Geography Class 44

THE CLASS STARTED WITH THE BRIEF REVIEW OF THE PREVIOUS CLASS AT: (09:35 AM):

MINERALS AND ENERGY RESOURCES: (09:41 AM):

- **Minerals:**
- They are of two types:
- a) Metallic: Ferrous and Non-Ferrous (Iron Ore) (Copper, Bauxite)
- b) Non-metallic: Organic or Energy Mineral (Coal/Petrol) and Inorganic Minerals (Mica, Graphite, etc.) Limestone

Ferrous Minerals are-
Manganese
Iron
Titanium
Nickel
MINT

we define metals and non-metals on the basis of conductivity.

- **Iron Ore:**
- **Deposit of Iron Ore (World Wise):**

Ferrous and Non-Ferrous are divided based on amount of iron found in these. Ferrous minerals are minerals that contain iron (Fe) as a major component in their composition. Non-ferrous minerals are minerals that do not contain iron in significant amounts, and therefore do not produce iron-based metals.

Organic minerals are minerals that are formed from living organisms or involve carbon-based compounds. They are majorly energy minerals except Uranium.
Inorganic minerals are naturally occurring substances that do not involve carbon-based life forms in their formation. They are typically found in rocks and minerals and are made up of inorganic compounds like salts, metals, and oxides.

- **Ore and Types:**

MaSi
HaLi

Ore	Type
Magnetite (Magnetite black h and Igneous rock bhi black jaisa h)	Igneous
Haematite (widely available and red in color)	Sedimentary
Limonite (Brown)	Sedimentary
Siderite (Grey)	Sedimentary

- The major ore of Copper is Chalcopyrite.
- Pyrolusite is the major ore of Manganese.
- Bauxite is the ore of Aluminium.

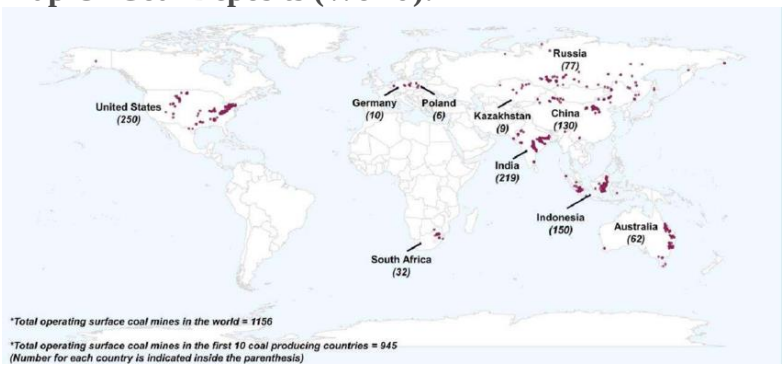
Copper and Aluminium are from non-ferrous group.
Manganese are from ferrous group.

Non-Ferrous :-
Copper
Aluminium
Gold (found in sedimentary and igneous both)
Silver

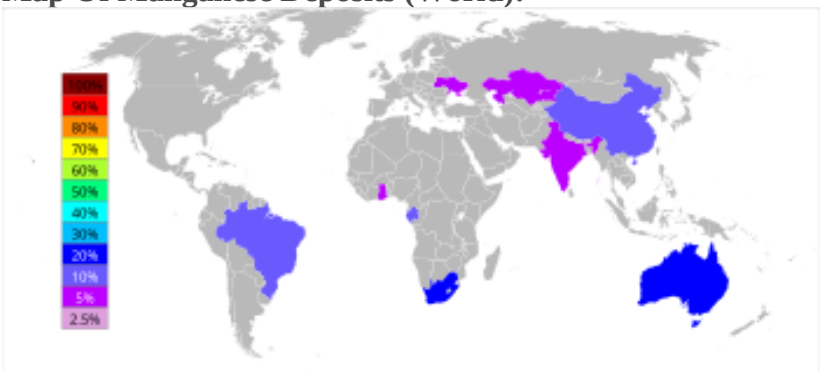
- Mica and Limestone are the major non-metallic (inorganic).

COAL, PETROLEUM, COPPER, BAUXITE & SHALE GAS: (09:53 AM):

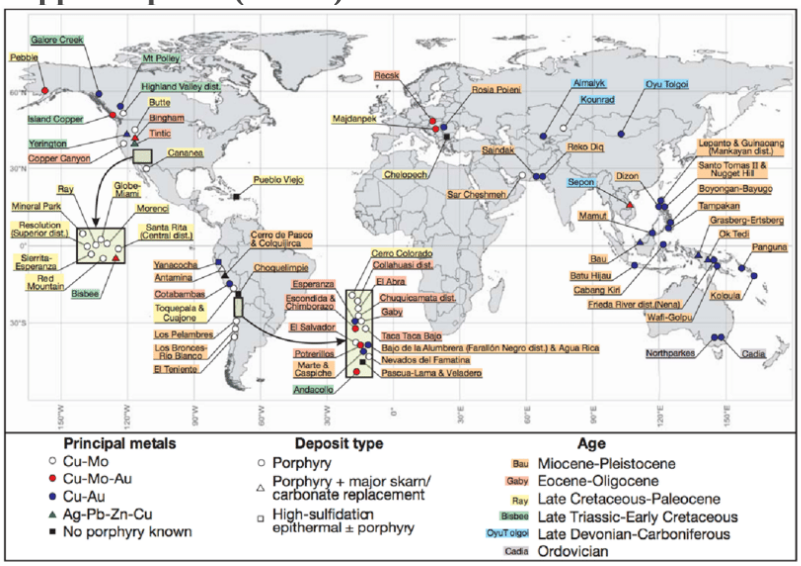
- **Types Of Coal Found In India:**
- Anthracite: Contains more than 95% of Carbon
- Bituminous: Between 45-80% of Carbon
- Lignite: 38-40% Carbon.
- Peat: Less than 38% of Carbon content.
- **Map Of Distribution of Coal Deposits In India**
- **Map Of Coal Deposits (World):**



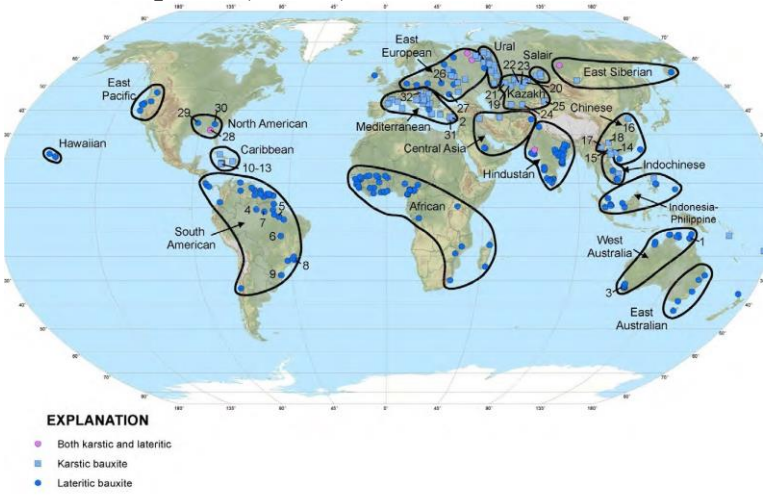
- **Map Of Manganese Deposits (World):**



