

Samples from  
**INDIAN POLITY**

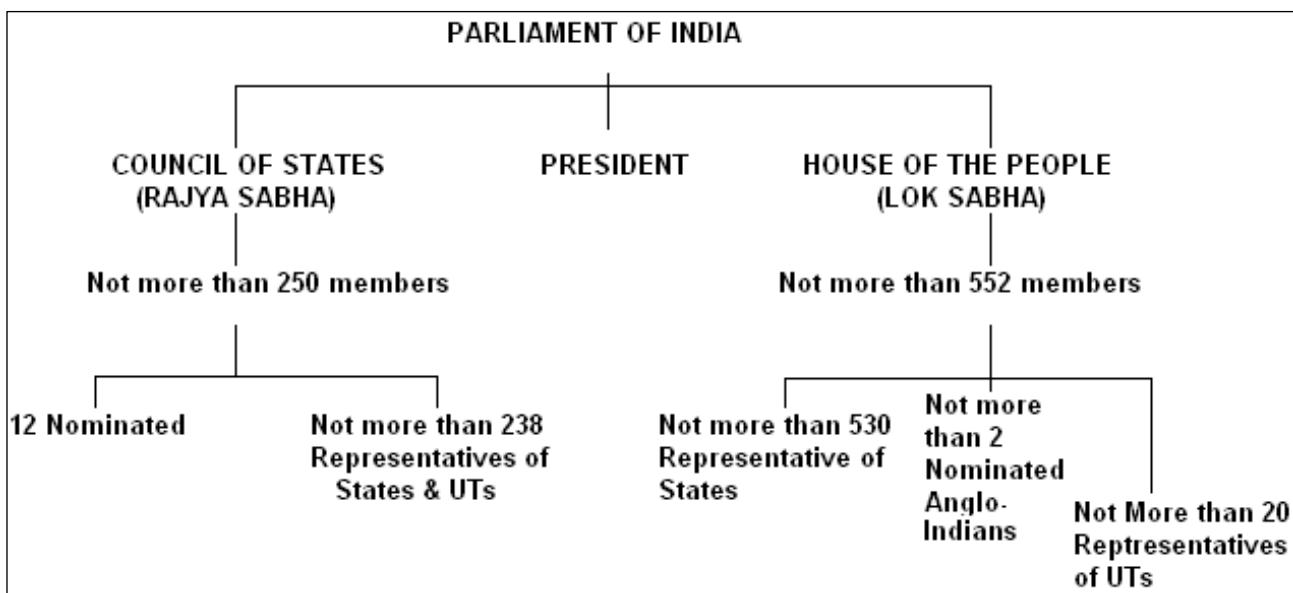
# THE PARLIAMENT



## Overview

Every game has some rules, and these rules are set by the setters of the game. Similarly, every society is run by some laws; and these laws are set by Parliament in India. Parliament in India is the highest law making institution in the country.

- The Parliament of India consists of the President and two Houses. The **lower House** is called the House of the People while the **upper House** is known as the Council of States [Art. 79]. The President is a part of the Legislature, like the English Crown, for even though he does not sit in Parliament, except for the purpose of delivering his opening address [Art. 87]; a Bill passed by House of Parliament cannot become law without President's assent.



At present the Lok Sabha consists of **545** members and Rajya Sabha **245** members

Only UTs of Delhi (3) and Pondicherry (1) have seats in Rajya Sabha because these have Legislative Assemblies.

**84<sup>th</sup> Amendment Act, 2001** freezed the **total number of existing seats** as allocated to various States in the Lok Sabha (on the basis of the 1971 census) till the first census to be taken after the year **2026**

The no. of seats in Lok Sabha as well as Rajya Sabha has been **fixed on the basis of population** of a State. The Constitution requires re-allocating the seats to the States after each census through the process of 'delimitation'.

Delimitation is done by the **Delimitation Commission** constituted under an Act of Parliament.

## QUALIFICATIONS FOR THE MEMBERSHIP OF PARLIAMENT (ART 84)

- A **citizen** of India

- **Age** above 30 years for Rajya Sabha and 25 years for Lok Sabha
- Other **qualifications** as prescribed by the Parliament under law
- Person's name should be **registered as a voter** in any Parliamentary constituency (Representation of People's Act ,1951)
- **No educational qualification** has been prescribed

## **DISQUALIFICATION FROM MEMBERSHIP OF PARLIAMENT**

- If holds **Office-of-Profit** under Government of India or the Government of a State (certain offices has been exempted by the Office-of-Profit Act)
- If he is of **unsound mind** (declared by a competent court)
- If he is an **un-discharged insolvent**
- Not a citizen of India and has **voluntarily acquired citizenship** of a foreign country or has allegiance to a foreign power.
- If he is so **disqualified** by or under any law made by Parliament (Art 102)
- President obtains the **opinion of Election Commission** while deciding about the disqualification of members (Art 103)
- **Representation of People's Act** also provides grounds for disqualifications.
- A member can also be disqualified on the grounds of **defection** (52<sup>nd</sup> Amendment has amended articles 101, 102, 190, 191 and added **10<sup>th</sup> Schedule** which specifies disqualifications on ground of defection.

## **CONDITIONS WHEN A MEMBER OF PARLIAMENT VACATES SEAT (ART 101)**

- If he has **obtained membership of both Houses** of Parliament, he needs to vacate one.
- If **elected to both Parliament & state Legislature**, he needs to resign from state Legislature
- If he is **disqualified** under the provisions of Art **102** (anti-defection)
- If he **resigns**
- If he remains **absent** from all meetings of the House for a period of 60 days without the permission of the House.

## **SESSIONS OF THE PARLIAMENT**

- President has power to summon either house and has power to dissolve the Lok Sabha. President must summon each house at such intervals that **6 months** shall not intervene between its last sitting in one session and the first sitting of next session [**Art 85(1)**]. Therefore, it is necessary that the Parliament must meet **at least twice** a year.
- The Parliament generally meets in **three sessions** in a year:-
  - **Budget Session** (longest session) - February - May
  - **Monsoon Session** - July - August
  - **Winter Session** (shortest session) - November - December
- **Adjournments:** During a session, there are a number of daily sittings separated by adjournments. These postpone the further consideration of business for a specified time, which may extend not only for hours or days but can be for weeks. Another type of adjournment is when the House is adjourned by the Presiding Officer without fixing any date of time of the next meeting. This is called **Adjournment sine die**, i.e. without fixing any time/ day.
- **Dissolution ends life** of the house & general elections are held to elect a new Lok Sabha

- **Prorogation** merely **ends a session**. It does not end life of the House. The House meets again after prorogation. Because of it, pending notices, motions and resolutions lapse, while the Bills remain unaffected.
- **Recess** is period between prorogation of Parliament and its re-assembly in a new session.

<b>FEW CONTROLS USED BY PARLIAMENT OVER GOVERNMENT</b>	
<b>Question (Interpellations) Hour</b>	
<ul style="list-style-type: none"> <li>▪ The <b>first hour of every sitting</b> in both Houses (11 am- 12 am) is devoted to asking and answering of questions.</li> <li>▪ A question is a request made by a member for an <b>oral explanation from the concerned minister</b>. A <b>minister can also refuse to answer</b> a question, but, this privilege is to be used infrequently and with care.</li> <li>▪ A <b>notice of 10 days</b> has to be given to the concerned minister before a question can be asked. But if a <b>matter is urgent</b>, then, a shorter notice is enough. Such a question is called <b>Short Notice Question</b>.</li> <li>▪ The questions are classified into <b>2 categories</b>- <ul style="list-style-type: none"> <li>▪ Questions <b>marked with a star</b> are answered <b>orally</b></li> <li>▪ <b>Un-starred</b> ones get a <b>written</b> answer</li> </ul> </li> <li>▪ <b>No supplementary</b> can be asked thereon <b>Un-starred</b> Questions.</li> </ul>	
<b>Resolutions</b>	
<ul style="list-style-type: none"> <li>▪ The resolution must <b>raise some definite issue</b> and should not deal with the conduct of anyone except in his official capacity. A member can also move a resolution on a <b>matter of public interest</b>.</li> <li>▪ These are of <b>2 kinds</b>: <ul style="list-style-type: none"> <li>▪ which <b>recommend a particular course of action</b> to government</li> <li>▪ which <b>seek to censure</b> an individual minister or whole ministry</li> </ul> </li> <li>▪ <b>15 days' notice</b> is required for moving a resolution.</li> </ul>	
<b>Motions</b>	
<ul style="list-style-type: none"> <li>▪ When a member of the Parliament feels that a <b>particular matter or report should be discussed</b> in the House, a motion for that has to be brought before the House.</li> <li>▪ When a member moves a motion, he may speak on it and so can the other members. Then, the <b>debate</b> over it takes place.</li> </ul>	
<b>Adjournment Motion</b>	
<ul style="list-style-type: none"> <li>▪ It's an <b>extraordinary device</b>, which enables the House to discuss matters of urgent importance, and, if passed, the <u>ordinary business of the House is adjourned</u> and the matter, for which the adjournment motion has been moved, is taken up.</li> <li>▪ For passing it, <b>40 or more members</b> need to support it. A debate on an adjournment motion may last only <b>3 hours</b>, but not for less than <math>2\frac{1}{2}</math> hours.</li> <li>▪ When the debate on the motion comes to an end at the specified time, the <b>Speaker closes the debate</b> and puts the motion to vote.</li> <li>▪ If such a motion is passed, it amounts to a <b>censure against the government</b>.</li> <li>▪ <b>Rajya Sabha</b> is not permitted to make use of this device.</li> </ul>	
<b>Zero Hour</b>	
<ul style="list-style-type: none"> <li>▪ It is an <b>informal device</b> to raise matters <b>without any prior notice</b>.</li> <li>▪ Starts immediately after the Question Hour and lasts until the agenda or regular business for the day is taken up.</li> <li>▪ It is an <b>Indian innovation</b>; used since <b>1962</b>.</li> </ul>	

<b>Half-an-Hour Discussion</b>			
<ul style="list-style-type: none"> <li>▪ Meant for raising a discussion on a matter of <b>sufficient public importance</b>, which has been <b>subjected to a lot of debate</b> and the answer to which <u>needs elucidation</u> on a matter of fact.</li> <li>▪ The Speaker can allot <b>3 days</b> in a week for such discussions.</li> <li>▪ There is <b>no formal motion or voting</b> before the House.</li> </ul>			
<b>Short Duration Discussion/ 2-Hour Discussion</b>			
<ul style="list-style-type: none"> <li>▪ Discussions on a matter of <b>urgent public importance</b></li> <li>▪ Speaker can allot <b>2 days</b> in a week for such discussions</li> <li>▪ There is <b>no formal motion or voting</b> before the House</li> <li>▪ Used since <b>1953</b></li> </ul>			
<b>Calling Attention Motion</b>			
<ul style="list-style-type: none"> <li>▪ Device innovated in the <b>Indian Parliament</b> in 1954; unlike Zero Hour, it is mentioned in rules of procedure.</li> <li>▪ By this method, a member can ask for an explanation or a <b>clarification from a minister</b> on matters of <b>urgent public importance</b> at <b>short notice</b>.</li> <li>▪ However, the <b>Speaker</b> is free to grant such a request or disallow it.</li> </ul>			
<b>No Confidence Motion</b>			
<ul style="list-style-type: none"> <li>▪ Council of Ministers is <b>collectively responsible</b> to the Lok Sabha (<b>Article 75</b>). Government stays in office so long as it enjoys confidence of the majority of the members of the Lok Sabha.</li> <li>▪ Lok Sabha can remove the ministry from office by passing the No Confidence Motion. The motion needs the support of <b>50 members to be admitted</b>.</li> </ul>			
<b>Short Duration Discussion</b>	-	1953	
<b>Calling Attention Motion</b>	-	1954	- Indian Innovation
<b>Zero Hour</b>	-	1962	- Indian Innovation

#### **No Confidence Motion vs. Censure Motion**

<b>No Confidence Motion</b>	<b>Censure Motion</b>
Need not state the reasons for its adoption in Lok Sabha	Need to <b>state the reasons</b>
Can be moved only against entire Council of Ministers	Can be moved against an <b>individual minister</b> or a group of minister also
Moved to <b>ascertain confidence</b> of Lok Sabha in the Council	Moved for censuring council of ministers for specific policies & actions.
If passed in Lok Sabha, Council of Ministers <b>must resign from office</b> .	If passed, the Council of Ministers need not resign from the office.

## **BILLS OF PARLIAMENT**

### **ORDINARY BILL**

- A bill other than Money Bill & Financial Bill
- May **originate in either house** of Parliament
- When passed by both the houses and signed by the President, it becomes a law
- In passing a Bill, each House follows a procedure. The stages in passing the Bill are called **Readings** i.e. First Reading, Second Reading and Third Reading

## MONEY BILL (ARTICLE 110)

- Parliament is the **sole power** to authorize expenditure and specify purposes.
- **Whether a Bill is a Money Bill or not, is decided by Speaker.** It shall **not be open to question** either in a Court of Law or in either House or even by President.
- Under **Article 110 (3)**, it has been specified that, if any question arises whether a bill is a money bill or not, the **decision of the Speaker shall be final**.
- Whenever a money bill is transmitted to the Rajya Sabha and when it is presented to President, a **certificate of Speaker** that it is a money bill is required to be given.
- Money Bill has been defined under **Article 110** as a bill that contains **only provisions** dealing with all or any of the following matters:
  1. The imposition, abolition, remission, alteration or regulation of any **tax**
  2. The regulation of borrowing of money or giving of any guarantee by the Government or amendment of law w.r.t. any government **financial obligations**
  3. The custody & operation of **Consolidated Fund or Contingency Fund** of India
  4. The appropriation of moneys out of the **Consolidated Fund** of India
  5. The declaring of any expenditure charged on the **Consolidated Fund** of India or the increasing of the amount of any such expenditure
  6. The receipt of money on account of the **Consolidated Fund** of India or the **public accounts** of India or the custody or issue of such money.
- **Art 109** says that Money Bill can **only be introduced in Lok Sabha** and not in Rajya Sabha. It can only be introduced with **prior recommendation** of President.
- When a money Bill is passed by Lok Sabha, it is sent to Rajya Sabha for **recommendations**. It must return the Bill with or without recommendations, within **14 days** from the date of receipt of Bill. It **cannot amend** the Bill. It is the **discretion of the Lok Sabha** whether to accept or reject recommendations made by the Rajya Sabha. The Bill now will deem to be passed by the Lok Sabha and will be sent to the President for his assent. Thus, in matters of money bills, the **primacy and supremacy of the Lok Sabha** is well established.
- **President cannot hold his assent** on the Money Bill (**Art 111**) as it was introduced with his recommendation only.
- There is **no provision for a joint sitting** in the case of Money Bills in which the Lok Sabha has final say.

