of **short-duration**.
 - **Limiting factors** - low intensity of irrigation and use of long-duration varieties of crops.
- **Types:**
 - A. Intercropping**
 - **Growing 2 or more crops simultaneously** on **same** piece of **land** with a **definite row arrangement** or in a fixed ratio.
 - Aids in **achieving cropping intensity in space**.

Cropping intensity

- Raising of a number of crops in a same field during one agriculture year.

Cropping intensity = (Gross cropped area / Net sown area) x 100

- **Gross Cropped area** - area of land x number of times same land is cultivated in a year
- **Net Sown Area** - area of same piece of land only once in same year.
- **Average cropping intensity** - 136%. (India)

B. Multi Storey/Multi-tiered/Multilevel cropping

- Cultivation of 2 or more crops of different heights simultaneously on same piece of land in any certain period.
- Crop of larger height - shade, nutrients (through disposed of leaves), etc. to the crop in focus.
- Eg, coffee - long trees provide shade to coffee.
- Mostly practiced in orchards and plantation crops for maximum use of solar energy even under high planting density.

C. Mixed cropping

- Cultivation of 2 or more crops simultaneously on same land without a definite row pattern or fixed ratio.
- Commonly practiced in dryland areas of India.
- A type of subsistence farming.
- Lessens the risk of total crop failures and to satisfy farmer's requirements of food and fodder.

D. Sequence cropping

- Growing of 2 or more crops in quick succession on same piece of land in a farming year.
- Succeeding crop is planted after preceding one is harvested.
- No intercrop competition.
- Eg. After harvesting Maize - Potato is sown followed by sowing of chili.
- aka Non-Overlapping cropping .

Ratoon cropping

- A system of sequential cropping.
- Fresh crop is grown from stubble (lower part of the crop left out after harvesting) or suckers of the plant crop without replanting.
- No replanting of the crop.
- E.g. Sugarcane.
- aka stubble cropping, re-harvesting, second crop, etc.
- Used extensively for sugarcane, bananas, etc.

E. Relay cropping

- Growing two or more crops simultaneously during the life cycle of each one.
- Second crop is planted after first crop has reached its reproductive stage of growth, but, before it is ready for harvest.
- Eg. Potato is planted before harvesting of Maize.
- aka overlapping cropping.

2. Mono-cropping

- **Growing large amounts of one crop** on the land.
- Recognized as a very **economical** way to provide farmers with a way to earn money.
- **Does not provide** the **diversity** needed in our **diets** or to our ecosystem.

Farming Systems



1. On the Basis of Economy of Agriculture

A. Primitive Subsistence Farming

- On **small land** by **primitive tools** and family/community labour.
- **Depends on monsoon, natural fertility** of the soil and **other environmental conditions** to the crops grown.



B. Intensive Subsistence Farming

- A **labour intensive farming**, where **high doses of biochemical inputs** and **irrigation** are used for **obtaining higher production**.
- **Division of land** among **successive generations** has rendered **land-holding size uneconomical**, the **farmers** still continue to take **maximum output** from the limited land in the absence of alternative sources of livelihood.

C. Commercial Farming

- **Use high yielding variety seeds, chemical fertilizers**, insecticides and **pesticides** in order to obtain higher productivity.
- Has **regional variations**.
- **Eg**, rice is a commercial crop in Haryana and Punjab, but in Odisha, it is a subsistence crop.

D. Plantation

- A type of **commercial farming** where a **single crop** is **grown on a large area**.
- **Interface of agriculture and industry**.
- **Cover large tracts of land**, using **capital intensive inputs**, with the help of **migrant labourers**.
- **Produce used as raw material** in respective industries.
- **Eg**, tea, coffee, rubber, sugarcane, banana, etc. are important plantation crops.

2. On the Basis of Source of Moisture for Crops

A. Irrigated Farming

- Source of moisture - available irrigation facilities - supplementary supply of water.
- Irrigation to provide sufficient soil moisture to achieve high productivity.



B. Rainfed Farming

- **Source of moisture - rainfall**.
- **Classified** on the basis of adequacy of soil moisture during cropping season as:
 - **Dryland Farming:**
 - Annual **rainfall** < 75 cm.
 - **Hardy and drought resistant crops** - ragi, bajra, moong, gram and guar (fodder crops) grown.
 - **Practise** various measures of **soil moisture conservation** and **rainwater harvesting**.