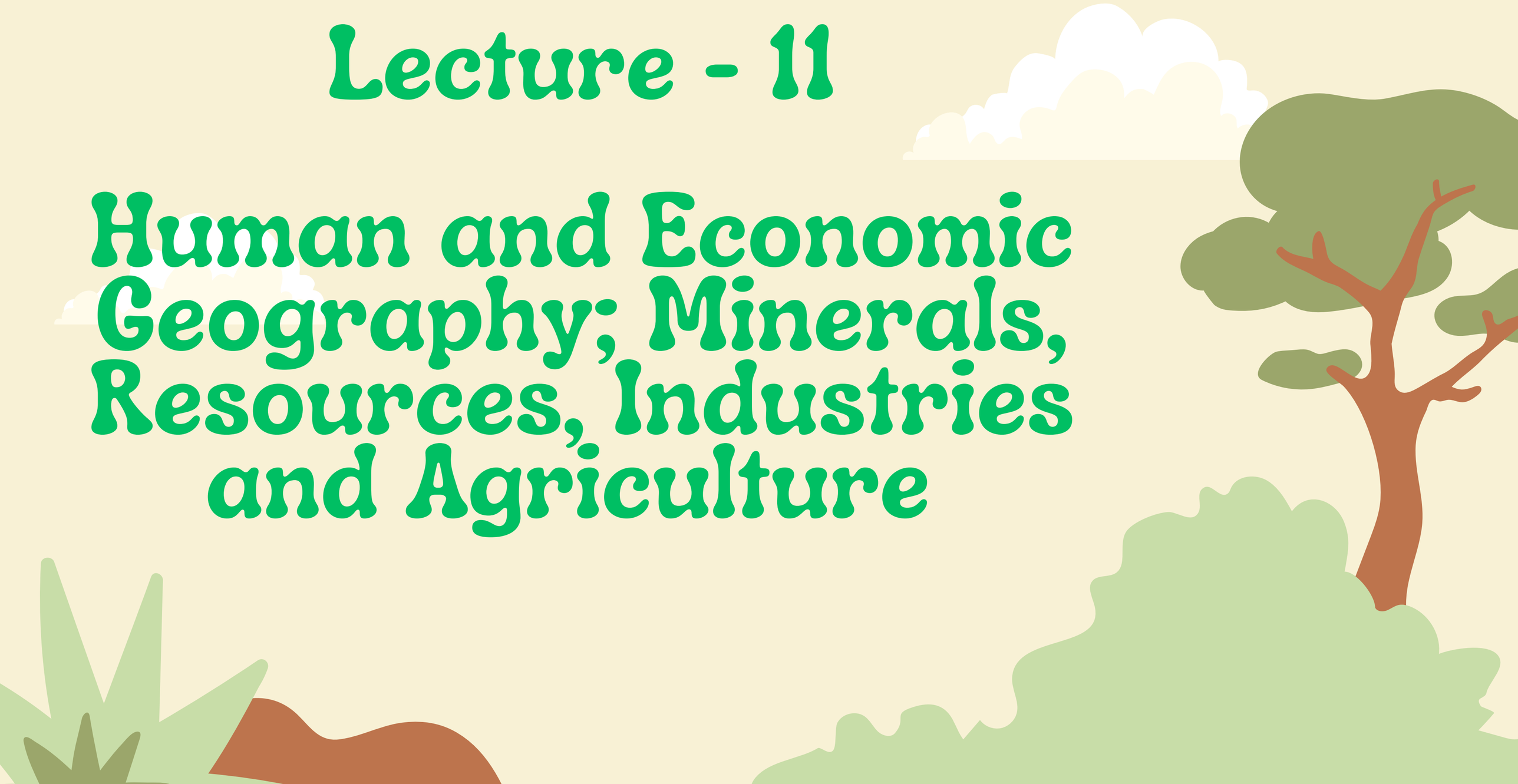
Lecture - 11

Human and Economic Geography: Minerals, Resources, Industries and Agriculture



MICRO ANALYSIS OF THE TREND

Topic	Definition Term-Based	Conceptual	Interlinking with Other Topics	Current Affairs Based	PYQ Repetition	Mapping
Infrastructure	-	-	1 Question	-	9 Questions	-
Minerals and Natural Resources in India	1 Question	1 Question	-	1 Question	11 Questions	7 Questions
Industries and Other Major Projects	1 Question	-	-	-	9 Questions	2 Questions
Agriculture	4 Questions	2 Questions	6 Questions	2 Question	16 Questions	5 Questions

Theme I - Infrastructure

2023

Q. With reference to India's projects on connectivity, consider the following statements:

1. East-West Corridor under Golden Quadrilateral Project connects Dibrugarh and Surat.
2. Trilateral Highway connects Moreh in Manipur and Chiang Mai in Thailand via Myanmar.
3. Bangladesh- China- India- Myanmar Economic Corridor connects Varanasi in Uttar Pradesh with Kunming in China.

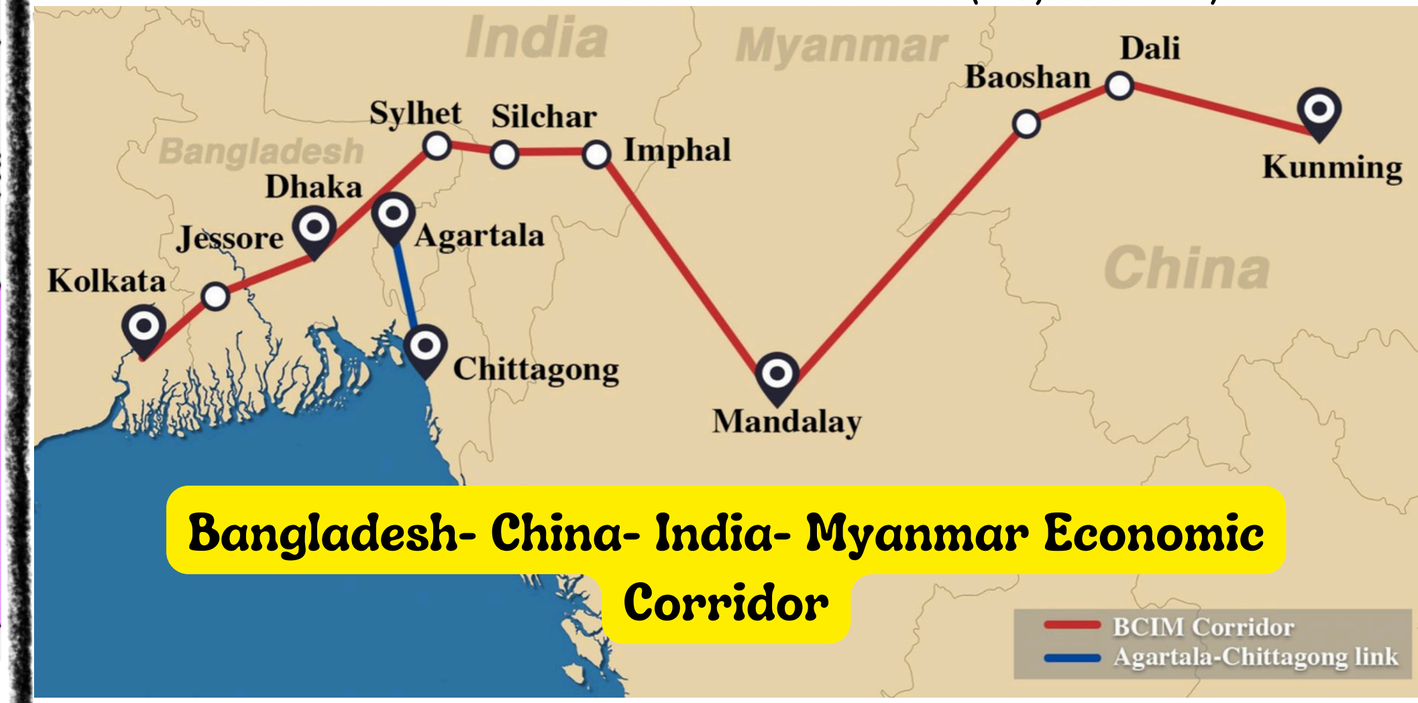
How many of the above statements are correct?

a) Only one
b) Only two
c) All three
d) None

- A highway network connecting Delhi, Mumbai, Kolkata, and Chennai forming a quadrilateral.
- Launch Year: 2001, under Phase-I of the National Highway Development Project (NHDP).
- Executing Agency: National Highways Authority of India (NHAI)
- **Corridor Integration:**
  - North-South Corridor: Srinagar to Kanyakumari
  - East-West Corridor: Silchar to Porbandar

India–Myanmar–Thailand Trilateral Highway (IMT Highway)

- Route: Connects Moreh (India) → Tamu (Myanmar) → Mae Sot (Thailand).
- Integral to India's Act East Policy (formerly Look East Policy).
- Extension Proposal:
- India plans to extend the IMT Highway to Cambodia, Laos, and Vietnam.
- Part of the proposed East-West Economic Corridor (EWEC).
- **East-West Economic Corridor (EWEC):**
  - Operational since 2015.
  - Links Thailand → Cambodia → Vietnam (~3,200 km).



Bangladesh- China- India- Myanmar Economic Corridor

2023

Q. Consider the following pairs:

Port : Well known as
1. Kamarajar Port: First major port in India registered as a company
2. Mundra Port: Largest privately owned port in India
3. Vishakhapatnam Port : Largest container port in India

How many of the above pairs are correctly matched?
a) Only one pair
b) Only two pairs
c) All three pairs
d) None of the pairs

2009

Q. In India, the ports are categorized as major and non-major ports. Which one of the following is a non-major port?

a) Kochi (Cochin)
b) Dahej
c) Paradip
d) New Mangalore

2003

Q. Which one among the following has the largest shipyard in India?

a) Kolkata
b) Kochi
c) Mumbai
d) Visakhapatnam

Major Ports

1. **Chennai Port (Tamil Nadu):** Oldest artificial port in India (1881); 3rd oldest overall.
    - Largest port in the Bay of Bengal; 2nd largest container port in India.
2. **Kolkata Port (West Bengal):** Only riverine port in India; on Hooghly River.
3. **Kamarajar/Ennore Port (Tamil Nadu)**: First major port to be operated by a public company.
4. **Jawaharlal Nehru Port (Maharashtra):** Largest container port in India.
5. **Kandla Port (Gujarat)**
6. **Kochi Port (Kerala):**Only transshipment port in India.
7. **Port Blair (Andaman & Nicobar):** Only major port in island territory.
8. **New Mangalore Port (Karnataka):** Deepest inner harbor on west coast. Only major port in Karnataka.
9. **Visakhapatnam Port (Andhra Pradesh)**
10. **Mumbai Port (Maharashtra):** Old natural deep-water port, built by British in 17th century.
11. **Mormugao Port (Goa)**
12. **Paradip Port (Odisha):** Only major port in Odisha.
13. **Mundra Port (Gujarat) (Privately owned by Adani Ports):** India's 2nd largest port by volume.

2014

Q. Consider the following pairs:

National Highway: Cities connected

1. NH4: Chennai and Hyderabad
2. NH6: Mumbai and Kolkata
3. NH15: Ahmedabad and Jodhpur

Which of the above pairs is/are correctly matched?

a) 1 and 2 only
b) 3 only
c) 1, 2 and 3
d) None

2007

Q. Which one of the following National Highways passes through Maharashtra Chhattisgarh and Orissa?

a) NH 4
b) NH 5
c) NH 6
d) NH 7

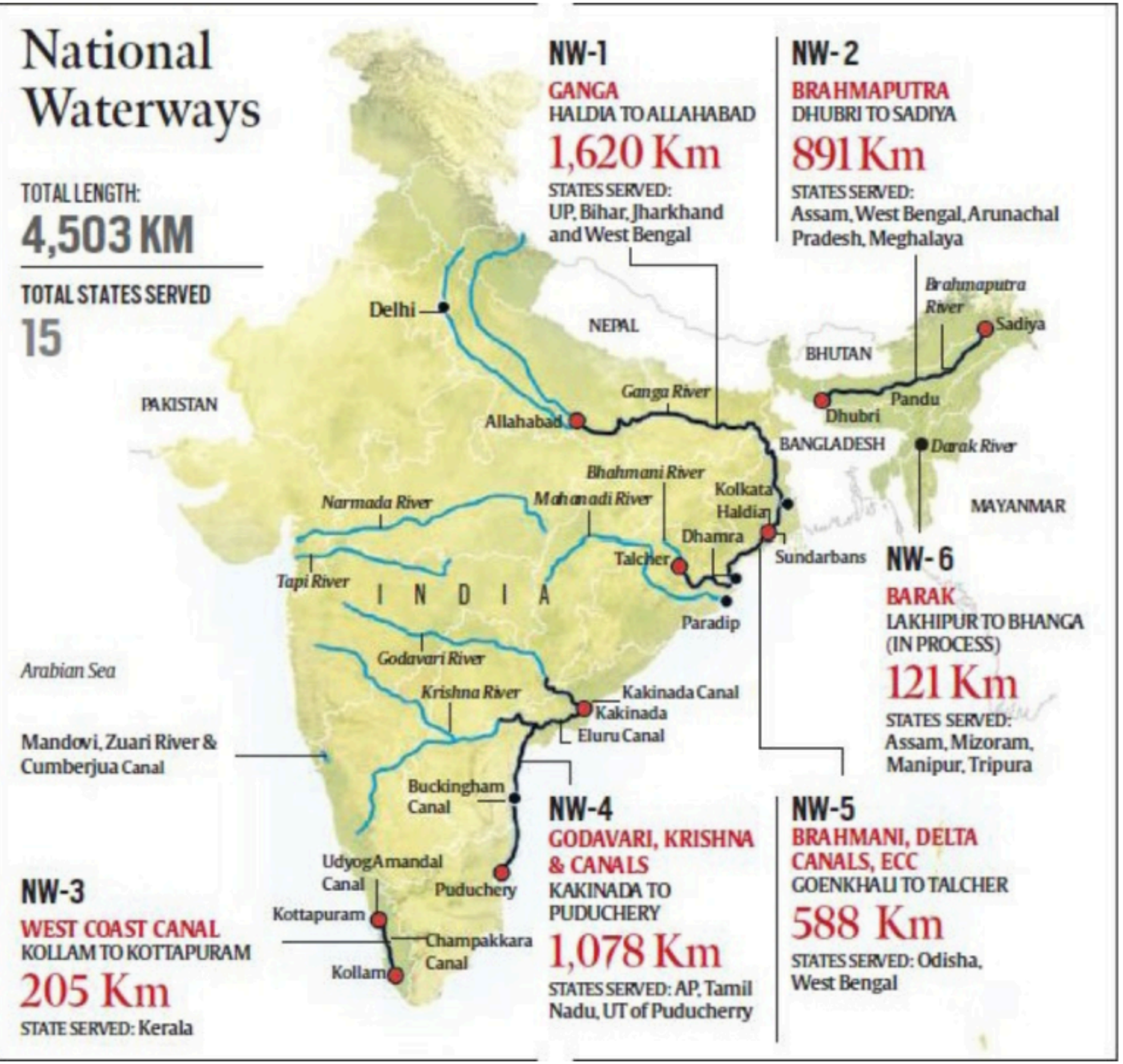
2004

Q. Which among the following National Highway routes is the longest?

a) Agra-Mumbai
b) Chennai-Thane
c) Kolkata-Hajira
d) Pune-Machilipatnam

National Highways

1. **NH 44** is the longest National Highway in India.
    a. 📍 Route: Srinagar (Jammu & Kashmir) to Kanyakumari (Tamil Nadu
2. **NH 766EE** is the shortest National Highway in India.
    a. 📍 Route: Hettikeri to Belekeri Port (Karnataka)
3. **World's Second Highest Motorable Highway:** The Leh-Manali Highway connects:
    a. 📍 Leh (Ladakh) to Manali (Himachal Pradesh)
4. The **old NH-1** was India's first National Highway:
    a. 📍 Linked Delhi to Attari (Punjab) near the Indo-Pak border



1. **National Waterway 1 (NW-1):** Ganga-Bhagirathi-Hooghly river system from Prayagraj to Haldia across Uttar Pradesh, Bihar, Jharkhand, and West Bengal.
2. **National Waterway 2 (NW-2):** Operates on the Brahmaputra River from Sadiya to Dhubri in Assam.
3. **National Waterway 3 (NW-3)**: Utilizes the West Coast Canal, Champakara Canal, and Udyogamandal Canal from Kottapuram to Kollam in Kerala.
4. **National Waterway 4 (NW-4):** Covers Krishna and Godavari rivers with routes like Kakinada-Puducherry canals and Bhadrachalam-Rajahmundry across Andhra Pradesh, Tamil Nadu, and Puducherry.
5. **National Waterway 10 (NW-10):** Operational on the Amba River in Maharashtra.
6. **National Waterway 83 (NW-83):** Located on the Rajpuri Creek in Maharashtra.
7. **National Waterway 85 (NW-85):** Covers the Revadanda Creek-Kundalika River system in Maharashtra.
8. **National Waterway 91 (NW-91)**: Functional on the Shastri River-Jaigad Creek system in Maharashtra.
9. **National Waterway 68 (NW-68):** Runs from Usgaon Bridge to the Arabian Sea on the Mandovi River in Goa.
10. **National Waterway 111 (NW-111)**: Connects Sanvordem Bridge to Marmugao Port on the Zuari River in Goa.
11. **National Waterway 73 (NW-73):** Operates on the Narmada River across Gujarat and Maharashtra.
12. **National Waterway 100 (NW-100):** Functional on the Tapi River across Gujarat and Maharashtra.
13. **National Waterway 97 (NW-97):** Known as the Sundarbans Waterways, running from Namkhana to Athara Banki Khal in West Bengal on the Indo-Bangladesh Protocol Route.