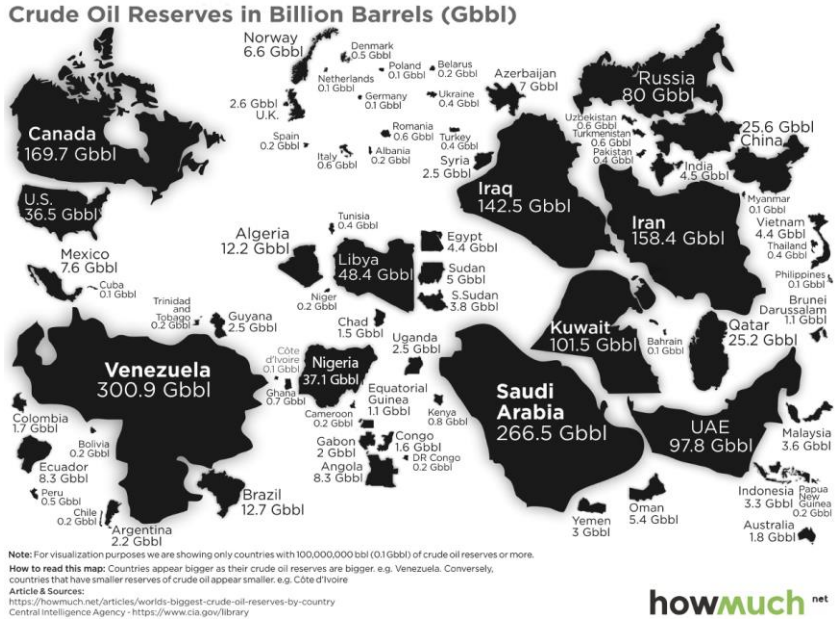
- **Copper Deposits (World):**



- **Bauxite Deposits (World):**

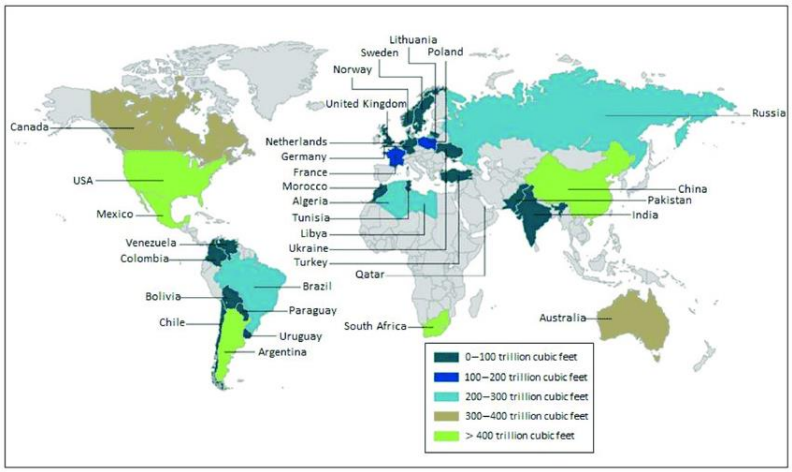


- **Regions Of Petroleum Deposits:**

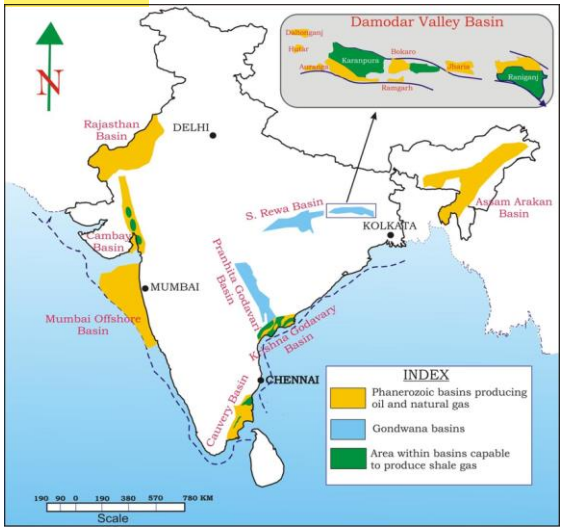


SHALE GAS DEPOSITS: (11:23 AM):

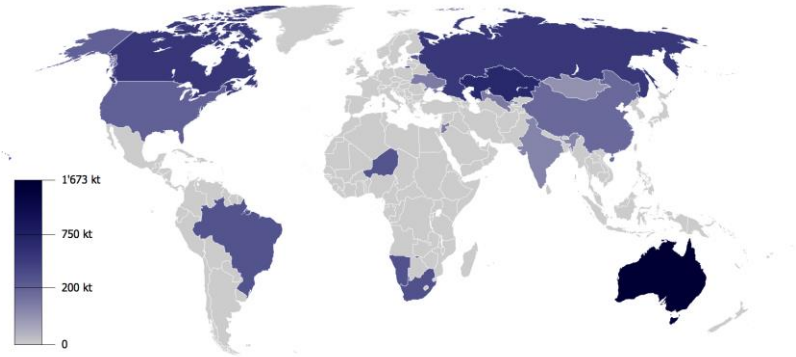
- **Shale Gas Deposits (World):**

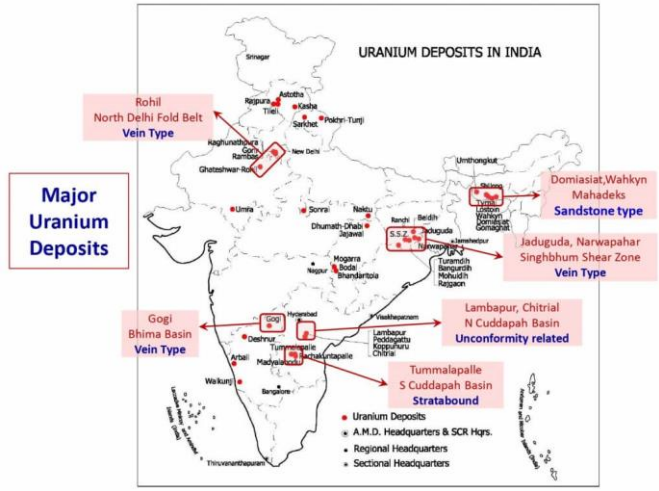


- Shale Gas is extracted through a process known as Fracking/Fracturing.

- Hydraulic fracturing is a technique in which large volumes of water and sand, and small volumes of chemical additives are injected into low-permeability subsurface formations to increase oil or natural gas flow.
- **Shale Gas In India:**
- 

(for extraction of shale gas after vertical drilling we do horizontal hydraulic fracturing in which we use gawargum which is the powder of seeds of gawar.)