## FINANCIAL BILLS

- They are of **3 kinds**
  1. Money bills
  2. Other financial bills
  3. Bills involving expenditure
- A financial bill, apart from dealing with one or more matters mentioned in Art 110 (1) regarding Money Bill, deals with other matters also. Therefore **all money bills are financial bills** but all financial bills are not money bills.
- Under **Article 117**, the **Financial Bills** which **do not receive the Speaker's certificate** to the effect that they are money bills are of 2 kinds:
  1. A bill, which contains any of the matters, specified in Article 110 but **does not consist solely of those matters**, for example, a bill which contains a taxation clause, but does not deal solely with taxation.
  2. Any ordinary bill which contains **provisions involving expenditure** from the Consolidated Fund

- All financial bills are **introduced** only in the Lok Sabha (and not in Rajya Sabha) after the **recommendations of the President**. However, **Rajya Sabha** can **reject or amend** such a Bill like non-financial Bills subject to the limitation that an amendment other than for reduction or abolition of a tax cannot be moved in either House without prior recommendation of the President.
- A Financial Bill is passed according to **procedure** provided for passing an Ordinary Bill
- Any ordinary Bill, which contains provisions involving expenditure from the Consolidated Fund, is a **Financial Bill** of the **second class [Art 117(3)]**.
- A **Financial Bill of the first class** contains any of the matters specified in **Art 110** but does not exclusively deal with such matters; it has two features in common with a Money Bill, viz. that it cannot be introduced in the Council of States and also cannot be introduced except on the recommendation of the President.
- A Bill, which **merely involves expenditure** and **does not include** any of the matters specified in **Article 110** is an ordinary Bill and may be initiated in either House. Rajya Sabha has full powers to amend or reject it. There is one special provision that it must not be passed unless the **President** has recommended its **consideration** (not for introduction but only for consideration).

## **ANNUAL FINANCIAL STATEMENT:: BUDGET (ARTICLE 112)**

### **Constitutional Provisions**

- Article **112**: President shall lay before each house of Parliament, an **annual financial statement**; estimates shall show separately the expenditure charged on and expenditure made from Consolidated Fund; it shall distinguish expenditure on revenue account from other expenditure
- Article **113**: **No demand for a grant** shall be made except on **recommendation of President**; expenditure charged on the Consolidated Fund shall not be submitted to the vote of Parliament.
- Article **114**: No money shall be withdrawn from Consolidated Fund of India **except under appropriation** made by law-
- Article **117**: No Money Bill imposing tax shall be introduced in the Parliament except on the recommendation of the President and Money Bill cannot be introduced in Rajya Sabha
- Article **265**: No tax can be levied except by authority of law
- Rajya Sabha has **no power to vote** on demand for grants
- Rajya Sabha should send Money Bill within **14 days** to Lok Sabha
- Parliament can reduce or abolish a tax but **cannot increase it**

**Term 'budget'** has nowhere been used in the Constitution

**DEMANDS FOR GRANTS:** On recommendation of the President, the estimates of expenditure (other than those charged on the Consolidated Fund of India) are presented to the Lok Sabha in the form of demands for grants. Under **Article 113**, the **Lok Sabha has the power** to assent to or to reject, any demand, or to assent to any demand/ subject to a reduction of the amount specified. These demands are not presented to the Rajya Sabha, though a general debate on the budget takes place there too.

**APPROPRIATION BILL:** According to **Article 114**, when the demand for grants has been voted for, the Appropriation Bill authorizes the withdrawal of the funds from the Consolidated Fund of India as regards **both votable & charged items**. **No amendments can be proposed** to this bill because that would amount to altering the once decided amount of a grant.

<b>VARIOUS CUT MOTIONS AS MOVED IN LOK SABHA</b>	
Disapproval of policy cut	It states that amount of demand be <b>reduced to Re 1.</b>
Economy Cut	Demand be reduced <b>by a specified amount/ lump-sum</b>
Token Cut	Demand be <b>reduced by a Rs 100.</b> It aims to ventilate specific grievance
Cut Motions have only <b>symbolic value</b> , for they have no chance of being carried unless the <b>government loses the support</b> of the majority in the House. Cut Motions are generally moved by members from the opposition, and if carried, amount to a vote of <b>censure against Government.</b>	

<b>STAGES IN ENACTMENT OF BUDGET</b>	
<b>Presentation of Budget</b>	Presented by Finance Minister (with prior recommendation of President) in 2 parts-
<b>Part A</b> - a general economic survey of country; <b>Part B</b> - taxation proposals. Presented in 2 phases- <b>Railway Budget</b> (by Railway Minister in 3 <sup>rd</sup> week of February) & <b>General Budget</b> (by Finance Minister on last working day of February at 5 pm)	
There is <b>no discussion</b> of Budget on the day on which it is presented.	
At the end of the budget speech, budget is laid before <b>Rajya Sabha</b>	↓↓
<b>General Discussion</b>	
Starts after few days of its presentation; spread over 3-4 days in both Houses. By Convention, at this stage, members deal with only the general aspect of fiscal & economic policy and not the details of taxation & expenditure. No cut Motions or voting at this stage. FM has general right of reply at the end	
	↓↓
<b>Budget in Department Related Standing Committees</b>	
These committees (17 in 1993; increased to 24 in 2004) work during recess of Parliament (April 1-18) and discuss individual demands of each ministry, and submit reports to Parliament within given time-limit; but cannot make suggestions amounting to cut motions	
	↓↓
<b>Voting on demands for grants</b>	
Demands for grants are presented Ministry-wise; discussed in detail & put in form of a motion. Members can disapprove a policy, suggest measures for economy, and focus attention to specific grievances by moving subsidiary motions called ' <b>Cut Motions</b> '. While the General Budget has totally <b>109 demands</b> (103 for civil expenditure and 6 for defence expenditure), the Railway Budget has <b>32 demands</b> . The Lok Sabha votes each demand separately. Business Advisory Committee fixes a time for voting a particular demand. As the time limit for a demand is over, ' <b>Closure</b> ' is applied & demand is put to vote. On last day, demands not disposed of so far, are put to vote whether discussed or not. This process is known as <b>Guillotine</b> . With this, the discussion on demands for grants is concluded.	
	↓↓
<b>Passing of Appropriation Bill</b>	
Gives legal authority to government to appropriate expenditure from & out of Consolidated Fund. Includes <b>grants voted</b> by Lok Sabha & expenditure <b>charged on</b> Consolidated Fund. It is passed in the same manner as any other Bill except that the debate is restricted to those matters only which were not covered during the debate on demands & that <b>no amendment</b>	

can be made to it. Once passed by Lok Sabha, it transmits to Rajya Sabha, which has no power to amend or reject it, but has to give its concurrence. The Bill is then sent to President for assent.

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### **Passing of Finance Bill**

It includes all **taxation proposals** of Government. All taxes are not to be voted every year. Some of them are permanent & their rates can be varied from time to time by Government.

While general criticism of the policy is permitted, discussion on the details of particular estimates is not. **Amendments** can be moved to it. This Bill has to be passed by Parliament & assented to by President within 75 days after it is introduced

### **OTHER GRANTS**

Vote on Account	Before the Appropriation Act is passed, no money is to be withdrawn from the Consolidated Fund. But the Government needs money to spend before it is passed. Accordingly, under <b>Article 116 (a)</b> , Lok Sabha can grant a limited sum to spend until the Appropriation Act is passed. Normally, it is taken for 2 months for a sum equivalent to 1/6 <sup>th</sup> of the estimated expenditure for the entire year.
Supplementary Grant	It is granted when the amount authorized by the Parliament through the Appropriation Act for a <b>particular service</b> for the current financial year is found to be <b>insufficient</b> of that year.
Additional Grant	It is granted when a need has arisen during the current financial year for additional expenditure upon <b>some new service</b> not contemplated in the budget for that year.
Excess Grant	It is granted when money has been spent on any service during a financial year <b>in excess of the amount granted for that service</b> in the budget for that year. It is voted by the Lok Sabha after the financial year.
Vote of credit	It is granted under <b>Article 116</b> for meeting an <b>unexpected demand</b> for the service/ national emergency, the demands <b>cannot be stated</b> with the details in the budget. It is like a <b>blank Cheque</b> given to the executive by the Lok Sabha.
Exceptional Grant	It is granted for a <b>special purpose</b> and <b>forms no part</b> of the current service of any financial year.
Token Grant	It is granted when funds to meet the proposed expenditure on the <b>new service can be made available by re-appropriation</b> . A demand for the grant of token sum of Re 1 is submitted to the vote of Lok Sabha and if assented, funds are made available.
<b>Article 115</b> of the Constitution lays down that the statements showing the estimates of expenditure for the <b>supplementary, additional or excess grants</b> have to be presented to the Lok Sabha.	

### **RELATED INFORMATION ON BUDGET**

India follows a **twin-budgetary system** wherein Railway budget is presented separately from the general budget. The **railways budget** was separated from the general budget in **1921** on the recommendations of the **Acworth committee**. Finance Ministry, the Administrative Ministries and their subordinate offices, Planning Commission and CAG are all involved in the preparation of Budget in India. The estimates of budget consists of **2 types of**

**expenditure**- the expenditure '**charged**' upon the Consolidated Fund of India and the expenditure '**made**' from the Consolidated Fund of India. The charged expenditure is **not votable** by the Parliament, that is, it **can only be discussed** by the Parliament, while the other type has to be voted by the Parliament. The list of the **CHARGED EXPENDITURE** is as follows:

1. Emoluments & allowances of the **President** and expenditure relating to his office.
2. Salaries & allowances of **Chairman** & Deputy Chairman of Rajya Sabha and **Speaker** & Deputy Speaker of Lok Sabha.
3. Salaries, allowances & pensions of the judges of **Supreme Court**, **CAG**, Chairman & members of **UPSC**, and of persons serving in these offices.
4. The pensions of the judges of **High Court**
5. **Debt charges** for which the GoI is liable including interest, sinking fund charges and redemption charges and other expenditure relating to raising of loans and the service and redemption of debt.
6. Any sum required to **satisfy and judgment**, decree or award.
7. Any other expenditure **declared by the Parliament** to be so charged.

There are **3 kinds of funds** provided under the Constitution for the custody of the funds:

- **Consolidated Fund of India** (Article 266): fund to which **all receipts** are credited and **all payments** are debited: (i) all revenues received by GoI; (ii) all loans raised by the issue of treasury bills, loans or ways & means of advances; and (iii) all moneys received in repayment of loans- from receipt side. No moneys out of it can be appropriated except in accordance with a Parliamentary law.
- **Public Account of India** (Article 266): All other public money (other than Consolidated Fund) received by GoI shall be credited to it: provident fund deposits, judicial deposits, savings bank deposits, departmental deposits, remittances etc. Operated by **executive action**, that is, the payments from this account can be made without the parliamentary appropriation. Such payments are mostly in the nature of banking transactions.
- **Contingency Fund of India** (Article 267): The Constitution authorized Parliament to establish a 'Contingency Fund of India', into which shall be paid from time to time such sums as may be determined by law. Accordingly, Parliament enacted **Contingency Fund of India Act in 1950**. This fund is placed at the disposal of the President, and he can make advances out of it to meet **unforeseen expenditure** pending its authorization by the Parliament.

## **TYPES OF BUDGET**

- Performance Budgeting: First Hoover Commission, USA. Introduced in India in 1968 on recommendations of **ARC**. Emphasis on '**purpose**' of expenditure
- Zero-Based Budgeting: Given by Phyr, USA. Every scheme critically reviewed & **re-justified totally from zero** (or scratch)
- Traditional/ line-item/ conventional: Developed in 18<sup>th</sup> century. Traditional system prevailed in India. Emphasis on **items of expenditure** & not its purpose. Sole objective is **control** over expenditure.
- Management by objectives: Emphasis on budgetary decentralization
- Target-base budgeting: Emphasizes Centralization in Budgeting
- Planning-programming-budget: Economic planning orientation

## **CONSTITUTIONAL AMENDMENTS**

- Provision of amendment (Article 368) incorporated in constitution of India to make it possible to change according to the change in social conditions of the country.
- **3 categories** of articles have been made for the purpose of amendments
  1. **Amendment by simple majority**– Article 5 (Citizenship), Art 169 (Abolition or creation of state Legislative Councils) and Article 239 A (Creation of Local Legislature of Council of Ministers)
  2. **Amendments by special majority:** All constitutional amendments (except mentioned above) must be affected by a majority of total membership of each House of Parliament as well as majority of not less than 2/3<sup>rd</sup> of members of that house present and voting
  3. **By special majority and ratification by half of the states:** These amendments are related to fundamental matters where states have important powers and interests involved: Following provisions require such ratifications:
    - A) Election of the President
    - B) Extent of executive Powers of the Union and states
    - C) Articles related to Union and State judiciary
    - D) Distribution of legislative powers between the centre and the states
    - E) Lists of VII Schedule
    - F) Representation of states in Parliament (IV Schedule.)
    - G) Art 368 itself.

## **POWERS, PRIVILEGES & IMMUNITIES OF PARLIAMENT AND ITS MEMBERS**

- Both the Houses of Parliament and State Legislature have **similar privileges** under the Constitution without which it would be impossible for either House to maintain its **independence** of action or the **dignity** of its position.
- **Art 105** (1) & (2) and **Art 194** (1) & (2) deal with the privileges to both the houses of Parliament and State Legislature respectively. Constitution deals **only with 2 matters**: freedom of speech and right of publication. Others have been added by **44<sup>th</sup> Amendment** which equates them to those of **House of Commons**.
- Supreme Court has held that if there was **any conflict between** the **privileges** of Parliament and **Fundamental Rights** of citizens, the **former** shall **prevail**. In a latter case, SC held that though the existing privileges would not be fettered by Article 19 (1) (a), they must be subject to Articles 20, 21, 22 & 32.
- Privileges can be classified into two categories:
  - Individual
  - Collective Privileges of each house

### **Individual Privileges**

- Freedom from **arrest**: available only in **civil cases** and not in criminal cases or under the law of preventive detention. CPC exempts a member from arrest during continuance of a meeting of the chambers or committee (of which he is a member) and during a period of **40 days before and after** such meeting or sitting.
- Freedom from **attendance as a witness & jurors**: a member cannot be summoned by a court to give evidence as a witness while Parliament is in session.
- Freedom of **speech**: A Member of Parliament cannot be made liable in any court for anything said in Parliament or any committee thereof. It is subject to **rules** framed by the House. **Constitution** places another limitation that no discussion shall take place w.r.t.