2006

Q. Which one of the following pairs is not correctly matched?

Railway Zone – Headquarters

a) North Eastern Railway – Gorakhpur
b) South Eastern Railway – Bhubaneshwar
c) Eastern Railway- Kolkata
d) South East Central Railway – Bilaspur

1999

Q. Which one of the following statements is not true of the Konkan Railway?

a) The total length is about 760 km
b) It runs through the states of Karnataka, Goa, Maharashtra and Kerala
c) It is the only rail route that cuts across the Western Ghats
d) The Konkan Railway Construction Company which came into being raised money through Public Issues

1998

Q. Which one of the following sets of states stands to benefit the most from the Konkan Railway?

a) Goa, Karnataka, Maharashtra, Kerala
b) Madhya Pradesh, Maharashtra, Tamil Nadu, Kerala
c) Tamil Nadu, Kerala, Goa, Maharashtra
d) Gujarat, Maharashtra, Goa, Tamil Nadu

INDIAN RAILWAYS NETWORK

After Telangana was created and the headquarters of the South Central Railway (SCR) went to the new state, Andhra Pradesh began demanding a new railway zone for the state. On Feb 27 Minister for Railways Piyush Goyal announced the creation of the 18th railway zone – the South Coast Railway (SCoR) – of the country based in Visakhapatnam.

NUTS AND BOLTS

- South Coast Railway will comprise existing Guntakal, Guntur and Vijayawada divisions that currently fall under the South Central Railway
- Waltair (having its headquarters in Visakhapatnam) division – one of the three divisions of the East Coast Railway Zone (ECoR) covering the northern districts of Andhra Pradesh, parts of Chhattisgarh and Odisha – will be split into two
- One part of the Waltair division will be incorporated in the new zone and merged with the neighbouring Vijaywada division
- The remaining portion of the Waltair division will be converted into a new Rayagada division in Odisha under the East Coast Railway
- South Central Railway will consist of the Hyderabad, Secunderabad and Nanded divisions
- According to an Indian Railways internal assessment, the cost of creating infrastructure for the new zone is around Rs 205 crore

ZONES AND DIVISIONS

01.	Northern Railway	Delhi
02.	North Eastern Railway	Gorakhpur
03.	Northeast Frontier Railway	Guwahati
04.	Eastern Railway	Kolkata
05.	South Eastern Railway	Kolkata
06.	South Central Railway	Secunderabad
07.	Southern Railway	Chennai
08.	Central Railway	Mumbai
09.	Western Railway	Mumbai
10.	South Western Railway	Hubballi
11.	North Western Railway	Jaipur
12.	West Central Railway	Jabalpur
13.	North Central Railway	Allahabad
14.	South East Central Railway	Bilaspur
15.	East Coast Railway	Bhubaneswar
16.	East Central Railway	Hajipur
17.	Kolkata Metro	kolkata
18.	South Coast Railway	Visakhapatnam

INDIAN RAILWAYS IN BRIEF

2019: February 27, South Coast Railway, the 18th railway zone, with HQ in Visakhapatnam announced

AT PRESENT: 17 zones and a total of a total of 73 divisions. Zonal headquarters are located in 14 cities: Kolkata, Hajipur, Gorakhpur, Allahabad, Delhi, Secunderabad, Chennai, Hubballi, Mumbai, Jaipur, Bilaspur, Jabalpur, Guwahati, and Bhubaneswar.

2002-2003: Seven new zones and eight new divisions were created

1951-52: Six zonal railways were created

1947: India's total rail network was 54,380 km, comprising 42 big and small networks – networks as small as Sangli (8 km) or as big as Nizam State Railway (2,125 km)

IANS GRAPHICS

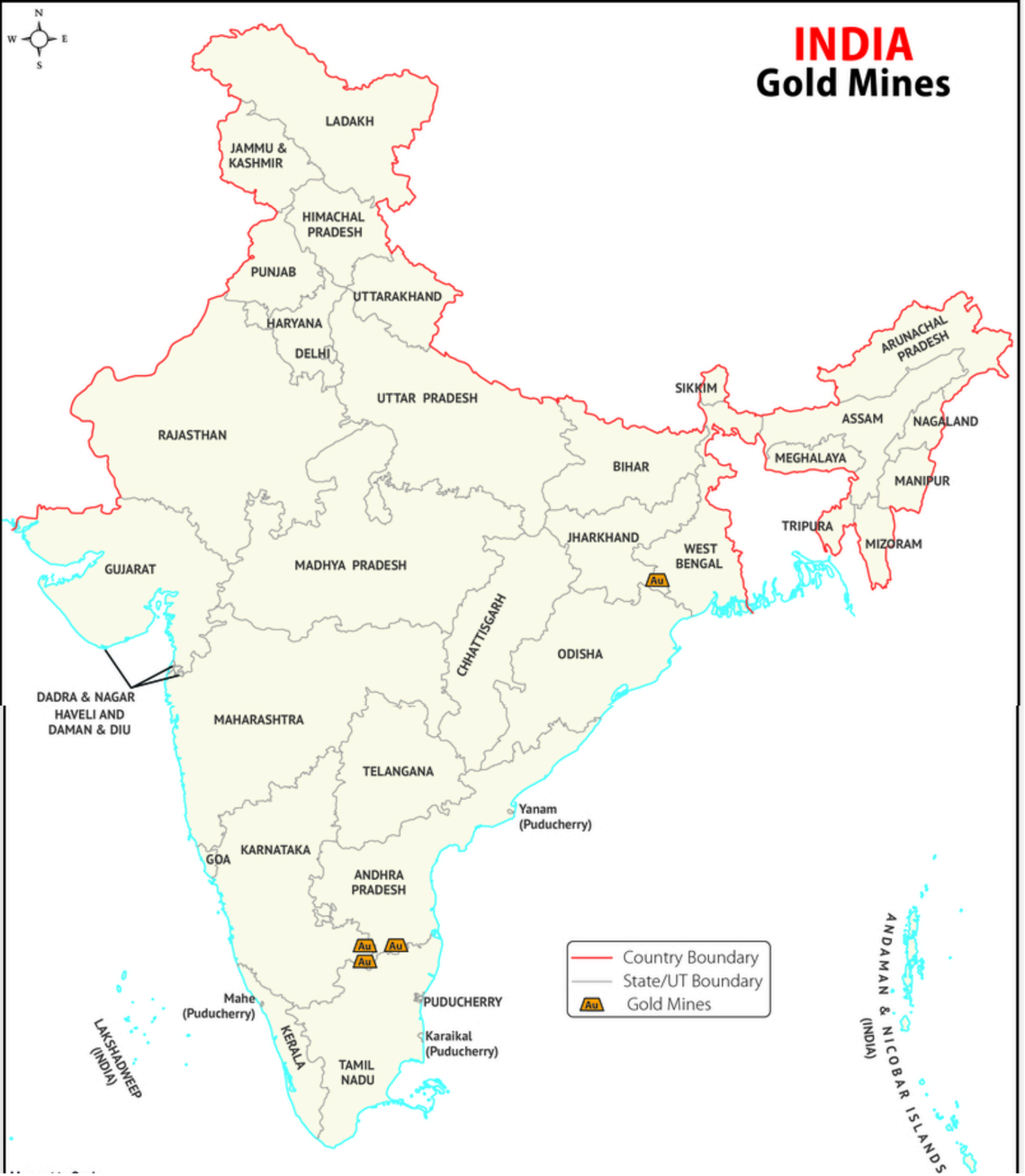
Theme II - Minerals and Natural Resources in India

2023

Q. Consider the following statements:

Statement-I: Switzerland is one of the leading exporters of gold in terms of value.
Statement-II: Switzerland has the second largest gold reserves in the world.

Which one of the following is correct in respect of the above statements?
a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
c) Statement-1 is correct but Statement-II is incorrect
d) Statement-I is incorrect but Statement-II is correct



- India's gold reserves ~600 tonnes, though not a top global produce
- Main gold-bearing states: Karnataka, Rajasthan, Andhra Pradesh, Uttarakhand.
- **Karnataka – Leading Producer**
  - 🟡 Hutti Gold Mine (Raichur) – Largest active mine, run by HGML.
  - ⛏️ Kolar Gold Fields (KGF) – Historic deep mine, now closed.
- **Rajasthan** – Significant Deposits
  - 📍 Kundargi Mine and 📍 Sukhadi Mine
- **Andhra Pradesh** – Emerging Player
- 🟨 Bachupally Mine and 📍 Nellore District
- **Uttarakhand** – Exploration Phase: 🧭 Pithoragarh Mines
- **Switzerland:** a top gold exporter despite lacking domestic mines.
  a. 🏭 Hosts world's major gold refineries, adding high value through processing.

1. **Top reserves:** USA > Germany > Italy > France > Switzerland

2020

Q. Consider the following minerals:

1. Bentonite
2. Chromite
3. Kyanite
4. Sillimanite

In India, which of the above is/are officially designated as major minerals?

a) 1 and 2 only
b) 4 only
c) 1 and 3 only
d) 2, 3 and 4 only

Minerals

In news

Major Minerals: All minerals except minor minerals

THE ECONOMIC TIMES | Industry

English Edition ▾ | **Today's ePaper**

Govt classifies barytes, felspar, mica, quartz as major minerals

1. GoI reclassified Barytes, Felspar, Mica & Quartz from minor to major minerals.
2. Done under the National Critical Mineral Mission for better exploration & scientific mining
3. Found in pegmatite rocks, key for energy transition, tech, aerospace & healthcare.

Minor Minerals:

Examples of Minor Minerals

1. Boulder, shingle, chalcedony pebbles (for ball mill).
2. Lime shell, kankar, limestone (for lime in construction).
3. Murrum, brick-earth, fuller's earth, bentonite, road metal, reh-matti.
4. Slate, shale, marble, stone (for utensils or buildings).
5. Quartzite, sandstone (used in roads/buildings/utensils).
6. Saltpeter, ordinary earth (used for leveling/filling in infra works).

2008

Q. Which of the following minerals are found in a natural way in the State of Chhattisgarh?

1. Bauxite
2. Dolomite
3. Iron ore
4. Tin

Select the correct answer using the code given below:

a) 1,2 and 3 only
b) 3 only
c) 2 only
d) 1, 2, 3 and 4

Iron Ore

Fig. 5.2 : India – Metallic Minerals (Ferrous)

- **India:** largest iron ore reserves in Asia; key types: Haematite & Magnetite.
- Iron ore mines lie close to coalfields in the northeastern plateau → logistical advantage.
- 🔁 ~95% reserves in Odisha, Jharkhand, Chhattisgarh, Karnataka, Goa, Telangana, Andhra Pradesh & Tamil Nadu.

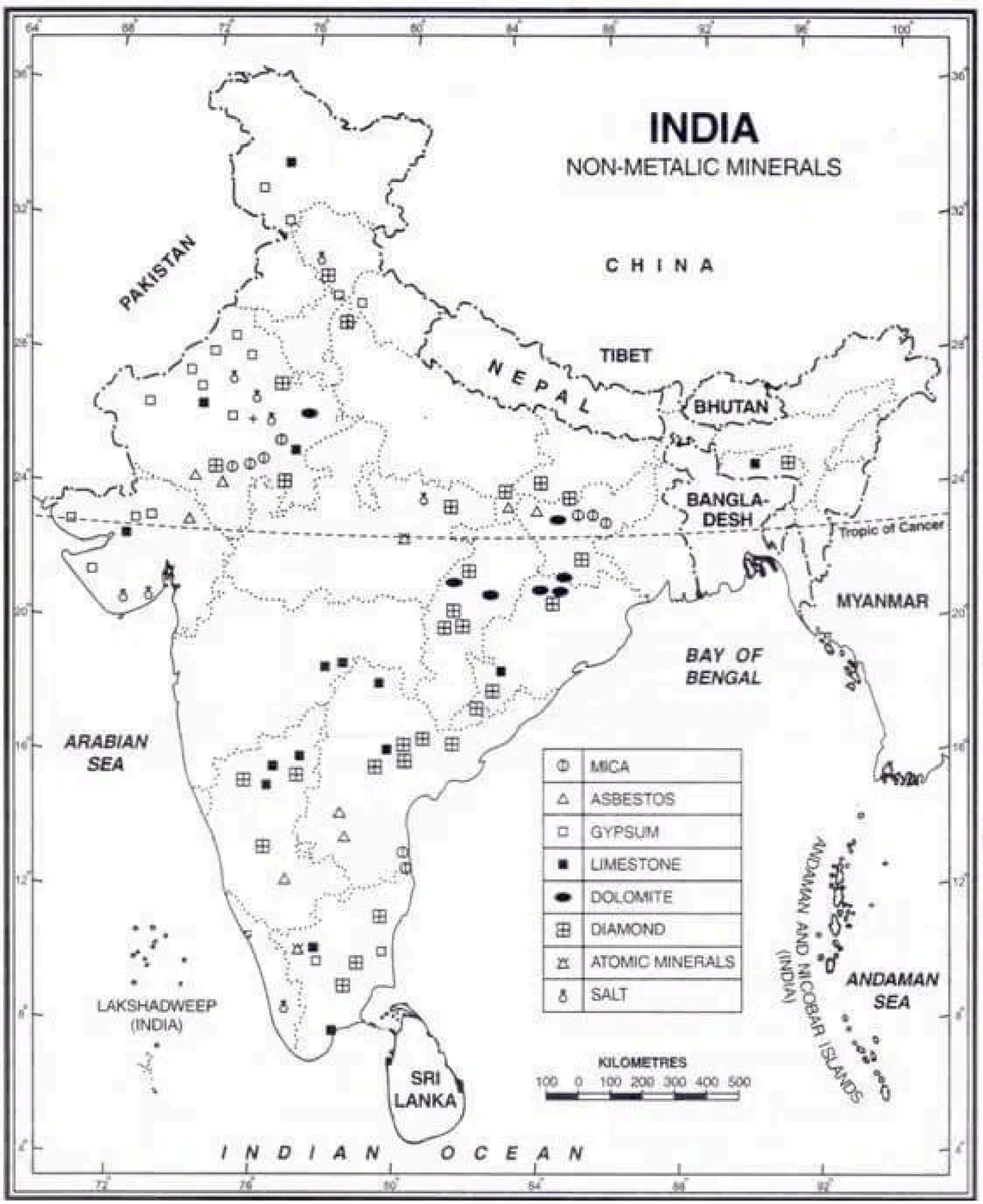
State-wise Iron Ore Distribution

- Odisha
  - Major hill ranges: Sundergarh, Mayurbhanj, Kendujhar (Jhar).
  - Key mines: Gurumahisani, Sulaipet, Badampahar (Mayurbhanj), Kiruburu (Kendujhar), Bonai (Sundergarh).
- **Jharkhand**
  - Historic mining state; important iron & steel plants nearby.
  - Major districts: Poorbi & Pashchimi Singhbhum.
  - Key mines: Noamundi, Gua.
- **Chhattisgarh:** from Jharkhand; **Important mines**: Durg (Dalli, Rajhara), Dantewara, Bailadila.
- **Karnataka:** Sandur-Hospet (Ballari), Baba Budan Hills, Kudremukh (Chikkamagaluru); **Other districts**: Shivamogga, Chitradurga, Tumakuru.
- **Maharashtra:** in Chandrapur, Bhandara, Ratnagiri.
- **Telangana:** in Karimnagar, Warangal.
- **Andhra Pradesh:** in Kurnool, Cuddapah, Anantapur.
- **Tamil Nadu:** Iron mining in Salem, Nilgiris.
- **Goa:** Emerged as an important iron ore producer.

Fig. 5.3 : India – Minerals (Non-Ferrous)

Bauxite

- Bauxite is the ore of aluminium.
- Found mainly in tertiary deposits, associated with laterite rocks.
- Occurs on plateaus/hill ranges of Peninsular India and coastal tracts
- **Odisha - Largest producer**: Kalahandi, Sambalpur, Bolangir, Koraput.
- **Jharkhand:**Rich deposits in Lohardaga patlands.
- **Gujarat**: Bhavnagar, Jamnagar.
- **Chhattisgarh:** Amarkantak plateau.
- **Madhya Pradesh:** Katni-Jabalpur area, Balaghat.
- **Maharashtra**: Kolaba, Thane, Ratnagiri, Satara, Pune, Kolhapur.
- **Minor Producers:** Tamil Nadu, Karnataka, Goa.



Dolomite

- Dolomite = Limestone with >10% magnesium.
- True dolomite = When Mg content >45%.
- Used in: Blast furnace flux, magnesium salts, fertilizers, glass.
- Iron & Steel industry = Major consumer (= 90%).
- **Odisha –** Largest producer (29%) : Sundargarh, Sambalpu r, Koraput.
- **Chhattisgarh –** ~28% production: Bastar, Bilaspur, Durg, Raigarh.
- **Andhra Pradesh** - Among top producers
- **Jharkhand:** north of Chaibasa (Singhbhum) & Palamu district.
- **Rajasthan:** Ajmer, Alwar, Bhilwara, Jaipur, Jaisalmer.
- **Karnataka** : Belgaum, Bijapur, Chitradurga, Mysore.