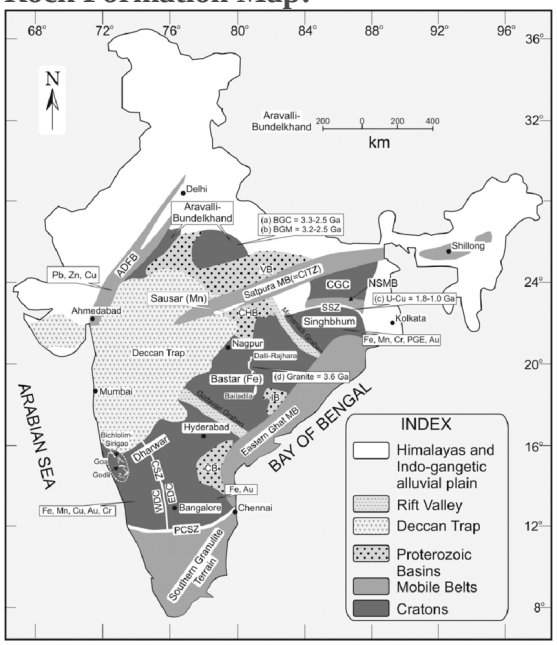
- **Uranium Deposits (World):**
- 

- **Uranium Deposits In India**:
- 

ROCK FORMATION IN INDIA: (11:37 AM):

- **Geological Formation:**

- **1) Archean Rock System:**
- The oldest is the Archean Rocks in India (approx. 3 billion years old).
- It is also known as the fundamental complex of the country.
- They are the deepest and largely metamorphosed (mainly made up of igneous and metamorphic rocks)
- These rocks contain no fossils and are the hardest. (bz when these rocks formed then life was there on earth so no fossils are found.)
- Economically of no use as cannot be mined/extracted.
- Example, Niligiri Geneiss, Bundelkhand Rocks. (usually these rocks are very deep to surface but at somewhere these are above the surface also for ex: in Nilgiri)
- **2) Dharwar Rocks System:** (Iron found in Dharwar rocks)
- They are the oldest sedimentary rocks in India.
- They are known as metallic ferrous minerals. (Dharwar region Karnataka, Chota Nagpur Plateau, parts of Aravalis.)
- Iron, Nickel, Cobalt, etc. are commonly found in metal deposits.
- **3) Cuddapah Rocks System:** (Cuddapah region of AP, Krishna valley)
- They refer to the deposition of accumulation of the sedimentation of the Archean and Dharwar Rock System.
- Present in the Krishna River Valley. These are famous for limestone, dolomite, and glass-making sand.
- Uranium deposits fund in the Bheema River Basin in this rock system.
- **4) Vindhyan Rock System:** (here we find layer of limestone, sandstone)
- Made due to the rifting activities.
- Known for Diamond (Panna Mines, Golconda).
- **5) Gondwana Rock System:**
- Formed due to the rifting of the Pangea.
- Coal deposits are commonly found in this rock system.
- **6) Deccan Traps:** (Made from highly fluid Basaltic magma from the reunion hotspot)
- No major minerals are present in the Deccan Traps in a concentrated form.
- **7) Tertairy Rock System:**
- The Himalayan Region is formed in the Tertiary Phase due to the upliftment of the Himalayas
- Limestone is found in the Shivalik, Pirpanjal, and Doon Valleys.
- Lithium deposits are also found here.
- **8) Quaternary Rock System:** (sedimentary rocks are present)
- Shale and Petroleum Reserves are found in this rock system.
- Brahmaputra Valley is famous for its petroleum deposits.

- **Rock Formation Map:**
- 

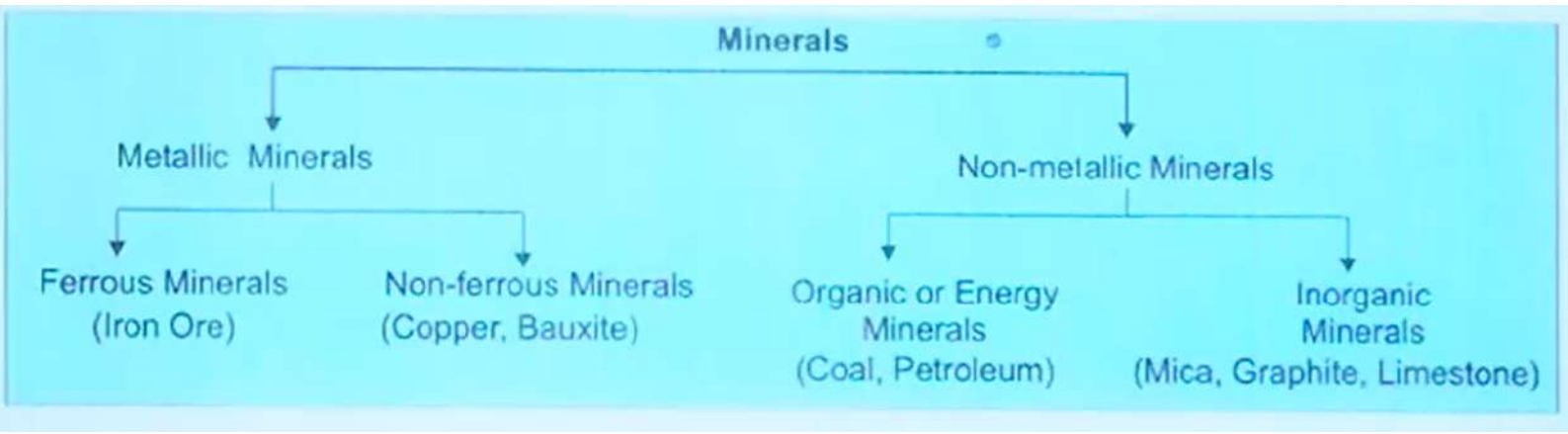
ISSUES IN MINERAL EXTRACTION: (12:15 PM):

