Value Addition

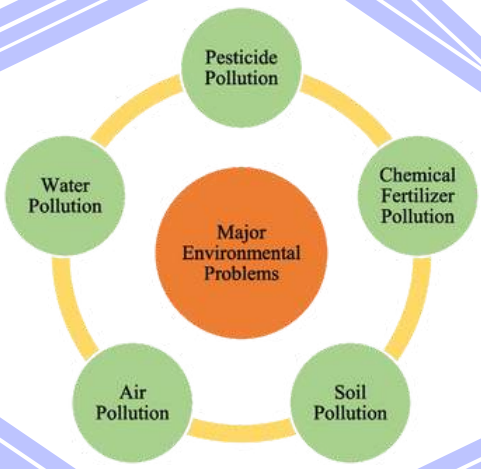
Connect Civils RAS

Updated 2024-25

Examples, Application, Diagrams based on new RPSC Pattern

Rajasthan Geography

Mica



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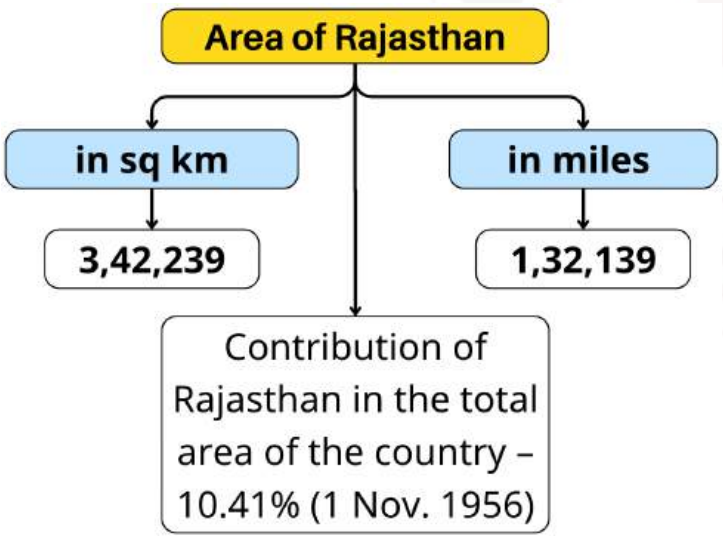
INDEX

Chapter 1

❖ **Broad Physical Features - Mountains Plateaus, Plains & Deserts**

PYQ		
2018	Describe the main physical characteristics of Shekhawati region.	5 M
2013	What makes Western Rajasthan an extreme drought affected area of India ?	2 M
2013	Give the characteristics of 'Dang region' of Rajasthan.	2 M
2013	Portray the geographic-cultural identity of Shekhawati region of Rajasthan.	5 M
2021	Discuss the physical features of the Hadoti plateau of Rajasthan.	5 M

Rajasthan: shape,location and extension



Geological History

❖ **Division of Pangea:**
- ➢ The supercontinent **Pangea** split into two parts:
  - ■ **Angara Land** (Northern part).
  - ■ **Gondwanaland** (Southern part).
- ➢ The **Tethys Sea**, a geosyncline, existed between these two parts.

❖ **Rajasthan's Geological Features:**
- ➢ India, including Rajasthan, has no remains of **Angara Land**.
- ➢ **Tethys Sea:**
  - ■ The **north-western desert area** and **eastern plains** of Rajasthan are remnants of the Tethys Sea.
- ➢ **Gondwanaland:**
  - ■ The **Aravalli Mountain Range** and **Hadoti Plateau** are geological remains of Gondwanaland.

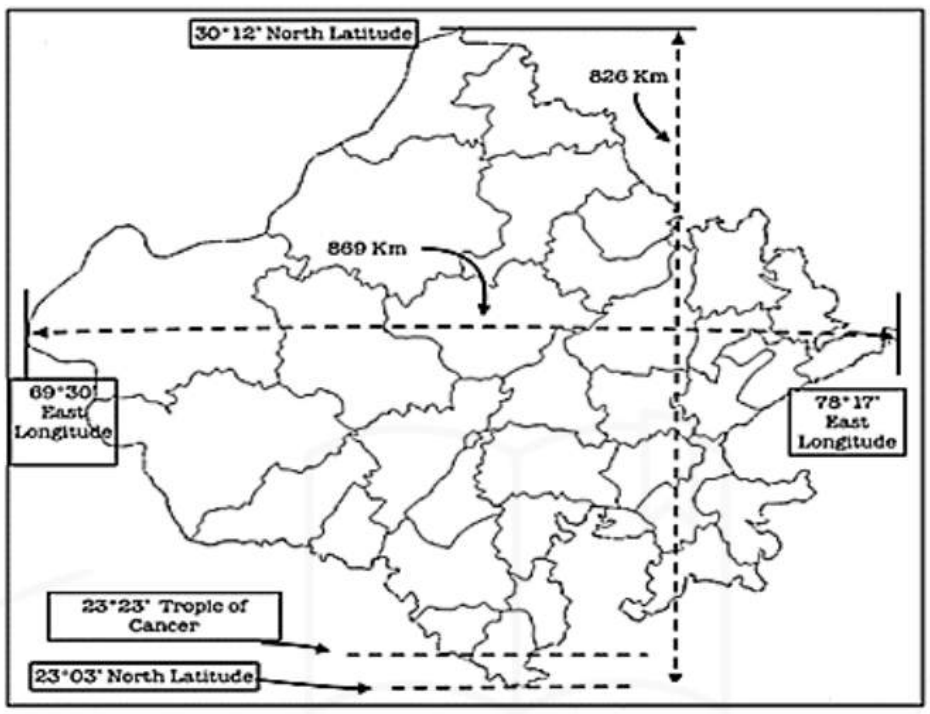
Location (position) of Rajasthan

Location (Position) of Rajasthan

❖ **Global Location:**
- ➢ Rajasthan is situated in the **Northern Hemisphere** by latitude and in the **Eastern Hemisphere** by longitude.

❖ **India's Context:**
- ➢ Rajasthan lies in the **north-western part** of India.

Extension of Rajasthan



Extension of Rajasthan

❖ **South to North (Latitudinal Extension):**
- ➢ **Range:** 23°03' N (Borkunda, Banswara) to 30°12' N (Kona Village, Sri Ganganagar).
- ➢ **Span:** 7°9'.
- ➢ **Distance:** 826 km.

❖ **West to East (Longitudinal Extension):**
- ➢ **Range:** 69°30' E (Katra Village, Jaisalmer) to 78°17' E (Silana Village, Dholpur).
- ➢ **Span:** 8°47'.
- ➢ **Distance:** 869 km.