**conduct of a judge** of SC or a High Court in the discharge of his duties except upon a motion for his removal.

### Privileges of Each House Collectively

- Right to **publish debates** and proceedings and the right to restrain publications by others - Though by convention, the Parliament does not prohibit the press to publish its proceedings, yet technically the House has every such right to forbid such publication. Again, while a member has the privilege of freedom of speech in Parliament, he has no right to publish it outside Parliament. Anyone violating this rule can be held responsible for any libelous matter it may contain under the common law rules.
- The right to **exclude others** (Speaker and the chairman have the right to order the withdrawal of strangers from any part of the House) - Each House of Parliament enjoys the right to exclude strangers (no-members or visitors) from the galleries at any time and to resolve to debate with closed doors. The punishment may be in the form of admonition, reprimand, or imprisonment.
- The right to **regulate the internal affairs** of the House and to decide matters within its walls- In Indian Union, each House is a High court of Parliament. Therefore, the House has the right to regulate its internal affairs. A member of the House is free to say whatever he likes subject only to the internal discipline of the House or the Committee concerned.
- The right to **punish the Parliamentary misbehavior**.
- The right to **punish** members and outsiders for **breach of its privileges**- In India, the Parliament has been given punitive powers to punish those who are adjudged guilty of contempt of the House. Such contempt can be committed by the members of any House or any outsider. When a member of the House is involved for parliamentary misbehavior or commits contempt, he can be expelled from the House.

### ATTORNEY GENERAL OF INDIA (ARTICLE 76)

Art. 76 provides for the **President to appoint** a person who is qualified to be appointed a Judge of the Supreme Court to be Attorney-General for India. He advises the Government of India on any legal matter. He performs any **legal duties assigned by the President** of India.

### Provisions Related To AG

- Appointed by the President and hold office during the **pleasure** of President.
- He is the **first Law officer** of the Government of India.
- He must be **qualified** to be appointed as a **Judge of the Supreme Court**
- He is neither a whole time counsel for the Government **nor a Government servant**.
- He is prohibited to take appointment as a director in any company. The Attorney General represents the Union and the States before the courts but is also allowed to take up **private practice** provided the other party is not the State. Because of this, he is not paid a salary but a **retainer** that is **determined by the President**. President has determined his monthly retainer equal to the salary of a judge of the Supreme Court.
- He is entitled to all the privileges and immunities as a Member of Parliament.
- He has **right of audience** in all **courts** in the territory of India, even in in-camera proceedings, while performing his official duties.
- He has representatives varying from 1 (Nagaland) to 34 (UP)

- He is the **only person** who is not a member of Parliament, yet **can take part in its proceedings (without a right to vote)**
- He is prohibited from **advising against government**; nor should he defend accused persons for **criminal prosecutions** without the permission of the Government of India.

## **PARLIAMENTARY COMMITTEES**

- The time at the disposal of Parliament is limited. It cannot make very detailed scrutiny of all legislative and other matters that come up before it. A good deal of Parliamentary business is, therefore, transacted in the committees.
- Both Houses of Parliament have a **similar committee structure**, with a few exceptions. Regulated under Rules made by the two Houses under **Article 118 (1)**.
- Broadly, Parliamentary Committees are of two kinds- **Standing Committees and ad hoc Committees**.
- While the Standing Committees are elected or **appointed every year** or periodically and their work goes on a continuous basis, the ad-hoc committees are appointed as need arises and they cease to exist as soon as they complete task assigned to them.

## **PUBLIC ACCOUNTS COMMITTEE (PAC)**

- It was first created in **1921** based on recommendations of the Act of 1919. It is the **oldest financial committee**.
- It consisted of **22 members**, elected **every year** by the MPs themselves, according to the principle of proportional representation, by means of a single transferable vote; 15 from **Lok Sabha** and 7 from the **Rajya Sabha**
- A **minister cannot** become a member of the PAC. Term of members is **1 year**, but most of the members are **re-elected** for a second term.
- **The Speaker appoints chairperson of the committee**; where the Deputy Speaker himself is a member of the committee, he will act as its chairman. Since **1967**; opposition member is appointed chairperson as a **convention**. The chairman has a casting vote in case of a tie.
- The **main function** of the PAC is to **examine the report of CAG**, which is laid before the Lok Sabha through the President.
- **Limitations of the PAC**
  - There is no obligation to adopt the reports on the part of the government. Its recommendations are **only advisory**.
  - The committee cannot interfere in the **internal administration** of departments. It **cannot disallow** any item of expenditure; it can only call attention to an item.
  - Its investigation is of the nature of **post-mortem**.

## **THE ESTIMATES COMMITTEE**

- Its origin can be traced to the **standing Finance Committee** constituted in **1921** following the Government of India Act, 1919. In the post-independence era, it was first elected in **1950** on recommendation of **John Mathai**, the then Finance Minister.
- **Members** are elected from the **Lok Sabha only**, from amongst the members according to the principle of proportional representation by means of a single transferable vote. A **minister cannot** be a member of this committee. **Tenure** of a member is **1 year**.
- **Chairman** is appointed by the Speaker and if the Deputy Speaker happens to be a member of the committee, he becomes the chairman. Generally, a **senior member of the ruling**

- party** is nominated as the chairman of the committee.
- EC is an instrument of Parliament set up with the **primary aim** of scrutinizing the estimates included in the budget and to make positive suggestions to introduce economy in government expenditure. Hence, it has been described as a '**continuous economy committee**'.
- Shortcomings of the committee**
  - The nature of the functions of EC demands that it be an **expert body**. However, its members are not experts.
  - The recommendations of the committee are **advisory** only.
  - It examines the budget estimates only after they have been voted by the Parliament. Its work is in the nature of a **post-mortem**.

### **COMMITTEE ON PUBLIC UNDERTAKINGS (COPU)**

- It was created in 1964; having **22** members - 15 from the Lok Sabha and 7 from Rajya Sabha. The **tenure** of its members is **1 year**.
- The members are elected by Parliament **every year** from amongst its members according to the principle of proportional representation by means of a single transferable vote. A **minister cannot be member** of the Committee.
- The **Chairman** of the Committee is appointed by the **Speaker** form amongst its members who are drawn from the **Lok Sabha only**.
- Its main function is to examine the reports & accounts of the **public undertakings** and all government companies and to examine the **reports of the CAG** on PSUs
- Shortcomings of COPU**
  - Several important public undertakings, including defence establishments, have been **kept outside** the committee's jurisdiction.
  - There are **no discussions on the reports** of COPU.
  - Its work is in the nature of a **post-mortem**.
  - Its recommendations are **advisory** and not binding on the ministries.

### **DEPARTMENTALLY RELATED STANDING COMMITTEES**

- The idea behind setting up these committees is to make the government departments more accountable. The most crucial function of these committees is to **scrutinize the demand for grants** made by various ministries.
- The standing committee system was created in **1993**. **17** standing committees were created (increased to 24 in 2004), with **45 members** each, 30 drawn from Lok Sabha and 15 from Rajya Sabha have been created.
- Members of Lok Sabha are **nominated by the Speaker**, while that of Rajya Sabha are nominated by the **Chairman**. A **minister cannot** be nominated as a member of the committee. Their term of office is **1 year**. The **Chairmen** of the **11** committees are appointed by the **Speaker**, while the Chairmen of the remaining **6** committees are appointed by the **Chairman** of the Rajya Sabha.
- The procedure followed in case of demands for grants is that **after general discussion** on the budget, the **House is adjourned** for a fixed period (around 3 weeks) during which the committees consider the demands for grants of the concerned ministries. The demands for grants are then considered by the house in the light of the **reports of the committees**. There is a separate report on the demands for grants of each ministry.
- Recommendations of these committees are **advisory** and hence, not binding on Parliament.
- Their merit is that these **strengthen Parliament control** vis-à-vis the executive; providing a detailed, close, continuous, in-depth and comprehensive control.

## OTHER IMPORTANT COMMITTEES OF PARLIAMENT

- × **Committee on Subordinate Legislation:** constituted in **1953**; its function is to **examine and report to the Lok Sabha**, whether the powers to make regulations, rules, sub-rules, bye-laws and others, conferred by the Constitution or delegated by the Parliament, are being properly exercised by it. It consists of **15 members** including the Chairman, all nominated by the **Speaker**. The term of office of the members is **1 year**. A **minister cannot be a member** of the Committee. The **Chairman** of the Committee is drawn from the **Opposition**.
- × **Committee on Government Assurances:** constituted in **1953**; its function is to examine the assurances, promises, undertakings etc. given by ministers on the floor of the Lok Sabha, and to report on: extent to which such assurances have been implemented; and whether such implementation has taken place within the minimum time necessary. It consists of **15 members** including the chairman, all nominated by the **Speaker**. The term of office of members is **1 year**. A **minister cannot be a member** of the Committee. The
- × **Committee on 'Private Members' Bills and Resolutions** of the Lok Sabha allocates time to Bills introduced by private members, recommends allocation of time for discussion on private members' resolutions and examines Constitution amendment bills before their introduction by private members in the Lok Sabha. It consists of 15 Members and **Deputy Speaker** is generally its Chairman. Rajya Sabha does not have such a committee.
- × **Business Advisory Committee** recommends allocation of time for discussion in consultation with the leader of the House. In Lok Sabha, it consists of **15 members** including the Speaker who is the ex-officio Chairman and nominates other members. In Rajya Sabha, it consists of **10 Members** including the Chairman who is also the Chairman of the Committee.
- × **Committee on Absence of Members** from the Sittings of the House of the Lok Sabha considers applications for leaves and examines every case where a member has been absent for a period of **60 days** or more without permission. It consists of **15 members** nominated by the Speaker who hold office for 1 year. There is no such committee in the Rajya Sabha.
- × **Rules Committee:** in both the Houses consists of **15 members** nominated by the Speaker/Chairman. It considers matters of procedure & conduct of business in the House and recommends amendments or additions to the Rules of Procedure and Conduct of Business that are considered necessary.
- × **Committee of Privileges:** it consists of not more than **15 members** in the Lok Sabha and not more than **10 members** in the Rajya Sabha. It examines questions of privileges referred to it.
- × **Committee on Petitions:** is one of the oldest Parliamentary Committees. It consists of not less than 15 members in the Lok Sabha and 10 members in the Rajya Sabha. It considers the petitions received from various sections of people.
- × **Committee on welfare of the SCs & STs:** it consists of **30 members** – 20 from Lok Sabha and 10 from Rajya Sabha. It considers all matters relating to the welfare of the Scheduled Castes and the Scheduled Tribes.
- × **Joint Committee on the Office of Profit:** it consists of 15 members, 10 members are elected from the Lok Sabha and 5 from the Rajya Sabha according to principles of proportional representation by means of single transferable vote.
- × In **1997**, a **Committee on Empowerment of women** with members from both Houses was constituted. **Ethics Committee of Rajya Sabha** was constituted in the same year. Ethics Committee of the Lok Sabha was formed in 2000.

## POSITION OF BILLS AT THE TIME OF DISSOLUTION OF LOK SABHA

- **All bills pending** in the Lok Sabha at the time of dissolution, whether originating in the House or transmitted to it by the Rajya Sabha shall **lapse**.
- **Bills passed by Lok Sabha**, but which have not been disposed of and are pending in the Rajya Sabha on the date of dissolution shall **lapse**.
- **Bills originating in Rajya Sabha**, which have not been passed by the Lok Sabha but are still pending before the Rajya Sabha **do not lapse**.
- Bills **passed by both the Houses** and sent to President for assent **do not lapse**.
- Bills **returned by the President** for reconsideration **do not lapse** and can be reconsidered by the succeeding House.
- **All other businesses** pending in Lok Sabha viz. motions, resolutions, amendments, supplementary demands for grants, etc. at whatever stage shall **lapse**.
  
- **QUORUM IN PARLIAMENT:** The Quorum to constitute a meeting of **either House** of Parliament shall be  $\frac{1}{10}$ <sup>th</sup> of the total number of members of the House. If, at any time during a meeting of a House, there is no quorum, it shall be the duty of the Chairman or Speaker, or person acting as such, either to adjourn the House or to suspend the meeting until there is a quorum.
- **PENALTY FOR SITTING AND VOTING WHEN NOT QUALIFIED:** If a person sits or votes as a member of either House of Parliament before he has complied with the requirements of Art. 99 (**Oath**), or when he knows that he is **not qualified** or that he is **disqualified** for membership thereof, he shall be liable in respect of each day on which he so sits or votes to a penalty of 500 rupees to be recovered as a debt due to the Union.
- **LEADER OF THE OPPOSITION:** There is no provision of the leader of opposition in the original Constitution. This was created and given a **Cabinet rank** by an Act of the Parliament. The party (other than from the ruling side) with the largest number of members in the Parliament, having at least  $\frac{1}{10}$ <sup>th</sup> of the strength of Lok Sabha is recognized as Opposition Party.

STATES/ UTs	Number of seats in the House of People	Reserved for SCs	Reserved for STs
Uttar Pradesh	80	18	-
Maharashtra	48	3	4
West Bengal	42	8	2
Andhra Pradesh	42	6	2
Bihar	40	7	-
Tamil Nadu	39	7	-
Madhya Pradesh	29	6	9
Karnataka	28	4	-
Gujarat	26	2	4
Rajasthan	25	4	3
Orissa	21	3	5
Kerala	20	2	-
Assam	14	1	2
Jharkhand	14	1	5
Punjab	13	3	-
Chhattisgarh	11	-	-
Haryana	10	2	-
Delhi	7	2	-
Jammu and Kashmir	6	-	-
Uttarakhand	5	-	-
Himachal Pradesh	4	1	-
Pondicherry	3	-	-

Manipur	2	-	1
Tripura	2	-	1
Arunachal Pradesh	2	-	-
Goa	2	-	-
Meghalaya	2	-	-
Lakshadweep	1	-	1
Mizoram	1	-	1
Dadra and Nagar Haveli	1	-	1
Daman and Diu	1	-	-
Chandigarh	1	-	-
Andaman & Nicobar	1	-	-
Nagaland	1	-	-
Sikkim	1	-	-

### LET'S PRACTICE :: UPSC LAST 10 YEARS QUESTIONS

In the Parliament of India, the purpose of an adjournment motion is

- to allow discussion on a definite matter of urgent public importance
- to let opposition members collect information from the ministers
- to allow a reduction of specific amount in demand for grant
- to postpone the proceedings to check the inappropriate or violent behaviour on the part of some members

Ans. A

Which of the following are the methods of Parliamentary control over public finance in India ?