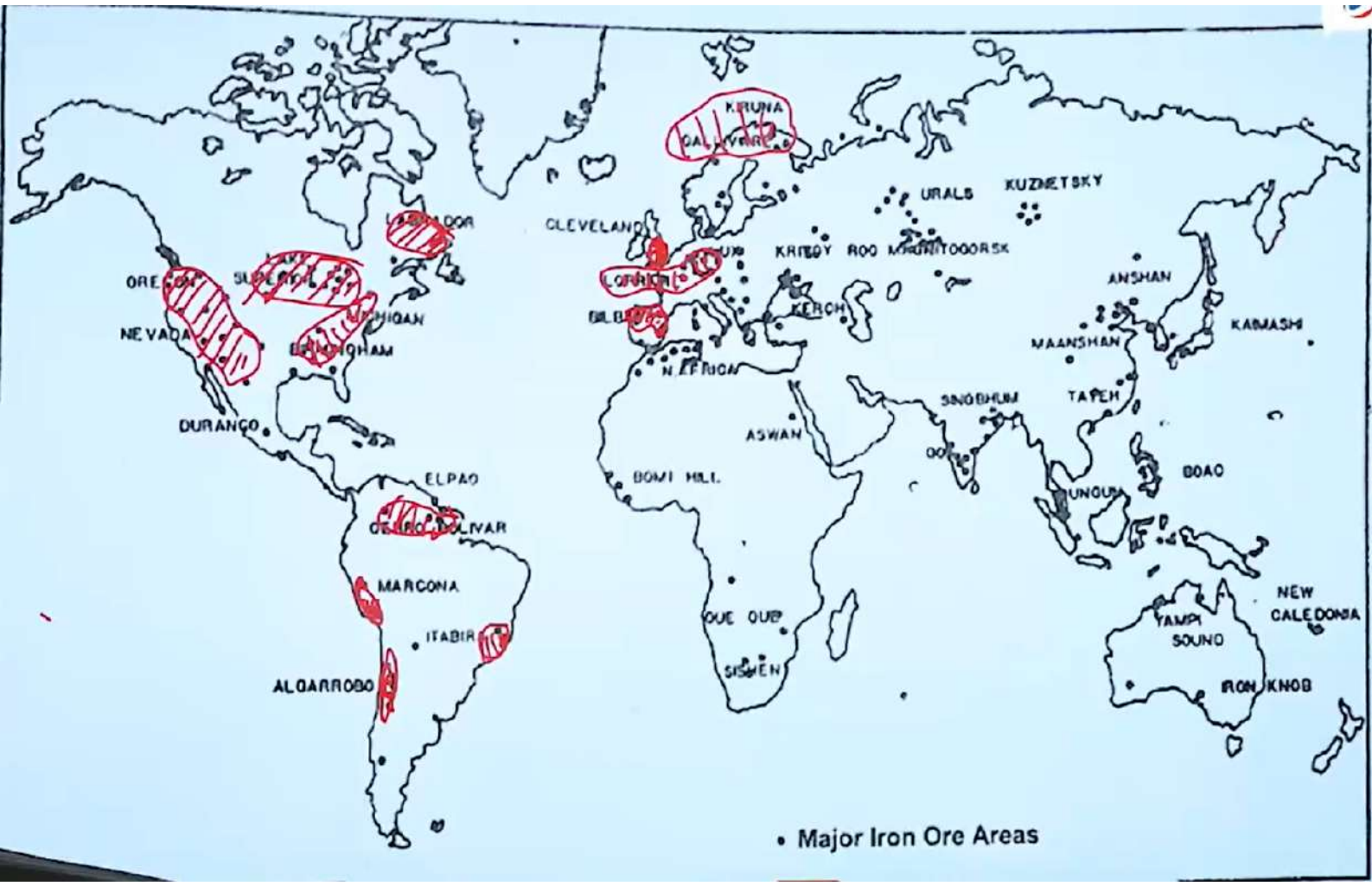
- **Issues:**
- **1) Environmental:**
- Air Pollution due to open-cast mining. (due to particles of sand and stones.)
- Water pollution as the affluent water is discharged into the streams, lakes, etc.
- Soil degradation.
- Deforestation.
- Land subsidence, and earthquakes due to underground mining.
- **2) Administrative:**
- Illegal mining.
- Revenue sharing and Corruption.
- Land acquisition.
- Damage to the infrastructure.
- **3) Technological:**
- Poor efficiency.
- Non-availability of modern technologies for extraction, and processing of the minerals.
- **4) Social Issues:**
- Inward and Outward migrations.
- Displacement and rehabilitation of the affected individuals with mining activities.
- Health issues. Rat hole mining
- **Important Minor Minerals:**

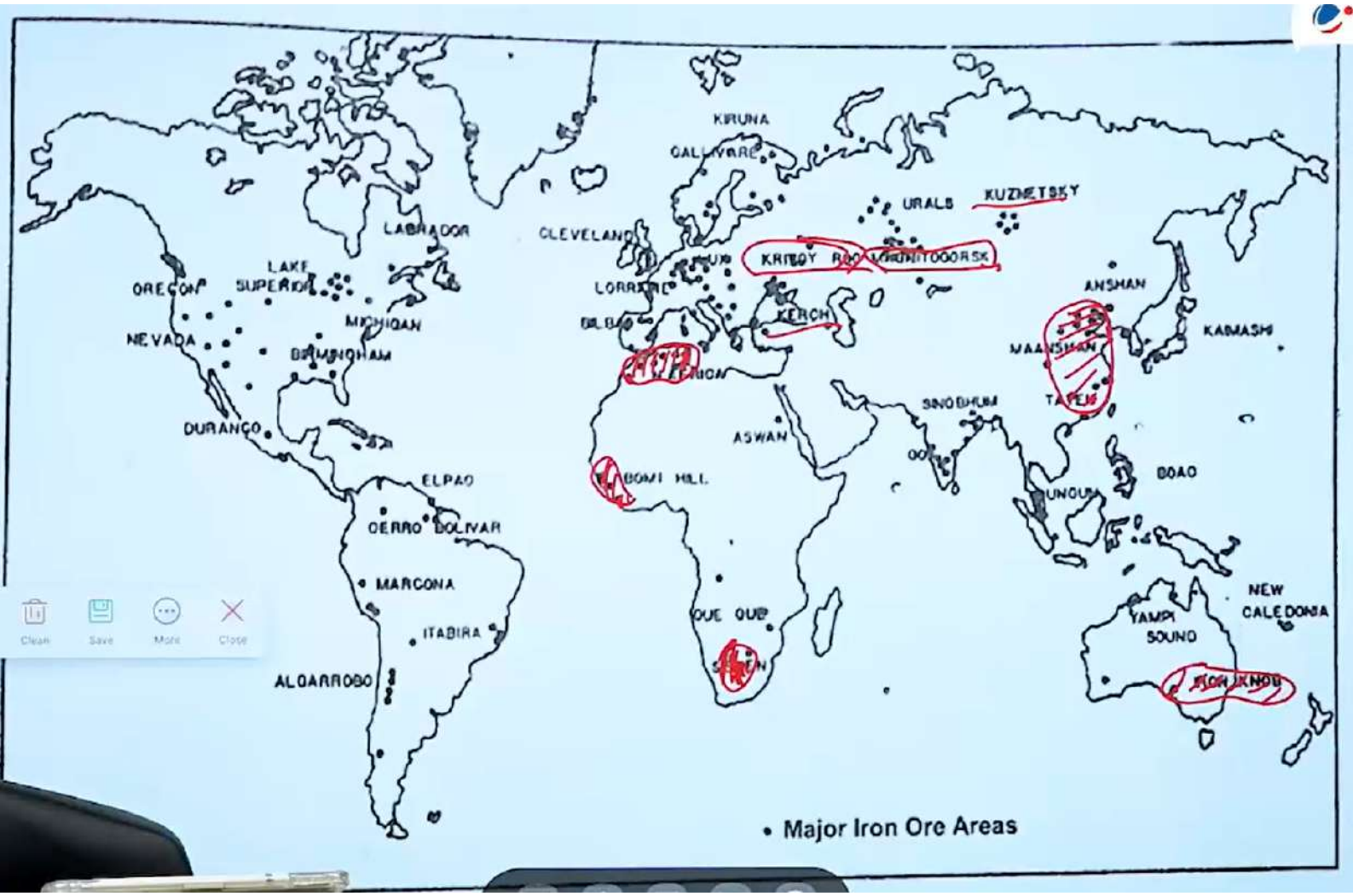
jo bhi hmne suna h wo sb major minerals and they are under central government.

