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**
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)
Bombay High

• Basin – a broad Shelf => Southerly extension of Cambay Basin
• Bounded – by Deccan Trap (N&E), by E-W Panjim Arch(S), by Shelf-edge basement arch (South)
• **Structure** => Basin is divided into :- Surat depression / Bombay Platform / Ratnagiri block faulted zone / Shelf margin basin / Shelf edge basement arch.

• **Stratigraphy** : **Tertiary sediments** – *Sands & Lignite Clays (Basal), Limestone & Shales (Middle) and Shales & Clays (Upper)*
• Petroleum Aspect : nearly half of India’s oil reserves located in Bombay High field
• Major producing horizons – **Middle Miocene age**
• Also oil / gas bearing in many structures – Eocene, Oligocene & early Miocene sequence
• **Source Rocks** : 3 possible – 1. pre-Mid Miocene Shales in Surat depression
  2. Shales in Shelf-margin basin
  3. Shales which alternate Limestone of Bombay platform
• **Reservoir Rocks** : In Miocene sequence 4 oil/gas bearing zones identified
  == **L1 , L2 & L3 reservoirs** -- in Limestones and **S1 reservoir** -- in Sandstones
• **Cap Rocks** : Post Mid- Miocene shales are Primary cap rocks while Secondary Shale cap rocks
• **Oil & Gas fields** : Structures are mostly developed by drape of sediments over the Paleo-highs and Faults.
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