2004

Q. Match List I (Minerals) with List II (Location) and select the correct answer using the codes given below the Lists:

List I (Minerals)	List II (Location)
A. Coal	1. Giridih
B. Copper	2. Jayamkondam
C. Manganese	3. Alwar
D. Lignite	4. Dharwar

Codes:

A B C D

a) 1 4 3 2

b) 2 3 4 1

c) 1 3 4 2

d) 2 4 3 1

2010

Q. With reference to the mineral sources of India, consider the following pairs:

Mineral – 90% National Sources in:
1. Copper — Jharkhand
2. Nickel — Orissa
3. Tungsten — Kerala

Which of the pairs given above is/are correctly matched?
a) 1 and 2 only
b) 2 only
c) 1 and 3 only
d) 1, 2 and 3

1999

Q. Assertion (A): Chile continues to be an important producer of copper in the world.
Reason (R): Chile is endowed with the world's largest deposit of porphyry copper.

a) Both A and R are true, and R is the correct explanation of A
b) Both A and R are true, but R is not a correct explanation of A
c) A is true, but R is false
d) A is false, but R is true

India: Distribution of Coal, Oil and Natural Gas

2016

Q. In which of the following regions of India are shale gas resources found?

1. Cambay Basin
2. Cauvery Basin
3. Krishna-Godavari Basin

Select the correct answer using the code given below.

a) 1 and 2 only
b) 3 only
c) 2 and 3 only
d) 1, 2 and 3

2014

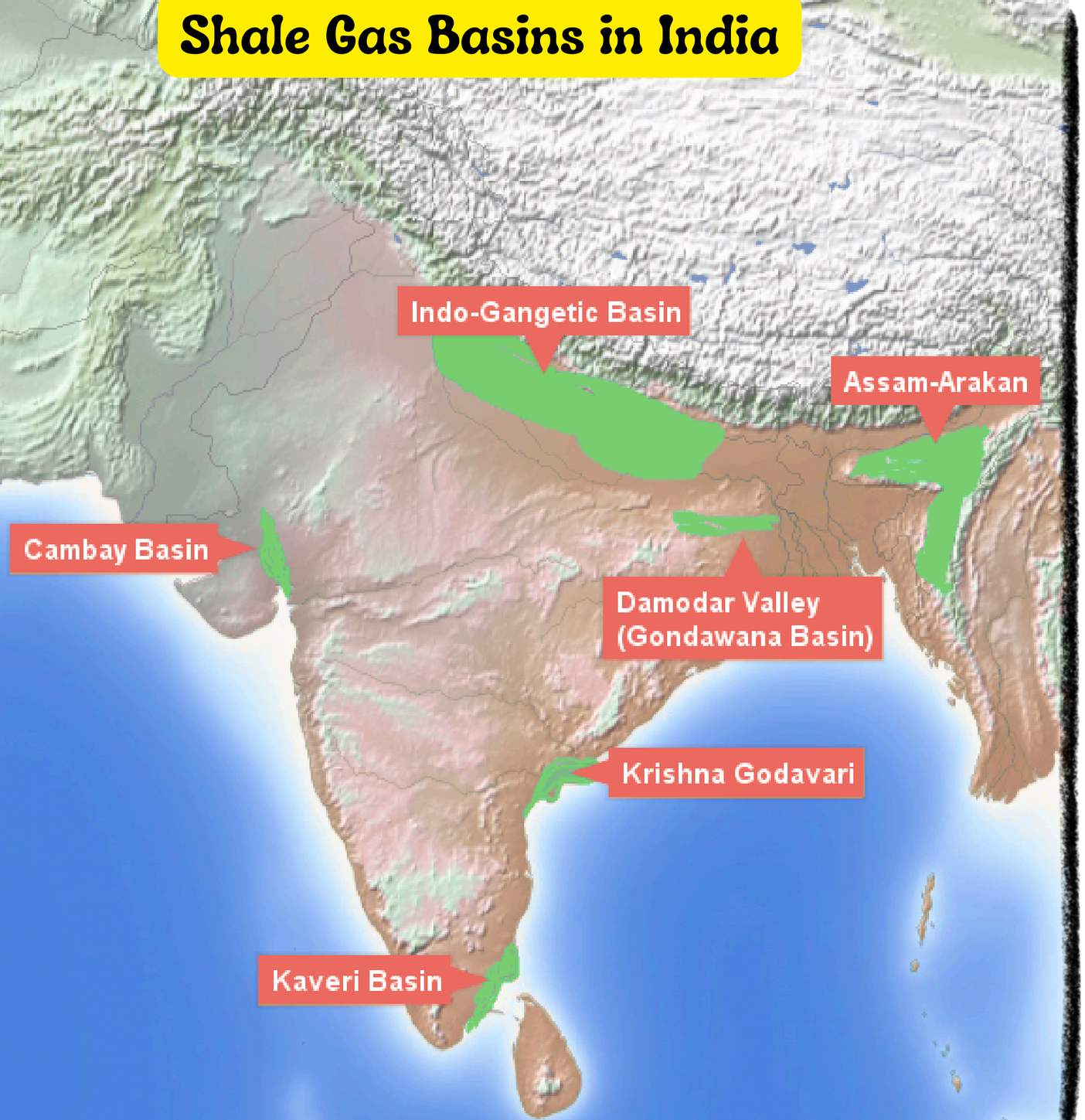
Q. With reference to two non-conventional energy sources called ‘coalbed methane’ and ‘shale gas’, consider the following statements:

1. Coalbed methane is the pure methane gas extracted from coal seams, while shale gas is a mixture of propane and butane only that can be extracted from fine-grained sedimentary rocks.
2. In India, abundant coalbed methane sources exist, but so far no shale gas sources have been found.

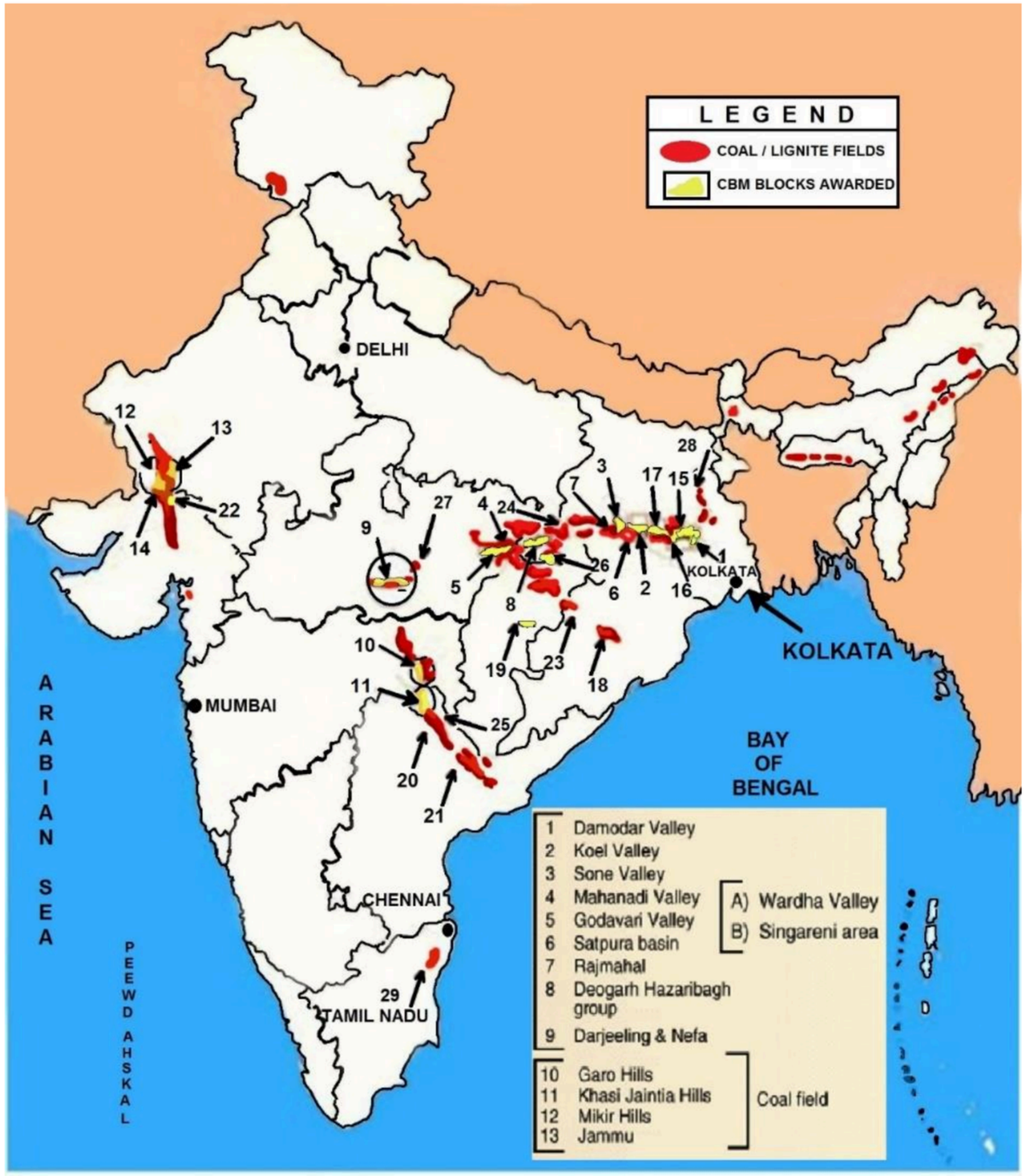
Which of the statements given above are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Shale Gas Basins in India



- **Shale =** fine-grained sedimentary rock formed from organic-rich mud.
- Gas forms under heat and pressure over geological time.
- Some gas migrates to form conventional reservoirs, rest remains trapped in shale.
- Unconventional resource like shale oil; composed mainly of methane.
- **Composition:** ✓ Methane dominant + Contains ethane, propane, butane, CO_2, nitrogen, hydrogen sulfide
- **Extraction Process:**
  - 🔻 Occurs at depths >1,500 meters
  - ⚙️ Extracted using horizontal drilling and hydraulic fracturing (fracking)



- **Coalbed Methane (CBM):** an unconventional form of natural gas found in coal seams.
- Called 'sweet gas' due to absence of hydrogen sulfide
- Composed mainly of methane, with trace ethane, nitrogen, CO_2.
- Unlike conventional gas, CBM has negligible propane/butane, and no condensate
- India, with vast coal reserves, has high CBM potential.
- CBM-Rich Areas in India: mostly in eastern India):
- **Damodar Koel Valley –** Raniganj (East, West, South), Jharia (Parbatpur), Bokaro (East, West)
- **Son Valley** – Sonhat North, Sohagpur East & West
- **Gondwana sediments**

2012

Q. Despite having large reserves of coal, why does India import millions of tonnes of coal?

1. It is the policy of India to save its own coal reserves for future, and import it from other countries for the present use.
2. Most of the power plants in India are coal-based and they are not able to get sufficient supplies of coal from within the country.
3. Steel companies need large quantity of coking coal which has to be imported.

Which of the statements given above is/are correct?

a) 1 Only
b) 2 & 3 Only
c) 1 & 3 Only
d) 1,2, & 3

2008

Q. In which one of the following states are Namchik- Namphuk Coalfields located?

a) Arunachal Pradesh
b) Meghalaya
c) Manipur
d) Mizoram

India: Distribution of Coal, Oil and Natural Gas

- India imports millions of tonnes of coal primarily due to the shortage of high-quality coal, especially coking coal.
- Coking coal is a key raw material in steelmaking and allied industries.
- Major import sources: Australia, Indonesia, South Africa, and Russia.

Types of Coal Fields in India

- **Gondwana Coal: Key Features**
  - Forms ~98% of India's coal reserves and ~99% of production
  - Found only in the Peninsular Plateau region.
  - Source of metallurgical-grade and superior quality coal; Lower carbon content (55–60%) due to younger age than Carboniferous coal.
  - Contains coking, non-coking, bituminous, and sub-bituminous coal; **Anthracite coal is generally absent** in Gondwana field
  - High in volatile compounds and ash content (13–30%) ;Free from moisture, but contains sulphur and phosphorus.

Major Gondwana Coal Basins

- Damodar Basin – Jharkhand and West Bengal
- Mahanadi Basin – Chhattisgarh and Odisha
- Son Basin – Madhya Pradesh and Jharkhand
- Godavari & Wardha Basin – Maharashtra and Andhra Pradesh
- Other Basins – Indravati, Narmada, Koel, Kanhan, and Panch rivers

- **Tertiary Coal: Key Features**
  - 15–60 million years old; younger than Gondwana coal.
  - Found mainly in extra-Peninsular India.
  - Low carbon, high moisture and sulphur content.
  - Not ideal for metallurgy but suitable for hydrogenation (liquid fuel).
- **Found in** Assam, Meghalaya, Arunachal Pradesh, J&K, Himachal, WB (Darjeeling), UP, Rajasthan, Kerala, TN, Puducherry.
- **Assam Tertiary Coalfields Fields:** Makum, Nazira, Mikir Hills, Dilli-Jeypore, Lakhuni.
- **Arunachal Pradesh:**Namchick-Namrup coalfield
- **Meghalaya**
  - Garo Hills: Darrangiri coalfield.
  - Khasi & Jaintia Hills: Siju, Cherrapunji, Liotryngew, Maolong, Langrin.
- **J&K**: Kalakot and nearby areas (south of Pir Panjal).
- **HP:** Coal in Chamba district.

2009

Q. Consider the following statements:

1. India does not have any deposits of Thorium
2 Kerala’s monazite sands contain Uranium

Which of the above statements is/ are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

2009

Q. Which among the following has the world’s largest reserves of Uranium?

a) Australia
b) Canada
c) Russian Federation
d) USA

2006

Q. Which one of the following countries is the leading producer of Uranium?

a) United States of America
b) Canada
c) Germany
d) Zambia

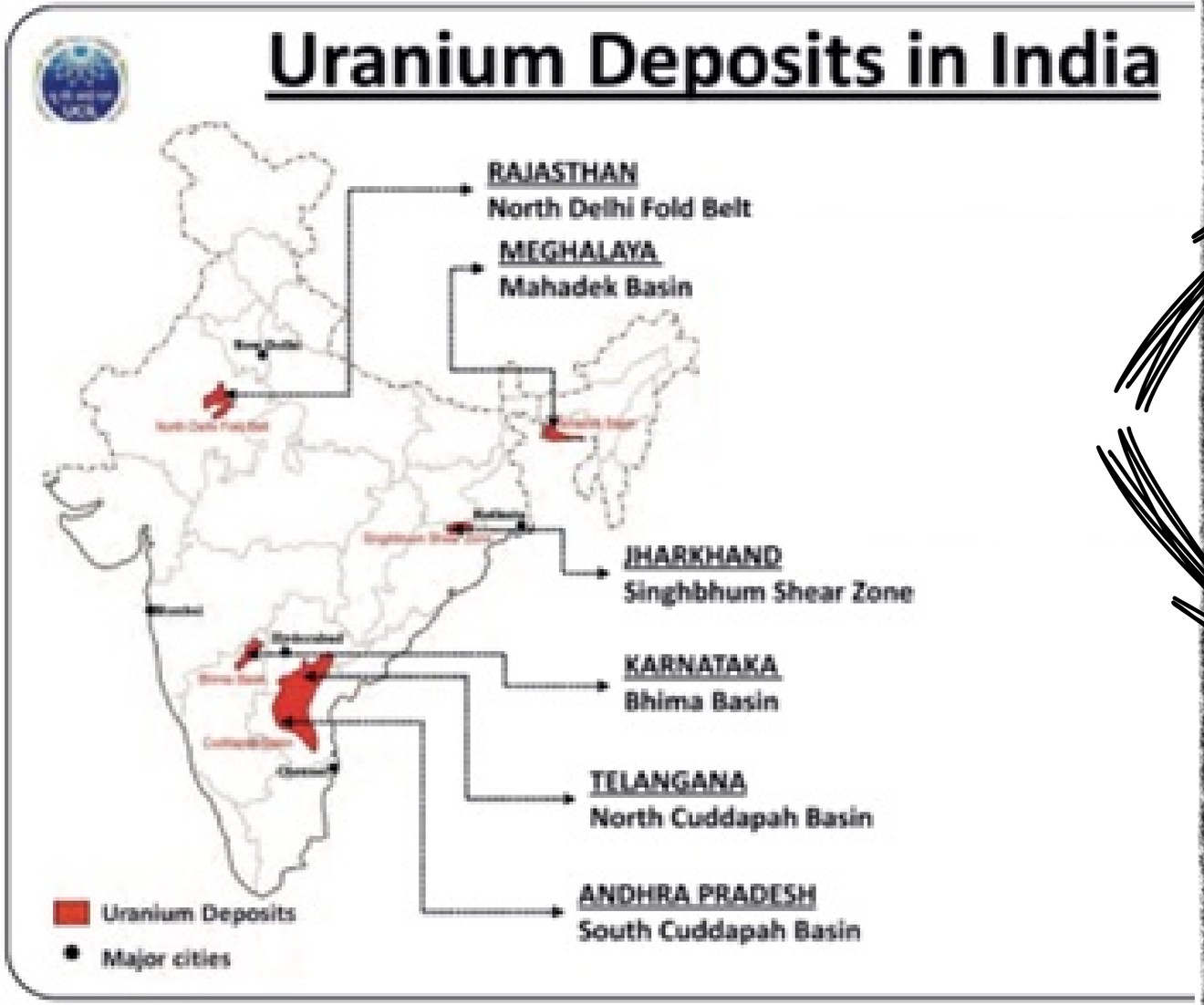


Fig.2: Uranium Deposits in India

Uranium Deposits in India

- Jharkhand: Singhbhum Copper Belt.
- Rajasthan: Udaipur, Alwar, Jhunjhunu.
- Chhattisgarh: Durg district.
- Maharashtra: Bhandara district.
- Himachal Pradesh: Kullu district.

Thorium Deposits in India

- Extracted from monazite and ilmenite in beach sands.
- Major sources:
  - Kerala: Palakkad, Kollam (world's richest monazite).
  - Andhra Pradesh: Near Visakhapatnam.
  - Odisha: Mahanadi delta.
  - Tamil Nadu: Coastal regions.

2022

Q. With reference to India, consider the following statements:

1. Monazite is a source of rare earths.
2. Monazite contains thorium.
3. Monazite occurs naturally in the entire Indian coastal sands in India.
4. In India, Government bodies only can process or export monazite.