Tropic of Cancer

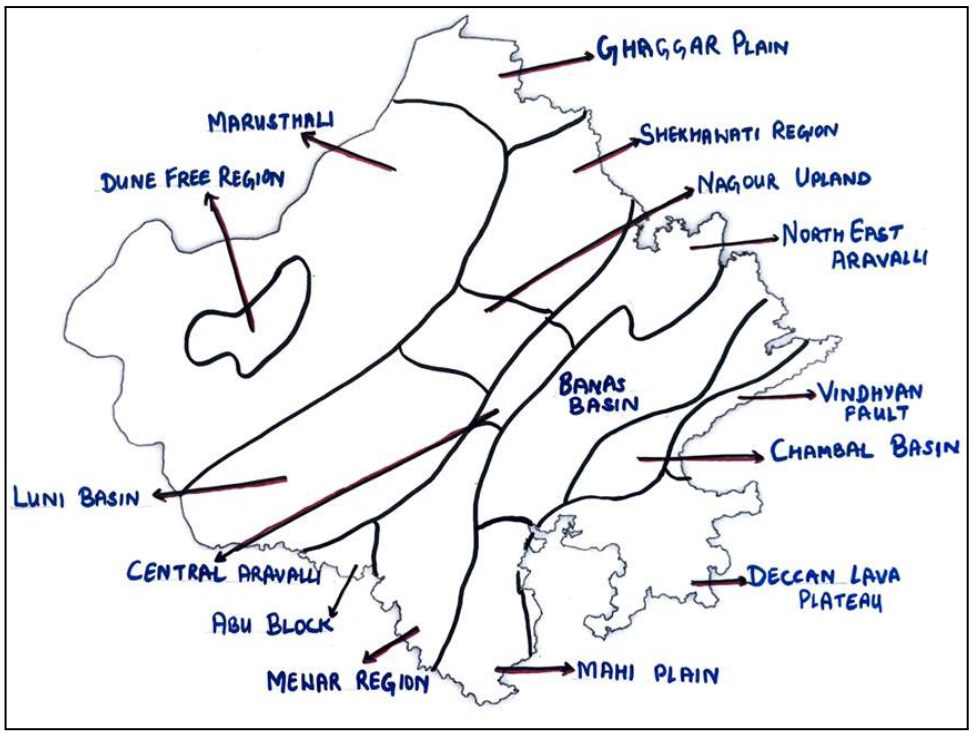
❖ The **Tropic of Cancer** (23°30' N Latitude) passes through Rajasthan:

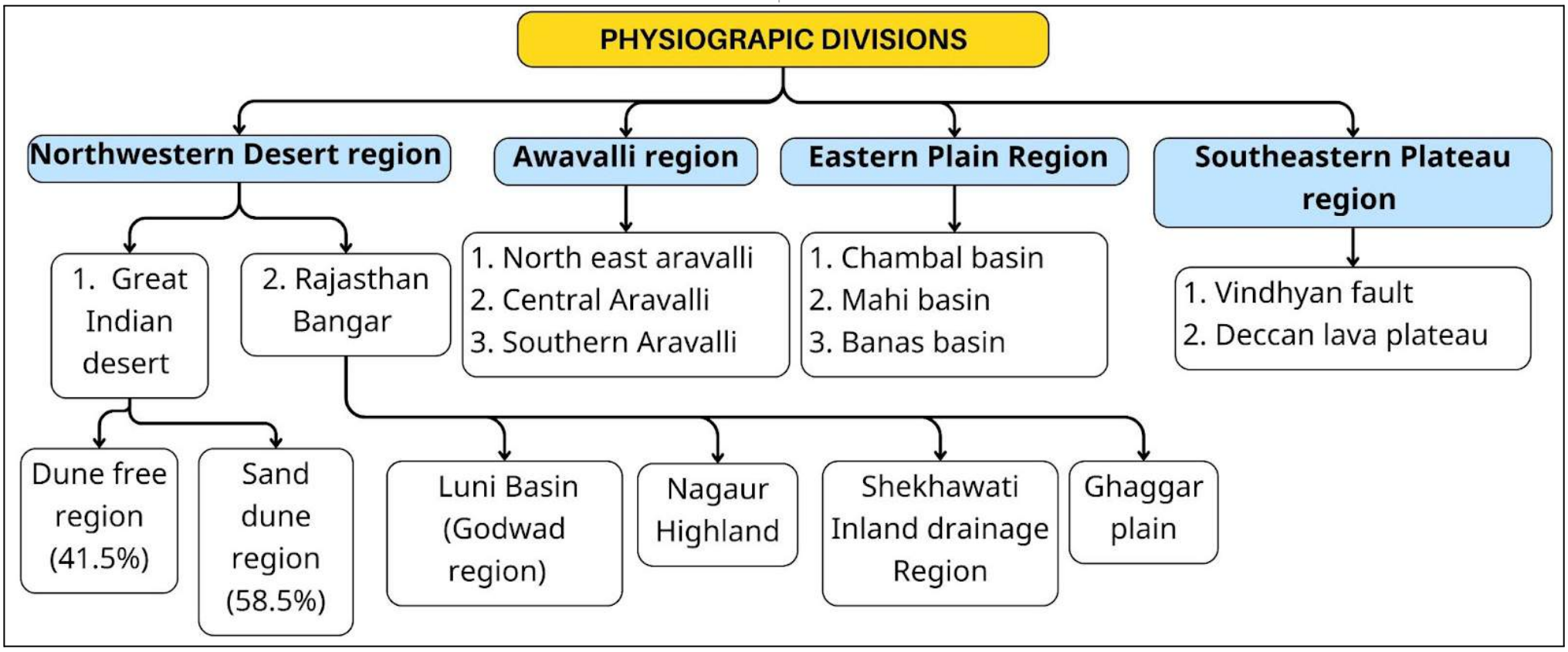
Physiographic Divisions of Rajasthan

Rajasthan is the largest state in the Union of India and has more physical variations than any other state. It has regions of rolling sand dunes in the west to lofty rocks in the middle to fertile plains in the east.