- Placing Annual Financial Statement before the Parliament
- Withdrawal of moneys from Consolidated Fund of India only after passing the Appropriation Bill
- Provisions of supplementary grants and vote-on-account
- A periodic or at least a mid-year review of programme of the Government against macroeconomic forecasts and expenditure by a Parliamentary Budget Office
- Introducing Finance Bill in the Parliament

Select the correct answer using the codes given below:

- 1, 2, 3 and 5 only
- 1, 2 and 4 only
- 3, 4 and 5 only
- 1, 2, 3, 4 and 5

Ans. A

A deadlock between the Lok Sabha and the Rajya Sabha calls for a joint sitting of the Parliament during the passage of

- Ordinary Legislation
- Money Bill
- Constitution Amendment Bill

Select the correct answer using the codes given below:

- 1 only
- 2 and 3 only
- 1 and 3 only
- 1, 2 and 3

Ans. A

With reference to Union Government, consider the following statements :

- The Constitution of India provides that all Cabinet Ministers shall be compulsorily the sitting members of Lok Sabha only.
- The Union Cabinet Secretariat operates under the direction of the Ministry of Parliamentary Affairs.

Which of the statements given above is/are correct?

- 1 only
- 2 only
- Both 1 & 2
- Neither 1 nor 2

Ans. D

Consider the following statements:

- The Chairman of the Committee on Public Accounts is appointed by the Speaker of the Lok Sabha
- The Committee on Public Accounts comprises Members of Lok Sabha,

<p>Members of Rajya Sabha and a few eminent persons of industry and trade</p> <p>Which of the statements given above is/are correct ?</p> <ul style="list-style-type: none"> <li>a. 1 only</li> <li>b. 2 only</li> <li>c. Both 1 and 2</li> <li>d. Neither 1 nor 2</li> </ul> <p>Ans. A</p> <p>Consider the following statements :</p> <ol style="list-style-type: none"> <li>1. Jawaharlal Nehru was in his fourth term as the Prime Minister of India at the time of his death</li> <li>2. Jawaharlal Nehru represented Rae Bareilly constituency as a Member of Parliament</li> <li>3. The first non-Congress Prime Minister of India assumed the Office in the year 1977</li> </ol> <p>Which of the statements given above is/are correct ?</p> <ul style="list-style-type: none"> <li>a. 1 and 2</li> <li>b. 3 only</li> <li>c. 1 only</li> <li>d. 1 and 3</li> </ul> <p>Ans. D</p> <p>Which one of the following is responsible for the preparation and presentation of Union Budget to the Parliament?</p> <ul style="list-style-type: none"> <li>a. Department of Revenue</li> <li>b. Department of Economic Affairs</li> <li>c. Department of Financial Services</li> <li>d. Department of Expenditure</li> </ul> <p>Ans. B</p> <p>Consider the following statements in respect of financial emergency under Article 360 of the Constitution of India :</p> <ol style="list-style-type: none"> <li>1. A Proclamation of financial emergency issued shall cease to operate at the expiration of two months, unless before the expiration of that period it has been approved by the resolutions of both Houses of Parliament</li> <li>2. If any Proclamation of financial emergency is in operation, it is competent for the President of India to issue directions for the reduction of salaries and allowances of all or any class of persons serving in connection with the affairs of the Union but</li> </ol>	<p>excluding the Judges of the Supreme Court and the High Courts</p> <p>Which of the statements given above is/are correct ?</p> <ul style="list-style-type: none"> <li>a. 1 only</li> <li>b. 2 only</li> <li>c. Both 1 and 2</li> <li>d. Neither 1 nor 2</li> </ul> <p>Ans. A</p> <p>Consider the following statements :</p> <ol style="list-style-type: none"> <li>1. The Speaker of Lok Sabha has the power to adjourn the House sine die but, on prorogation, it is only the President who can summon the House</li> <li>2. Unless sooner dissolved or there is an extension of the term, there is an automatic dissolution of the Lok Sabha by efflux of time, at the end of the period of five years, even if no formal order of dissolution is issued by the President</li> <li>3. The Speaker of Lok Sabha continues in office even after the dissolution of the House and until immediately before the first meeting of the House</li> </ol> <p>Which of the statements given above are correct ?</p> <ul style="list-style-type: none"> <li>a. 1 and 2</li> <li>b. 2 and 3</li> <li>c. 1 and 3</li> <li>d. 1, 2 and 3</li> </ul> <p>Ans. D</p> <p>With reference to Indian Parliament, which one of the following is not correct ?</p> <ul style="list-style-type: none"> <li>a. The Appropriation Bill must be passed by both Houses of Parliament before it can be enacted into law</li> <li>b. No money shall be withdrawn from the Consolidated Fund of India except under the appropriation made by the Appropriation Act</li> <li>c. Finance Bill is required for proposing new taxes but no another Bill/ Act is required for making changes in the rates of taxes which are already under operation</li> <li>d. No Money Bill can be introduced except on the recommendation of the President</li> </ul> <p>Ans. C</p>
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<p>With reference to Indian Public Finance, consider the following statements:</p> <ol style="list-style-type: none"> <li>1. Disbursements from Public Accounts of India are subject to the Vote of Parliament</li> <li>2. The Indian Constitution provides for the establishment of a Consolidated Fund, a Public Account and a Contingency Fund for each State</li> <li>3. Appropriations and disbursements under the Railway Budget are subject to the same form of parliamentary control as other appropriations and disbursements</li> </ol> <p>Which of the statements given above are correct?</p> <ol style="list-style-type: none"> <li>a. 1 and 2</li> <li>b. 2 and 3</li> <li>c. 1 and 3</li> <li>d. 1, 2 and 3</li> </ol> <p>Ans. B</p> <p>The consultative Committee of Members of Parliament for Railway Zones is constituted by the</p> <ol style="list-style-type: none"> <li>a. President of India</li> <li>b. Ministry of Railways</li> <li>c. Ministry of Parliamentary Affairs</li> <li>d. Ministry of Transport</li> </ol> <p>Ans. C</p> <p>Consider the following statements :</p> <ol style="list-style-type: none"> <li>1. The joint sitting of the two houses of the Parliament in India is sanctioned under Article 88 of the Constitution</li> <li>2. The first joint sitting of Lok Sabha and Rajya Sabha was held in the year 1961</li> <li>3. The second joint sitting of the two Houses of Indian Parliament was held to pass the Banking Service Commission (Repeal) Bill</li> </ol> <p>Which of these statements are correct?</p> <ol style="list-style-type: none"> <li>a. 1 and 2</li> <li>b. 2 and 3</li> <li>c. 1 and 3</li> <li>d. 1, 2 and 3</li> </ol> <p>Ans. D</p> <p>The power to enlarge the jurisdiction of the Supreme Court of India with respect to any matter included in the Union List of Legislative Powers rests with</p> <ol style="list-style-type: none"> <li>a. The President of India</li> <li>b. The Chief Justice of India</li> </ol>
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<p>c. The Parliament d. The Union Ministry of law, Justice and Company Affairs</p> <p>Ans. C</p> <p>Consider the following statements :</p> <ol style="list-style-type: none"> <li>1. While members of the Rajya Sabha are associated with Committees on Public Accounts and Public Undertakings, Members of Committee on Estimates are drawn entirely from Lok Sabha</li> <li>2. The Ministry of Parliamentary Affairs works under the overall direction of Cabinet Committee on Parliamentary Affairs</li> <li>3. The Minister of Parliamentary Affairs nominates members of Parliament on Committees, Councils, Boards and Commissions etc. set up by the Government of India in the various ministries</li> </ol> <p>Which of these statements are correct?</p> <ol style="list-style-type: none"> <li>a. 1 and 2</li> <li>b. 2 and 3</li> <li>c. 1 and 3</li> <li>d. 1, 2 and 3</li> </ol> <p>Ans. D</p> <p>Which one of the following Bills must be passed by each House of the Indian Parliament separately, by special majority?</p> <ol style="list-style-type: none"> <li>a. Ordinary Bill</li> <li>b. Money Bill</li> <li>c. Finance Bill</li> <li>d. Constitution Amendment Bill</li> </ol> <p>Ans. D</p> <p>Which one of the following statements about a Money Bill is not correct ?</p> <ol style="list-style-type: none"> <li>a. A Money Bill can be tabled in either House of Parliament</li> <li>b. The Speaker of Lok Sabha is the final authority to decide whether a Bill is a Money Bill or not</li> <li>c. The Rajya Sabha must return a Money Bill passed by Lok Sabha and send it for consideration within 14 days</li> <li>d. The President cannot return a Money Bill to Lok Sabha for reconsideration</li> </ol> <p>Ans. A</p> <p>In what way does the Indian Parliament exercise control over the administration?</p>
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- a. Through Parliamentary Committees
- b. Through Consultative Committees of various ministries
- c. By making the administrators send periodic reports
- d. By compelling the executive to issue writs

Ans. A

The parliament can make any law for the whole or any part of India for implementing International treaties

- a. With the consent of all the States
- b. With consent of the majority of States
- c. With the consent of the States concerned
- d. Without the consent of any State

Ans. D

Consider the following statements about the Attorney-General of India :

1. He is appointed by the President of India
2. He must have the same qualifications as are required for a Judge of the Supreme Court
3. He must be a member of either House of Parliament
4. He can be removed by impeachment by Parliament

Which of these statements are correct?

- a. 1 and 2
- b. 1 and 3
- c. 2, 3 and 4
- d. 3 and 4

Ans. A

Which one of the following are/is stated in the Constitution of India?

1. The President shall not be a member of either House of Parliament
2. The Parliament shall consist of the President and two Houses

Choose the correct answer from the codes given below :

- a. Neither 1 nor 2
- b. Both 1 and 2
- c. 1 alone
- d. 2 alone

Ans. B

Consider the following statements : The Parliamentary Committee on Public Accounts

1. Consists of not more than 25 Members of the Lok Sabha
2. Scrutinizes appropriation and finance accounts of the Government
3. Examines the report of the Comptroller and Auditor General of India

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 and 3 only
- c. 3 only
- d. 1, 2 and 3

Ans. B

In the context of India, which of the following principles is/are implied institutionally in the parliamentary Government?

1. Members of the Cabinet are Members of the Parliament
2. Ministers hold the office till they enjoy confidence in the Parliament
3. Cabinet is headed by the Head of the State

Select the correct answer using the codes given below:

- a. 1 and 2 only
- b. 3 only
- c. 2 and 3 only
- d. 1, 2 and 3

Ans. A

Consider the following statements :

1. The Chairman and the Deputy Chairman of the Rajya Sabha are not the members of that House
2. While the nominated members of the two Houses of the Parliament have no voting right in the presidential election, they have the right to vote in the election of the Vice President

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

Ans. B

The authorization for the withdrawal of funds from the Consolidated Fund of India must come from

- The President of India
- The Parliament of India
- The Prime Minister of India
- The Union Finance Minister

Ans. B

All revenues received by the Union Government by way of taxes and other receipts for the conduct of Government business are credited to the

- Contingency Fund of India
- Public Account
- Consolidated Fund of India
- Deposits and Advances Fund

Ans. C

What is the difference between "vote-on-account" and "interim budget"?

- The provision of a vote-on-account is used by a regular Government, while an interim budget is a provision used by a caretaker Government.
- A vote-on-account only deals with the expenditure in Government's budget while an interim budget includes both expenditure and receipts.

Which of the statements given above is/are correct?

- 1 only
- 2 only
- Both 1 and 2
- Neither 1 nor 2

Ans. B

The Parliament can make any law for whole or any part of India for implementing international treaties

- With the consent of all the States
- With the consent of the majority of States
- With the consent of the States concerned
- Without the consent of any State

Ans. D

When a bill is referred to a joint sitting of both the Houses of the Parliament, it has to be passed by

- A simple majority of members present and voting

- Three-fourths majority of members present and voting
- Two-thirds majority of the Houses
- Absolute majority of the Houses

Ans. A

With reference to the Union Government, consider the following statements:

- The Department of Revenue is responsible for the preparation of Union Budget that is presented to the Parliament.
- No amount can be withdrawn from the Consolidated Fund of India without the authorization from the Parliament of India.
- All the disbursements made from Public Account also need the authorization from the Parliament of India.

Which of the statements given above is/are correct?

- 1 and 2 only
- 2 and 3 only
- 2 only
- 1, 2 and 3

Ans. C

Which one of the following is the largest Committee of the Parliament?

- The Committee on Public Accounts
- The Committee on Estimates
- The Committee on Public Undertakings
- The Committee on Petitions.

Ans. B

Which of the following is / are the function/functions of the Cabinet Secretariat?

- Preparation of agenda for Cabinet Meetings
- Secretarial assistance to Cabinet Committees
- Allocation of financial resources to the Ministries

Select the correct answer using the code given below.

- 1 only
- 2 and 3 only
- 1 and 2 only
- 1, 2 and 3

Ans. C

# LOK SABHA (HOUSE OF PEOPLE)

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Lok Sabha is a popular house. Its members are directly elected by the People. States' representatives are **elected directly** by the people of the state. UTs' representatives are elected in the **manner prescribed by Parliament** by law. For elections to Lok Sabha, each state is divided into territorial constituencies. **Art 81 (2)** provides for the **uniformity** of representation in two respects (as it stands after **7<sup>th</sup> Amendment** Act 1956):

- (1) As **between different states**
- (2) As **between different constituencies** within the same state

Each state has been allotted a **no. of seats** in a way that the ratio between that no. and the population remains almost the same for all the states. Further, each state has been divided into a **no. of territorial constituencies** such that the ratio between the population of the state and the no. of seats allotted to it remains almost the same.

## DELIMITATION OF TERRITORIAL CONSTITUENCIES (ART 82)

- As per the constitution, the **delimitation process** has to be undertaken after **each census** every 10 years by such authority and in such a manner as Parliament by law determine (in perspective of latest census report, which is prepared after taking into account the demographic changes in the country). Such exercises were carried out till the 1970s and the last one occurred on the basis of the **1971 census**.
- The Parliament has passed the **Delimitation (Amendment) Bill, 2008**. This was done after **Justice Kuldip Singh Committee** report on delimitation. This calls for **redrawing of electoral seats** on the basis of the **2001 census**. The new delimitation will supersede the existing Delimitation Order of 1976 and as a result to amend the Representation of the People Act, 1950.
- However, the **84<sup>th</sup> Amendment Act, 2001** **freezed** the **total no. of existing seats** as allocated to various States in the Lok Sabha (on the basis of the 1971 census) till the first census to be taken after the year **2026**. This was done on the basis of concern expressed by those States who have fared well on population control that their no. of seats in the Parliament would decrease.
- Constitution provides for **proportional representation** for **Council of States** and not for House of People and legislative assemblies.
- The **no. of seats reserved** for SCs and STs will enhance from 555 to 610 for SCs and from 527 to 545 for STs in state assemblies. In Lok Sabha, no. of seats reserved for SCs will go up from the existing 79 to 85 and to 48 from 41 for STs.