Which of the statements given above are correct?

a) 1, 2 and 3 only
b) 1, 2 and 4 only
c) 3 and 4 only
d) 1, 2, 3 and 4

2006

Q. Which of the following substances are found in the beach sands of many parts of Kerala?

1. Ilmenite
2. Zircon
3. Sillimanite
4. Tungsten

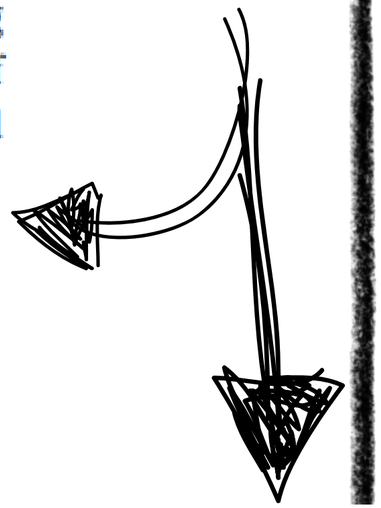
Select the correct answer using the code given below:

a) 1, 2, 3 and 4
b) 1, 2 and 3
c) 3 and 4 only
d) 1 and 2 only

Nuclear energy has emerged as a viable source in recent times. Important minerals used for the generation of nuclear energy are uranium and thorium. Uranium deposits occur in the Dharwar rocks. Geographically, uranium ores are known to occur in several locations along the Singbhum Copper belt. It is also found in Udaipur, Alwar and Jhunjhunu districts of Rajasthan, Durg district of Chhattisgarh, Bhandara district of Maharashtra and Kullu district of Himachal Pradesh. Thorium is mainly obtained from monazite and ilmenite in the beach sands along the coast of Kerala and Tamil Nadu. World's richest monazite deposits occur in Palakkad and Kollam districts of Kerala, near Vishakhapatnam in Andhra Pradesh and Mahanadi river delta in Odisha.

Atomic Energy Commission was established in 1948, progress could be made only after the establishment of the Atomic Energy Institute at Trombay in 1954 which was renamed as the Bhabha Atomic Research Centre in 1967. The important nuclear power projects are Tarapur (Maharashtra), Rawatbhata near Kota (Rajasthan), Kalpakkam (Tamil Nadu), Narora (Uttar Pradesh), Kaiga (Karnataka) and Kakarapara (Gujarat).

Direct from Ncert



The Himalayan belt is another mineral belt where copper, lead, zinc, cobalt and tungsten are known to occur. They occur on both the eastern and western parts. Assam valley has mineral oil deposits. Besides oil resources are also found in off-shore-areas near Mumbai Coast (Mumbai High).

In the following pages you will find the spatial pattern of some of the important minerals.

In news

Union Minister Dr Jitendra says, India is not reliant on China for accessing rare earth minerals

The production of Monazite the primary source of rare earth mineral in India is around 4000 MT per annum: Dr Jitendra Singh

2007

Q. Consider the following statements:

1. Balaghat is known for its diamond mines.
2. Majhgawan is known for its manganese deposits.

Which of the statements given above is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Diamond

- Hardest natural substance on Earth.
- Forms in the mantle; brought to crust by volcanic activity (in dykes & sills).

Diamond Reserves in India

- **Major Sources:**
  - Panna (Madhya Pradesh)
  - Krishna River gravels & Wajrakarur pipe (Andhra Pradesh)
  - **New fields:** Raichur-Gulbarga (Karnataka)
- **Diamond cutting/polishing**: Surat, Navasari, Ahmedabad, Palampur.
- Only Panna and Krishna gravels have estimated reserves.

Top Producers Globally:

- **Russia** – largest reserves
- **Botswana** – top in value (Orapa & Jwaneng mines)
- Canada, Australia, South Africa, DRC (Zaire)
- **Australia –** top producer of color diamonds (pink, red, purple).
- **US –** top synthetic diamond producer.

Manganese (NCERT)

Manganese

Manganese is an important raw material for smelting of iron ore and also used for manufacturing ferro alloys. Manganese deposits are found in almost all geological formations, however, it is mainly associated with Dharwar system.

Madhya Pradesh and Odisha are the leading producers of Manganese. Major mines in Odisha are located in the central part of the iron ore belt of India, particularly in Bonai, Kendujhar, Sundergarh, Gangpur, Koraput, Kalahandi and Bolangir.

The manganese belt of Madhya Pradesh extends in a belt in Balaghat-Chhindwara-Nimar-Mandla and Jhabua districts. Karnataka is another major producer and here the mines are located in Dharwar, Ballari, Belagavi, North Canara, Chikkmagaluru, Shivamogga, Chitradurg and Tumakuru. Maharashtra is also an important producer of manganese, which is mined in Nagpur, Bhandara and Ratnagiri districts. The disadvantage to these mines is that they are located far from steel plants.

Telangana, Goa, and Jharkhand are other minor producers of manganese.

2013

Q. Consider the following statements:

1. Natural gas occurs in the Gondwana beds.
2. Mica occurs in abundance in Kodarma.
3. Dharwars are famous for petroleum.

Which of the statements given above is/are correct?

a) 1 and 2
b) 2 only
c) 2 and 3
d) None

Natural Gas (NCERT)

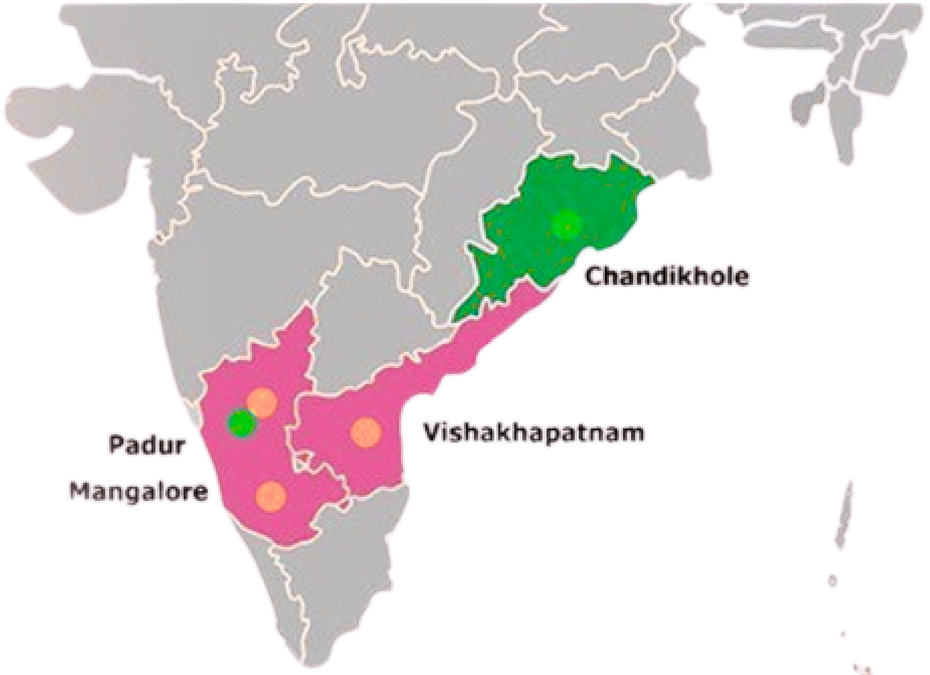
Natural Gas

Natural Gas is found with petroleum deposits and is released when crude oil is brought to the surface. It can be used as a domestic and industrial fuel. It is used as fuel in power sector to generate electricity, for heating purpose in industries, as raw material in chemical, petrochemical and fertiliser industries. With the expansion of gas infrastructure and local city gas distribution (COD) networks, natural gas is also emerging as a preferred transport fuel (CNG) and cooking fuel (PNG) at homes. India's major gas reserves are found in the Mumbai High and allied fields along the west coast which are supplemented by finds in the Cambay basin. Along the East Coast, new reserves of natural gas have been discovered in the Krishna-Godavari basin.

Mica (NCERT)

Mica

Mica is mainly used in the electrical and electronic industries. It can be split into very thin sheets which are tough and flexible. Mica in India is produced in Jharkhand, Andhra Pradesh, Telanganga and Rajasthan followed by Tamil Nadu, West Bengal and Madhya Pradesh. In Jharkhand, high quality mica is obtained in a belt extending over a distance of about 150 km, in length and about 22 km, in width in lower Hazaribagh plateau. In Andhra Pradesh, Nellore district produces the best quality mica. In Rajasthan, mica belt extends for about 320 kms from Jaipur to Bhilwara and around Udaipur. Mica deposits also occur in Mysuru and Hasan districts of Karanataka, Coimbatore, Tiruchirapalli, Madurai and Kanniyakumari in Tamil Nadu, Alleppey in Kerala, Ratnagiri in Maharashtra, Purulia and Bankura in West Bengal.



Indian Strategic Petroleum Reserve

Petroleum (NCERT)

Petroleum

Crude petroleum consists of hydrocarbons of liquid and gaseous states varying in chemical composition, colour and specific gravity. It is an essential source of energy for all internal combustion engines in automobiles, railways and aircraft. Its numerous by-products are processed in petrochemical industries, such as fertiliser, synthetic rubber, synthetic fibre, medicines, vaseline, lubricants, wax, soap and cosmetics.

Crude petroleum occurs in sedimentary rocks of the tertiary period. Oil exploration and production was systematically taken up after the Oil and Natural Gas Commission was set up in 1956. Till then, Digboi in Assam was the only oil producing region but the scenario changed after 1956. In recent years, new oil deposits have been found at the extreme western and eastern parts of the country. In Assam, Digboi, Naharkatiya and Moran are important oil producing areas. The major oilfields of Gujarat are Ankaleshwar, Kalol, Mehsana, Nawagam, Kosamba and Lunej. Mumbai High which lies 160 km off Mumbai was discovered in 1973 and production commenced in 1976. Oil and natural gas have been found in exploratory wells in Krishna-Godavari and Kaveri basin on the east coast.

Oil extracted from the wells is crude oil and contains many impurities. It cannot be used directly. It needs to be refined. There are two types of refineries in India: (a) field-based and (b) market-based. Digboi is an example of field-based and Barauni is an example of market-based refinery.

2023

Q. About three-fourth of world’s Cobalt, a metal required for the manufacture of batteries for electric motor vehicles, is produced by:

a) Argentina
b) Botswana
c) The Democratic Republic of the Congo
d) Kazakhstan

THE ECONOMIC TIMES | News

English Edition ▾ | **Today's ePaper**

India holds talks with Congo for pact to source cobalt, copper, sources say

- India is in talks with the Democratic Republic of Congo (DRC) to sign an initial MoU for the supply of critical minerals like cobalt and copper.
- Congo is the world's top producer of cobalt and a major producer of copper—both vital for EVs, electronics, and infrastructure.

Major Global Producers:

- Cobalt: Congo (70% of global output), followed by Russia, Australia.
- Copper: Chile (largest), Peru, China, Congo.

Cobalt

- Cobalt (Co, Atomic Number 27) is a hard, lustrous, silver-white metal.
- Chemically similar to iron and nickel.

Cobalt Reserves and Production

- ~50% of world's cobalt reserves are in the Democratic Republic of Congo (DRC).
- DRC produces over 70% of global cobalt.

Applications of Cobalt

- **Lithium-ion batteries:** Essential cathode material in smartphones, laptops, EVs.
- **Magnets:** Used in permanent magnets (e.g., hard drives, loudspeakers).
- **High-strength alloys:** Added to steel in jet engines, tools, mining equipment.
- **Ceramics:** Improves toughness, strength, color in coatings, spark plugs, dental implants.
- **Glass:** Imparts a deep blue color (used in stained glass, blue ceramics).

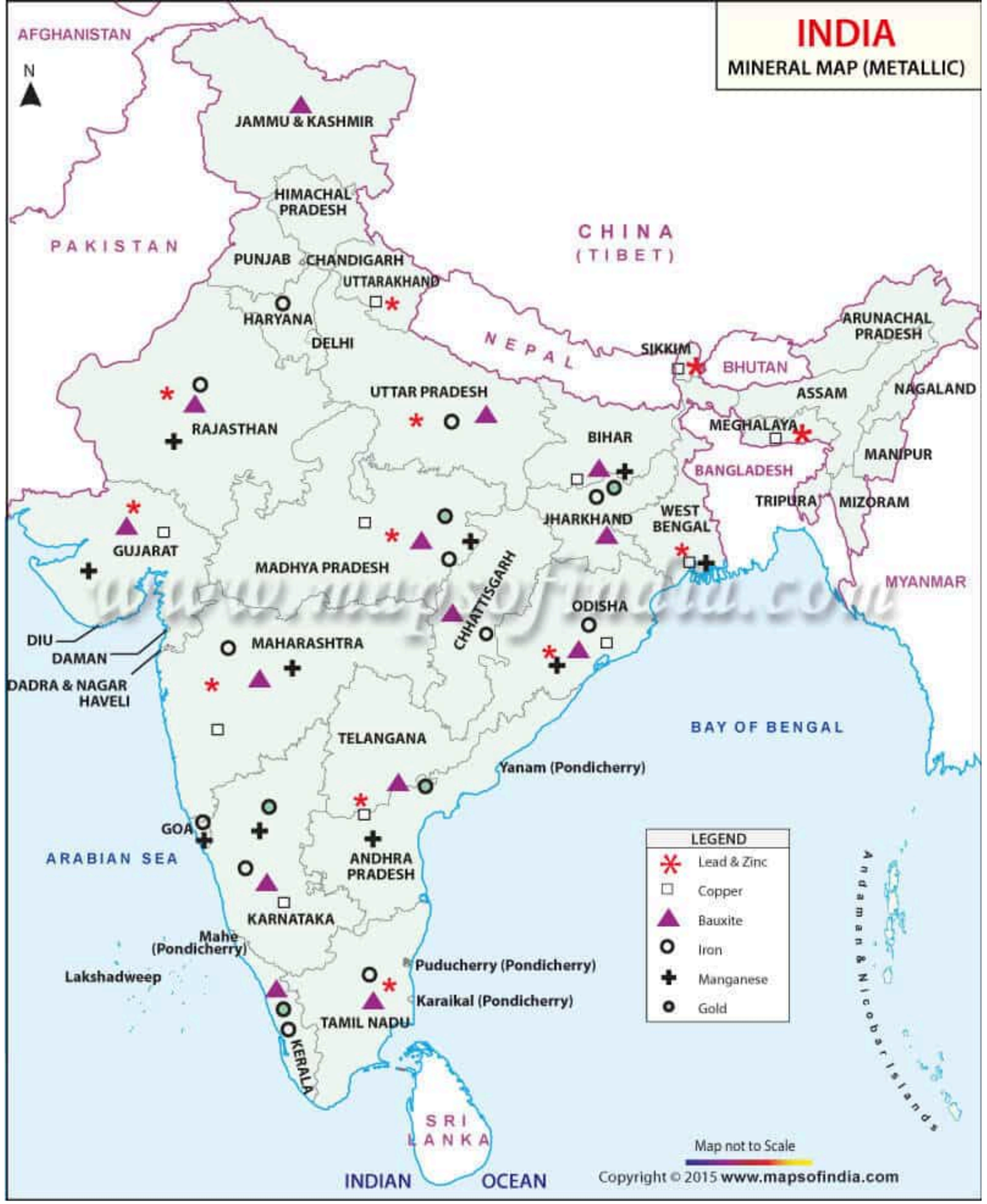
1998

Q. Match List I with List II and select the correct answer using the codes given below the lists:

List I (Minerals)	List II (Mining area)
I. Graphite	A) Bellary
II. Lead	B) Didwana
III. Salt	C) Rampa
IV. Silver	D) Zawar

Codes:

a) I-C, II-D, III-A, IV-B
b) I-A, II-D, III-B, IV-C
c) I-C, II-A, III-D, IV-B
d) I-B, II-C, III-A, IV-D



Salt

- India ranks third in salt production globally, after the USA and China.
- Sea salt constitutes about 70% of India's total salt production.
- Other sources include lake brines, subsoil brines, and rock salt deposits.
- Major salt-producing states in India: Gujarat (~28.5 million tonnes/year; ~80% of production; Kutch, Bhavnagar, Jamnagar), Tamil Nadu, Rajasthan (only non-coastal major producer), Andhra Pradesh, Maharashtra, Karnataka, Odisha, West Bengal, Goa.
- **Salt-producing areas in Rajasthan** include Sambhar, Didwana, Pachpadra, Phalodi, Lunkaransar, Pokran, Kuchaman, Nawa, Rewasa, Tal-Chapper, and Deg.

WION

IMD issues orange alert for Tamil Nadu's Thoothukudi; heavy rains hit salt production

Silver Distribution

- **Uses**: Chemicals, electroplating, photography, glass coloring.
- **Ore minerals:** Argentite, stephanite, pyrargyrite, proustite.
- **Occurrence**: Found with copper, lead, gold, zinc.
- **Global status:** India is a minor silver producer globally.
- **Key producer**: Zawar mines, Rajasthan (galena ore smelting).
- **Jharkhand:** Tundoo smelter (Dhanbad), Maubhandar smelter (Singhbhum) extract silver.
- **Gold fields:** Minor output from Kolar and Hutti mines.
- **Andhra Pradesh:** Vizag Zinc smelter recovers silver from lead ores.

Graphite Distribution

- **Form**: Naturally occurring crystalline carbon, also called plumbago/black lead.
- Carbon Content: ≥ 95%.
- **Coal Relation:** Highest grade, above anthracite in carbon content.
- **Electric Conductivity:** Only non-metal that conducts electricity.
- **Applications**: Refractories, batteries (mainly anode), steelmaking, lubricants, brake linings, and pencil lead.
- **Indian Resources**: Arunachal Pradesh (43%), Jammu & Kashmir (37%), Jharkhand (6%), Tamil Nadu (5%), Odisha (3%).
- **Indian Production:** Tamil Nadu (37%), Jharkhand (30%), Odisha (29%).
- **Global Production**: China (>50%), India (20%), Brazil.