On the basis of the existing relief features, there are following physical divisions of Rajasthan:

1. Northwestern desert Region
2. Aravalli Range And Hilly Region
3. Eastern Plains
4. South-eastern Plateau (Hadoti Plateau)



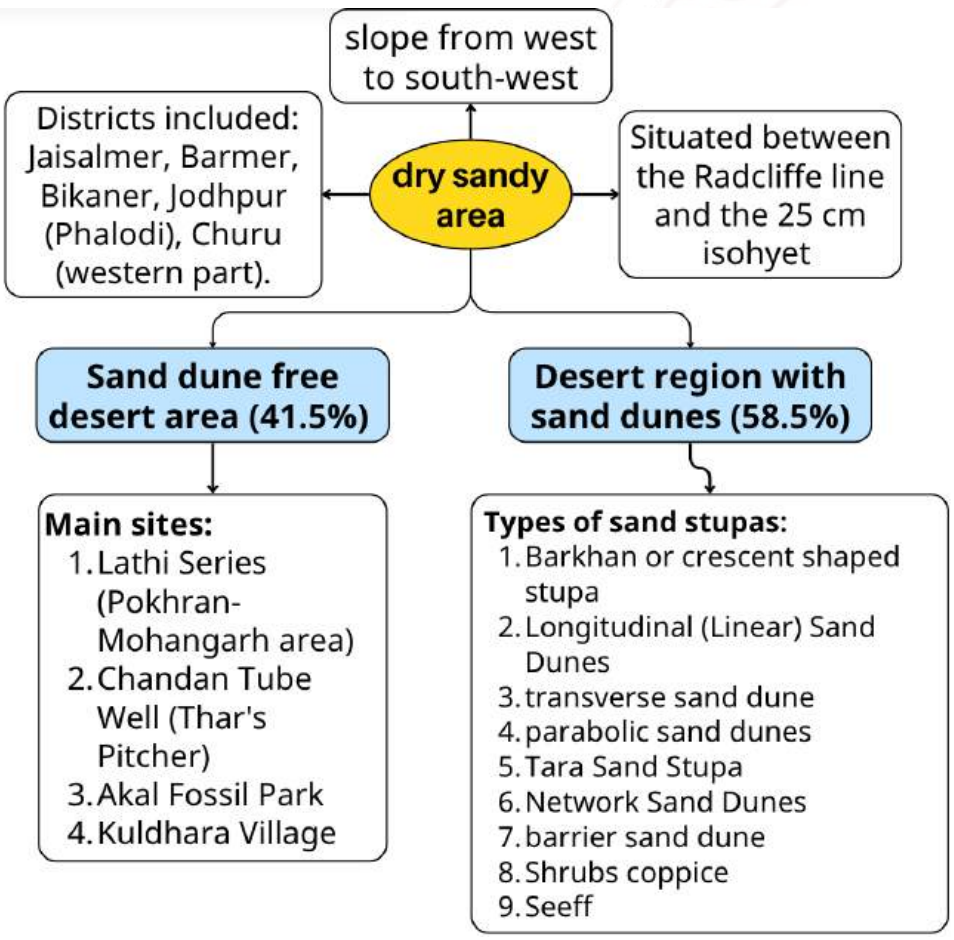


Rajasthan's four physical regions based on relief and climate.

	Northwestern desert		Aravali mountain	Eastern Plain	Hadoti Plateau
	Arid	Semi-arid			
Area %	61		9	23	7
Population (%)	40		10	39	11
Districts (OLD)	12		13	10	7
Soil	Sandy soil		Mountain soil	alluvial	Light black/cotton
Rainfall	0-20 cm	20-40 cm	40-60cm	60-80 cm	80-120
Climate	Arid and semi arid		Sub humid	humid	Maximum humid
Vegetation (Koppen)	Xerophytes & thorny	Steppe (Largest)	Dry deciduous	Dry and wet	Savana (vagad hadoti +Mt abu)

favourable conditions for **conventional** energy resources (coal, petroleum, natural gas) and **non-conventional** energy resources (solar energy, wind energy, biogas) are found.

- **Tertiary** period **sedimentary rocks** are predominant in which deposits of **fossil minerals** like coal, petroleum, natural gas, limestone etc. are found.
- **Rainfall** less than **25 cms** annually
- Districts- Bikaner, Barmer, Balotra, Jaisalmer, Jodhpur, Nagaur, Churu
- **Area** - 120500 Sq. Km (Thar Desert)
- Height of sand dunes – 6 m to 60 m
- Length of sand dunes – 3 km to 5 km
- Towards west of it is the sandy arid desert **Marushthali** also known as the **Thar Desert**.

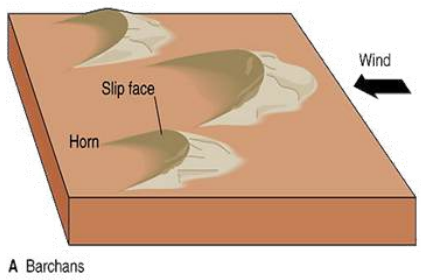


- **March of the Desert :-** The process of desert advancement or expansion of desert is called **March of Desert** or desertification for which **Nachana** village of Jaisalmer is famous. The Indian desert is expanding towards Delhi, Haryana, Uttar Pradesh and Madhya Pradesh.
- Shifting sand dunes is locally termed **Dharians**.
- Divided into two parts
  1. Sand dune region (58.5%)
  2. Dune free region (41.5%)

Sand dune region

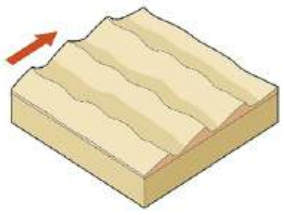
- Types of sand dunes-
  - ➢ Sand dunes are geographical structure formed by deposition of fine soil by wind
  - ➢ Majority six types of sand dunes are found in Rajasthan

1. **Barkhan sand dunes (Barchans)**-
   - ➢ **Shape:** Semicircular dunes; the term "Barkhan" is derived from Turkish, meaning "semicircle."