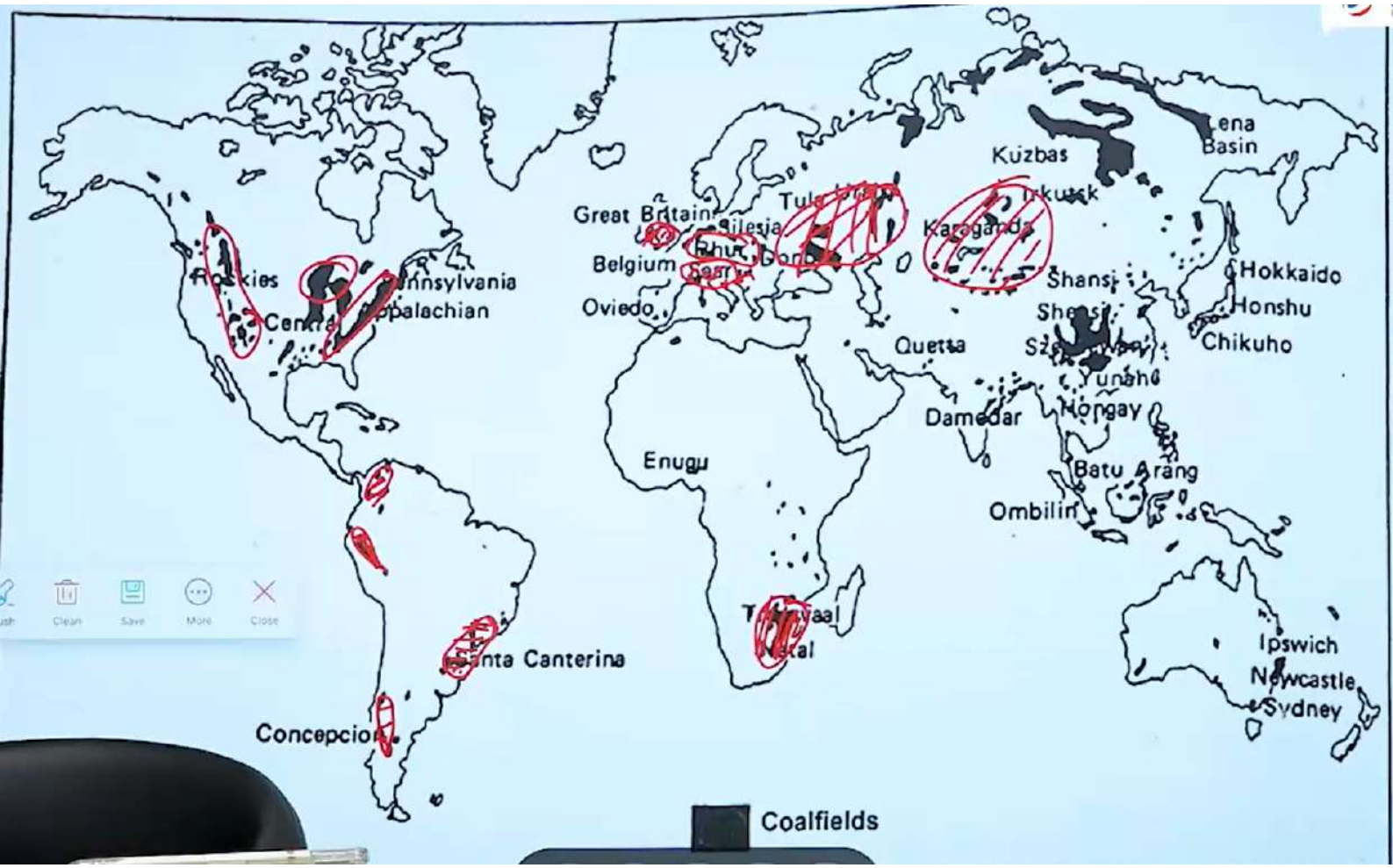
- Bentonite.
- Salt Petre.
- Slate.
- Dolomite, Gypsum.
- Sand.
- Kaolin.
- Barytes.
- Agate.

TOPICS OF THE NEXT CLASS: Industries, Population, etc.

