

Petroliferous Basins of India

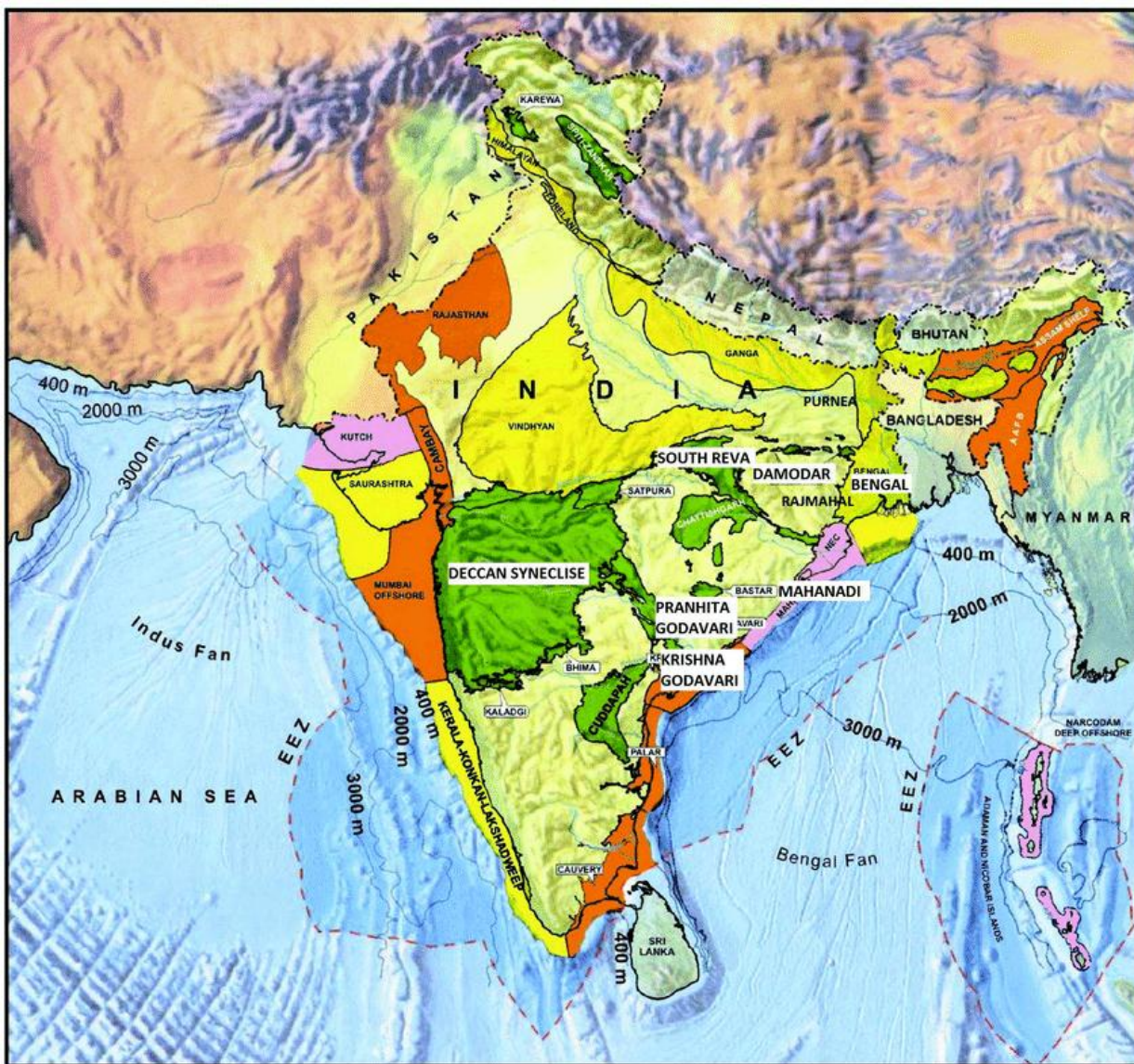
E-Content

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Paper -- MGELEC1(Fuel)



LEGEND

- | | |
|---|--|
| <ul style="list-style-type: none"> CATEGORY-I BASIN
(Proven commercial productivity) CATEGORY-II BASIN
(Identified prospectivity) CATEGORY-III BASIN
(Prospective Basins) | <ul style="list-style-type: none"> CATEGORY-IV BASIN
(Potentially Prospective) PRE-CAMBRIAN BASEMENT/
TECTONISED SEDIMENTS DEEP WATER AREAS
WITHIN EEZ |
|---|--|

Assam – Arakan Basin

- **Structure** :

=> *Long belt of Overthrust masses (Schuppen Belt)*, outermost is **Naga Thrust**

=> In the **Naga Thrust** – **anticlinal structures** are present, most important is at **DIGBOI**.