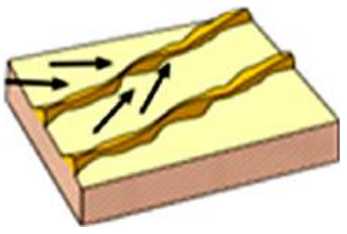


A Barchans

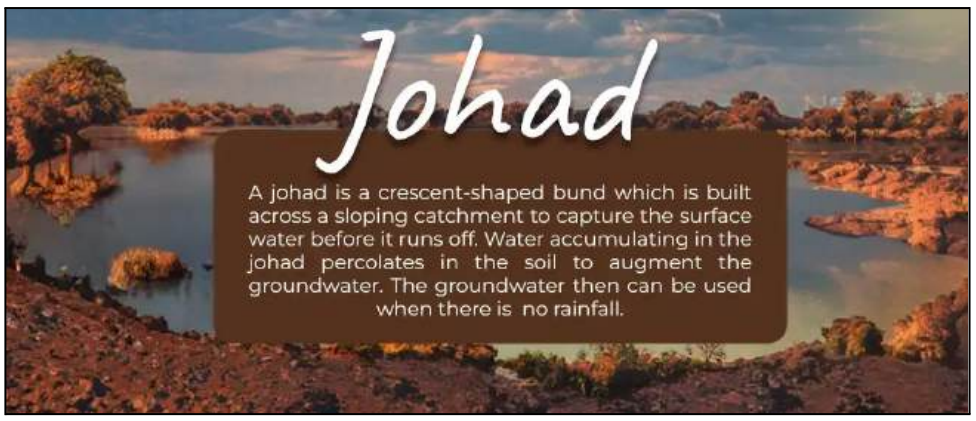
   - ➢ **Features:**
     - **Windward side (convex slope):** Faces the wind and has a gentle slope.
     - **Leeward side (concave slope):** Faces away from the wind and has a steeper slope.
   - ➢ **Mobility:** Highly mobile, leading to significant desertification.
   - ➢ **Maximum Expansion: Shekhawati region**, particularly in **Churu**.
2. **Transverse sand dunes**-
   - ➢ **Shape:** Formed at right angles (perpendicular) to the wind direction due to obstructions in the wind's path.



   - ➢ **Features:** Prominent ridges aligned across the wind flow.
   - ➢ **Maximum Expansion: Jodhpur**, and parts of **Rawatsar (Hanumangarh), Suratgarh (Sri Ganganagar), Churu, and Jhunjhunu**.
3. **Longitudinal sand dunes (Linear Dunes)** -
   - ➢ **Shape:** Long and narrow, aligned parallel to the wind direction.



   - ➢ **Features:** Stretch over long distances in the direction of prevailing winds.
   - ➢ **Maximum Found: Jaisalmer** region.
4. **Star shaped sand dunes**-



3. Nagaur Highland

- Sandy barren areas free from sand dunes Extending in Nagaur and Ajmer.
- This region is a 300 to 500 meter high land region.
- This region is a highland area separate from the Aravalli mountainous region.
- Inland water drainage is found mainly.
- Some salty lakes in the eastern parts of this region are Sambhar, Didwana, Nawa, Kuchaman.According to Professor H.S. Sharma, some geologists have described these lakes as the remnants of the Tethys Sea, which is a false fact because sea water contains magnesium while the water of these lakes lack magnesium.
- Source of salt in there lakes-
  1. The micaceous salty rocks found beneath the soil from which the salt comes to the surface by **capillary action** which then turns into sodium chloride after evaporation.
  2. During the rainy season, small rivers collect salt particles along with water and bring them here (inland drainage)
- Soil contains excess sodium chloride, so it's unfit for agriculture (barren)
- **Hump belt/kubad patti** – Due to evaporation of salty water salt gets accumulated in pits which have **high content of fluoride salts** in it. The hump belt is found between the borders of Nagaur-Ajmer but the area from **Jayal to Pushkar** is most affected. Due to excess fluoride in water, hunchback is seen among the residents here.Fluorosis disease is very commonly seen in local residents , in which teeth become yellow, bones become crooked, back bends due to which people develop humps, hence it is called Hump Belt/Banka Patti/Hoch Belt.

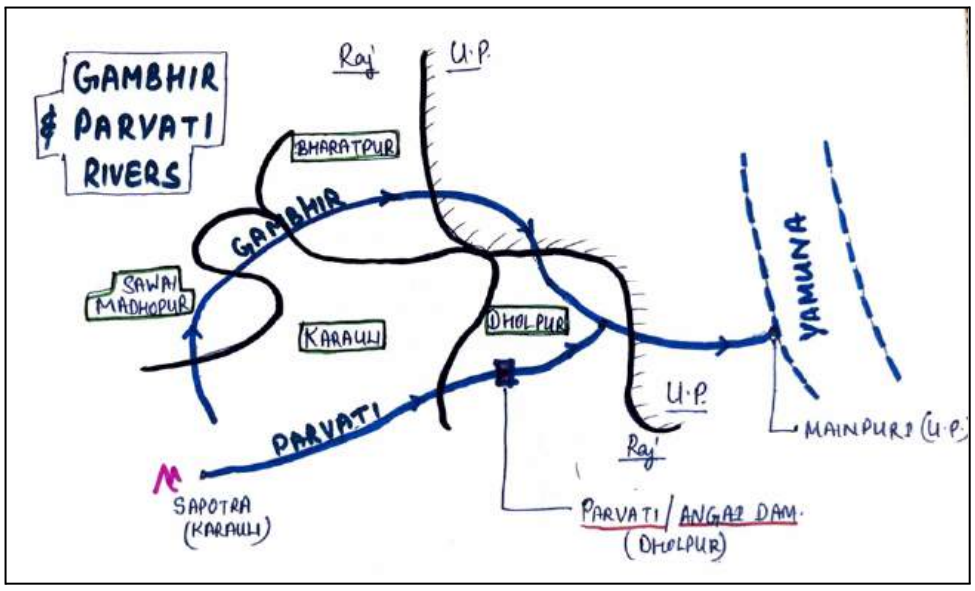
4. Luni Basin (Godwad region)

- **Extends** from Jodhpur, Jalore, Pali, Balotra & Barmer.
- **Alluvial plain** Formed by Luni river and its tributaries,Which is called 'Luni Basin' or 'Luni Jawai Basin'. Salinity is also visible on land in some areas adjacent to the Rann of Kutch.
- **Soil** - New alluvial soil which covers 47.51 percent of the entire luni basin.
- It is spread over **35,000 sq km**.
- **Most humid region** of Western Rajasthan
- Main canal of Luni basin - **Narmada Canal**
- The entire area of this region is plain, but some solitary hills are also located in this region, the main ones of which are as follows
  - **Chappan Hills** - Circular hills about 11 km long and 1.5 km wide are spread from Mokalsar village to Siwana in Balotra. Being a **group of 56 hills**, they are called 'Chhappan ki Paharis'. Granite is found in abundance in it, hence it is also called 'Granite Mountain'. **Peeplood** (Balotra)- It is called the Mount Abu of the desert or the **Little Mount Abu of Rajasthan**. It is the place with the highest rainfall in western Rajasthan. The temple of Haldeshwar Mahadev is situated in Peeplood
  - **Jalore -Siwana Hills** are famous for Granite reserves (Jalore is called Granite City) Hills made of granite and hills of Malani rhyolite are found in the form of domes and inselbergs. These are spread up to Mandalia, Hemawas, Ravaniya, Chotila, Khejarla, Kakni, Mogra Khurd
  - **Malani Hills**- famous for limestone reserves.
  - **Nakoda Hills** (Balotra) - This is a religious place of Jainism, Parshvanath temple is built here, which is known as Nakoda Bhairava.
  - **Sendra Hills** (Beawar) - Rocks of various shapes including serpentine are found in Sendra (Beawar). There is a possibility of a rock garden.
- **Run of Nehra** (Neerhad)- after Balotrat that part of Barmer and Sanchore district which touches Kutch of Gujarat, here due to upwelling of water from beneath, water of Luni river turns salty. It is