## DURATION OF LOK SABHA

- Normally 5 years but can be **dissolved earlier by the President**.
- Normal term of Lok Sabha can be **extended beyond 5 years** by the Parliament. This can be done during the **proclamation of emergency** (under Art 352). But this extension cannot be done for a period exceeding **one year** at a time and such extension cannot continue beyond a period of 6 months after the proclamation of emergency ceases to operate.
- **Dissolution** ends the very life of the existing House of the People so that all matters pending before the House lapse with the dissolution. If these matters have to be pursued,

- they must be re-introduced in the next House after fresh election. But a **Bill pending in the Council** which has not yet been passed by the House shall not lapse on dissolution.
- Dissolution would not, however, affect a **joint sitting** of the two Houses summoned by the President to resolve a disagreement between the Houses if the President has notified his intention to hold a joint sitting before the dissolution [Art. 108(5)].

## **OFFICERS OF LOK SABHA: SPEAKER & DEPUTY SPEAKER**

- Speaker presides over the House of the People. This office originated during the British period. The first elected President of the Central Assembly was **Vithalbhai Patel** in 1925. **GoI Act, 1935** provided for the office of the Speaker & Deputy Speaker but the Act could not be implemented. It was only in **1946** that G.V. **Mavalankar** was elected as the Speaker of the Legislative Assembly and continued to hold this high office until 1956.
- Speaker & Deputy speaker are **elected by the Lok Sabha** from among its own members in accordance with **Article 93**. In the existing procedure, this election is to be held on the very first sitting of the House. This meeting is to be presided over by a **pro-tem Speaker** and a tradition, the **senior-most member** of House is so nominated for the purpose. His position is similar to that of **House of Commons** in England. His functions include **administering oath** to the Lok Sabha members and presiding over the **election of a new Speaker**. The office of the Speaker Pro-term sinks as soon as the Speaker is elected.
- A convention has gradually developed whereby a candidate sponsored by **ruling party** is elected unopposed to the office of the Speaker and the candidate for the post of Deputy Speaker is generally from the opposition & supported by the ruling party. His salary is charged on the **Consolidated Fund** of India to ensure his independence.
- He vacates his office as soon as he ceases to be the member of the House. However, **Speaker continues** in his office even if Lok Sabha is dissolved & **until new Lok Sabha** meets. However, both the Speaker & his Deputy can be **removed by a resolution** of the Lok Sabha passed by a majority of all the then members (special majority) of the House. Such a Resolution needs support of **50 members** for consideration by the House. Before moving such a resolution, a **14 days' notice** is necessary to exhibit the intention of members.
- When his removal **resolution is under consideration**, he shall not preside, but can take part in proceedings of House, has right to speak and vote (except when there is equality of votes).
- If the Speaker intends to **resign**, the letter of his resignation has to be addressed to the **Deputy Speaker**. Deputy Speaker performs the duties of the Speaker if the office of Speaker is vacant. If the office of Deputy Speaker is also vacant, the duties of the Speaker shall be performed by such member of House as **President may appoint** for the purpose.

### **Powers of the Speaker**

- His **foremost duty** is to see that there is decorum & discipline in the House. His authority in the premises of the House and over the **Galleries** is final.
- He decides who shall hold the floor & speak, **time** to be allotted to each item, what should appear in the proceedings, which questions should or should not be admitted and **authenticates all the bills** passed by the House
- He exercises a **casting vote** in the case of equality of votes.
- He has the **final power to maintain order** within the House of the People and to interpret its Rules of Procedure. In the absence of a quorum, it will be the duty of the Speaker to adjourn the House or to suspend the meeting until there is a quorum.
- Speaker **presides over joint sitting** of both the Houses of Parliament [Art 118 (4)]

- When a **Money Bill** is transmitted from the Lower House to the Upper House, the Speaker shall endorse on the Bill his **certificate** that it is a Money Bill [Art 110 (4)]. The decision of the Speaker as to whether a Bill is Money Bill is final.
- He is the custodian of the **rights and privileges** of members. No arrest or warrant can be issued against any member of Lok Sabha within the four walls of the House without his prior permission.
- The **committees of Parliament** (e.g. Public Accounts Committee etc.) function essentially under the Speaker and their chairpersons are also appointed or nominated by him. If the Speaker is a member of any Committee, he is the ex-officio chairman of such a Committee.
- A **vote of no-confidence** against the Government is also admitted by him.
- He accepts all **resignations** sent to him by members of the House.
- He is the head of the **Lok Sabha Secretariat**.

<b>LOK SABHA</b>	<b>SPEAKER NAME</b>
First Lok Sabha	Ganesh Vasudev Mavalankar M. Ananthasayanam Ayyangar
Fifteenth Lok Sabha	Meira Kumar
<ul style="list-style-type: none"> <li>• Bal Ram Jakhar was <b>longest serving Speaker of Lok Sabha</b> (1980-1989)</li> <li>• 5 Persons served more than 1 Lok Sabha Term.</li> </ul>	

# RAJYA SABHA (COUNCIL OF STATES)

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Government of India Act, **1919** established the second chamber- the **Council of States** consisting of 60 members, nominated and elected. GoI Act of **1935** provided directly elected Council of States as the second Chamber. Rajya Sabha enjoys a **continuity of life**. Rajya Sabha is a **Permanent House** and is not subject to dissolution. The term of the members of the Rajya Sabha is **6 years**. At the end of every second year,  $\frac{1}{3}$  rd of the members retire. Elections to the Rajya Sabha are **indirect**; members representing States are elected by **elected members of State Assemblies** in accordance with the system of **proportional representation** (partially adopted) by means of the single transferable vote, and those representing **UTs** are chosen in such manner as **Parliament** may by law prescribe.

Only the UTs of **Delhi** (3) and **Pondicherry** (1) have seats in Rajya Sabha because these have Legislatives Assemblies. This system of election was adopted to give some representation to minority communities and parties. Lok Sabha adopted single-member constituency as proportional representation is ill suited to Parliamentary form as it would not permit stable government.

## CHAIRMAN AND DEPUTY CHAIRMAN OF RAJYA SABHA

- He must be a citizen of India, 35 years of age & eligible for election as a member of Rajya Sabha.
- **Vice-President** of India is the **ex-officio chairman** of the Council of states. He is elected by members of **an electoral college** consisting of members of **both Houses** of Parliament in accordance with the system of proportional representation by means of single transferable vote. **Salary** of Chairman is same as that of Speaker.
- **The Rajya Sabha elects Deputy Chairman**. He shall be a **member of Rajya Sabha**. Office of Deputy Chairman **terminates** if he ceases to become the member of the Council. He can also **resign**, submitting his resignation to the chairman in writing.
- He can also be **removed** from his office by a resolution of the Rajya Sabha, passed by a majority of all the then members of the Council. But such a resolution can only be moved by giving at least **14 days' notice** in advance. Chairman may be **removed** from his office **only if** he is removed from the office of Vice-President.
- If the office of Chairman is **vacant**, Deputy Chairman discharges his functions. But if the office of Deputy Chairman is also vacant, the duties of his office shall be discharged by such a member of the Rajya Sabha as **President may appoint**.
- The **sitting** of the House is **presided** over by the Chairman and in his absence, by the Deputy Chairman. But if both of them are absent then such person as may be determined by the **rule of Procedure of the Council** shall preside over the sitting of the House.
- In **2003**, amendments were made to the Representation of the People Act, dispensing with the **domicile requirement** and introducing **open ballot system** for Rajya Sabha elections.

## JOINT SESSION OF THE HOUSE

- There are **2 occasions** on which a joint sitting of Parliament is convened
  1. **Special address** by President: first session after each general election and first session of each year (generally a budget session)
  2. For resolving any **deadlock** over the passage of a Bill.

- **Art 108** provides that when a Bill is passed by one House is sent to the other. There may be **3 circumstances** which can lead to a **deadlock** between two Houses if the other House:
  - **Reject** the Bill altogether
  - **Disagrees** on it and returns it with some **amendments** which are not ultimately considered by the originating House
  - Takes **no action** and more than **6 months'** time has passed

The **President** in such a case may summon a **Joint Sitting** of both the Houses

- At a joint sitting of two Houses, the **Speaker** of the Lok Sabha and in his absence, the **Deputy Speaker** of the House, or if he is also absent, **Deputy Chairman** of the Council and if he is also absent, such person as may be determined by the members present in the sitting presides. **Lok Sabha** by its **numerical majority** prevails over the joint sitting.
- This provision **does not apply to Money Bill**. There **cannot** be a joint sitting for **Constitution Amendment Bills**. **Nor** do such Bills require **previous sanction of President**.
- In addition, President **cannot summon a joint sitting** if the bill has lapsed by reason of dissolution of Lok Sabha. However, if President has **already summoned** joint sitting on a Bill and then the Lok Sabha is dissolved, the joint sitting will take place.

## **DIFFERENCE BETWEEN LOK SABHA AND RAJYA SABHA**

- Members of Lok Sabha are directly **elected** by the eligible voters. Members of Rajya Sabha are elected by the elected members of State Assemblies in accordance with the system of proportional representation by means of single transferable vote.
- The normal **life** of Lok Sabha is 5 years only while Rajya Sabha is a permanent body.
- Lok Sabha is the House to which the Council of Ministers is **responsible** under the Constitution. A **vote of no-confidence** can be passed only in Lok Sabha.
- Rajya Sabha has special powers to declare that it is necessary and expedient in the **national interest** that Parliament may make laws with respect to a matter in the State List (**Article 249**)
- RS has special powers to pass resolutions to create by law one or more **All India Services (Art 312)** common to Union & States. It passed such resolution on 2 occasions; one in 1961 for creation of (i) Indian Service of Engineers, (ii) Indian Forest Service & (iii) Indian Medical & Health Service; and the other in 1965 for the creation of Indian Agricultural Service and Indian Educational Service.
- Rajya Sabha also has special powers under **Art 67** by passing a resolution seeking the **removal of the Vice-President** that can originate only in the Rajya Sabha. After the Rajya Sabha passes such a resolution by a majority of the then members of the House, it goes for approval of the Lok Sabha.
- **Legislative Powers:**
  - a. **Ordinary Bills:** Rajya Sabha enjoys **co-equal** powers in the field of ordinary or a non-money bill. It can be **introduced** in Rajya Sabha and it has to be approved in both the Houses of Parliament before it becomes an Act. The Lok Sabha has no power to overrule the Rajya Sabha.
  - b. **Constitution Amendment Bill:** both Rajya Sabha and Lok Sabha have been **at par**.
  - c. **Removal of President:** Article 61 requires the resolution be passed by each House by a majority of not less than two-third of the total membership of each House separately.
  - d. Power of the Rajya Sabha is equal so far as the approval of **emergency** proclamations under Articles 352, 356 and 360 is concerned.

- e. **Money Bills** can only be introduced in Lok Sabha. Rajya Sabha has no power to reject or amend a Money Bill, but can only discuss. It has no power to vote money for the public expenditure and demands for grants. **Speaker** of the Lok Sabha has got the sole and final power of deciding whether a Bill is a Money Bill.

### **LET'S PRACTICE :: UPSC LAST 10 YEARS QUESTIONS**

Regarding the office of the Lok Sabha Speaker, consider the following statements:

1. He/ She holds the office during the pleasure of the President.
2. He/ She need not be a member of the House at the time of his/ her election but has to become a member of the House within six months from the date of his/ her election.
3. If he/ she intends to resign, the letter of his/ her resignation has to be addressed to the Deputy Speaker.

Which of the statements given above is/ are correct?

- a. 1 and 2 only
- b. 3 only
- c. 1, 2 and 3
- d. None

Ans. B

Which one of the following is the largest (area-wise) Lok Sabha constituency?

- a. Kangra
- b. Ladakh
- c. Kachchh
- d. Bhilwara

Ans. B

Who was the Speaker of the First Lok Sabha?

- a. Hukam Singh
- b. G.V.Mavalankar
- c. K.M.Munshi
- d. U.N.Dhebar

Ans. B

Which one of the following statements is not correct?

- a. In Lok Sabha, a no-confidence motion has to set out the grounds on which it is based
- b. In the case of a no-confidence motion in the Lok Sabha, no conditions of

admissibility have been laid down in the Rules

- c. A motion of no-confidence, once admitted, has to be taken up within ten days of the leave being granted
- d. Rajya Sabha is not empowered to entertain a motion of no-confidence

Ans. A

Who among the following was never the Lok Sabha Speaker?

- a. K.V.K. Sundaram
- b. G.S. Dhillon
- c. Baliram Bhagat
- d. Hukam Singh

Ans. A

Which of the following Constitutional Amendments are related to raising the number of Members of Lok Sabha to be elected from the States?

- a. 6th and 22<sup>nd</sup>
- b. 13th and 38th
- c. 7th and 31st
- d. 11th and 42nd

Ans. C

The term of the Lok Sabha

- a. Cannot be extended under any circumstances
- b. Can be extended by six months at a time
- c. Can be extended by one year at a time during the proclamation of emergency
- d. Can be extended-for two years at a time during the proclamation of emergency

Ans. C

The Speaker can ask a member of the House to stop speaking and let another member speak. This phenomenon is known as

- a. Decorum
- b. Crossing the floor
- c. Interpolation
- d. Yielding the floor

Ans. D

The State which has the largest number of seats reserved for the Scheduled Tribes in Lok Sabha is

- a. Bihar
- b. Gujarat
- c. Uttar Pradesh
- d. Madhya Pradesh

Ans. D

In which of the following countries will the no-confidence motion to bring down the government passed by the legislature be valid only when the legislature is able to find simultaneously a majority to elect a successor government?

- a. France
- b. Germany
- c. Italy
- d. Portugal

Ans. B

When the annual Union Budget is not passed by the Lok Sabha,

- a. The Budget is modified and presented again
- b. The Budget is referred to the Rajya Sabha for suggestions
- c. The union Finance Minister is asked to resign
- d. The Prime Minister submits the resignation of Council of Ministers

Ans. D

Consider the following statements: Attorney General of India can

- 1. Take part in the proceedings of the Lok Sabha
- 2. Be a member of a committee of the Lok Sabha
- 3. Speak in the Lok Sabha
- 4. Vote in the Lok Sabha

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 and 4
- c. 1, 2 and 3
- d. 1 and 3 only

Ans. C

What will follow if a Money Bill is substantially amended by the Rajya Sabha?

- a. The Lok Sabha may still proceed with the Bill, accepting or not accepting the recommendations of the Rajya Sabha
- b. The Lok Sabha cannot consider the Bill further
- c. The Lok Sabha may send the Bill to the Rajya Sabha for reconsideration
- d. The President may call a joint sitting for passing the Bill

Ans. A

Consider the following statements regarding a No-Confidence Motion in India:

- 1. There is no mention of a No-Confidence Motion in the Constitution of India.
- 2. A Motion of No-Confidence can be introduced in the Lok Sabha 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

Ans. C

Which of the following special powers have been conferred in the Rajya Sabha by the Constitution of India?