1997

Q. Match List I with List II and select the correct answer by using the codes given below the lists:

List I (Minerals)	List II (Typical areas of Occurrence)
I. Coal	A) Bhandara
II. Gold	B) Karanpura
III. Mica	C) Hutti
IV. Manganese	D) Nellore

Codes:

a) I-A, II-C, III-B, IV-D

b) I-B, II-C, III-D, IV-A

c) I-C, II-D, III-B, IV-A

d) I-B, II-A, III-D, IV-C

1996

Q. Match List I (Ores) with List II (States where they are mined) and select the correct answer by using the codes given below the lists:

List I	List II
I. Manganese	A) Madhya Pradesh
II. Nickel	B) Orissa
III. Lead-zinc	C) Rajasthan
IV. Asbestos	D) Andhra Pradesh

Codes:

a) I – A, II – C, III – B, IV – D

b) I – D, II – C, III – B, IV – A

c) I – A, II – B, III – C, IV – D

d) I – D, II – B, III – C, IV – A

Nickel Distribution

- **Occurrence**: Never free in nature, found with copper, uranium, and other metals.
- **Alloying Material**: Vital for stainless steel (Iron + Nickel).
- **Applications:** Used in armoured plates, bullet jackets (nickel steel); coins (Nickel + Copper/Silver); aeroplane and engine manufacturing (Nickel-aluminium alloys); storage batteries, catalyst for hydrogenation, and food products (Vanaspati).

Occurrences:

- Odisha (Sukinda Valley, Jajapur): Major nickeliferous limonite (92% of India's resources).
- Jharkhand (East Singhbhum, Jaduguda): Nickel in sulphide form with copper, uranium deposits.
- Other States: Karnataka, Kerala, Rajasthan.
- Sea Nodules: Another source of nickel.

Asbestos

- **Types:** Includes two minerals – amphibole variety and the more important fibrous serpentine variety (chrysotile).
- **Commercial Value:** Chrysotile accounts for 80% of asbestos used commercially; prized for high tensile strength and fire resistance.
- **Applications:** Used in fire-proof cloth, rope, paper, millboard, sheeting, gloves, aprons, brake linings, cement products, magnesia bricks, filter pads, and heat insulation.

Major Producers in India:

- **Rajasthan:** Largest producer; occurs in Udaipur, Dungarpur, Alwar, Ajmer, Pali.
- **Andhra Pradesh**: Fine quality asbestos found in Pulivendla taluk, Cuddapah district.
- **Karnataka:** Occurs in Hassan, Mandya, Shimoga, Mysore, and Chikmaglur districts.

Theme III - Industries and Other Major Projects

2009

Q. The Dul Hasti Power Station is based on which one of the following rivers?

a) Beas
b) Chenab
c) Ravi
d) Sutlej

2008

Q. On which one of the following rivers is the Tehri Hydropower Complex located?

a) Alaknanda
b) Bhagirathi
c) Dhauliganga
d) Mandakini

2008

With which one of the following rivers is the Omkareshwar Project associated?

a) Chambal
b) Narmada
c) Tapi
d) Bhima

2008

Q. Where are Tapovan and Vishnugarh Hydroelectric Projects located?

a) Madhya Pradesh
b) Uttar Pradesh
c) Uttarakhand
d) Rajasthan

2007

Match List-I with List-II and select the correct answer using the code given below the lists:

List-I (Aluminium Company) (Location)	***List-II***
A. BALCO	1. Hirakud
B. HINDALCO	2. Korba
C. Indian Aluminium Company	3.Koraput
D. NALCO	4. Renukoot

A B C D

a) 3 1 4 2
b) 2 4 1 3
c) 3 4 1 2
d) 2 1 4 3

2007

Q. HINDALCO, an aluminium factory located at Renukut owes its site basically to:

a) Proximity of raw materials
b) Abundant supply of power
c) Efficient transport network
d) Proximity to the market

Aluminium Industry

- Importance: 2nd most important industry after iron and steel, used in electricity transmission, household utensils, appliances, defense, and aerospace.
- **Industry Segments:**
  - Upstream: Primary Aluminium production from bauxite mining.
  - Downstream: Processing Aluminium into semi-finished goods (rods, bars, castings).
- **Raw Material Requirement**: 6 tonnes of bauxite produce 2 tonnes of Aluminium.

List of Aluminium Smelting Plants in India:

- Korba – Bharat Aluminium Co. (BALCO)
- Alupuram – Hindustan Aluminium Co. (HINDALCO)
- Renukoot – Hindustan Aluminium Co. (HINDALCO)
- Mettur – Madras Aluminium (MALCO)
- Hirakud – Hindustan Aluminium Co. (HINDALCO)
- Angul – National Aluminium Co. (NALCO)
- Jharsuguda – Vedanta Aluminium Co. (VAL)

Bauxite

Bauxite is the ore, which is used in manufacturing of aluminium. Bauxite is found mainly in tertiary deposits and is associated with laterite rocks occurring extensively either on the plateau or hill ranges of peninsular India and also in the coastal tracts of the country.

Odisha happens to be the largest producer of Bauxite. Kalahandi and Sambalpur are the leading producers. The other two areas which have been increasing their production are Bolangir and Koraput. The patlands of Lohardaga in Jharkhand have rich deposits. Gujarat, Chhattisgarh, Madhya Pradesh and Maharashtra are other major producers. Bhavanagar, and Jamnagar in Gujarat have the major deposits. Chhattisgarh has bauxite deposits in Amarkantak plateau while Katni-Jabalpur area and Balaghat in M.P. have important deposits of bauxite. Kolaba, Thane, Ratnagiri, Satara, Pune and Kolhapur in Maharashtra are important producers. Tamil Nadu, Karnataka and Goa are minor producers of bauxite.

2006

Q. Recently Uttar Pradesh and Madhya Pradesh governments signed a Memorandum of Understanding for the linking of two rivers as a link project. Which are these two rivers?

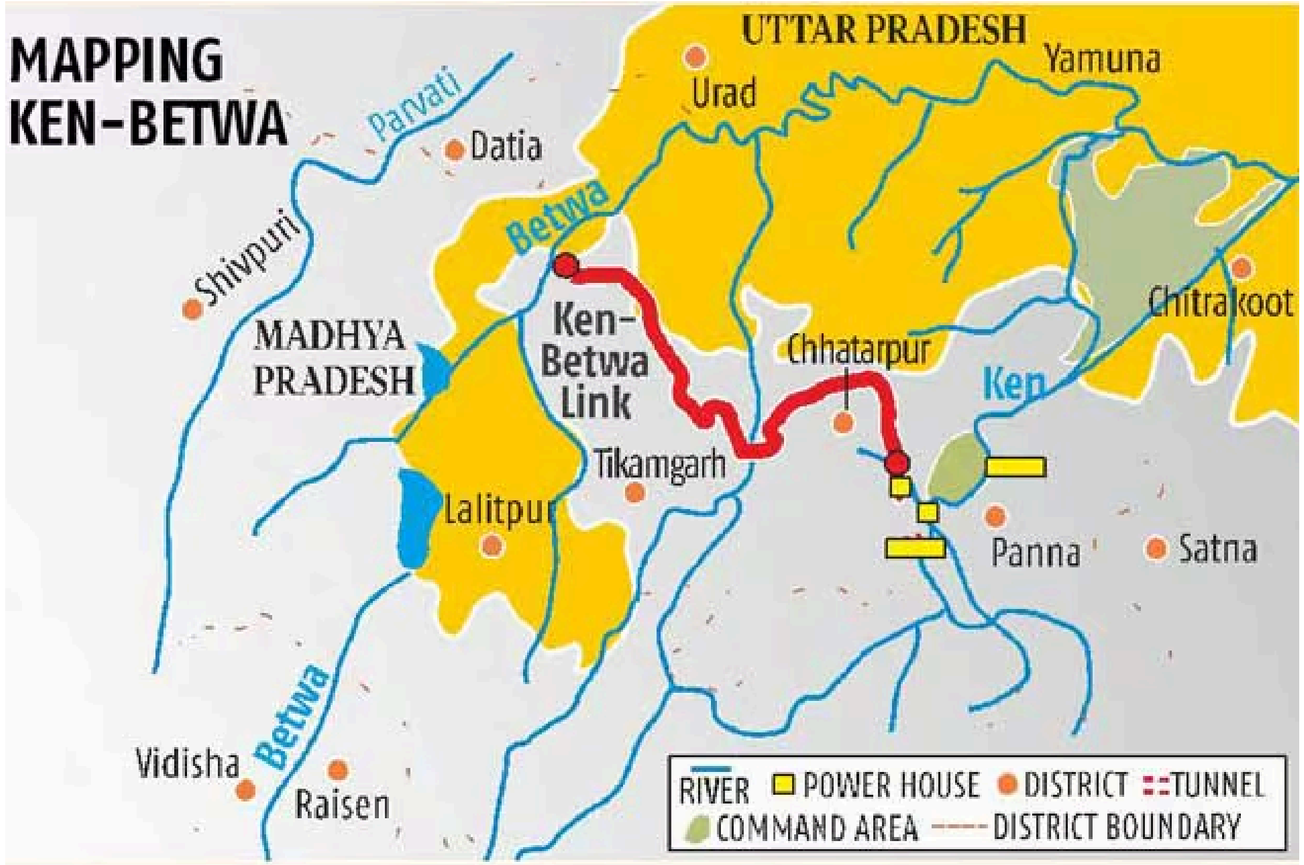
a) Betwa and Chambal
b) Betwa and Ken
c) Chambal and Son
d) Ken and Narmada

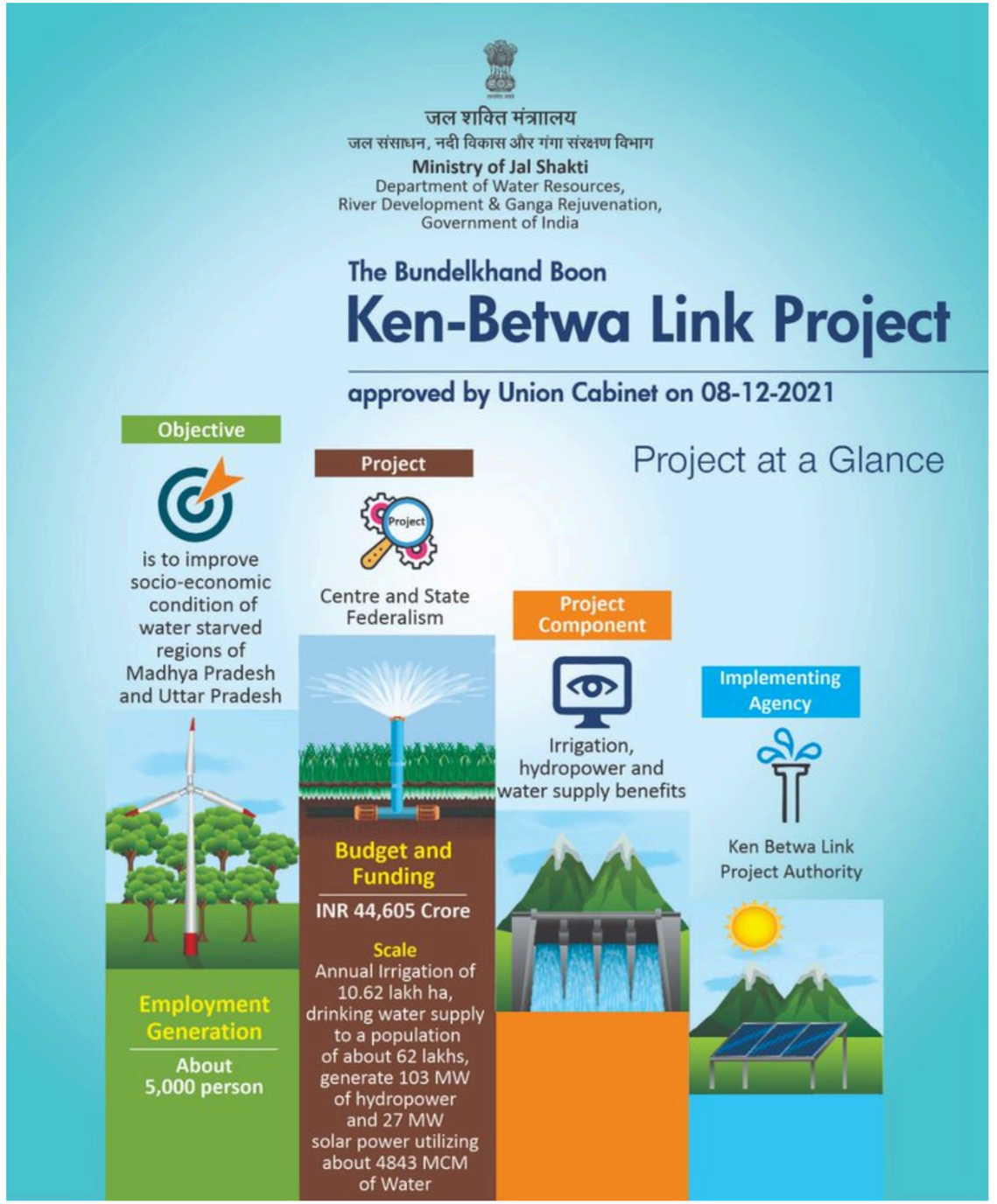
THE HINDU

PM Modi lays foundation for Ken-Betwa river-linking project to solve water woes of Bundelkhand

PM Modi credited Dr. B.R. Ambedkar's vision for India's major river valley projects, and accused the Congress of not giving due recognition to the architect of the Constitution.

- MP becomes the first state in India to have two ongoing river-linking projects: Ken-Betwa and Parbati-Kalisindh-Chambal.





2005

Q. Match items in the List I (Power Station) with those in the List II (State) and select the correct answer using the codes given below the list:

List I	***List II***
A. Kothagudem	1. Andhra Pradesh
B. Raichur	2. Gujarat
C. Mettur	3. Karnataka
D. Wanakbori	4. Tamil Nadu

A B C D

a) 4 2 1 3

b) 1 3 4 2

c) 4 3 1 2

d) 1 2 4 3

1996

Q. Which of the following pairs are correctly matched?

I. Idukki : Thermal power station
II. Sabarigiri: Hydro-electric project
III. Ghatprabha: Irrigation project
IV. Ramganga: Multipurpose project

Select the correct answer by using the codes given below:
Codes:
a) II, III and IV
b) I, II, III and IV
c) III and IV
d) I and II

2005

Q. For which one of the following, is Satara well-known?

a) Thermal power plant
b) Wind energy plant
c) Hydro electric plant
d) Nuclear power plant

2004

Q. Consider the following statements:

1. Damodar Valley Corporation is the first multipurpose river valley project of independent India.
2. Damodar Valley Corporation includes thermal and gas power stations.

Which of the statements given above is/ are correct?
a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

2003

Q. The thermal power plant of Bokaro is located in:

a) Bihar
b) Chhattisgarh
c) Jharkhand
d) Orissa

Theme IV - Agriculture

2023

Q. Consider the following statements:

1. India has more arable area than China
2. The proportion of irrigated area is more in India as compared to China
3. The average productivity per hectare in Indian agriculture is higher than that in China

How many of the above statements are correct?

a) Only one
b) Only two
c) All three
d) None

THE HINDU businessline.
Companies / Markets / Portfolio / Opinion / Economy / bl. PREMIUM

Irrigated area increased to 55% from 47% in 6 years, says Niti Aayog's Chand

It has helped increase production of rabi crops

- NITI Aayog member Ramesh Chand highlighted an increase in India's irrigated area and the growing water demand in agriculture, emphasizing the need for efficient water use, particularly amid climate change and rising population.
- India's net cropped area is 140 million hectares.
- Irrigated area has increased from 47% to 55% over the last six years.
- This rise in irrigation has led to increased rabi crop production.
- The demand for water-intensive crops (like paddy and off-season vegetables) is rising due to changing consumer preferences.

2022

Q. Consider the following States:

1. Andhra Pradesh
2. Kerala
3. Himachal Pradesh
4. Tripura

How many of the above are generally known as tea-producing States?
a) Only one State
b) Only two States
c) Only three States
d) All four States

2010

Q. Though coffee and tea both are cultivated on hill slopes, there is some difference between them regarding their cultivation. In this context, consider the following statements:

1. Coffee plant requires a hot and humid climate of tropical areas whereas tea can be cultivated in both tropical and subtropical areas.
2. Coffee is propagated by seeds but tea is propagated by stem cuttings only.

Which of the statements given above is/are correct?
a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

2007

Q. Assertion(A): There are no tea plantations in any African country.
Reason (R): Tea plants need fertile soil with high humus.

a) Both A and R are individually true and R is the correct explanation of A.
b) Both A and R are individually tru but R is not the correct explanation of A.
c) A is True but R is false
d) A is false but R is true

2008

Q. Consider the following statements:

1. Chikmagalur is well-known for sugar production.
2.Mandya is well-known as a coffee-production region.

Which of the statements given above is/ are correct?
a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Direct from Ncert

Tea: Tea cultivation is an example of plantation agriculture. It is also an important beverage crop introduced in India initially by the British. Today, most of the tea plantations are owned by Indians. The tea plant grows well in tropical and sub-tropical climates endowed with deep and fertile well-drained soil, rich in humus and organic matter. Tea bushes require warm and moist frost-free climate all through the year. Frequent showers evenly distributed over the year ensure continuous growth of tender leaves. Tea is a labour-intensive industry. It requires abundant, cheap and skilled labour. Tea is processed within the tea garden to restore its freshness. Major tea-producing states are Assam, hills of Darjeeling and Jalpaiguri districts, West Bengal, Tamil Nadu and Kerala. Apart from these, Himachal Pradesh, Uttarakhand, Meghalaya, Andhra Pradesh and Tripura are also tea-producing states in the country. In 2020 India was the second largest producer of tea after China.

Fig. 4.10: *T*

Tea: Tea is a beverage crop grown on plantations. This requires cool climate and well distributed high rainfall throughout the year for the growth of its tender leaves.

It needs well-drained loamy soils and gentle slopes. Labour in large number is required to pick the leaves. Kenya, India, China, Sri Lanka produce the best quality tea in the world.

Coffee: Indian coffee is known in the world for its good quality. The Arabica variety initially brought from Yemen is produced in the country. This variety is in great demand all over the world. Initially its cultivation was introduced on the Baba Budan Hills and even today its cultivation is confined to the Nilgiri in Karnataka, Kerala and Tamil Nadu.

Coffee: Coffee requires warm and wet climate and well-drained loamy soil. Hill slopes are more suitable for growth of this crop. Brazil is the leading producer followed by Columbia and India.