- **Dheel**- Tributary of Banas, originating from Baawli Village (Tonk) and flows through Tonk and Sawai Madhopur.
- **Menal-** Originates from Begun (Chittorgarh) and meets Banas at Bigod Triveni Sangam.
- **Bedach/Aayad** -
  - Originates from Gogunda Hills and after flowing 190 kms through Udaipur & Chittorgarh, meets Banas at Bigod Triveni Sangam along with Menal.
  - River is called Aayad Prior to Udaisagar Lake and after that it is called Bedach.
  - Its tributaries are Gambhiri Gujari Arooi and Baagan.
  - Dams - Madaar dam(udpr),Ghosunda dam (chittor)
- **Chandrabhaga**- Originates from Devado ka Gudha, Amet (Rajsamand) and meets banas at Matrikundiya
- **Gambhiri**- Originates from Javed Hills Ratlam Madhya Pradesh flows only through Chittorgarh and meets Bedach . Gambhir dam is constructed on it.
- **Morel**-Originates from hills of Chainpura Village, Bassi and flowing through Dausa and Sawai Madhopur and meets banas at Karauli Sawai Madhopur border.
- **Kalisil** – Originates from Saputara Karoli and meets banas at Karauli Sawai Madhopur border.

Gambhir

- Originates from hills of Nadothi Village, Saputara Karoli.
- Also called as Uttanga River in Uttar Pradesh and Parvati in Dholpur It meets Yamuna River at Rithvillage Agra.
- Tributaries are Panchna, Parvati, Khaer Machi, Ata, Bhadravati,Barkheda.
- **Panchna dam** is built over Panchna River (Dam is made of mud with assistance of USA)



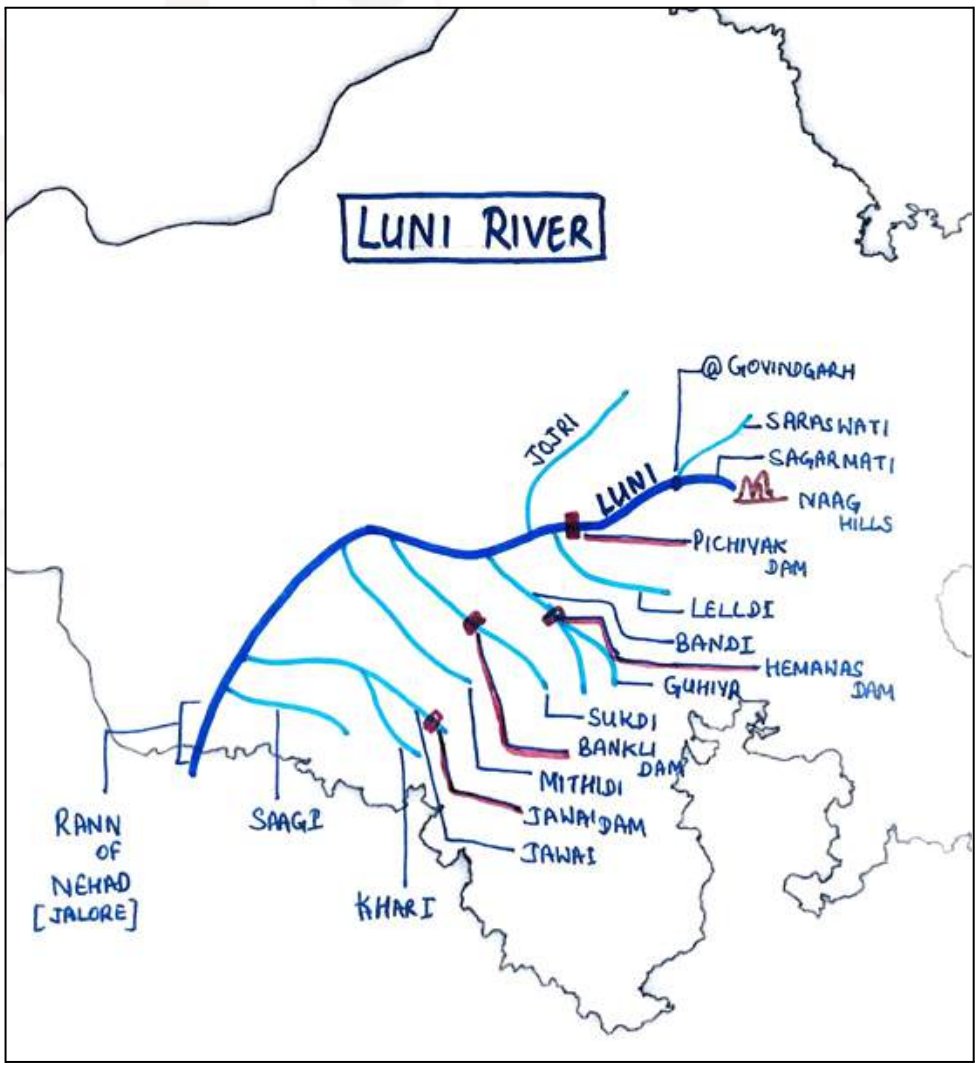
Parvati

- Originates from Chawar Hills of Karauli and meets Gambhir river at Kharagpur Dholpur, Parvati/ Angai Dam is built on it.