- a. To change the existing territory of a State and to change the name of a State
- b. To pass a resolution empowering the Parliament to make laws in the State List and to create one or more All India Services
- c. To amend the election procedure of the President and to determine the pension of the President after his/ her retirement
- d. To determine the functions of the Election Commission and to determine the number of Election Commissioners

Ans. B

Consider the following statements:

- 1. The Rajya Sabha alone has the power to declare that it would be in national interest for the Parliament to legislate with respect to a matter in the State List
- 2. Resolutions approving the Proclamation of Emergency are passed only by the Lok Sabha

Which of the statements given is/are correct?

- a. 1 only

- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Ans. A

Consider the following statements:

- 1. The Rajya Sabha has no power either to reject or to amend a Money Bill.
- 2. The Rajya Sabha cannot vote on the Demands for Grants.
- 3. The Rajya Sabha cannot discuss the Annual Financial Statement.

Which of the statements given above is/are correct?

- a. 1 only
- b. 1 and 2 only
- c. 2 and 3 only
- d. 1, 2 and 3

Ans. B

Who among the following have the right to vote in the elections to both Lok Sabha and Rajya Sabha?

- a. Elected members of the Lower House of the Parliament
- b. Elected members of the Upper House of the Parliament
- c. Elected members of the Upper House of the State Legislature
- d. Elected members of the Lower House of the State Legislature

Ans. D

Consider the following statements : An amendment to the Constitution of India can be initiated by the

- 1. Lok Sabha
- 2. Rajya Sabha
- 3. State Legislatures
- 4. President

Which of the above statements is /are correct?

- a. 1 alone
- b. 1, 2 and 3
- c. 2, 3 and 4
- d. 1 and 2

Ans. D

Consider the following statements:

- 1. An amendment to the Constitution of India can be initiated by an introduction of a bill in the Lok Sabha only
- 2. If such an amendment seeks to make changes in the federal character of the Constitution, the amendment also requires to be ratified by the legislature of all the States of India

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

Ans. D

# *My PowerPoints*



Samples from  
**INDIAN HISTORY**

# Decade of 1940-1950

## Overview

If there was a time machine, 1940s was a decade when you would love to live a life; your Great Grandfather or Grandfather lived it! This was the most charged decade of Indian History. This was also a decade wherein we as Indians would like to erase some parts, if God allows us!

### Look at this decade from this perspective-

- World War-II had started; Britain was at losing end; taking Indian help without their consent was not an easy task.
- Internally, British had seen 2 mass movements; the 3<sup>rd</sup> much more charged movement – the Quit India Movement – for throwing away British Rule had started.
- The army had started disobeying and questioning the government. Imagine that how a single soldier Mangal Pandey generated a revolt 100 years ago; what if whole army does it!
- A strong leader of India – Subhash Chander Bose – shook hands with British enemies to militarily overthrow British.
- Internally, the growing tensions between Hindus and Muslims was becoming a major law and order issue.

What would anybody else have done in such a scenario? This is what British did – a number of commissions and missions to appease and come on terms with Indian leaders. British had understood that fooling, controlling and governing Indians was no more possible. Independence of India was the natural outcome! The whole decade passed in negotiations at the political levels – between British Government & Indian Leaders; between Hindu & Muslim Leaders; between National Leaders & local kings (to bring them under the ambit of National Government). We won independence; we lost many sons of India. The story of Freedom Struggle ends with a New Beginning!



# 2<sup>nd</sup> WORLD WAR & NATIONALIST RESPONSE

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The WW-II started in **Sept. 1939** and Britain declared war against Germany along with India's support for the war without consulting the Indian opinion. The Congress greatly opposed India's unilateral involvement in WW-II and was of the view, "**the issue of war and peace is to be decided by the people of India not the imperialist government**". The onset of WW-II placed the Indian leaders in a difficult situation. They were totally opposed to Fascist philosophy for it being ruthless totalitarianism and racial bigotry, but were strongly opposed to imperialism too. Thus, their attitude depended on aims and objectives of the war.

- **Viceroy Linlithgow** declared India was at war without consulting Indian opinion.
- Different perspectives were adopted by Congress leaders in relation to War.
- Gandhiji strongly opposed to Nazism and was sympathetic to Allies.
- **Subhash Bose**, Socialist, communists called it as **imperialist war** with both sides motivated by Imperialism.
- **Nehru** who has been warning the world against dangers of Nazi aggression and believed that Justice is on the side of Allies but at the same time, he understood that Britain and France were imperialists.
- He emphasized that if **Britain was fighting for Democracy** and Freedom then she should declare how her war aims would be applicable to India. Congress accepted his view.
- Congress asked Britain to **declare how war aims would be implemented** in India after war.
- Viceroy Linlithgow in Oct 1939 refused to define Britain war aims beyond stating that British were just **resisting aggression**.
- Congress rejected the Viceroy's statement and asked ministries to resign.

## AUGUST OFFER (1940)

- A change of government took place in Britain in May 1940 and **Winston Churchill** became the prime minister (1940–45). The **fall of France** temporarily softened the attitude of Congress in India. Britain was in **immediate danger of Nazi occupation**. As the war was taking a menacing turn from the allied point of view, congress offered to cooperate in the war if **transfer of authority in India is done to an interim government**.
- Viceroy Linlithgow offered a set of proposals to Congress for securing its cooperation in war in August 1940 known as **August proposals**. These are -
  - It turned down Congress demand for **provisional National government**.
  - It envisaged **representative Constitution** making body after the war.
  - For present there would be **expansion of Viceroy's Council** to include Indians
  - A **war advisory Council** would be set up.
- However, Congress rejected it as Nehru said that idea of Dominion on which August offer was based was dead as a doornail.

## INDIVIDUAL SATYAGRAHA (Oct 1940)

- In **Oct 1940**, Gandhiji launched Individual Satyagraha in which selected Satyagrahis in every locality would undertake the individual Satyagraha.

- The demand of the Satyagrahi would be **freedom of speech against participation in the War**. The Satyagraha was kept limited so as not to restrict British war efforts but at the same time idea was to let everyone know that India condemned both Nazism and British colonialism.
- The individual satyagraha (1940) is also known as **Delhi Chalo Movement**.
- Vinoba **Bhave** was selected as the **first satyagrahi** whereas **Nehru** was to be **second**. Third was **Brahma Datt**, one of the inmates of the Gandhi's Ashram. Other prominent Satyagrahis were Srikrishna Sinha, C. Rajagopalachari, N. V. Gadgil, Mian Iftikhar-ud-din (President of Punjab Congress), Sarojini Naidu, G. V. Mavalankar, Aruna Asaf Ali and Satyawati.
- However, since it was not a mass movement, it **attracted little enthusiasm** and in December 1940, Gandhi suspended the movement. The campaign started again in January 1941, this time, thousands of people joined and around 20 thousand people were arrested.
- Meanwhile Japan had occupied Rangoon (1942) and was at India's doorstep.
- There was pressure on P.M Churchill by American President Roosevelt and Chiang Kai Shek of China and Labour Party to seek **active cooperation of India in War**.
- This led Churchill to send his Cabinet Minister Stafford Cripps, who was member of Labour Party and had actively supported Indian national movement with a mission.

## **CRIPPS MISSION (1942)**

In March 1942, a mission headed by Stafford Cripps was sent to India with constitutional proposals **to seek Indian support for the war**. Stafford Cripps was a left wing Labourite, the leader of the House of Commons and a member of the British War Cabinet who had actively supported the Indian national movement. The Mission visited during the lordship of **Lord Linlithgow**.

### **Main Proposals**

- The main proposals of the mission were as follows –
  - An Indian Union with a **dominion status** would be set up; it would be free to decide its relations with the Commonwealth and free to participate in the United Nations and other international bodies.
  - **After the end of the war**, a **constituent assembly** would be convened to frame a new constitution. **Members** of this assembly would be partly **elected by the provincial assemblies** and partly **nominated by the princes**.
  - The British Government would accept the new constitution subject to two conditions: (i) any province not willing to join the Union could have a separate constitution and form a separate Union, and (ii) the new constitution-making body and the British Government would negotiate a treaty to effect the transfer of power and to safeguard racial and religious minorities.
  - In the meantime, **Executive Council** would be expanded to include Indians but defence of India would remain in British Hands.
- The making of the constitution was to be **solely in Indian hands** now (and not "mainly" in Indian hands – as contained in the August Offer).
- A concrete plan was provided for the constituent assembly.
- Option was available to any province to have a separate constitution – a blueprint for India's partition.

- Cripps Mission failed to satisfy Indian nationalists and turned out to be merely a propaganda device for US and Chinese consumption.
- The **Congress objected** to
  - The offer of dominion status instead of **complete independence**.
  - **Representatives of Princely States** to be nominated by princes.
  - **Right to secede** as this went against the principle of national unity.
  - Above all **no immediate plan** for transfer of effective power, the governor general's supremacy had been retained.
- The **Muslim League** objected to absence of any plan for **separate state of Pakistan**.
- The incapacity of Cripps to go beyond the Draft Declaration and the adoption of a rigid "**take it or leave it**" attitude along with efforts of Churchill (the British Prime Minister), Amery (the secretary of state), Linlithgow (the viceroy) and Wavell (the commander-in-chief) to prevent any real agreement was important reason for failure.
- Talks broke down on the question of the **viceroy's veto**.
- **Gandhi** described the scheme as "**a post-dated cheque**" as all-important proposals were to be implemented only after War was over.
- Now frustrated and embittered Indian people, who, though still sympathizing with the victims of Fascist aggression, that the time had come for a final struggle.
- Gandhiji also wanted to launch new struggle to reinvigorate people in chance of Japanese aggression so that they would be able to resist it.
- In July **1942**, Congress Working Committee met at **Wardha** and passed the famous resolution for the new struggle.
- **All India Congress Committee** met at **Bombay** at **Gowalia Tank Maidan** on 8 Aug 1942 and ratified the famous "**Quit India**" resolution.
- Here Mahatma Gandhi asked British to Quit India & gave famous Mantra **Do or Die**.
- On the wee hours of 9 August all the important leaders of Congress were arrested and thus movement passed into hands of people. They followed the **Resolution of August 8** – that "**Every man his own guide**".
- Many young leaders went underground and continued the struggle- such as Aruna Asaf Ali, Achyut Patwardhan, **J. Prakash Narayan** (**he had escaped from prison**), Ram Manohar Lohia, Sucheta Kriplani, Biju Patnaik, R. P. Goenka.
- **Most of the underground leaders were Congress Socialists**.
- Sucheta Kriplani & Aruna Asaf Ali were important woman organizers of Underground movement.
- **Congress radio** was started by **Ram Manohar Lohia** and **Usha Mehta** at **Bombay**.
- Most remarkable aspect of 1942 was rise of **Parallel governments** at **Satara** (Maharashtra), **Ballia** (U.P), **Tamluk** (Bengal), **Talcher** (Orissa)

AREA	NAME	LEADER	WORK
Satara (Maharashtra)	Prati Sarkar	Nana Patil	Nyayadan Mandals (peoples courts), Gandhi Marriages
Tamluk (Bengal)	Jatiya Sarkar	Satish Samanta	Vidyut Vahini (armed wing)
Ballia (U.P)	-	Chittu Pandey	-

- The native state of Aundh in Maharashtra got its constitution drafted by Gandhiji.
- In Tamluk, 73-year old Matangini Hazra and Kanaklata Barua (Bihar) became martyrs to British repression.

- National Herald and Harijan (after Gandhiji's arrest it was edited by K. G. Mashruwala) ceased to publish for entire duration of struggle, others for shorter period.
- The Quit India movement is also described as Revolt of 1942 or August Revolt.
- Gandhiji was jailed in **Aga Khan Palace near Poona** (Kasturba and Mahadev Desai, Gandhiji's Secretary died here during their imprisonment)
- Here he started the 21 day fast as Government pressurized him to condemn violence by people
- Erosion of loyalty of government's own officers was an important aspect of 1942.

## **INDIAN NATIONAL ARMY**

- The idea of I.N.A. was **first conceived** in **Malaya** by **Mohan Singh**, officer of British Indian army. It was to be formed of Indian Prisoners of war in custody of Japan
- In Sep. **1942**, **first division** of **INA** formed with help from **Japanese army**.
- But soon **differences** arose between Mohan Singh and **Nirjan Singh Gill** (senior officers of INA) and Japanese as later only wanted a token force of Indians.
- The veteran revolutionary leader **Rash Behari Bose** had already organized **Indian Independence League in Japan**.
- Meanwhile **Subhash Chandra Bose** had escaped from India in **1941** to go to **USSR** to seek help against British but as USSR joined Britain and he went to Germany.
- From there he reached **Singapore** in **1943** and on request of Rash Behari Bose assumed leadership of Indian Independence League and **rebuilt** the **INA**.
- He formed the **Provisional government of Free India (Azad Hind)** in **Oct 1943** at **Singapore** and declared war on Britain and U.S. He gave the call of **Chalo Delhi** and Exhorted to "**Give me Blood and I will give you Freedom**".
- Bose established two INA HQs at **Rangoon** and **Singapore**.
- **Subhas C. Bose through his radio address sought blessing of Gandhiji and called him the father of the Nation**.
- INA had **women battalion Rani Lakshmi** Regiment under **Lakshmi Swaminathan**.
- INA joined Japanese army in its march on India and participated in the **Imphal campaign**.
- **Netaji Bose** went to Andamans (occupied by Japanese) and hoisted the Flag of India there and named the islands as **Shaheed and Swaraj**.
- He is supposed to have died in Air crash in **Formosa** (modern Taiwan)
- After World War ended the trial of 3 officers of INA Shah Nawaz Khan, G. S. Dhillon and P. K. Sehgal was carried out at Red Fort, Delhi.
- **They were defended by Nehru, Bhulabahi Desai, Tej Bahadur Sapru, K. N. Katju and Asaf Ali**.
- The INA trials were one of the great upsurges of Post-war struggles, which brought together Hindus and Muslims.

**SEARCH FOR NATIONAL UNITY:** The decade of 1940s saw various efforts to solve the problem of national unity such as CR formula and Desai-Liaquat Pact.

## **RAJAGOPALACHARI FORMULA (1944)**

**C. Rajagopalachari** prepared a **formula for Congress-League cooperation** based on a tacit acceptance of demand for Pakistan. The formula seemed to have **support of Gandhiji**. The CR Plan had following proposals

- Muslim League to **endorse Congress demand for independence**.