Indian Coffee Market

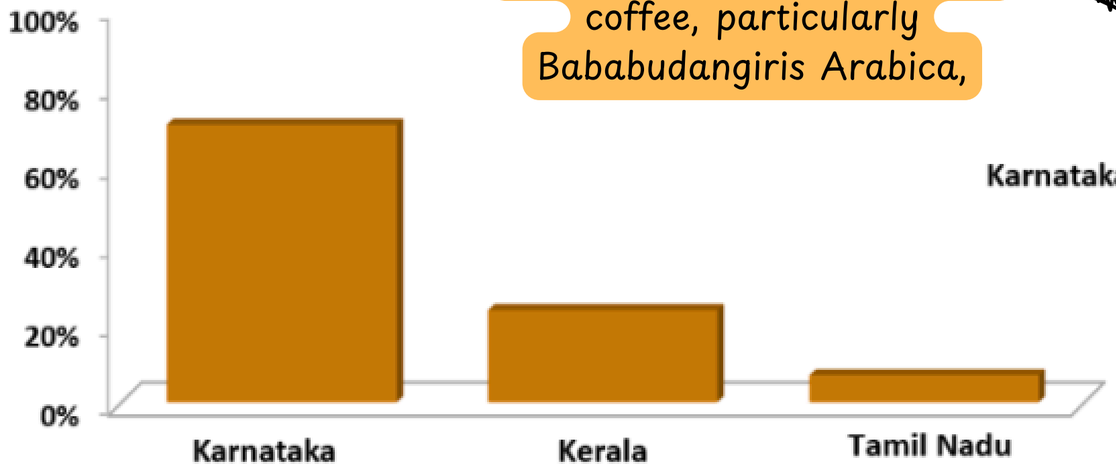
Coffee Production 2018-19

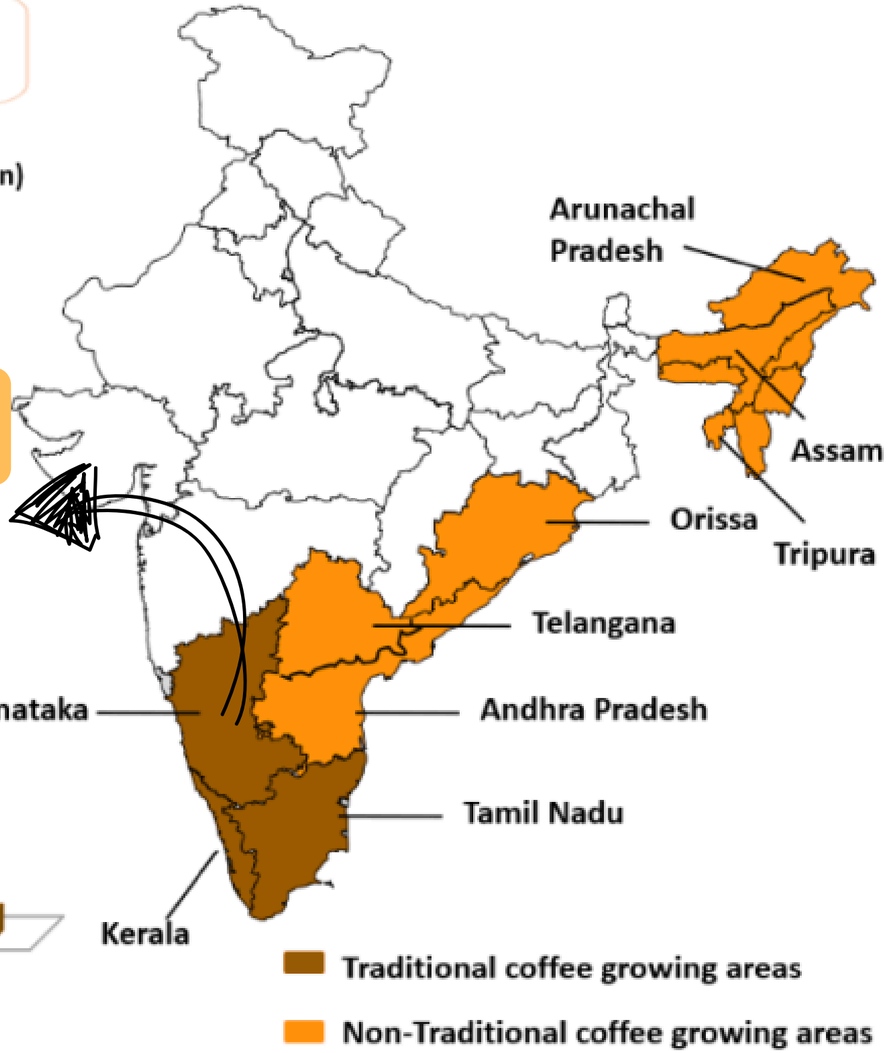
Robusta:224,500MT

Arabica: 95,000MT

$ 983
Value (Million)

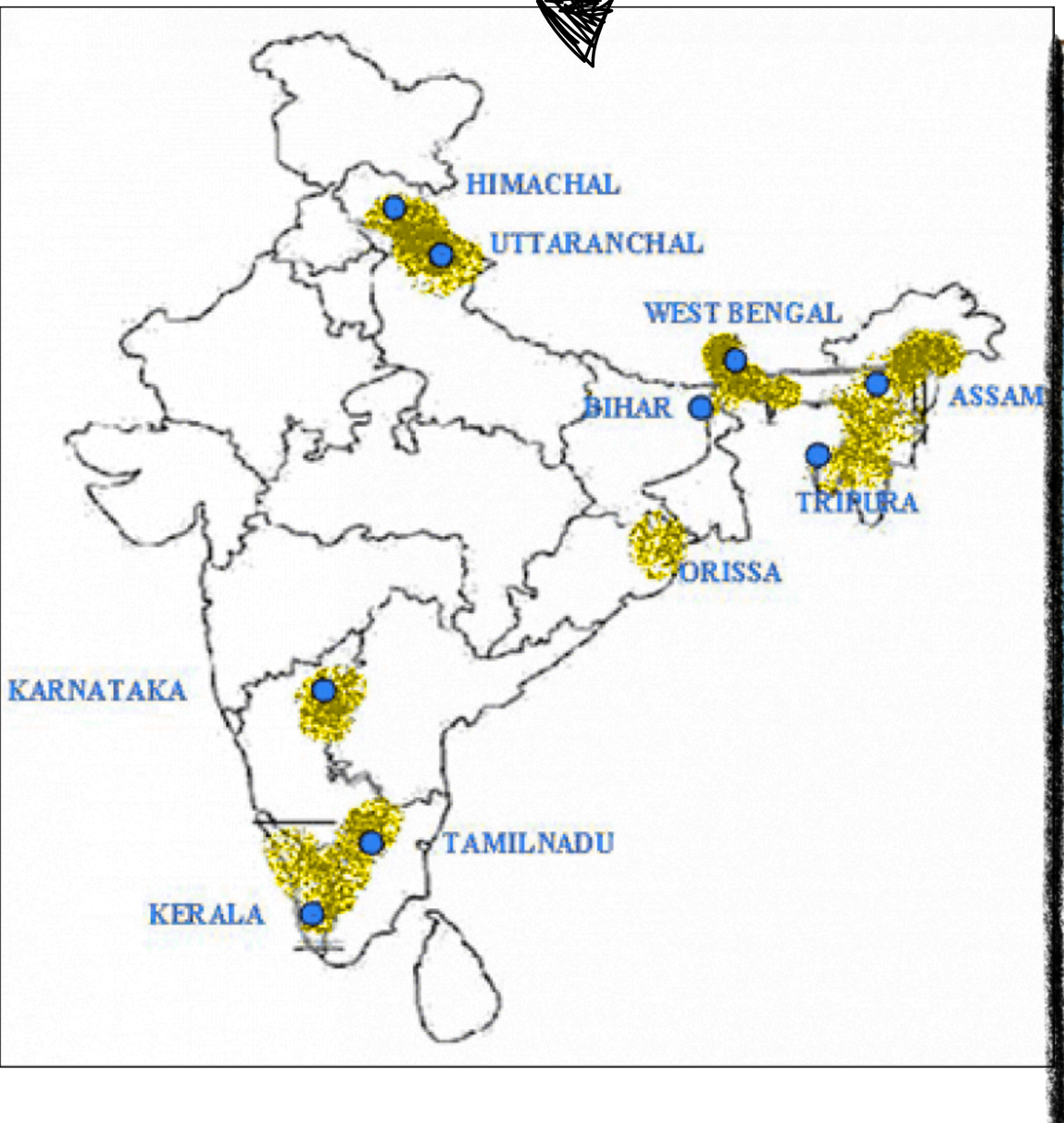
Chikmagalur is a major coffee-producing region in Karnataka, India, known for its Arabica coffee, particularly Bababudangiris Arabica,

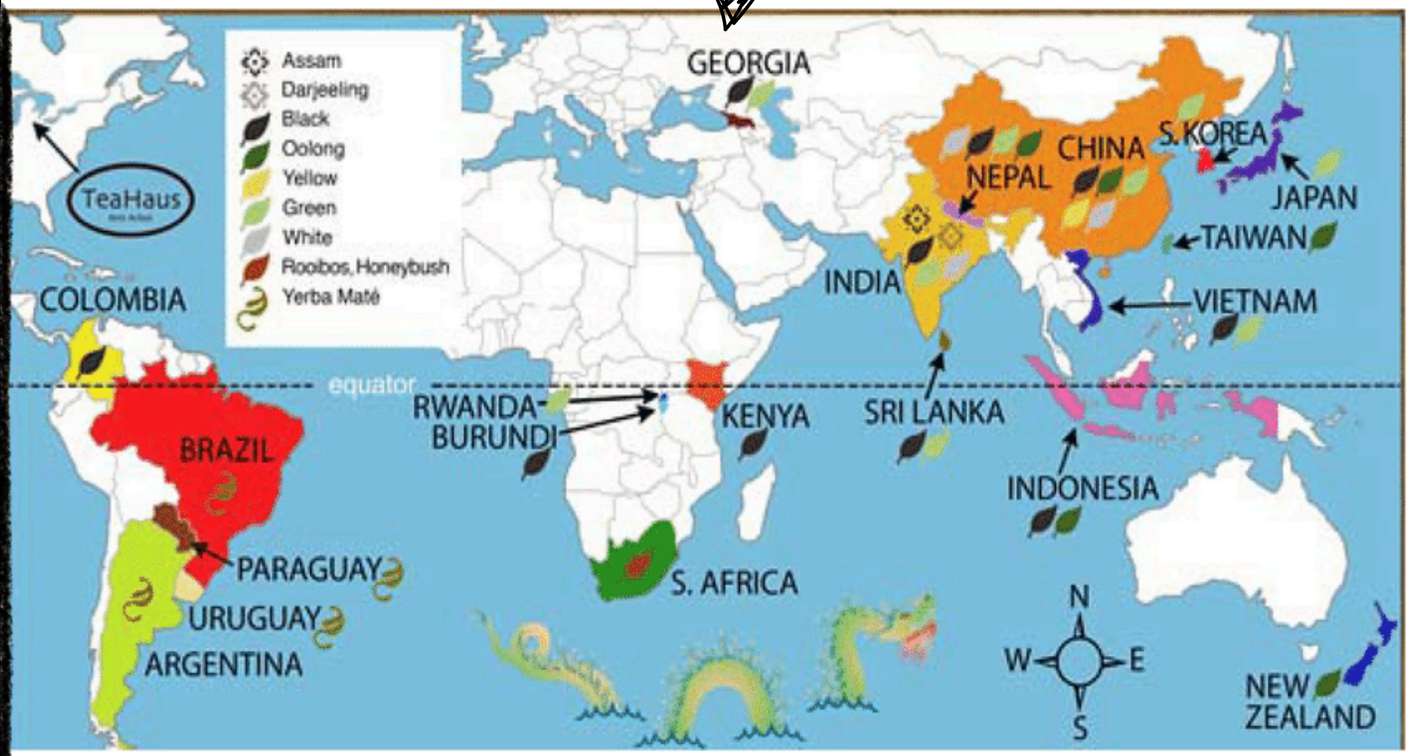




Source: Coffee Board of India, Wikipedia

Tea Producing areas





2021

Q. Consider the following statements:

1) Moringa (drumstick tree) is a leguminous evergreen tree.
2) Tamarind tree is endemic to South Asia.
3) In India, most of the tamarind is collected as minor forest produce.
4) India exports tamarind and seeds of moringa.
5) Seeds of moringa and tamarind can be used in the production of biofuels.

Which of the statements given above are correct?

a) 1, 2, 4 and 5
b) 3, 4 and 5
c) 1, 3 and 4
d) 1, 2, 3 and 5

Moringa

- **Native to:** Indian subcontinent; drought-resistant and fast-growing tree.
- Known as drumstick tree or horseradish tree.
- Leaves and pods used in food and herbal medicine.
- Also used in water purification.
- Rich in vitamins, iron, magnesium; low in fat and free of cholesterol.
- Moringa belongs to the Moringaceae family and is not a leguminous plant.
- It is deciduous, thus sheds leaves seasonally.

Tamarind (Tamarindus indica)

- A leguminous tree
- Native to Africa
- Tamarind is majorly collected as minor forest produce
- India is among the largest exporters of Tamarind and Moringa seeds
- Seeds of Moringa and Tamarind are used in biofuel production.

2021

Q. How is permaculture farming different from conventional chemical farming?

1) Permaculture farming discourages monocultural practices but in conventional chemical farming, monoculture practices are pre-dominant.
2) Conventional chemical farming can cause increase in soil salinity but the occurrence of such phenomenon is not observed in permaculture farming.
3) Conventional chemical farming is easily possible in semi-arid regions but permaculture farming is not so easily possible in such regions.
4) Practice of mulching is very important in permaculture farming but not necessarily so in conventional chemical farming.

Select the correct answer using the code given below.
a) 1 and 3
b) 1, 2 and 4
c) 4 only
d) 2 and 3

Permaculture

- Coined in the 1970s by Bill Mollison & David Holmgren, blending "permanent agriculture" and "permanent culture."
- **Core Principle:** Nurtures the earth and promotes mutually beneficial relationships with nature
- **Principles:** Observing nature, capturing & storing energy, obtaining yields, valuing renewables, minimizing waste, and creative responses to change.

Key Practices

Practice	Description
Agroforestry	Integrating trees with crops/livestock for sustainability.
Rainwater/Greywater Harvesting	Conserving water for irrigation and other uses.
Cell Grazing	Rotational grazing to regenerate land.
Sheet Mulching	Organic no-dig method to improve soil fertility.
Natural Building	Use of recycled materials for eco-friendly construction.
Intercropping/Companion Farming	Maximizing space and resources with complementary plant species.

2020

Q. What are the advantages of fertigation in agriculture?

1 Controlling the alkalinity of irrigation water is possible.
2. Efficient application of Rock Phosphate and all other phosphatic fertilizers is possible.
3. Increased availability of nutrients to plants is possible.
4. Reduction in the leaching of chemical nutrients is possible.

Select the correct answer using the code given below:
a) 1, 2 and 3 only
b) 1, 2 and 4 only
c) 1, 3 and 4 only
d) 2, 3 and 4 only

Fertigation

- A method combining irrigation and fertilization by injecting fertilizers into the irrigation system.
- **Efficiency**: Reduces time, resources, and effort by combining fertilization and irrigation.
- **Method**: Drip fertigation is the most efficient, delivering nutrients directly to the root zone.
- **Fertilizers Used**: Includes ammonium nitrate, urea ammonium nitrate, potassium nitrate, phosphoric acid, etc.
- **Dual Role**: Some fertilizers in fertigation also act as acidifiers, improving soil properties.
- **Types:**
  - **Proportional fertigation**: Fertilizer is injected proportionally with irrigation water.
  - **Quantitative fertigation:** Pre-determined amount of fertilizer is injected based on needs.

2020

With reference to pulse production in India, consider the following statements:

1. Black gram can be cultivated as both kharif and rabi crop.
2. Green-gram alone accounts for nearly half of pulse production.
3. In the last three decades, while the production of kharif pulses has increased, the production of rabi pulses has decreased.

Which of the statements given above is/are correct?

a) 1 only
b) 2 and 3 only
c) 2 only
d) 1, 2 and 3

2002

Q. With reference to Indian agriculture, which one of the following statements is correct?

a) About 90 per cent of the area under pulses in India is rainfed.
b) The share of pulses in the gross cropped area at the national level has doubled in the last two decades
c) India accounts for about 15 per cent of the total area under rice in the world
d) Rice occupies about 34 per cent of the gross cropped area of India

2013

Q. Consider the following crops:

1. Cotton
2. Groundnut
3. Rice
4. Wheat

Which of these are Kharif crops?
a) 1 and 4
b) 2 and 3 only
c) 1, 2 and 3
d) 2, 3 and 4

2004

Q. Consider the following crops:

1. Cotton
2. Groundnut
3. Maize
4. Mustard

Which of the above are Kharif crops?
a) 1 and 2
b) 1, 2 and 3
c) 3 and 4
d) 1, 2, 3 and 4

- **Black Gram (Urad) Cultivation**
  - Grown in both kharif (monsoon) and rabi (winter) seasons.
- **Green Gram (Moong) Production**
  - Moong accounts for around 8-10% of India's total pulse production.
- **Pulse Production**: Pulse production in both kharif and rabi seasons has increased over the last three decades.
- **India's Global Dominance:** Largest producer, consumer, and importer of pulses globally.
- **Share:** India accounts for 25% of global pulse production and 27% of global consumption.
- **Area & Contribution:** Pulses cover 20% of food grain area, contributing 7-10% to total food grain production.
- **Rabi Pulses:** Contribute over 60% of India's total pulse production.