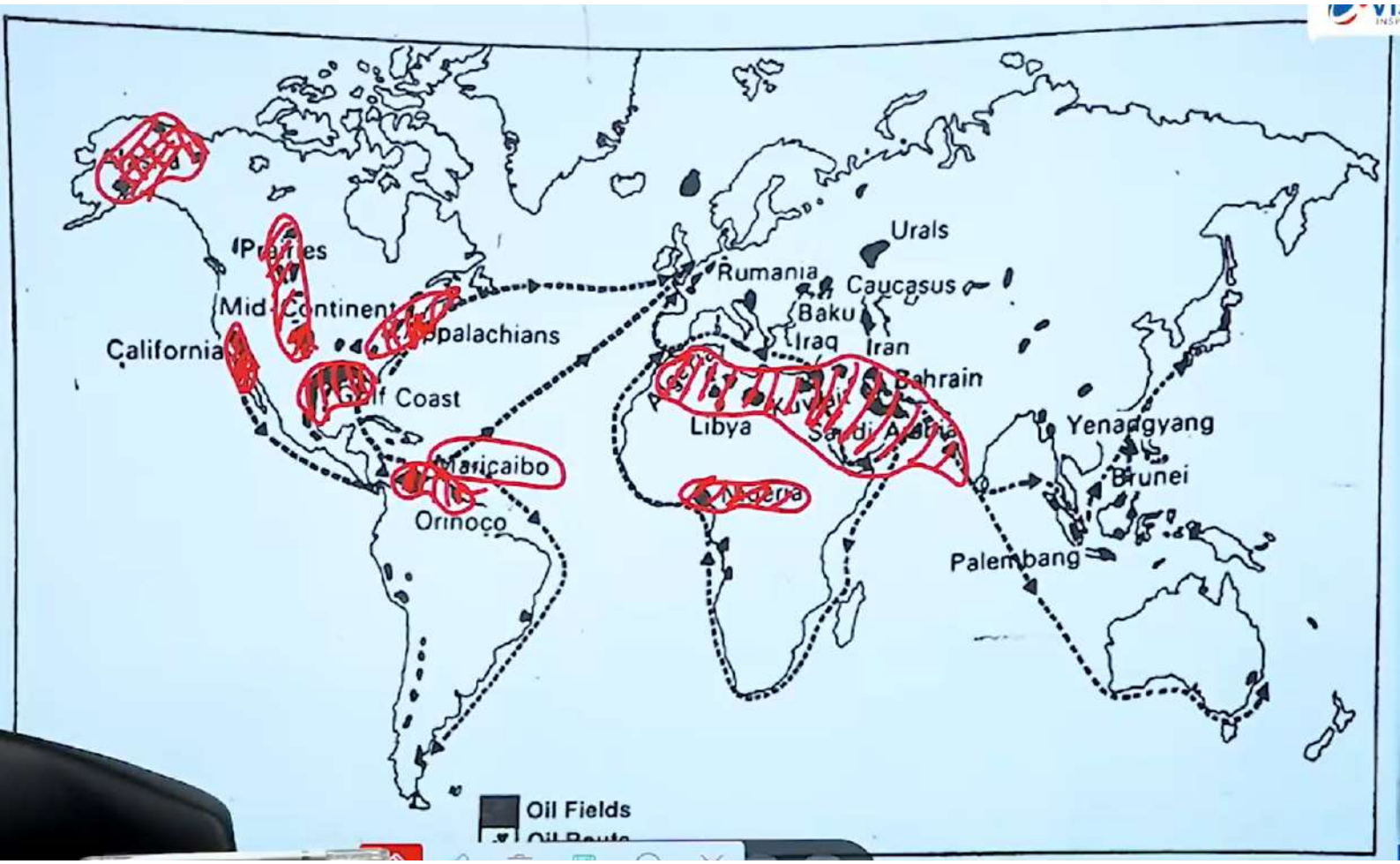

Minerals
Metallic Minerals
Non-metallic Minerals
Ferrous Minerals
(Iron Ore)
Non-ferrous Minerals
(Copper, Bauxite)
Organic or Energy
Minerals
(Coal, Petroleum)
Inorganic
Minerals
(Mica, Graphite, Limestone)


KIRUNA
URALS
KUZNETSKY
CLEVELAND
KRIVOY ROG
ANSHAN
KERCH
NEVADA
MAANSHAN
KAMASHI
N. AFRICA
SHOBHUM
TAPEH
DURANGO
ASWAN
BOAO
BOMI HILL
ELPAO
MARCONA
NEW
CALEDONIA
YAMPI
SOUND
ITABIR
ALGARROBO
IRON KNOB
• Major Iron Ore Areas


KIRUNA
GALLIVARE
URALS
KUZNETSKY
LABRADOR
CLEVELAND
KRIVOY ROG
MAGNITOGORSK
LAKE SUPERIOR
OREGON
LORRAINE
ANSHAN
MICHIGAN
KERCH
NEVADA
BIRMINGHAM
KAMASHI
WAANSHAN
TAPEH
DURANGO
ASWAN
SINOBHUM
ELPAO
BOMI HILL
BOAO
CERRO BOLIVAR
MARCONA
NEW CALEDONIA
YAMPI SOUND
ITABIRA
ALGARROBO
Major Iron Ore Areas


Lena Basin
Kuzbas
Irkutsk
Great Britain
Karaganda
Belgium
Oviedo
Shansi
Hokkaido
Honshu
Chikuho
Quetta
Damodar
Batu Arang
Ombilin
Enugu
Ipswich
Newcastle
Sydney
Concepcion
Coalfields


Kuzbas
Irkutsk
Tula
Ural
Great Britain
Karaganda
Belgium
Saar
Donbas
Oviedo
Shansi
Hokkaido
Honshu
Chikuho
Quetta
Damodar
Hongay
Batu Arang
Ombilin
Enugu
Transvaal
Natal
Santa Canterina
Concepcion
Coalfields


Urals
Rumania
Caucasus
Baku
Iraq
Iran
Bahrain
Libya
Yenangyang
Brunei
Palembang
Maracaibo
Orinoco
California
Mid-Continent
Gulf Coast
Oil Fields

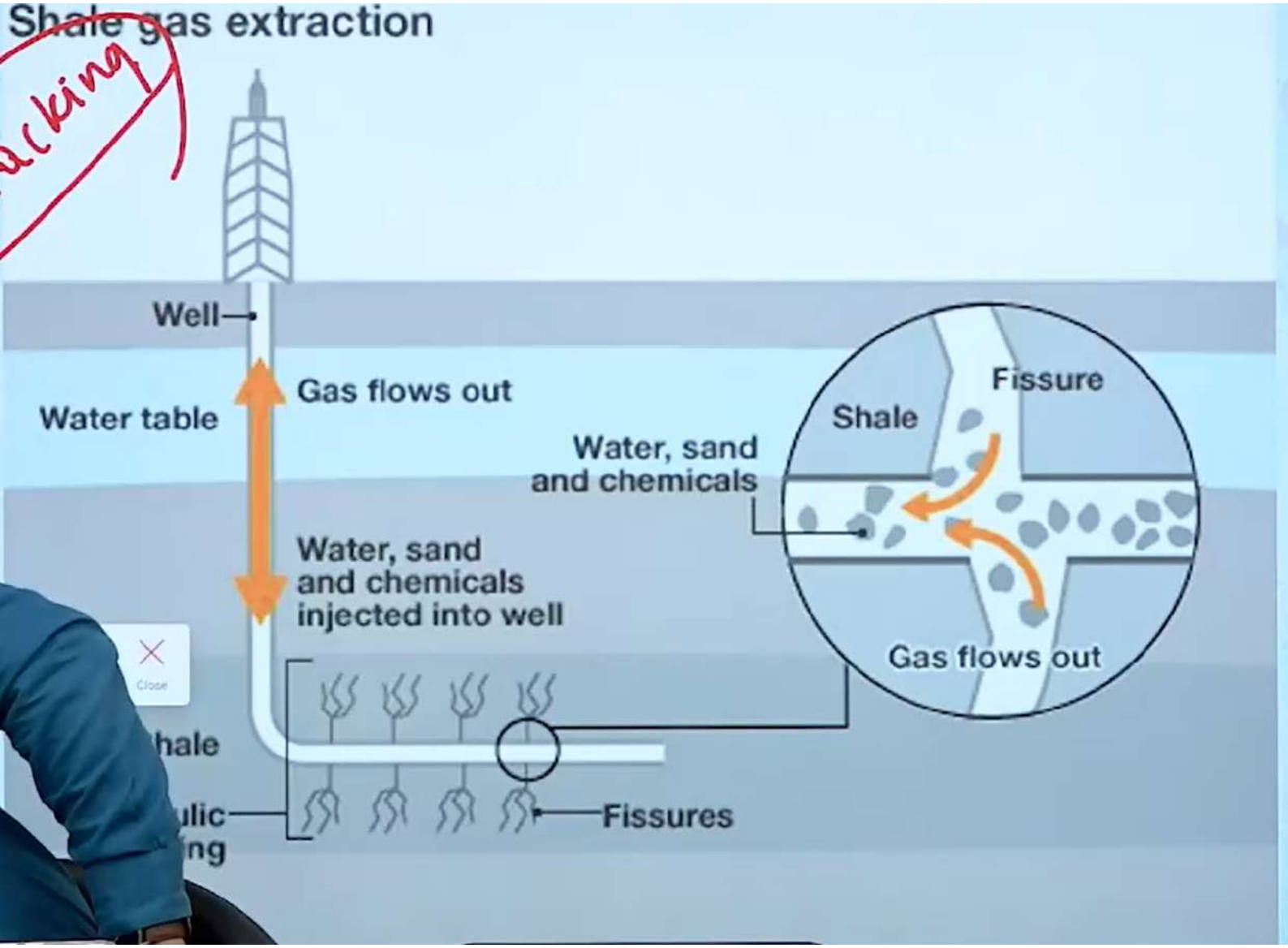

Shale gas extraction
Well
Water table
Gas flows out
Water, sand
and chemicals
injected into well
Fissures
Shale
Fissure
Water, sand
and chemicals
Gas flows out