- League to **cooperate** with Congress in **forming a provisional government at centre**.
- After the end of the war, the entire population of Muslim majority areas in the North-West and North-East India to decide by a **plebiscite**, whether or not to form a **separate sovereign state**.
- In case acceptance of partition, **agreement to be made jointly** for safeguarding defence, commerce, communications, etc.
- The above terms to be operative only if **England transferred full powers** to India
- **Gandhi Jinnah talks were held in Bombay to discuss it. But Jinnah outrightly rejected the plan.**

### **DESAI-LIAQAT PACT (1944)**

- **Bhulabhai Desai, leader of the Congress Party in the Central Legislative Assembly**, met **Liaqat Ali Khan**, deputy leader of the Muslim League in that Assembly and drafted the proposal for an interim government at the centre
- An equal number of persons were to be nominated by the Congress and the League in the central legislature. 20% seats were reserved for minorities.

### **WAVELL PLAN OR SHIMLA CONFERENCE (1945)**

As the war ended in Europe, **Viceroy Lord Wavell** was permitted to start negotiations with Indian leaders. Congress leaders were released from jails in June 1945. The idea was to **reconstruct the Governor - General's Executive Council** pending the preparation of a new constitution after the war.

- For this purpose, **a conference** was convened by the viceroy, Lord Wavell, **at Shimla in June 1945**.
- The main proposals of the Wavell Plan were as follows:
  - With the exception of the Governor-General and the Commander-in-Chief, all members of the executive council were to be Indians.
  - Caste Hindus and Muslims were to have **equal representation**. There will be representation of minorities also.
  - Representatives of different parties were to submit a **joint list** to the viceroy for nominations to the executive council. If a joint list was not possible, then separate lists were to be submitted.
- The **League**, asserting itself as **sole representative of Indian Muslims**, wanted all Muslim members to be League nominees.
- However, it was **unacceptable to Congress** as it would reduce the Congress to the status of a purely caste Hindu Party and insisted on its right to include members of all communities among its nominees.
- On unbending attitude of Muslim League, Wavell declared failure of talks (as he wanted pro-British **Khizr Hyatt Khan of Unionist Party** as the Muslim representative from Western Punjab).
- Thus, it is said that **Wavell gave the League and Jinnah a virtual Veto to** obstruct all negotiations and strengthened the League's position.

## TOWARDS INDEPENDENCE

**The end of world war saw** increasing militant activities by people all over India including those of Princely States. Many struggles took place such as

POST – WAR STRUGGLE		
STRUGGLE	AREA	NATURE
INA Trials	All India	Trial of INA officers united the nation; Calcutta mass demonstrations for release of Abdur Rashid, INA prisoner
<b>RIN mutiny of Feb.1946</b> (Most imp.)	Bombay and Karchi	Naval ratings of <i>HMIS TALWAR</i> struck work at Bombay for discriminatory treatment and for arresting B.C.Dutt for writing <i>Quit India</i> on the ship. Soon spread to Karachi. <b>Vallabhai Patel and Jinnah</b> negotiated the surrender of ratings.
Tebhaga	Bengal	Peasant struggle
Punnapra-Vaylar	Travancore (Kerala)	People of the princely state were protesting for democratic reforms and to become part of independent India
Telengana	Hyderabad	Anti-Nizam and Anti-Zamindar movement inspired by Communist

- In elections to provincial assembly, the Congress won overwhelmingly on general seats and Muslim League won on Muslim seats.
- Meanwhile in England Churchill's Conservative party was defeated by **Labour Party** and **Clement Attlee** became the P.M.
- It was now clear that Britain weakened by the War would not be able to hold against the rising tide of Indian nationalism.
- The new government sent a **Cabinet Mission** to hold talks on issue of Indian Independence. It consisted of 3 members- Lord Pathick Lawerence, Sir Stafford Cripps and A.V. Alexander
- The mission reached Delhi in March 1946 and had prolonged discussions with Indian leaders of all parties and groups on the issues of -
  1. Interim Government.
  2. Principles and procedures for framing a new Constitution giving freedom to India.
- As the Congress, the League could not come to any agreement on the fundamental issue of the unity or partition of India, the mission put forward its own plan for the solution of the constitutional problem in May 1946.

### CABINET MISSION PLAN (1946)

It **rejected** the **demand for a full-fledged Pakistan** mainly because Pakistan so formed would include a large non-Muslim population in the North-west and in Northeast; it grouped existing **provincial assemblies into 3 sections**:

- **Section A** – Madras, Bombay, Central Provinces, United Provinces, Bihar and Orissa (Hindu-majority provinces).
- **Section B** – Punjab, North-West Frontier Province and Sindh (Muslim-majority provinces) in NW.
- **Section C** – Bengal and Assam (Muslim-majority provinces) in NE.
- **Three-tier executive and legislature** at provincial, section and union levels.
- A **constituent assembly** to be elected by provincial assemblies by **proportional representation** (voting in three groups – General, Muslims, Sikhs). This constituent

- Assembly to be a **389-member** body with provincial assemblies sending 292, chief commissioner's provinces sending 4, and princely states sending 93 members.
- In the constituent assembly, members from sections A, B and C were to **sit separately to decide the constitution for provinces** and if possible, for the groups also then, the whole constituent assembly (all three sections A, B and C combined) would **sit together to formulate the Union constitution**.
  - A **common centre** would control defence, communication and external affairs.
  - **Provinces** were to have **full autonomy** and **residual powers**.
  - **Princely states** were no longer to be under paramountcy of British Government. They would be **free to enter into an arrangement** with successor governments or the British Government in U.K.
  - After the first general elections, a **province** was to be **free to come out of a group** and after 10 years, a province was to be **free to call for a reconsideration** of the group or the Union constitution.
  - Meanwhile, an **interim government** to be formed from the constituent assembly.

### **CHANGE IN BRITISH ATTITUDE**

- The rejection of Partition was important, as earlier British had helped Communalism.
- It was due to the fact British wanted a united and friendly India and an active partner in defence of the Commonwealth, and divided India would lack in defence and would be a blot on Britain's diplomacy.
- This was reflected in declaration of March 1946, of the British Prime Minister Clement Attlee said: "...though mindful of the rights of minorities we cannot allow a minority to place their veto on advance of the majority."
- Both Congress and Muslim League agreed to the plan but could not agree on different interpretations of grouping clause of the Cabinet Mission.
- **Congress -Provinces should not have to wait** until the first general elections to come out of a group. They **should** have the **option of not joining a group** in the first place. Compulsory grouping contradicts the oft-repeated insistence on provincial autonomy.
- **Muslim League-Grouping** should be **compulsory** with **sections B and C** developing into **solid entities** with a view to future secession into Pakistan.
- **July 1946** Elections were held in provincial assemblies for the Constituent Assembly.
- **In September 1946**, an **interim government headed by Jawaharlal Nehru** (called as Vice President of Executive Council) was formed by Congress and included – Sarat Chandra Bose, Jagjivan Ram, Rajendra Prasad, Vallabhai Patel, Asaf Ali and Syed Ali Zaheer, Baldev Singh, John Mathai, C.Rajagopalachari.
- **Muslim League** did not take part in interim Government at first and called **August 16, 1946** to be observed as "**Direct Action day**" for realizing the demand of Pakistan. The League ministry of **Bengal** headed by **Suhrawardy encouraged violence** and riots during the Great Calcutta Killings.
- However League soon joined the Interim Government but without giving up its policy of Direct action and with view of obstructing the working of Interim government. **Liaquat Ali Khan (Finance minister)** did not release funds for the departments of Congress ministers.
- While the country was passing such anarchic phase the **Famous Attlee declaration of February 20 1947** where **P.M. Attlee** declared that Britain would transfer power in responsible hands and leave India **not later than June 1948**.
- He also announced appointment of **Lord Mountbatten as Viceroy** in place of Wavell.

## **MOUNTBATTEN PLAN or 3<sup>rd</sup> JUNE PLAN/ DICKEY BIRD FORMULA**

The **freedom-with-partition formula** was coming to be widely accepted. It was suggested by **V.P. Menon** (Senior Civil Servant and political advisor to Viceroy) the immediate transfer of power on the basis of grant of dominion status (with a right of secession), thus obviating the need to wait for an agreement in the Constituent Assembly on a new political structure. Based on these deliberations Mountbatten put forward on 3<sup>rd</sup> June his plan for transfer of power

### **MAIN PROPOSALS**

- **Punjab and Bengal Legislative Assemblies** would meet in **two groups**, Hindus and Muslims, to vote for partition. If a **simple majority** of either group voted for partition, then these provinces would be partitioned.
- In case of partition, **two dominions** and **two constituent assemblies** would be created.
- **Sindh** would take its **own decision**.
- **Referendum** in **NWFP** and **Sylhet district of Bengal** would decide the fate of these areas.
- Independence for **princely states** ruled out, they would **join either India or Pakistan**.
- **Freedom** would come on **August 15, 1947**.
- The **boundary commission** would be set up if partition was to be effected. (it was set up under **Radcliffe**)
- Thus, League's demand was conceded to the extent that Pakistan would be created and the Congress' position on unity was taken into account to make Pakistan as small as possible. Mountbatten's formula was to divide India but retain maximum unity.
- Both Congress and Muslim League accepted this plan.
- Many criticized the partition of India but the most moving was Khan Abdul Ghaffar Khan's anguish "**Congress has thrown us to wolves**".
- Punjab and Bengal were partitioned. **NWFP and Sylhet dist. of Assam** voted for joining Pakistan.
- In July, India Independence Act was passed in British Parliament in July 1947 provided for setting up two dominions of India and Pakistan from 15 August 1947. It provided for separate Governor-general for each dominion.
- Thus, Pakistan came into existence on 14 August 1947 (with Jinnah as Governor-General) and India on 15 August 1947 (Mountbatten as Governor-General).

## LETS PRACTICE :: UPSC LAST 10 YEARS QUESTIONS

Which party was founded by Subhash Chandra Bose in the year 1939 after he broke away from the Congress?

- a. Indian Freedom Party
- b. Azad Hind Fauz
- c. Revolutionary Front
- d. Forward Block

Ans. D

After Quit India Movement, C. Rajagopalachari issued a pamphlet entitled "The Way Out". Which one of the following was a proposal in this pamphlet?

- a. The establishment of a "War Advisory Council" composed of representatives of British India and the Indian States.
- b. Reconstitution of the Central Executive Council in such a way that all its members, except the Governor General and the Commander - in - Chief should be Indian leaders
- c. Fresh elections to the Central and Provincial Legislatures to be held at the end of 1945 and the Constitution making body to be convened as soon as possible
- d. A solution for the constitutional deadlock

Ans. D

Consider the following statements: On the eve of the launch of Quit India Movement, Mahatma Gandhi

- 1. Asked the government servants to resign.
- 2. Asked the soldiers to leave their posts.
- 3. Asked the Princes of the Princely States to accept the sovereignty of their own people.

Which of the statements given above is/ are correct?

- a. 1 and 2
- b. 2 and 3
- c. 3 only
- d. 1, 2 and 3

Ans. C

Which Indian nationalist leader looked upon a war between Germany and Britain as a god sent opportunity which would enable Indians to exploit the situation to their advantage?

- a. C. Rajagopalachari
- b. M. A. Jinnah
- c. Subhash Chandra Bose
- d. Jawaharlal Nehru

Ans. C

Who among the following were official Congress negotiators with Cripps Mission?

- a. Mahatma Gandhi and Sardar Patel
- b. Acharya J. B. Kripalani and C. Rajagopalachari
- c. Pandit Nehru and Maulana Azad
- d. Dr Rajendra Prasad and Rafi Ahmed Kidwai

Ans. C

Assertion (A): Lord Linlithgow described the August Movement of 1942 as the most serious rebellion since Sepoy Mutiny.

Reason (R): There was massive upsurge of the peasantry in certain areas.

Ans. A

Assertion (A): Lord Linlithgow described the August Movement of 1942 as the most serious revolt after the Sepoy mutiny.

Reason (R): Peasants joined the movement in large number in some places.

Ans. A

Who of the following Prime Ministers sent Cripps Mission to India?

- a. Ramsay MacDonald
- b. Stanley Baldwin
- c. Neville Chamberlain
- d. Winston Churchill

Ans. D

During the freedom struggle, Aruna Asaf Ali was a major woman organizer of underground activity in:

- a. Civil Disobedience Movement
- b. Non - Cooperation Movement
- c. Quit India Movement
- d. Swadeshi

Ans. C

Quit India Movement was launched in response to

- a. Cabinet Mission Plan
- b. Cripps Proposals
- c. Simon Commission Report
- d. Wavell Plan

Ans. B

With which one of the following movements is the slogan "Do or Die" associated?

- a. Swadeshi Movement
- b. Non - Cooperation Movement
- c. Civil Disobedience Movement
- d. Quit India Movement

Ans. D

- Which one of the following observations is not true about the Quit India Movement of 1942?
- It was a non-violent movement
  - It was led by Mahatma Gandhi
  - It was a spontaneous movement
  - It did not attract the labour class in general

Ans. A

In the "Individual Satyagraha", Vinoba Bhave was chosen as the first Satyagrahi. Who was the second?

- Dr Rajendra Prasad
- Pandit Jawaharlal Nehru
- C rajagopalachari
- Sardar Vallabhbhai Patel

Ans. B

With reference to Indian freedom struggle, Usha Mehta is well-known for

- Running the secret Congress Radio in the wake of Quit India Movement
- Participating in the Second Round Table Conference
- Leading a contingent of Indian National Army
- Assisting in the formation of Interim Government under Pandit Jawaharlal Nehru

Ans. A

Consider the following statements: (The Cripps Proposals include the provision for)

- Full independence for India
- Creation of Constitution making body.

Which of the statements given above is / are correct?

- 1 only
- 2 only
- Both 1 and 2
- Neither 1 nor 2

Ans. B

Which one of the following places was associated with Acharya Vinoba Bhave's Bhoojan Movement at the beginning of the movement?

- Udaygiri
- Ranpur
- Pochampalli
- Venkatagiri

Ans. C

**Assertion (A):** According to the Wavell Plan, the number of Hindu and Muslim Council were to be equal. **Reason (R):** Wavell thought that this arrangement would have avoided the partition of India.

Ans. C

- During the Indian freedom Struggle, who of the following raised an army called 'Free Indian Legion'?
- Lala Hardayal
  - Rashbehari Bose
  - Subhas Chandra Bose
  - V. D. Savarkar

Ans. C

Which one of the following suggested the reconstitution of the Viceroy's Executive Council in which all the portfolios including that of War Members were to be held by the Indian leaders?

- Simon Commission
- Simla Conference
- Cripps Proposal
- Cabinet Mission

Ans. C

The Congress ministries resigned in the seven provinces in 1939, because

- the Congress could not form ministries in the other four provinces
- emergence of a 'left wing' in the Congress made the working of the ministries impossible
- there were widespread communal disturbances in their provinces
- None of the statements (a), (b) and (c) given above is correct

Ans. D

With reference to the Cabinet Mission, which of the following statements is / are correct?