Rivers flowing towards Arabian Sea

These all rivers are seasonal rivers

LUNI



- Originates from Nagpahad(Nag hills) Ajmer. After flowing for 495 kilometres, Disappears in run of Kutch Gujarat. Flows for 350 kilometres in Rajasthan through districts ajmer, nagaur, beawar, Jodhpur, Balotra, Barmer and Jalaur.
- Often termed as most polluted river of Rajasthan (NGT has imposed fine on state government for

- ❖ Bhabhulya (due to spiral or cyclonic winds)
- ❖ Least humidity is found during this season

2. Rainy Season/Monsoon

- ❖ Arrival 25th June (@banswara, Dungarpur)
- ❖ Retreat 30th September
- ❖ Average annual rainfall **57.5cms (india-125cms)**
- ❖ Monsoon rains contribute 90% of Rajasthan's annual rainfall
- ❖ Southwest monsoon is divided into two branches- Arabian sea branch and Bay of Bengal branch.
- ❖ Arabian sea branch again divides into 3 branches- western ghat, Chota Nagpur, Himachal branch (causes first rain in Rajasthan which is very low).
- ❖ Bay of Bengal branch divides into two branches- eastern Himalaya branch and Western Great northern-plain branch (brings maximum rainfall in Rajasthan)
- ❖ EL-NINO- is a hot oceanic current occurring during the last week of December, which weakens monsoon in India and Rajasthan also(also known as Ocean fever / Child of Christ)
- ❖ LA-NINA-is cold oceanic current occurring during the last week of December, which makes monsoon strong for India and Rajasthan also (also known as younger sister of EL - Nino)

3. Autumn season

- ❖ Retreating of Monsoon (withdrawal of monsoon)
- ❖ Kartik heat (increase in temperature when the Monsoon is retreating)
- ❖ Oct-nov months
- ❖ Minimum daily temperature difference

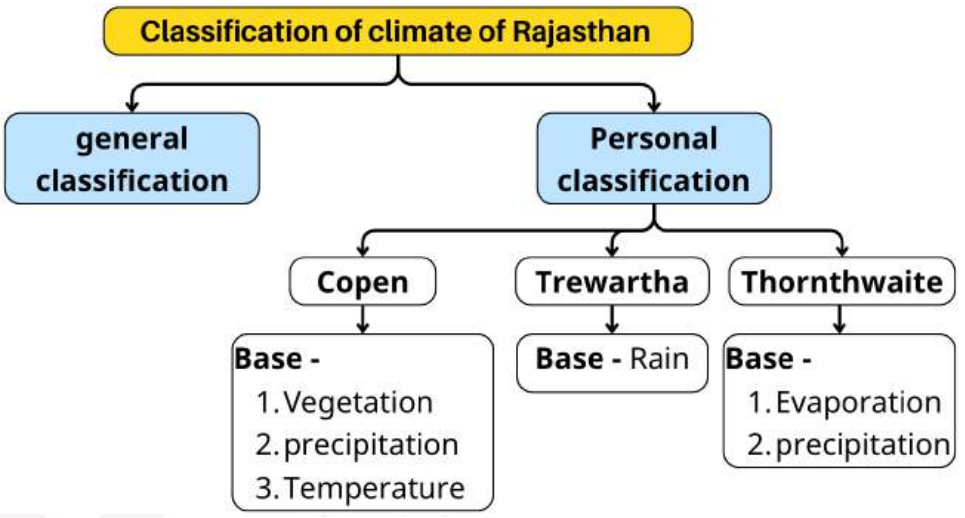
4. Winter season

- ❖ High pressure and low temperature
- ❖ December to March
- ❖ Cold winds from Himalayas

Mavath

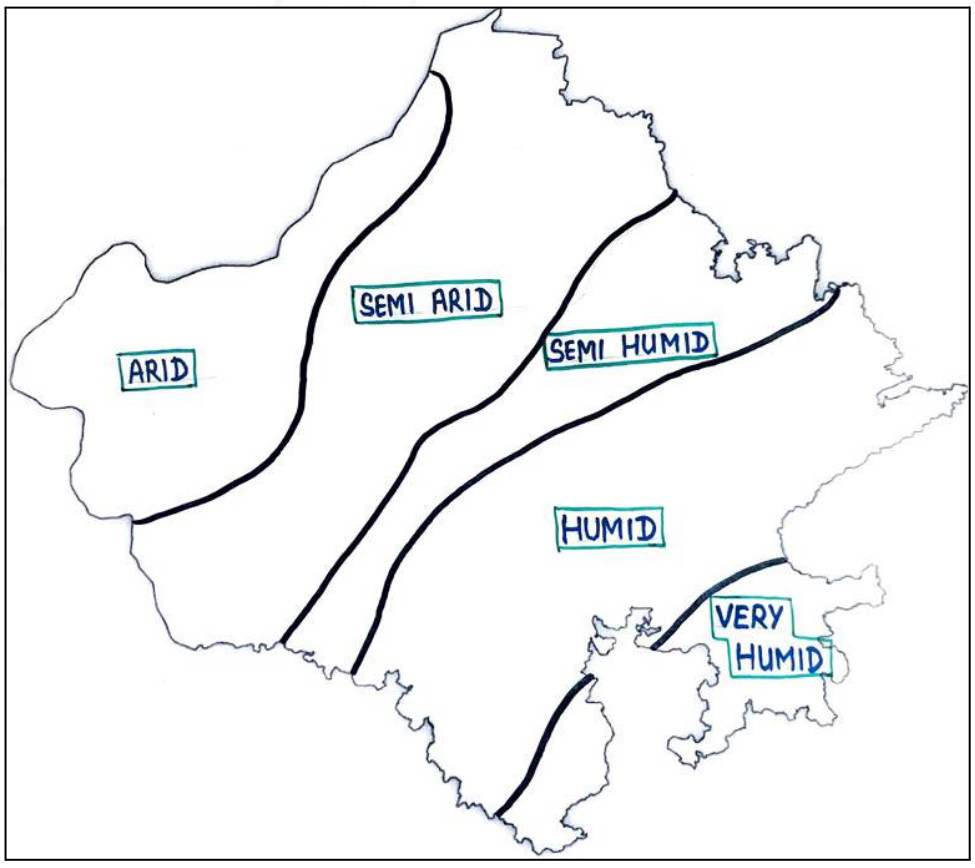
- ❖ winter rainfall during month of December to march, brought by western disturbances from Mediterranean sea(western jet stream flowing at low latitudes); called as **golden drops**(blessing for rabi crops) ;
- ❖ contributes 10% of Rajasthan's annual rainfall
- ❖ also called as temperate monsoon/winter monsoon/ Mediterranean monsoon/north west monsoon.

Climate Classification



General Classification of Climate

Rajasthan is divided into five parts on the basis of Rainfall & Temperature -



- Among Kharif, 60-65% food grains and 10-15% oilseeds, 4% cotton and sugarcane are sown.
- 80% of rainfed crops are sown(rainy season crop)
- Being a, it is completely dependent on South-West monsoon rain.
- Sowing time – during months of June & July
- Harvesting time - September October
- Also called as- Rainy crops, Siyalu, Savani crop.
- Example - Paddy, soybean, sesame, green gram(moong), gram, cowpea, sorghum, millet (ragi, bajra), groundnut, cotton, castor, maize, moth.