=> **Mikir Hills** – composed of gneisses, is like a **Tectonic High**, Oilfields lie South of ridge

- **Stratigraphy** :

a) **Pre-Tertiary** => include Pre-Cambrian Quartzites etc. of E.Himalayas, Gneisses of Mikir Hills & a narrow outcrop of Lower Gondwana beds in E. Himalayas

b) **Tertiary** => Shelf – facies occur in Shillong Plateau & Mikir Hills
=> Geosynclinal facies occur in Naga Hills

- **Habitat of Oil** : => (**Basin contributes over Half of India's Onshore Oil Production**)

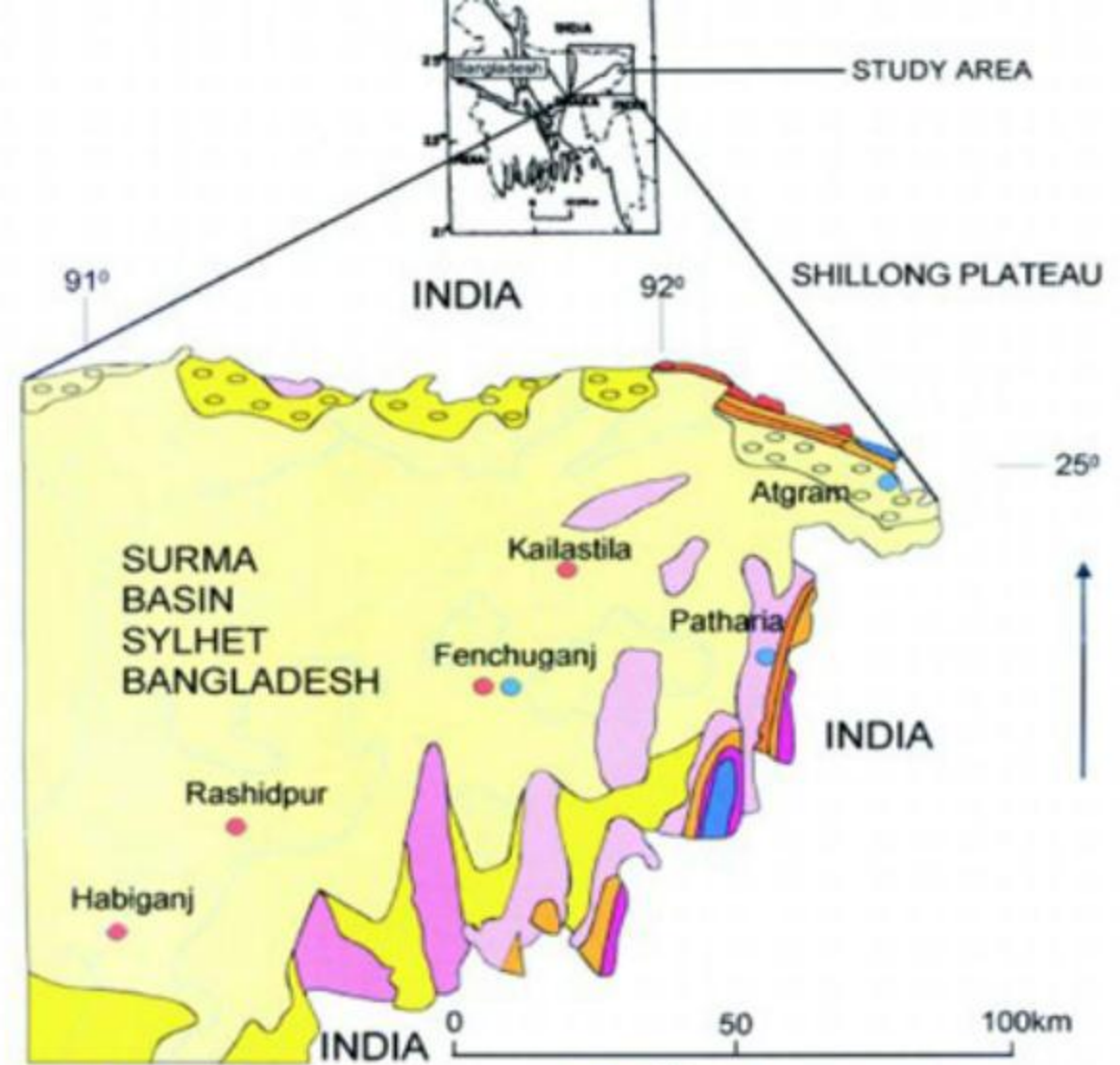
- *In Tertiaries* – Eocene, Oligocene & Miocene – contain productive horizons