Table 1: Leading Countries with Technically Recoverable Shale Gas Resources

Rank	Country	Technically recoverable Shale gas (trillion cubic feet)
1	China	1,115
2	Argentina	802
3	Algeria	707
4	U.S.A	623
5	Canada	573
6	Mexico	545
7	Australia	429
8	South Africa	390
9	Russia	285
10	Brazil	245
11	India	96
	World Total	7576

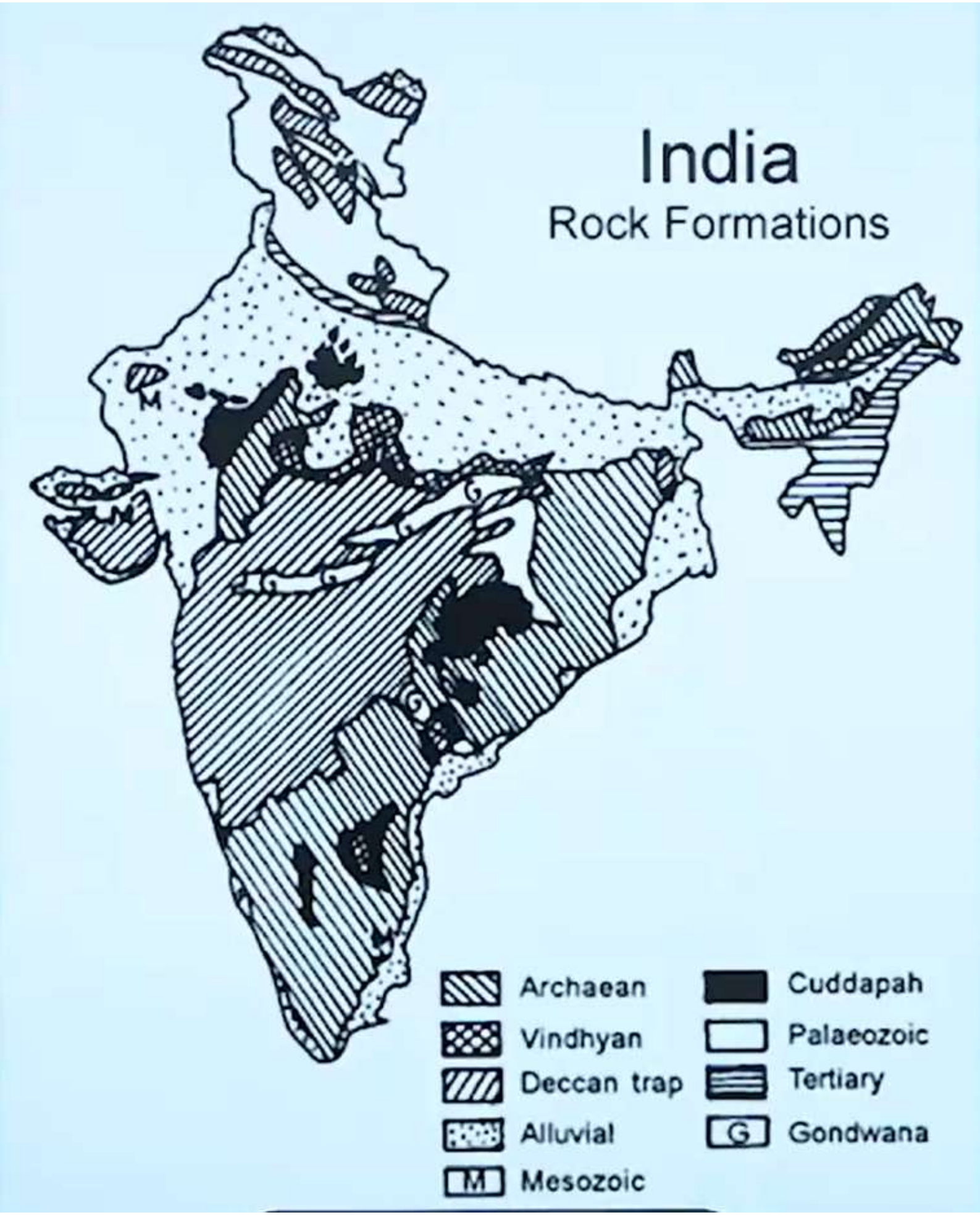
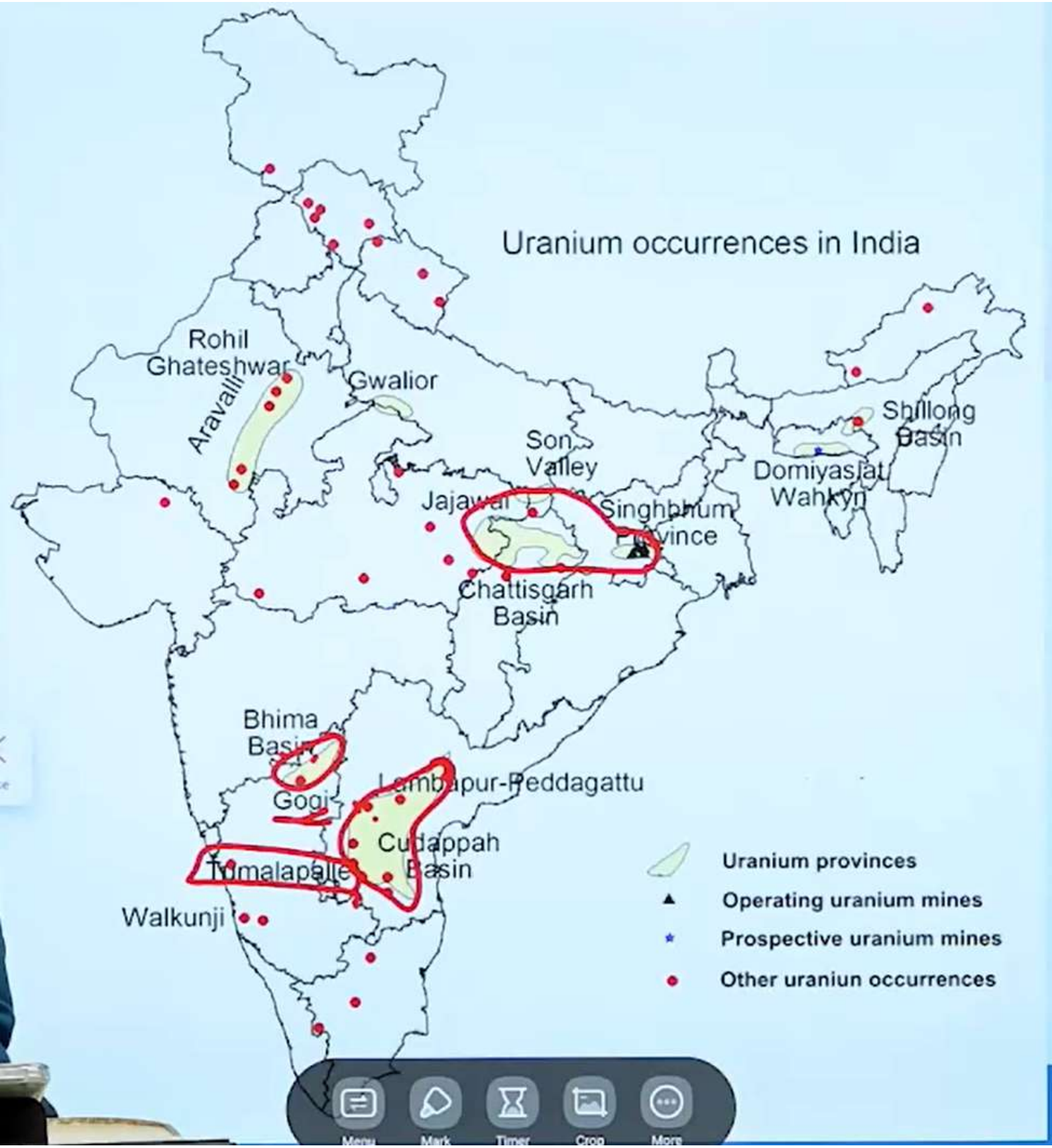
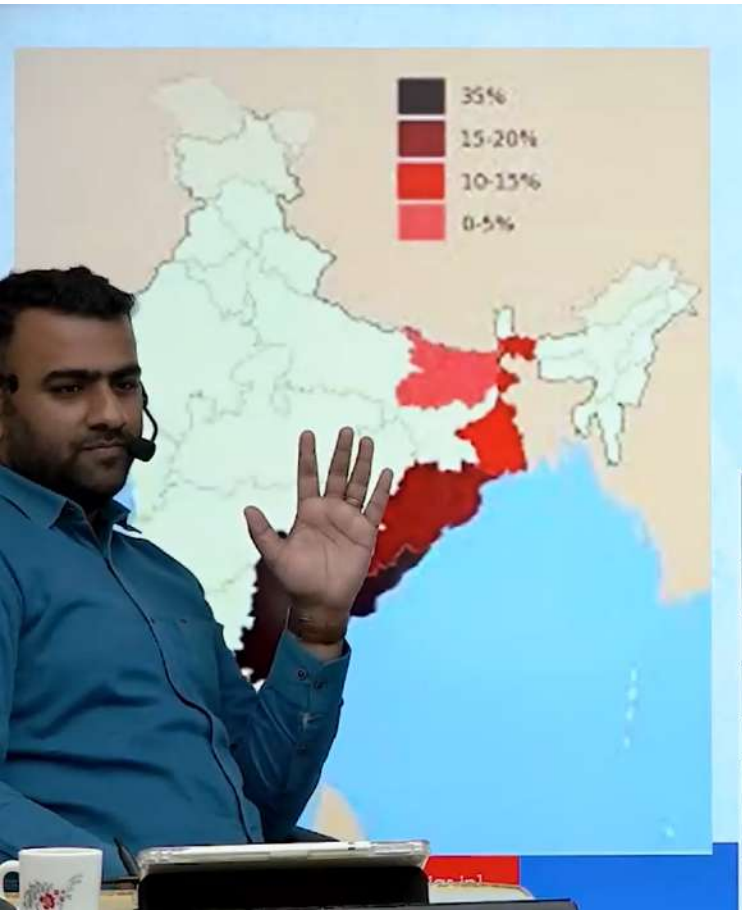