RABI CROPS

- Sowing - October November and Harvesting March April
- Also called as Winter or Unalu Crop
- Rainfall from the Western Disturbance is beneficial for Rabi crops(MAAVATH/GOLDEN DROPS)
- These require low temperature During sowing and maximum temperature for ripening.
- Example - Wheat, Barley, Gram, Peas, Mustard, Potato, Lentils, Linseed, Rye, Coriander, Fennel, Fenugreek , Isabgol, Opium, Taramira etc.

ZAID CROPS

- This is an intermediate crop between Rabi and Kharif, which is sown in summer.
- Sowing in March and harvesting by end of June
- Example - Cucumber, watermelon, bitter gourd, brinjal, ridge gourd, bottle gourd, etc.

MAJOR CROPS- Production & Distribution

Millet

- It is a Kharif crop and is most sown food grain in Rajasthan
- **Requirements**
  - Temperature - 35-40 degrees
  - Climate – Dry
  - Soil - Sandy
- Most sown area - Barmer
- Rajasthan ranks **first** in the country, contributes **38.98%** to the total production of the country.
- First - **Alwar**, Second - Jaipur
- **Institutes**
  - Millet Research Centre-Barmer
  - Millet Excellence Center - Jodhpur
  - Varieties - Raj 171, Moti, RCB-2, HB-3, Pusa, Composite 383, RHB-30, RCB-911

Cotton

- It is Kharif commercial crop
- **Requirements**
  - Temperature - 20-30 degrees
  - Climate - Tropical climate
  - Soil - Light black soil
- Rajasthan ranks **FOURTH** in production of Cotton in India(7.95% Contribution in Total produce)
- **production: -** First **Hanumangarh**, Second Sri Ganganagar
- **Varieties -** Vikas, Vikram, Vijay, Narmada, Girnar, Digvijay,Varaha Lakshmi, PST-9, RAJ HH-16, RS-875
- **5 F benefits of bajra :** Food, Febric, Fertiliser, Fuel and Fodder
- Union Budget 2023-24 : Millets → Shree Ann

SORGHUM/JOWAR

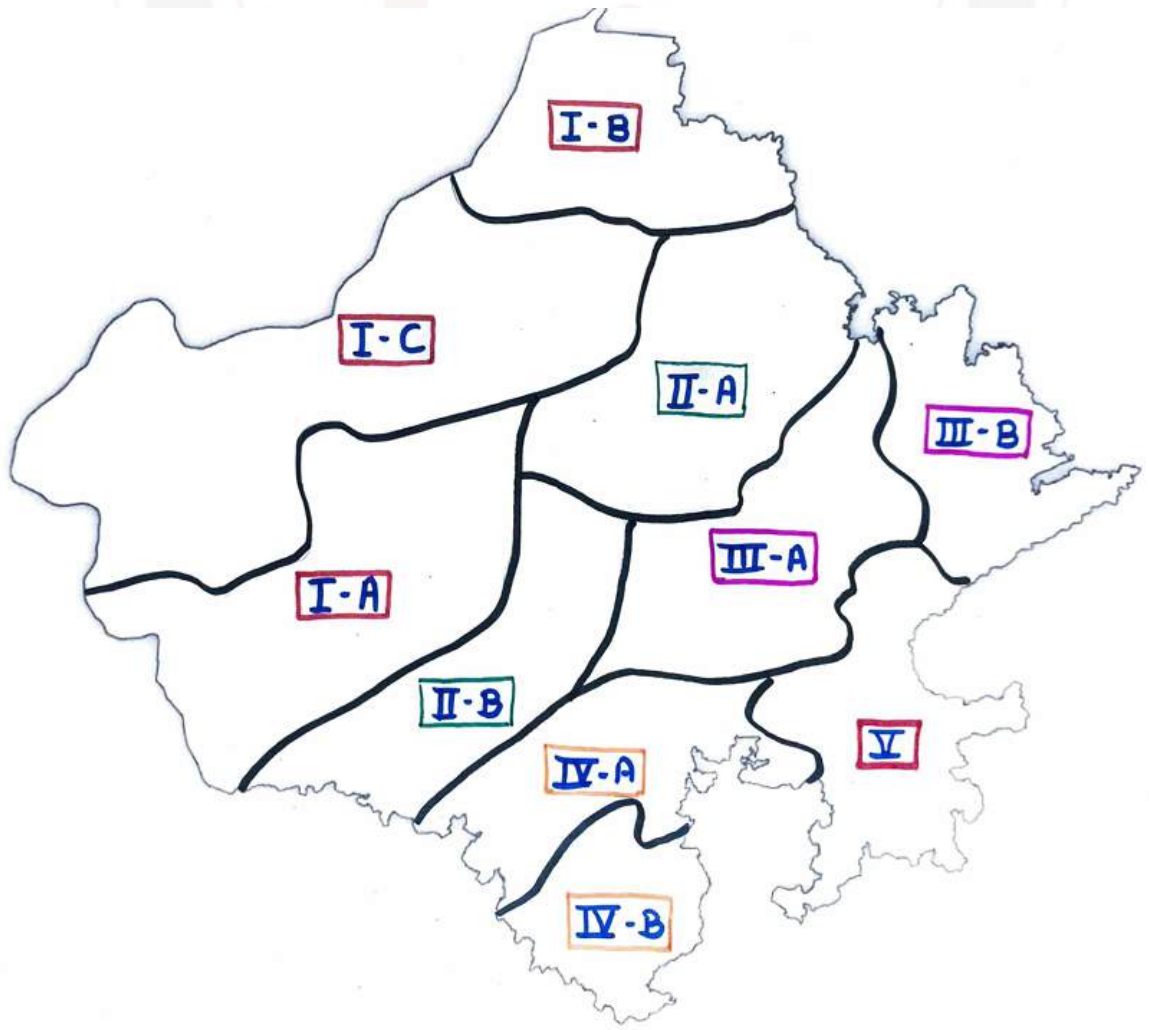
- It is a kharif crop Kharif crop
- **Requirements**
  - Climate Hot climate
  - Temperature 25-30 degrees
- Rajasthan ranks **THIRD** in India (12.67% Contribution in Total produce)
- **Production:** First **Ajmer**, Second- Bhilwara