Table 3.2 : Cropping Seasons in India

Cropping Season	Major Crops Cultivated	
	Northern States	Southern States
Kharif June-September	Rice, Cotton, Bajra, Maize, Jowar, Tur	Rice, Maize, Ragi, Jowar, Groundnut
Rabi October – March	Wheat, Gram, Rapeseeds and Mustard, Barley	Rice, Maize, Ragi, Groundnut, Jowar
Zaid April–June	Vegetables, Fruits, Fodder	Rice, Vegetables, Fodder

Pulses: India is the largest producer as well as the consumer of pulses in the world. These are the major source of protein in a vegetarian diet. Major pulses that are grown in India are tur (arhar), urad, moong, masur, peas and gram. Can you distinguish which of these pulses are grown in the kharif season and which are grown in the rabi season? Pulses need less moisture and survive even in dry conditions. Being leguminous crops, all these crops except arhar help in restoring soil fertility by fixing nitrogen from the air. Therefore, these are mostly grown in rotation with other crops. Major pulse producing states in India are Madhya Pradesh, Rajasthan, Maharashtra, Uttar Pradesh and Karnataka.

2020

Q. The crop is subtropical in nature. A hard frost is injurious to it. It requires at least 210 frost-free days and 50 to 100 centimeters of rainfall for its growth. A light well-drained soil capable of retaining moisture is ideally suited for the cultivation of the crop.” Which one of the following is that crop?

a) Cotton
b) Jute
c) Sugarcane
d) Tea

2010

Q. Tamil Nadu is a leading producers of mill – made cotton yarn in the country. What could be be the reason?

1. Black cotton soil is the predominant type of soil in the State.
2. Rich pool of skilled labour is available.

Which of the statements given above is/are correct?
a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

1996

Q. Which one of the following areas of India produces largest amount of cotton?

a) North-western India and Gangetic West Bengal
b) North-western and Western India
c) Western and Southern India
d) Plains of Northern India

1998

Q. Match List I with List II and select the correct answer using the codes given below the lists:

List I (Agricultural products)
I. Cotton
II. Gram
III. Black pepper
IV. Pineapple

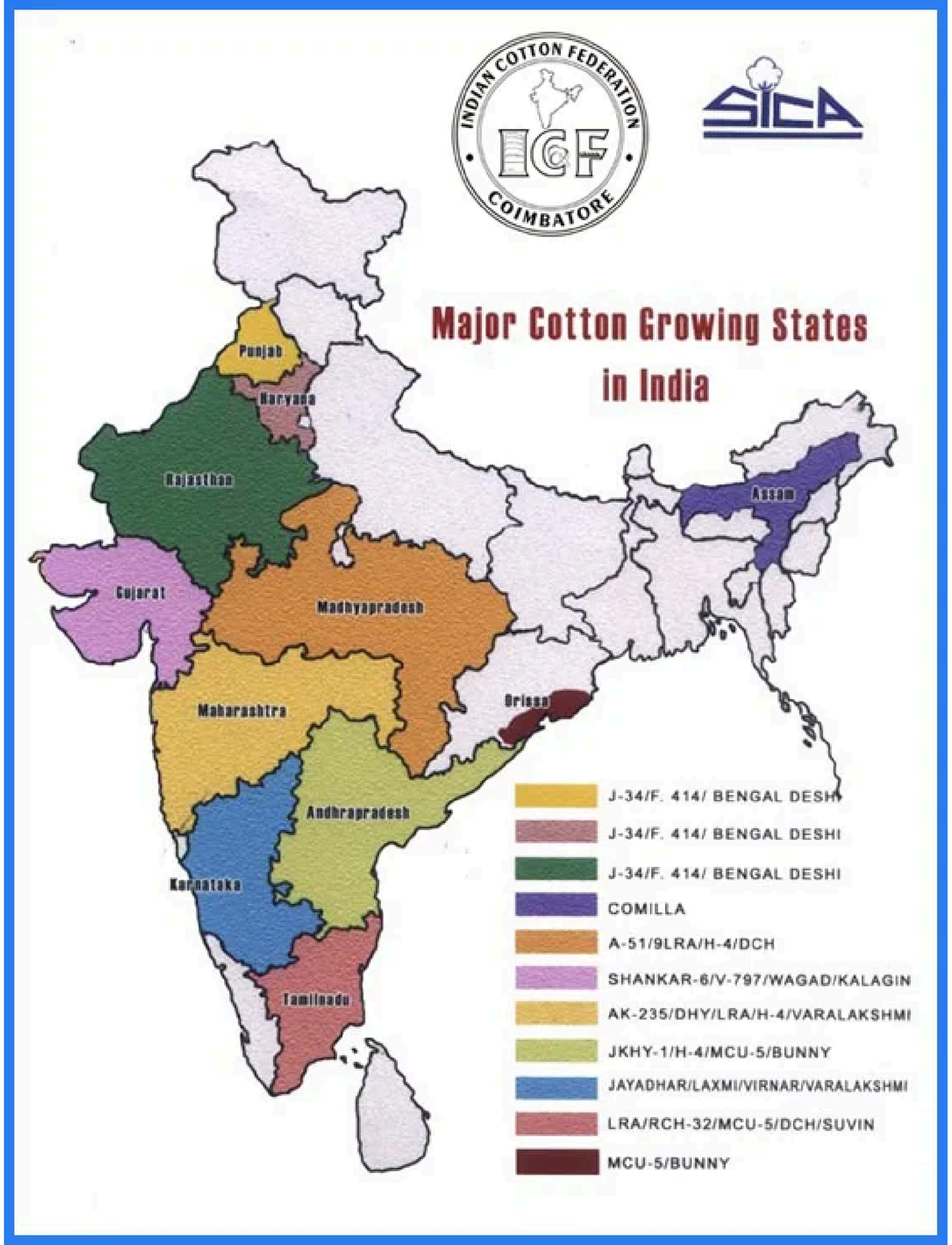
List II(Foremost producer)
A) Madhya Pradesh
B) Gujarat
C) West Bengal
D) Kerala

Codes:
a) I-B, II-A, III-D, IV-C
b) I-B, II-A, III-C, IV-D
c) I-A, II-B, III-D, IV-C
d) I-A, II-B, III-C, IV-D

Cotton

Fibre Crops: Cotton, jute, hemp and natural silk are the four major fibre crops grown in India. The first three are derived from the crops grown in the soil, the latter is obtained from cocoons of the silkworms fed on green leaves specially mulberry. Rearing of silk worms for the production of silk fibre is known as **sericulture**.

Cotton: India is believed to be the original home of the cotton plant. Cotton is one of the main raw materials for cotton textile industry. India is second largest producer of cotton after China. Cotton grows well in drier parts of the black cotton soil of the Deccan plateau. It requires high temperature, light rainfall or irrigation, 210 frost-free days and bright sun-shine for its growth. It is a kharif crop and requires 6 to 8 months to mature. Major cotton-producing states are– Maharashtra, Gujarat, Madhya Pradesh, Karnataka, Andhra Pradesh, Telangana, Tamil Nadu, Punjab, Haryana and Uttar Pradesh.



2020

Q. With reference to the current trends in the cultivation of sugarcane in India, consider the following statements:

1. A substantial saving in seed material is made when ‘bud chip settlings’ are raised in a nurse, and transplanted in the main field.
2. When direct planting of setts is done, the germination percentage is better with single-budded setts as compared to setts with many buds.
3. If bad weather conditions prevail when setts are directly planted, single-budded setts have better survival as compared to large setts.
4. Sugarcane can be cultivated using settlings prepared from tissue culture.

Which of the statements given above is/are correct?

a) 1 and 2 only
b) 3 only
c) 1 and 4 only
d) 2, 3 and 4 only

2000

Q. The correct sequence in decreasing order of the four sugarcane producing States in India is:

a) Maharashtra, U.P., Tamil Nadu, Andhra Pradesh
b) U.P., Maharashtra, Tamil Nadu, Andhra Pradesh
c) Maharashtra, U.P., Andhra Pradesh, Tamil Nadu
d) U.P., Maharashtra, Andhra Pradesh, Tamil Nadu

2021

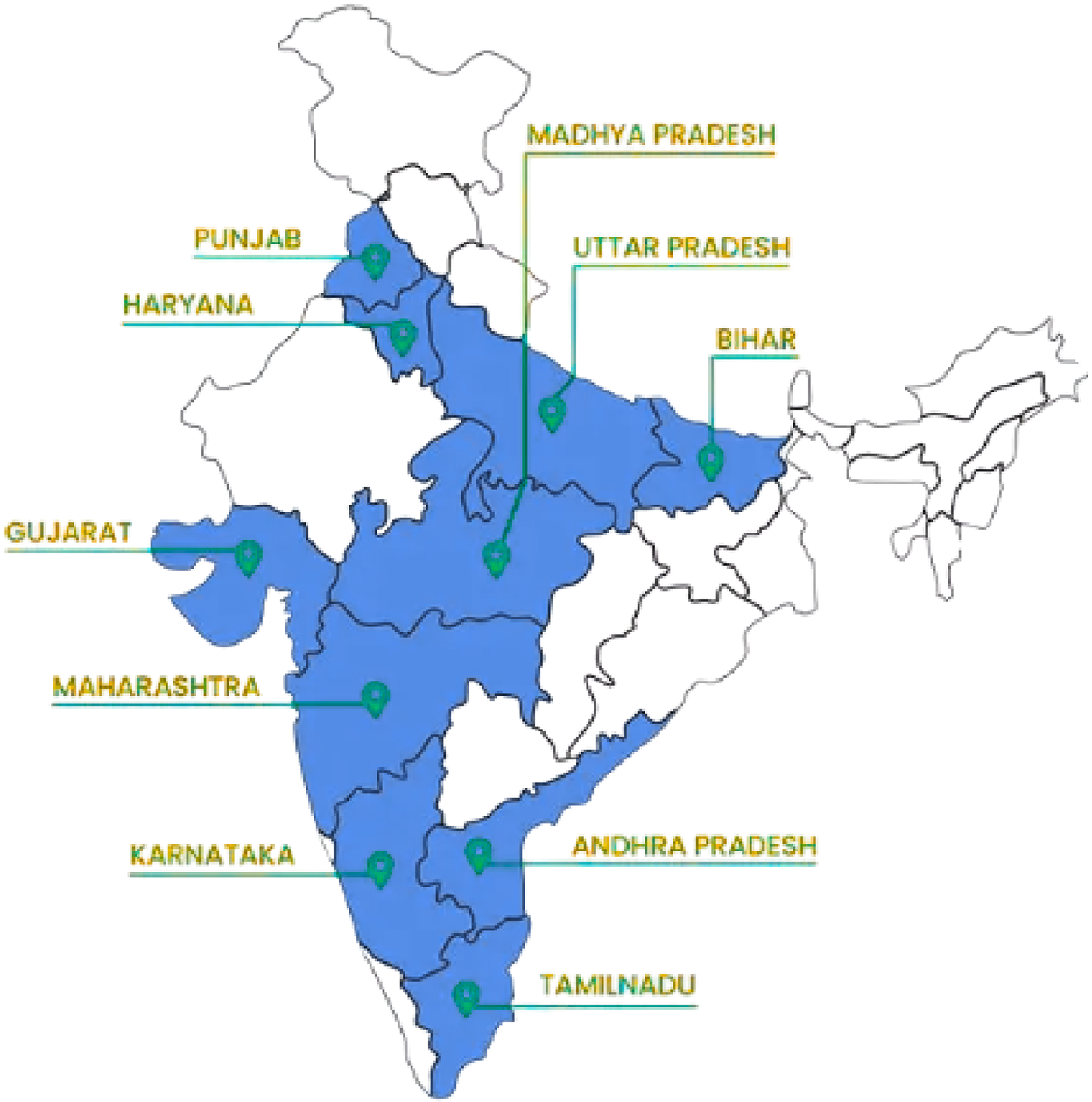
Q. Among the following, which one is the least water-efficient crop?

a) Sugarcane
b) Sunflower
c) Pearl millet
d) Red gram

Sugarcane

Food Crops other than Grains

Sugarcane: It is a tropical as well as a subtropical crop. It grows well in hot and humid climate with a temperature of 21°C to 27°C and an annual rainfall between 75cm. and 100cm. Irrigation is required in the regions of low rainfall. It can be grown on a variety of soils and needs manual labour from sowing to harvesting. India is the second largest producer of sugarcane only after Brazil. It is the main source of sugar, gur (jaggary), khandsari and molasses. The major sugarcane-producing states are Uttar Pradesh, Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, Telangana, Bihar, Punjab and Haryana.



Top States

The Bud Chip Method

- **The Bud Chip Method** is a modern technique of sugarcane planting where single buds (or eye buds) are chipped off from a mature cane and used for raising settlings (young plants) in a nursery before transplanting into the main field.
- **Key Features of Bud Chip Method:**
  - Only one bud per plant is used, significantly reducing seed cane requirement.
  - Seed saving: Up to 80% less seed material needed compared to traditional planting.
  - Healthier crops: Uniform growth, better germination, and disease resistance.
  - Cost-effective: Less labor, transport, and input costs.
  - Eco-friendly: Reduced water usage, often paired with drip irrigation.
- Also, Multi-budded setts germinate better due to higher moisture and nutrient reserves
- Larger/multi-budded setts survive adverse weather better than single-budded sett

2019

Q. Among the following, which one is the largest exporter of rice in the world in the last five years?

a) China
b) India
c) Myanmar
d) Vietnam

2011

Q. The lower Gangetic plain is characterized by humid climate with high temperature throughout the year. Which one among the following pairs of crops is most suitable for this region?

a) Paddy and cotton
b) Wheat and jute.
c) Paddy and jute
d) Wheat and cotton

2003

Q. Assertion (A): The eastern coast of India produces more rice than the western coast.:
Reason (R): The eastern coast receives more rainfall than the western coast.

a) Both A and R are individually true and R is the correct explanation of A
b) Both A and R are individually true but R is NOT the correct explanation of A
c) A is true but R is false
d) A is false but R is true

Rice

Rice: It is the staple food crop of a majority of the people in India. Our country is the second largest producer of rice in the world after China. It is a kharif crop which requires high temperature, (above 25°C) and high humidity with annual rainfall above 100 cm. In the areas of less rainfall, it grows with the help of irrigation.

Rice is grown in the plains of north and north-eastern India, coastal areas and the deltaic regions. Development of dense network of canal irrigation and tubewells have made it possible to grow rice in areas of less rainfall such as Punjab, Haryana and western Uttar Pradesh and parts of Rajasthan.

Jute

Jute: It is known as the golden fibre. Jute grows well on well-drained fertile soils in the flood plains where soils are renewed every year. High temperature is required during the time of growth. West Bengal, Bihar, Assam, Odisha and Meghalaya are the major jute producing states. It is used in making gunny bags, mats, ropes, yarn, carpets and other artefacts.

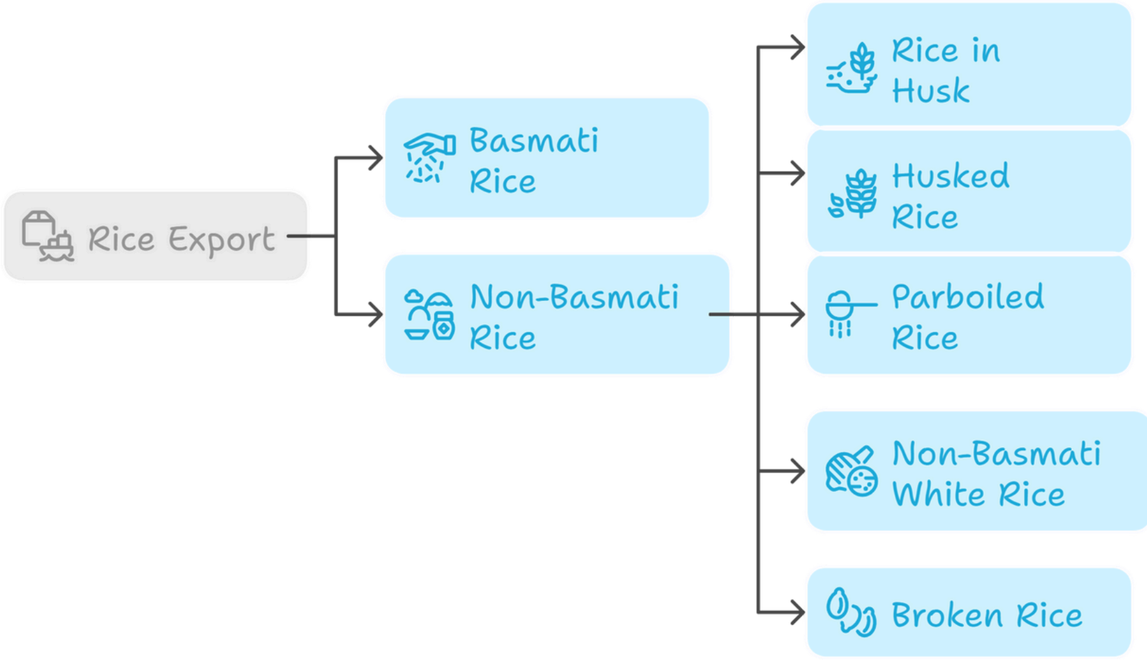
The Indian EXPRESS
JOURNALISM OF COURAGE

Amid hopes for record production, India's rice exports jump by nearly 86% in October

With a jump in October, India's overall rice export has increased by 5.27% to $6,171.35 million during April-October of the current financial year.