- *In U.Assam* => one commercial oilfield on an exposed structure at **Digboi**

=> **Digboi oilfield** -- is in a faulted elongated Anticline in **Tipam group** rocks

=> **Naharkatiya Ofield** – series of small accumulations controlled by stratigraphy & structure, which is concealed beneath Shelf Facies.

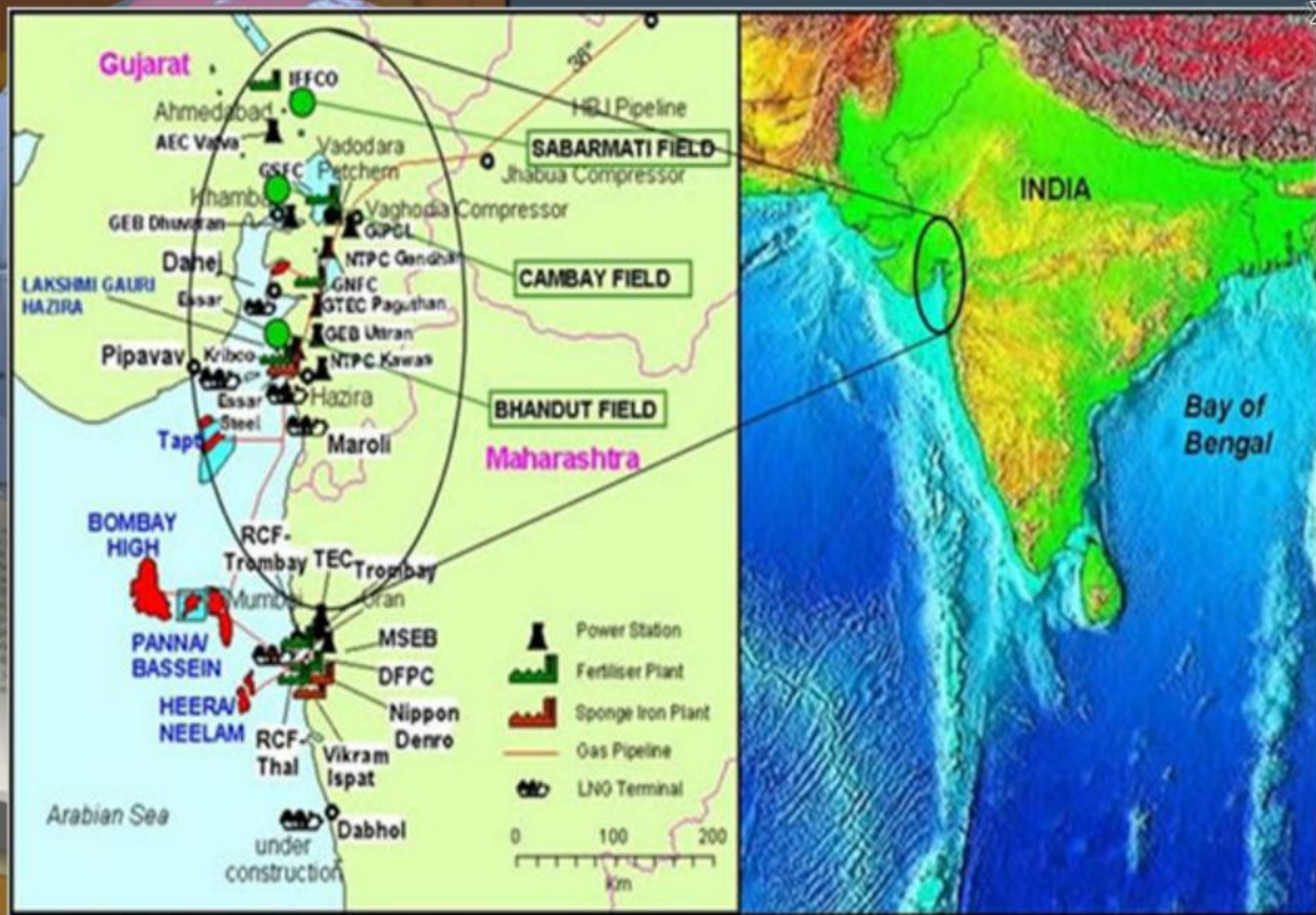
-- Hydrocarbons produced – is from **Tipam & Barails or both**