Table: 4.5 Comparative Status of major crops production with other States

S. No.	Crops	First Position	Second Position	Third Position	Contribution of Rajasthan in total production of Country (in percentage)
1.	Rapeseed & Mustard	Rajasthan	Uttar Pradesh	Madhya Pradesh	46.13
2.	Bajra	Rajasthan	Uttar Pradesh	Gujarat	44.66
3.	Total Oilseeds	Rajasthan	Madhya Pradesh	Gujarat	22.78
4.	Nutri-Cereals	Rajasthan	Karnataka	Madhya Pradesh	15.66
5.	Guar	Rajasthan	Haryana	Gujarat	90.36
6.	Groundnut	Gujarat	Rajasthan	Tamil Nadu	18.76
7.	Jowar	Maharashtra	Karnataka	Rajasthan	14.87
8.	Gram	Maharashtra	Madhya Pradesh	Rajasthan	14.75
9.	Total Pulses	Madhya Pradesh	Maharashtra	Rajasthan	13.88
10.	Soyabean	Maharashtra	Madhya Pradesh	Rajasthan	8.05

AGRO-CLIMATIC ZONES OF RAJASTHAN

- According to ICAR India is divided into 126 agro-climatic zones, out of which 10 fall under Rajasthan
- Factors considered are rainfall, temperature, topography, soil characteristics, cropping pattern, irrigation facilities availability



- Zoos (Jaipur Jaipur Kota Bikaner)
- Deer Parks (7) : Ashok Vihar, jaipur; machiya safari, jodhpur; pushkar etc
- Captive Breeding Center: Great Indian Bustard (GIB) Conservation Breeding Centre in Sam, Jaisalmer
- 4 biological parks (jodhpur Udaipur Kota Jaipur)

National parks

- **Ranthambore National Park,1980**
  - Rajasthan's first and largest National Park Spread over an area of 283km² in Sawai Madhopur District, Over Banas and Chambal River

  - Established as wildlife sanctuary (1955) and a tiger reserve (1973)
  - Also called home of Tigers
  - Tourist attraction places- Ranthambore Fort, Trinetra Ganesh Temple, Jogi Mahal and Dogvalley

- **Keoladeo Ghana bird sanctuary,1981**
  - Established as wildlife century in 1956, Ramsar site 1981, UNESCO World Heritage Site 1985(Only natural heritage site)

  - Called as paradise of birds
  - Smallest National Park Extended over 29 kM² In Bharatpur District over Banganga and Gambhir River
  - Attractions- python Siberian crane

- **Mukundra Hills,2012**
  - 199 sq km-spread over Kota, Chittorgarh, Baran, Jhalawar.
  - 3rd Tiger project of state (Ranthambore,Sariska)
  - Attractions- Gagroni parrot, Abli meeni palace(Kota), Gagron fort, Ravtha palace

Wildlife sanctuaries

- **National Desert Park Sanctuary,1980**
  - 3162 sq km (**largest sanctuary**), Spread over Jaisalmer, Barmer
  - Xerophyte vegetation , Sevan-Leelan grass is found
  - Attractions- Godavan bird (great Indian bustard), chinkara,Desert Fox,Spiny-Tailed Lizard, Akal wood fossil park features remnants from the Jurassic period(Recently remains of whale have also been found)

- **Kela Devi Wildlife Sanctuary,1983**
  - 677 sq km (**second largest**), Spread over Karoli, Sawai Madhopur
  - Dhok forest
- **Kumbhalgarh wildlife sanctuary,1971**
  - 611 sq km (**third largest)**, Spread over Udaipur Pali and Rajsamand
  - Attractions- wolves, ranakpur jain temple

- **Sariska Sanctuary,1955 -** Alwar
  - second tiger project of Rajasthan 1978
  - Attractions-Peacocks and green pigeons Bhartrihari Temple, Neelkanth Mahadev Temple ,Pandupol Temple
- **Sariska 'A' Sanctuary**
  - Alwar
  - smallest and newest sanctuary
- **Tal Chappar Sanctuary,1971**
  - Churu

  - Attractions- Mochia grass, black buck and Kurja (demoiselle crane)
- **Jamwa Ramgarh Wildlife Sanctuary,1982**
  - Jaipur
  - Attractions- Jamwa Mata Temple, dhok forest

- ❖ The chief ore minerals are sphalerite, galena and chalcopyrite. Zinc, lead and copper are dominant.

5. **Stromatolite Park Near Bhojunda, Chittorgarh**
   - ❖ Stromatolites are structures produced by blue-green algae, which through their filaments, attract and bond carbonate particles forming a mat.

   - ❖ They form generally in shallow water where tides bring floating sedimentary material continuously and make it flow through carbonate particles.
   - ❖ Stromatolites are known as impressions of one of the earliest forms of life on earth.

6. **Akal Fossil Wood Park,Jaisalmer**
   - ❖ The wood carries the signature of the forests in a warm and humid climate, bordering the sea some 180 m.y. ago.

   - ❖ The 21 hectare Fossil Park contains about a dozen fossil wood logs lying horizontal in random orientation. The fossils are of the lower Jurassic period.
   - ❖ Potential: Ideal for paleontological studies, ecotourism, and educational tours.

7. **Kishangarh Nepheline Syenite, Ajmer**
   - ❖ Kishangarh syenite, by which the unit is also called, has been dated 1590 million years to 1910 million years.

8. **Jodhpur Group – Malani Igneous Suite Contact, Jodhpur**
   - ❖ Lies at the foot of the picturesque Mehrangarh Fort within the Jodhpur city. The igneous suite marks the last phase of igneous activity of Precambrian age in the Indian Subcontinent.
   - ❖ The contact is enhanced by the multi-coloured igneous suite in contact with light coloured Jodhpur sandstone.

9. **Welded Tuff, Jodhpur**
   - ❖ Occur like weathered Malani volcanics.
   - ❖ They are composed of glass, quartz and feldspar. On cooling they develop joints which give rise to columns and terraces.
   - ❖ The Malani rhyolites comprise pink, maroon, brown, purple, grey and green rhyolite separated by tuff, welded tuff and pyroclastic rocks.

   - ❖ Potential: Geo-tourism linked to heritage sites and understanding sedimentary rock formations.

10. **Great Boundary Fault at Satur, Bundi**
    - ❖ Characterised by a faulted boundary between Pre-Aravallis and Upper Vindhyans.

    - ❖ Constituted by a number of parallel and oblique faults resulting in a step-like feature.
    - ❖ Deformed limestone at the site is worth viewing.
    - ❖ Potential: A research hotspot for geologists studying plate tectonics and structural geology.

11. **Ramgarh crater- Baran**
    - ❖ The 3.5 km diameter crater is an eye pleasing geomorphic feature.