India
Rock Formations
M
Archaean
Vindhyan
Deccan trap
Alluvial
M
Mesozoic
Cuddapah
Palaeozoic
Tertiary
G
Gondwana

Table 11.1. Gondwana Coalfields

State	River Valley	Coalfields
1. Jharkhand	Damodar	Jharia, Karnpura, Ramgarh, East and West Bokaro, Giridih, Auronga, Hutar and Daltonganj.
2. Odisha	Mahanadi	Sambalpur, Sundargarh and Talcher.
3. Madhya Pradesh	Mahanadi/Son	Singrauli, Narsingpur, Chhindwara, Betul.
4. Chhattisgarh	Mahanadi/Son	Sarguja, Sendurgarh, Rampur, Korba and Raigarh.
5. Maharashtra	Godavari	Kamptee, Wardha valley, Chandrapur and Yavatmal.
6. Andhra Pradesh	Godavari	East and West Godavari.
.7. Telangana	Godavari	Adilabad, Khammam and Warangal.
8. West Bengal	Damodar	Raniganj, Bardhaman, Bankura, Purulia, Darjeeling and Jalpaiguri.


Uranium occurrences in India
Rohil
Ghateshwar
Aravalli
Gwalior
Son
Valley
Jajawal
Singhbhum
Province
Chattisgarh
Basin
Shillong
Basin
Domiyasiat
Wahkyn
Bhima
Basin
Gogi
Lambapur-Peddagattu
Cuddapah
Basin
Tumalapalle
Walkunji
Uranium provinces
Operating uranium mines
Prospective uranium mines
Other uraniun occurrences



USGS Estimates in tonnes (2011)

Country	Reserves
India	963,000
United States	440,000
Australia	300,000
Canada	100,000
South Africa	35,000

State	Monazite (Million tonnes)
Odisha	2.41
Andhra Pradesh	3.72
Tamil Nadu	2.46
Kerala	1.90
West Bengal	1.22
Jharkhand	0.22
Total	11.93

Important minor minerals

1. boulder,
2. shingle,
3. lime shell, kankar and limestone used in kilns for manufacture of lime used as building material,
4. brick-earth,
5. bentonite,
6. slate and shale when used for building material,
7. marble,
8. stone used for making household utensils,
9. quartzite and sandstone when used for purposes of building or for making road metal and household utensils,
10. saltpetre
11. ordinary earth (used or filling or leveling purposes in construction or embankments, roads, railways, building).

Important minor minerals

12. Agate,
13. Barytes,
14. Calcite,
15. Chalk,
16. Corundum,
17. Diaspore,
18. Dolomite,
19. Dunite/Pyroxenite,
20. Felspar,
21. Gypsum,
22. Jasper,
23. Kaolin,
24. Laterite,
25. Sand (others),
26. Silica Sand,
27. Steatite or Talc or Soap stone.