- | | | |
|---|-------------------------------|-----------|
| Holocene (Alluvial deposit) | Pliocene (Tipam Sandstone) | Gas Field |
| Holocene (Paludal, Alluvial & deltaic deposits) | Pliocene (Boka Bil Formation) | Oil Show |
| Pleistocene (Dihing and Dupi Tila Formation) | Miocene (Bhuban Formation) | |
| Pleistocene & Pliocene (Dihing Formation) | Oligocene (Barail Formation) | |
| Pleistocene & Pliocene | Eocene & Paleocene | |

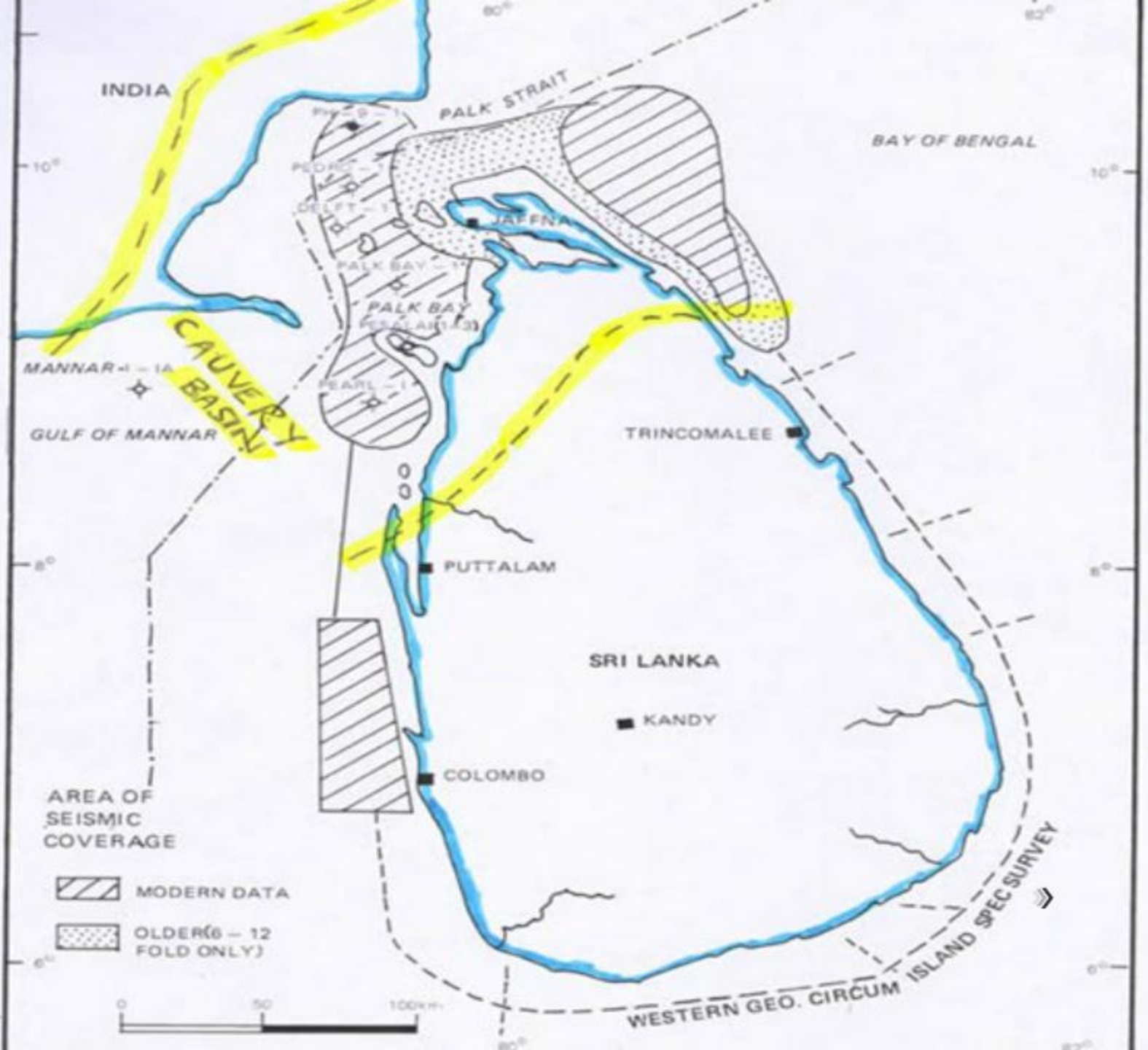
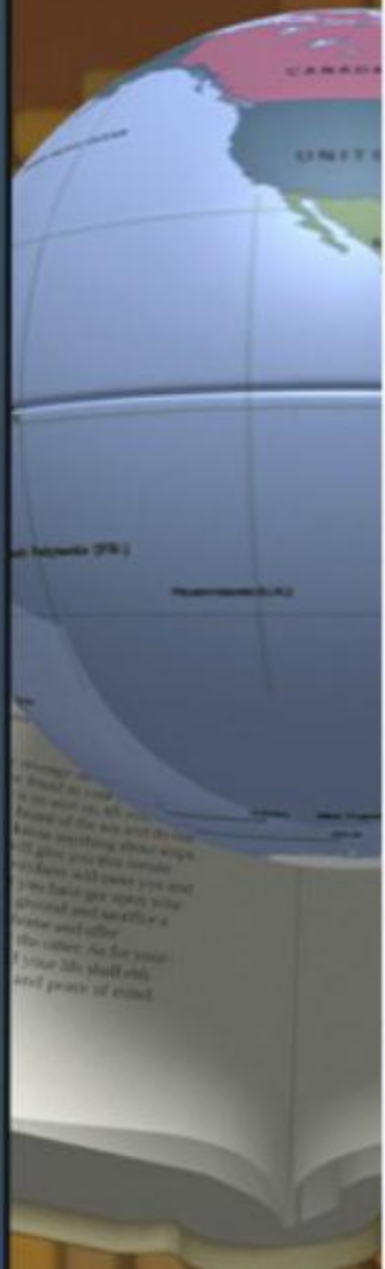
Cambay Basin