- India's rice exports crossed $1 billion in October 2024 — up by 85.79% YoY
- **Factors Behind the Export Surge:**
  - Govt Policy Easing:
    - 20% export duty removed on Non-Basmati White Rice.
    - Duties halved on paddy, husked, and parboiled rice (later removed completely).
    - Export ban lifted on Non-Basmati White Rice.
    - Minimum Export Price (MEP) of $490/tonne removed.
  - High Kharif Output (2024-25)
- **India:** World's largest rice exporter, second-largest producer.
- **Share in global exports (2023):** 33% (17 million tonnes of 53 MT).
  - Was 40% in 2022 before export restrictions.
- **Main competitors:** Thailand and Vietnam
- **China:** Large producer but biggest consumer → minimal export

Rice Export Categories

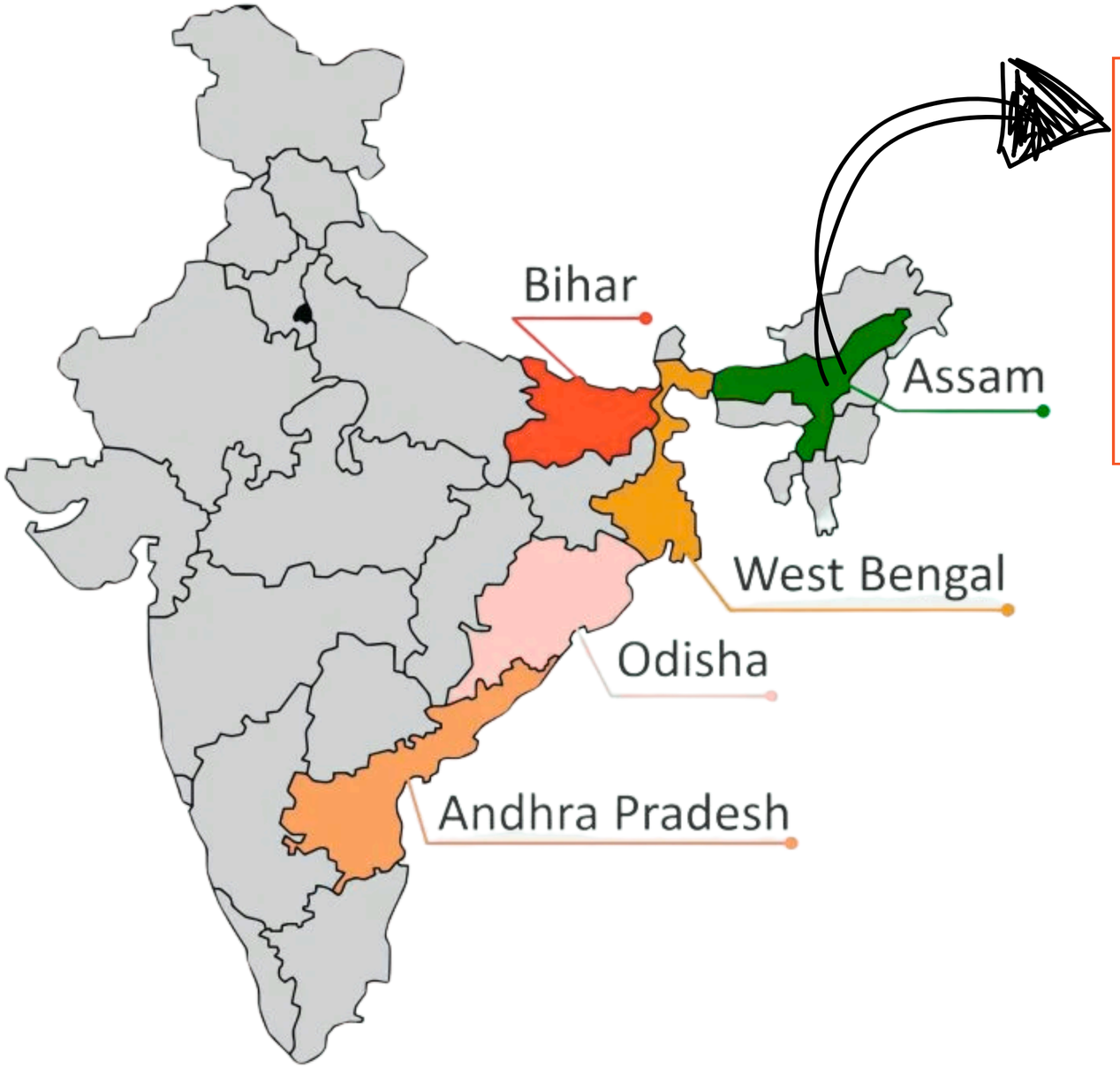


1996

Q. Which one of the following is an important crop of the Barak valley?

a) Jute
b) Tea
c) Sugarcane
d) Cotton

Major Jute Growing regions



Barak Valley

- Situated in the southern part of Assam, comprising three districts: Cachar, Karimganj, and Hailakandi.
- Known for its fertile plains and humid tropical climate.

2018

Q. With reference to agriculture soils consider the following statements:

1. A high content of organic matter drastically reduces its water holding capacity.
2. Soil does not play role in the sulphur cycle.
3. Irrigation over a period of time can contribute to the salinization of some agricultural lands.

Which of the statements given above is/are correct?

a) 1 and 2 only
b) 3 only
c) 1 and 3 only
d) 1, 2 and 3

2017

Q. Which of the following practices can help in water conservation in agriculture?

1. Reduced or zero tillage of the land
2. Applying gypsum before irrigating the field
3. Allowing crop residue to remain in the field

Select the correct answer using the code given below:

a) 1 and 2 only
b) 3 only
c) 1 and 3 only
d) 1, 2 and 3

Different methods for minimizing water stress

- Zero tillage/reduced tillage: Minimizes soil disturbance and conserves soil moisture.
- Residue mulching: Crop residues left on soil reduce evaporation and improve infiltration.
- Crop rotation & cover crops: Enhance soil health and moisture retention.
- Farm ponds, check dams, percolation tanks: Capture and store rainwater for future use.
- Roof-top harvesting: Especially useful in water-scarce rural and urban areas.
- Contour barriers (permeable/impenetrable): Slow down runoff, increase infiltration.
- Terracing: Reduces slope length and conserves water on hilly terrain.
- Organic matter (compost, manure): Improves water-holding capacity of soil.
- Drip irrigation: Supplies water directly to the root zone, minimizes losses.
- Sprinkler irrigation: Uniform water distribution with reduced wastage.
- Adoption of short-duration and drought-tolerant crop varieties.
- Trees/shrubs integrated with crops improve microclimate and reduce evapotranspiration.

2014

Q. Consider the following pairs:

Region: Well-known for the production of

1. Kinnaur: Areca nut
2. Mewat: Mango
3. Coromandel: Soya bean

Which of the above pairs is/are correctly matched?

a) 1 and 2 only
b) 3 only
c) 1, 2 and 3
d) None

2012

Q. Consider the following crops of India:

1. Groundnut
2. Sesamum
3. Pearl millet

Which of the above is / are predominantly rainfed crop/crops?

a) 1 & 2 Only
b) 2 & 3 Only
c) 3 Only
d) 1,2 & 3

Pulses

Oil Seeds: In 2020 India was the second largest producer of groundnut in the world after China. Different oil seeds are grown covering approximately 12 per cent of the total cropped area of the country. Main oil-seeds produced in India are groundnut, mustard, coconut, sesamum (til), soyabean, castor seeds, cotton seeds, linseed and sunflower. Most of these are edible and used as cooking mediums. However, some of these are also used as raw material in the production of soap, cosmetics and ointments.

Groundnut is a kharif crop and accounts for about half of the major oilseeds produced in the country. Gujarat was the largest producer of groundnut followed by Rajasthan and Tamil Nadu in 2019–20. Linseed and mustard are rabi crops. Sesamum is a kharif crop in north and rabi crop in south India. Castor seed is grown both as rabi and kharif crop.

- **Extent of Rainfed Land:** 60% of India's net sown area falls under rainfed agriculture.
- **Crop Coverage**
  - Rainfed lands account for:
    - 48% of area under food crops
    - 68% of area under non-food crops
- **Share in Major Crop Production**
  - 89% of millets
  - 88% of pulses
  - 73% of cotton
  - 69% of oilseeds (like groundnut and sesamum)
  - 40% of rice

2012

Which of the following is the chief characteristic of ‘mixed farming?

a) Cultivation of both cash crops and food crops
b) Cultivation of two or more crops in the same field
c) Rearing of animals and cultivation of crops together
d) None of the above

Mixed Farming

This form of agriculture is found in the highly developed parts of the world, e.g. North-western Europe, Eastern North America, parts of Eurasia and the temperate latitudes of Southern continents (Fig. 4.14).

Mixed farms are moderate in size and usually the crops associated with it are wheat, barley, oats, rye, maize, fodder and root crops. Fodder crops are an important component of mixed farming. Crop rotation and intercropping play an important role in maintaining soil fertility. Equal emphasis is laid on crop cultivation and animal husbandry. Animals like cattle, sheep, pigs and poultry provide the main income along with crops.

Mixed farming is characterised by high capital expenditure on farm machinery and building, extensive use of chemical fertilisers and green manures and also by the skill and expertise of the farmers.

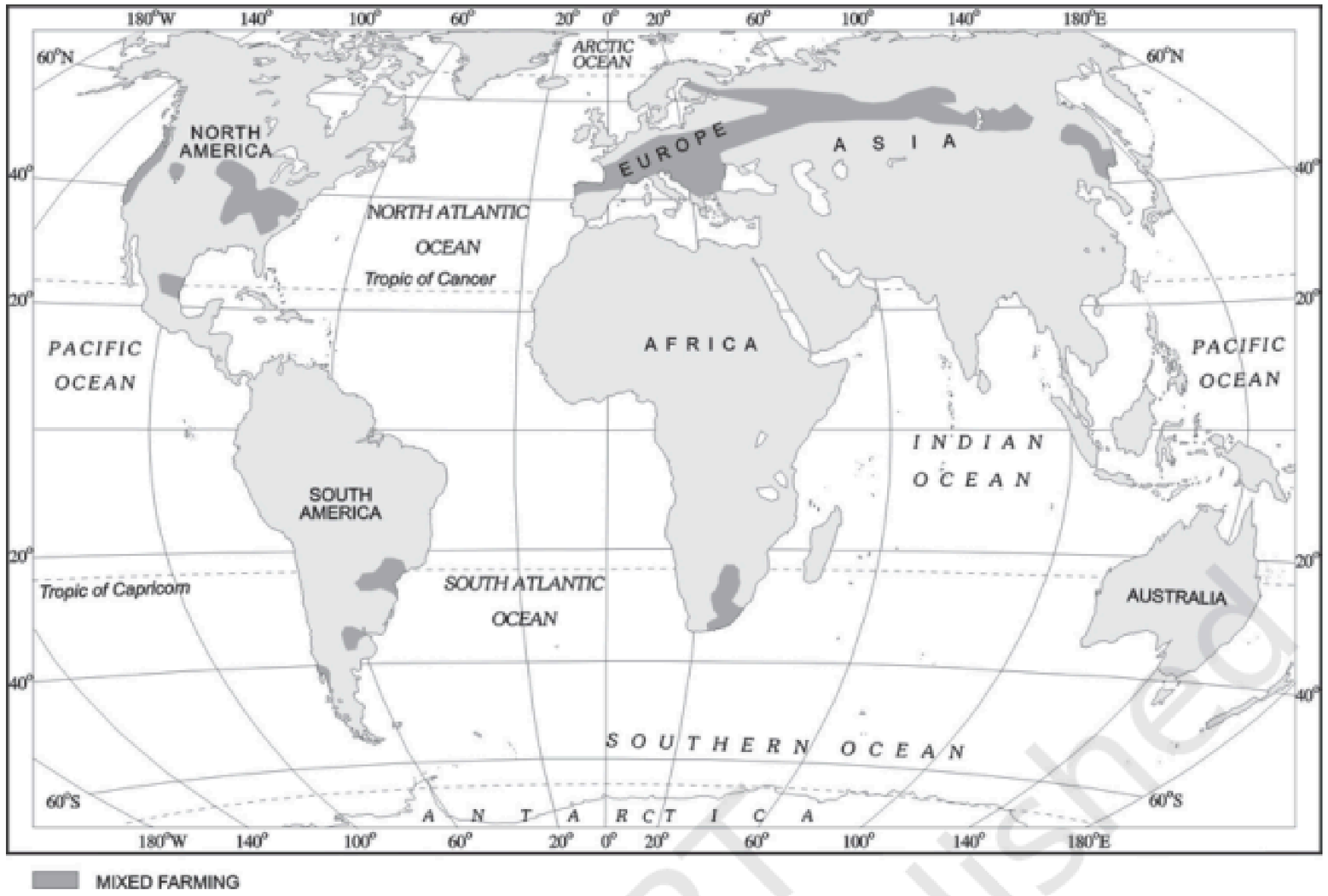


Fig. 4.14: Areas of Mixed Farming

2012

Q. Consider the following crops of India:

1. Cowpea
2. Green gram
3. Pigeon pea

Which of the above is/are used as pulse, fodder and green manure?

a) 1 & 2 Only
b) 2 & 3 Only
c) 1 & 3 Only
d) 1,2 & 3

2011

Q. Among the following states, which one has the most suitable climatic conditions for the cultivation of a large variety of orchids with minimum cost of production, and can develop an export oriented industry in this field?

a) Andhra Pradesh.
b) Arunachal Pradesh.
c) Madhya Pradesh.
d) Uttar Pradesh.

INDIA TODAY NE

Arunachal Deputy CM releases book highlighting state as 'Orchid paradise'

Arunachal Pradesh's floral wealth is celebrated in 'Orchids of Arunachal Pradesh', launched by Deputy CM Chowna Mein. The book, featuring 657 species, highlights the state's biodiversity.

- On January 17, Arunachal Pradesh Deputy Chief Minister Chowna Mein released the book ‘Orchids of Arunachal Pradesh’ in Itanagar.
- Showcases Arunachal Pradesh as the ‘Orchid Paradise of India’.
- **Arunachal Pradesh**
  - Arunachal Pradesh hosts about 60% of India’s orchid species, making it a major biodiversity hotspot for orchids.
  - Its diverse ecological zones and climatic variations provide the perfect habitat for various orchid species.
- **Orchid Growth**
  - Ideal temperature: ~20°C
  - Ideal humidity: ~80%
  - Orchids thrive in warm, tropical, and moist conditions.
  - As one moves away from the tropics towards the poles, orchid diversity decreases.

2005

Q. Consider the following statements:

1. India is the only country in the world producing all the five known commercial varieties of silk.
2. India is the largest producer of sugar in the world.

Which of the statements given above is/ are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Business Standard

Talking stock: Will sugar turn sweeter in coming year as supply stabilises?

- The sugar sector in India is showing signs of recovery after a phase of uncertainty.
- Improved production estimates and a favorable outlook for the upcoming season (starting October 2024) have improved supply confidence.
- ***India's Global Ranking***
  - Producer: 2nd (after Brazil)
  - Consumer: 1st
  - Share in Global Production: ~19%
- ***Geographical Distribution***
  - Northern States: Uttar Pradesh, Bihar, Haryana, Punjab
  - Southern States: Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh **(South India offers higher yield due to a tropical climate with greater sucrose content.)**

Silk Production in India

- ***Global Standing***
  - 2nd largest silk producer in the world (after China)
  - India is the only country producing all five commercial silk types.
    - Mulberry (dominant)
    - Tropical Tasar
    - Oak Tasar
    - Eri
    - Muga (exclusive to India; golden yellow silk)
- ***Geographical Distribution***
  - Karnataka, Andhra Pradesh, Tamil Nadu, West Bengal, Jharkhand: Mulberry silk
  - Assam & Bodoland (Kokrajhar, Chirang, Baksa, Udalguri): All 4 types including Muga
  - North East India
  - Unique in producing all four varieties – contributes 18% of national output

1997

Q. Match List I with List II and select the correct answer by using the codes given below the lists:

List I(Crops)	***List II (Geographical conditions)***
I. Barley	A) Hot and dry climate with poor soil
II. Rice	B) Cool climate with poorer soil
III. Millets	C) Warm and moist climate with high altitude
IV. Tea	D) Hot and moist climate with rich soil

Codes:

a) I-B, II-D, III-A, IV-C
b) I-C, II-D, III-A, IV-B
c) I-B, II-A, III-D, IV-C
d) I-C, II-B, III-D, IV-A

1996

Q. Which of the following pairs of states and their important crops are correctly matched?

I. Kerala:	Tapioca
II. Maharashtra:	Cotton
III. W. Bengal:	Jute
IV. Gujarat:	Groundnut

Select the correct answer using the codes given below:
Codes:
a) I, II and III
b) I, II and IV
c) I, III and IV
d) II, III and IV

Tapioca / Cassava Plant

- Tapioca is native to South America, introduced to India during the colonial period.
- It is drought-tolerant once established.
- Used as a subsistence crop and in industrial starch production.
- Classified as a horticultural tuber crop.
- Major Producing Areas in India
- Tamil Nadu - largest cultivator
- Also found in Kerala, Andhra Pradesh, Assam, and North-Eastern states
- All parts of the plant — leaves, stem, tuber, and rind — contain toxic compounds called:
  - Linamarin
  - Lotaustralin
- These are hydrolysed by linamarase enzyme, forming:
  - Acetone cyanohydrin, which decomposes into hydrogen cyanide (HCN)
  - Both acetone cyanohydrin and HCN are toxic to humans and animals.

THE HINDU

Central Tuber Crops Research Institute issues advisory on using parts of tapioca plant to feed cattle

Advisory issued in view of the incident in Idukki district of Kerala where 13 cows had died in a farm recently

- ICAR-Central Tuber Crops Research Institute (CTCRI) issued an advisory on cassava toxicity after an incident in Idukki, Kerala, where 13 cows died reportedly due to cyanide poisoning from cassava feed.
- Feeding crushed leaves or peels immediately after crushing can cause cyanide poisoning.
- Sudden deaths in animals like cows, goats, and pigs have been reported due to improper feeding practices.

1996

Q. Which one of the following sets of conditions is necessary for a good cultivation of wheat?

a) Moderate temperature and moderate rainfall
b) High temperature and heavy rainfall
c) High temperature and moderate rainfall
d) Low temperature and low rainfall

2024

Q. Which of the following countries are well known as the two largest cocoa producers in the world?

a) Algeria and Morocco
b) Botswana and Namibia
c) Cöte d’Ivoire and Ghana
d) Madagascar and Mozambique

THANK YOU!
KEEP LEARNING