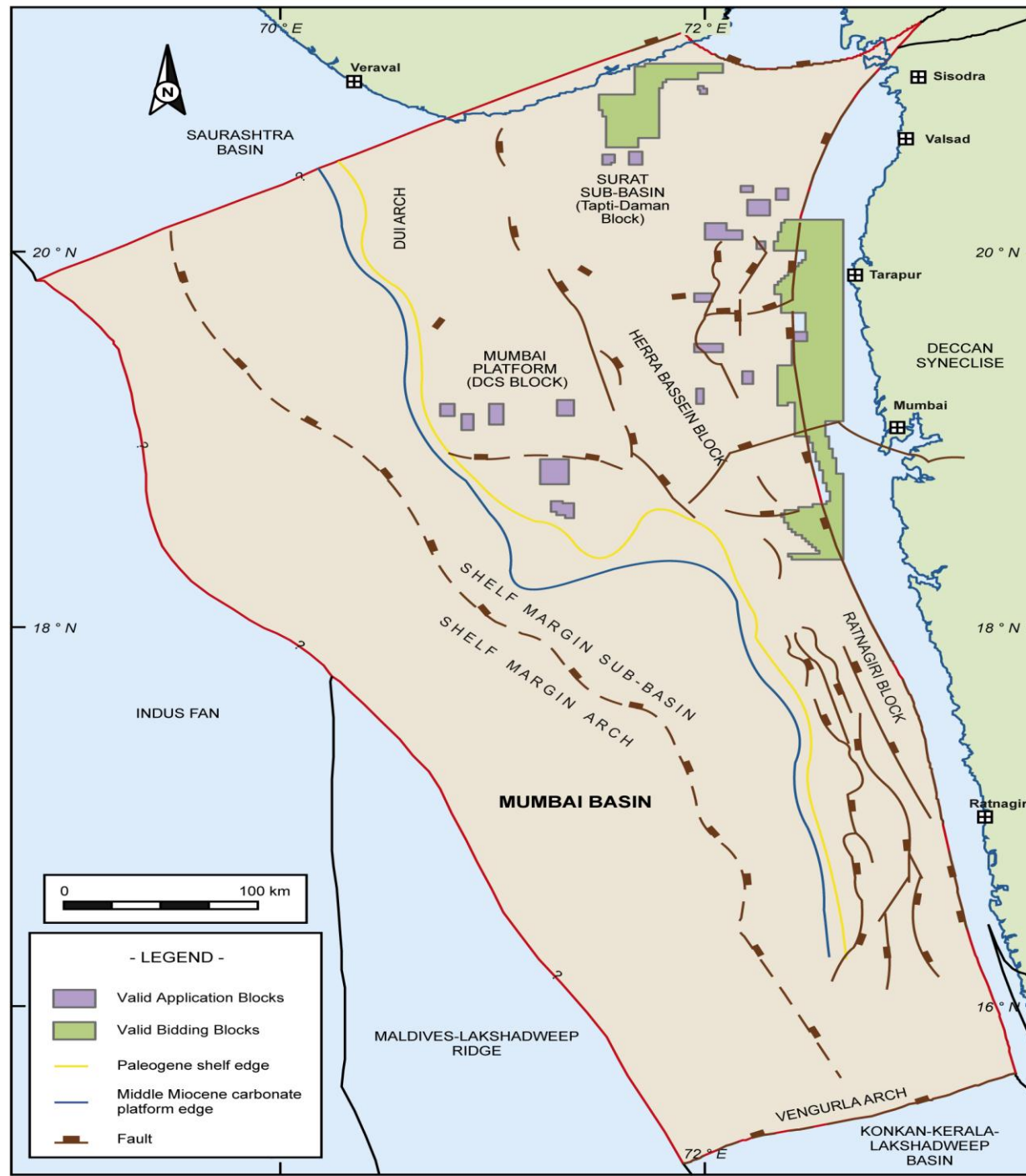
- Located in NW margin of Indian Peninsula, one of the best explored sed. Basin
- Ankaleshwar Oilfield => first major oilfield of Cambay basin
- **Structure** : => Intra-cratonic rift graben -- in form of long, narrow depression (N-S)
 - Basin setting => similar to Divergent Continental Margin basin
 - Basin is tectonically divided into 7 blocks from N to S.
- **Stratigraphy** : => a **Tertiary basin** with sequence of **Tertiary-Quaternary rocks overlying the Deccan Trap.**
=>Basin developed in **3 stages** – **Lower** (Mesozoic rocks), **Middle** (Basaltic flow) & **Upper** (Palaeogene / Neogene)
- **Habitat of Oil** :
 - => **Productive Horizons** – Mid-Eocene, Oligocene & Miocene ages
 - => **Source Rocks** – **Cambay Shales** (Palaeocene to L. Eocene)
 - => **Reservoir Rocks** – **Sandstone** (with Siltstone)
 - => **Cap Rocks** – **Tarapur Shales** (U.Eocene)
- **Oil & Gas Fields** => There are several oilfields in the region
 - => **Majority of the Traps are – Structural**
 - => **All major oilfields are** -- **Anticlines (with one or both limbs faulted)**



Cauvery Basin

- **Largest Sedimentary basin on the East Coast of India (25000 sq.km)**
- Location – South of Chennai , Occupies a large coastal & adjoining land in **Tamilnadu & Pondicherry**
- **Offshore** => Basin extends along **Coromandel coast, the Palk Bay** (b/w India/ SriLanka) and **Gulf of Mannar**.
- Western limits – formed by exposures of **Archaen rocks**
- **Regional alignment** of tectonic feature is **NE-SW**, parallel to **Eastern Ghats** trend.
- **Basement** – has a **Horst-graben morphology** resulting from faults
- **Stratigraphy** => Cauvery Basin came into existence in **Early Mesozoic**
 - => **Basement** – formed by **Archaen Gneisses & Charnockites**
 - => Phanerozoics – Late Jurassic & Early Cretaceous rocks
 - => **Exposed rocks** – are of **Cretaceous, Palaeocene / Eocene & Miocene** age
 - => **Predominant Lithology** – **Sandstone, Siltstone & Shales**
 - => **Carbonates** – very limited & present in few depressions only
- Oil / Gas => **No surface oil / gas shows** in the basin (**Oil shows of Eocene** in shallow water wells only)





K-G Basin

- Ca. 50000 sq.km area –Onshore & Offshore
- Called the Middle East of India (as its huge reserves can serve the energy needs of India and even export crude oil & oil products)
- From West & NW – limited by Eastern Ghats (Archaean rocks)
- Towards East – basin extends offshore into Bay of Bengal
- Basin – Pericratonic an example of
 1. Divergent Continental Margin Basin associated with initial rifting
 2. Then covered by Platform type Carbonates
 3. Final stage –Superimposed by Delta system
- Gas shows in the shallow coastal wells drilled in the basin –common
- Commercial accumulations of Oil / Gas in Miocene zones -- recorded in offshore wildcat wells
- Further exploration is going on