- It recommended a federal government.
- It enlarged the powers of the Indian courts.
- It provided for more Indians in the ICS.

Select the correct answer using the code given below:

- 1 only
- 2 and 3
- 1 and 3
- None

Ans. A

**Assertion A:** The Congress rejected the Cripps proposals.

**Reason R:** The Cripps Mission consisted solely of whites.

Ans. B

An important aspect of the Cripps Mission of 1942 was

- That all Indian States should join the Indian Union as a condition to consider any degree of autonomy for India

- b. The creation of an Indian Union with Dominion status very soon after the Second World War
- c. The active participation and cooperation of the Indian people, communities and political parties in the British war effort as a condition for granting independence with full sovereign status to India after war
- d. The framing of a constitution for the entire Indian Union, with no separate constitution for any province, and a Union constitution to be accepted by all provinces

Ans. B

The plan of Sir Stafford Cripps envisaged that after the Second World War

- a. India should be granted complete independence
- b. India should be partitioned into two before granting independence
- c. India should be made a republic with the condition that she will join the Commonwealth
- d. India should be given Dominion status

Ans. D

Consider the following statements:

1. Lord Mountbatten was the Viceroy when Simla Conference took place.
2. Indian Navy Revolt, 1946 took place when the Indian sailors in the Royal Indian Navy at Bombay and Karachi rose against the Government.

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

Ans. B

The Radcliffe Committee was appointed to

- a. Solve the problem of minorities in India
- b. Give effect to the Independence Bill
- c. Delimit the boundaries between India and Pakistan
- d. Enquire into the riots in East Bengal

Ans. C

# UNIFICATION OF PRINCELY STATES

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Under the **June 3 Plan**, more than 600 princely states were given the option of joining either India or Pakistan, or choosing independence. There was a prevailing fear that if these states did not accede, a vast majority of the people and territory would be fragmented and there shall be **Balkanization of India**. **Sardar Patel** was chosen for the task of achieving unification of the princely states with the Indian dominion. Some kings, such as the kings of **Bikaner and Jawhar**, were motivated to join India out of ideological and patriotic considerations.

- Patel and Menon backed their diplomatic efforts by producing **2 types of treaties**:
  1. **Standstill Agreement**: confirmed that the agreements and administrative practices that existed as between the princely state in question and the British would be continued by India.
  2. **Instrument of Accession**: by which the ruler of the princely state in question agreed to the accession of his kingdom to independent India, and to granting India control over specified subject matters. The nature of the subject matters varied depending on the acceding state.
- Instruments of Accession implemented a **number of other safeguards**. It provided that the princes would not be bound to the Constitution of India as and when it was drafted. Rulers who agreed to accede would receive guarantees that their **Extra-territorial rights**, such as Immunity from prosecution in Indian courts and exemption from Customs duty, that none of the 18 major states would be forced to merge, and that they would remain eligible for British honours.
- Between **May 1947 and August 15 1947**, the vast majority of states signed Instruments of Accession. In addition, all but three of the states (Jammu and Kashmir, Junagadh, and Hyderabad State) willingly merged into the Indian union.
- **Junagadh**- Nawab under pressure from Shah Nawaz Bhutto acceded to Pakistan. It was however, quite far from Pakistan and 80% of its population was Hindu. Patel sent the Army to occupy three principalities of Junagadh. A plebiscite later organised produced a 99.5% vote for merger with India.
- **Hyderabad**- Its ruler, the Nizam Osman Ali Khan was a Muslim, although over 80% of its people were Hindu. The Nizam sought independence or accession with Pakistan. In September 1948, Patel emphasized military action and ordered the Indian Army to integrate Hyderabad (in his capacity as Acting Prime Minister) when Nehru was touring Europe. Hyderabad was comfortably secured into the Indian Union.
- **Kashmir**- Kashmir was ruled by Maharaja Hari Singh, a Hindu, although the state itself had a Muslim majority. Pakistan, attempting to force the issue of Kashmir's accession, cut off supplies and transport links. Pathan tribesmen from the North-West Frontier Province of Pakistan crossed the border and entered Kashmir. The Maharaja of Kashmir wrote to India, asking for military assistance, offering an Instrument of Accession (Jammu and Kashmir), and setting up an Interim government headed by Sheikh Abdullah. The accession was accepted.

Indian troops secured Jammu, Srinagar and the valley itself during the Indo-Pakistani War of 1947, but the intense fighting flagged with the onset of winter, which made much of the state impassable. Nehru declared a ceasefire and sought UN Arbitration arguing that India would otherwise have to invade Pakistan itself, in view of its failure to stop the tribal incursions. On January 26 1957, the Constitution of India came into force in Kashmir, but with special provisions made for it in the Constitution's Article 370.

# A BRIEF OF VARIOUS ACTS DURING BRITISH PERIOD

## Overview

Initially, East India Company was sent to India by British Government for commercial purposes; but the company soon found that its commercial ends shall not be fulfilled unless it has a good say in political affairs of the country. Using its carrot & stick policies, the company started controlling political affairs of different kings. When the company's political control was established in India, the British Government in Britain started regulating and controlling the affairs of the company to establish its own control through various Acts and Regulations. Between 1600 and 1765, the Company chiefly remained a trading corporation, whose charter was renewed by the Crown from time to time.

## CONSTITUTIONAL LANDMARKS

### Regulating Act of 1773

- **First step** by British Government to **regulate affairs** of East India Company (EIC); establish a **central administration**; determine the form of Indian government & first statute that recognizes the Company as fulfilling functions **other than those of trade**.
- It established a **definite system of government** of India. I
- Designated Governor of Bengal as **Governor General (GG) of Bengal**. 1<sup>st</sup> one was **Warren Hastings** and subordinated Governors of Bombay & Madras to GG of Bengal.
- Established **Supreme Court (SC)** at Calcutta

- **1<sup>st</sup> step** to control EIC
- Centralization Started
- **GG** of Bengal & SC

### Pitts India Act, 1784

- Indian affairs came under **direct control** of British Government in Britain
- Distinguished between commercial & political functions of the company.
- **Board of Control** (representing British Cabinet) was established to manage political affairs of the company.
- **Introduced dual government** in India.

- Direct control
- Dual government
- Ended EIC's political functions

### Charter Act of 1833

- Final step towards **centralization** in British India
- GG of Bengal became **Governor-General of India**. GG was vested with all civil & military powers, & Governors of Bombay & Madras were deprived off their legislative powers.
- Created **Government of India**, for first time having authority over British India (the part of India under control of Britain)
- Ended activities of East India Co. as **commercial body**
- Presidency of Bengal was divided into 2 parts- Bengal and Agra

- GG of India
- Centralization completed
- Ended EIC's commercial functions too

### Charter Act of 1853

- **Separated** Legislative & Executive functions of GG's Council

- Separate

<ul style="list-style-type: none"> <li>A <b>separate Lieutenant-Governor</b> was appointed for <b>Bengal</b>.</li> <li>Created separate <b>Legislative Councils</b> for India, but with only officials as its members</li> <li>Also <b>introduced</b> open <b>competition</b> for <b>civil services</b> of the company &amp; deprived the Directors of the company their patronage powers</li> </ul>	legislative body created • Open competition
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### Government of India, 1858

<ul style="list-style-type: none"> <li>Rule of company was replaced by <b>rule of crown</b></li> <li><b>Secretary of State</b> (SoS) for India was appointed to exercise the power of the crown. He was member of <b>British Cabinet</b>, responsible to British <b>Parliament</b> &amp; assisted by <b>Council of India</b> having <b>15 members</b>.</li> <li>GG became the <b>agent</b> of the crown.</li> </ul>	<ul style="list-style-type: none"> <li>Rule of Crown started</li> <li>Secretary of state created</li> </ul>
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### Indian Councils Act of 1861

<ul style="list-style-type: none"> <li>Introduced some <b>Indians</b> as <b>non-official members</b> in Legislature</li> <li>Provision was also made for the inclusion of some <b>Indians</b> in the Governor-General's Council.</li> <li>Thus seeds of <b>Parliamentary system</b> sown in India (representative institutions)</li> <li><b>Initiated</b> process of <b>decentralization</b> by restoring Bombay &amp; Madras' legislative powers</li> <li>Policy of legislative devolutions introduced which culminated into grant of almost complete internal autonomy of Provinces in 1937</li> <li>Empowered GG to <b>frame rules of business</b> (powers that Indian President has today under Article 77)</li> <li><b>Statutory</b> recognition to <b>portfolio</b> system</li> <li>Member in-charge of his department could <b>issue final orders</b> with regard to matters which concerned his department</li> </ul>	<ul style="list-style-type: none"> <li>Introduced Indians in legislature; they were nominated</li> </ul>
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### Indian Councils Act of 1892

<ul style="list-style-type: none"> <li>Introduced <b>indirect elections</b>. GG still had power to nominate members</li> <li><b>Enlarged functions</b> of Legislative Councils. They had power to <b>discuss budget</b> and <b>address questions</b> to the executive, but they were not given the power of voting.</li> </ul>	<ul style="list-style-type: none"> <li>Indirect elections</li> <li>Power to discuss budget &amp; ask questions</li> </ul>
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### Indian Councils Act, 1909 :: Morley-Minto Reforms

<ul style="list-style-type: none"> <li>Minto (Governor-General of India); Morley (Secretary of State)</li> <li>Changed name of Central Legislative Council to <b>Imperial Legislative Council</b>. Officials had majority in it</li> <li>Attempted for the first time the introduction of representative and popular element in the government</li> <li><b>Provincial</b> legislative Councils had <b>non-official majority</b></li> <li>Introduced <b>separate electorate</b> system. Introduced <b>communal representation</b> for <b>Muslims</b>. Legalized communalism (Lord <b>Minto</b> called as father of <b>communal</b> electorate)</li> </ul>	<ul style="list-style-type: none"> <li>Enlarged deliberative powers of members of councils</li> <li>Separate electorate</li> <li>Communal representation</li> </ul>
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### Government of India Act, 1919 (Montagu -Chelmsford Reforms)

<ul style="list-style-type: none"> <li>Chelmsford (Governor-General of India); Montagu (Secretary of State)</li> <li><b>Separated</b> central subjects from provincial</li> </ul>	<ul style="list-style-type: none"> <li>Created centre-state relations</li> </ul>
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<ul style="list-style-type: none"> <li>• <b>Provincial subjects</b> were of 2 types: 1. <b>Transferred</b> 2. <b>Reserved</b></li> <li>• Transferred subjects administered by Governor with <b>aid of ministers responsible to Legislature</b></li> <li>• Reserved subjects administered by Governor &amp; his <b>executive Council</b> without any responsibility to Legislature</li> <li>• <b>Diarchy</b> (dual system of government) was introduced</li> <li>• Introduced <b>Bicameral Legislature</b> (upper &amp; lower houses)</li> <li>• Introduced <b>direct elections</b> for the first time as majority members of both houses were directly elected.</li> <li>• 3 of 6 members of <b>Governor-General's Council</b> were Indian</li> <li>• Demand for responsible government remains unfulfilled as Central Government remain responsible to British Parliament.</li> <li>• Diarchy failed in Provinces because of dominance of Governor and Executive Council over policy and ministers</li> <li>• Provided for establishing a <b>Public Service Commission</b> for recruitment to higher civil services.</li> <li>• <b>Local-self government</b> became a provincial &amp; transferred subject under a responsible Indian minister.</li> </ul>	<ul style="list-style-type: none"> <li>• Diarchy</li> <li>• 2 Houses of legislature (birth of Lok Sabha &amp; Rajya Sabha)</li> <li>• Direct elections</li> </ul>
<b>Simon commission</b>	
<ul style="list-style-type: none"> <li>• The Indian Statutory Commission was a group of <b>7 British Members</b> of Parliament that had been dispatched to India <b>in 1927</b> to study <b>constitutional reform</b> in Britain's most important colonial dependency.</li> <li>• Commonly referred to as the Simon Commission after its chairman, <b>Sir John Simon</b>.</li> <li>• One of its members, <b>Clement Attlee</b>, who subsequently became the British Prime Minister, would oversee the granting of independence to India and Pakistan in 1947.</li> </ul>	<ul style="list-style-type: none"> <li>• New constitution</li> <li>• Diarchy should be scrapped</li> <li>• Federal union</li> <li>• Franchise should be extended</li> </ul>
<p><b>The Commission's recommendations were:</b></p> <ul style="list-style-type: none"> <li>• <b>Future Advance:</b> <ul style="list-style-type: none"> <li>✓ The first principle was that the <b>new constitution</b> should, as far as possible, contain within itself provision for its <b>own development</b>. It should <b>not lay down too rigid</b> and uniform a plan, but should allow for natural growth and diversity.</li> <li>✓ Constitutional progress should be the outcome of <b>practical experience</b>. Where further legislation is required, it should result from the needs of the time, not from the arbitrary demands of a fixed time-table.</li> <li>✓ The constitution, while contemplating and conforming to an ultimate objective, <b>should not</b> attempt to lay down length or the number of the stages of the journey.</li> </ul> </li> <li>• <b>Almost Responsible Government at the Provincial Level:</b> <ul style="list-style-type: none"> <li>✓ <b>Diarchy should be scrapped</b> and <b>Ministers responsible to the Legislature</b> would be entrusted with all provincial areas of responsibility.</li> <li>✓ However, safeguards were considered necessary in areas such as the maintenance of peace and tranquility and the protection of the legitimate interest of the minorities. These safeguards would be provided, mainly, by the grant of <b>special powers to the Governor</b>.</li> </ul> </li> <li>• <b>Federation</b> <ul style="list-style-type: none"> <li>✓ The Report considered that a <b>formally federal union</b>, including both British India &amp; <b>Princely States</b>, was the only long-term solution for a united, autonomous India.</li> </ul> </li> <li>• <b>Immediate Recommendations at the Centre</b></li> </ul>	

<ul style="list-style-type: none"> <li>✓ To help the growth of political consciousness in the people, the <b>franchise should be extended</b>; and the <b>Legislature enlarged</b>.</li> <li>✓ The Report <b>strongly opposed the introduction of Diarchy at the Centre</b>.</li> </ul>	
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### Government of India Act, 1935

<ul style="list-style-type: none"> <li>• Provided for establishment of <b>All-India Federation</b> with its units consisting of Provinces &amp; Princely States (they didn't join &amp; so federation didn't come into existence)</li> <li>• <b>3 lists</b> of subjects – Federal, Provincial &amp; Concurrent- introduced; Residuary powers with GG.</li> <li>• <b>Abolished Diarchy in provinces</b> &amp; introduced <b>provincial autonomy</b></li> <li>• Introduced <b>Diarchy at Centre &amp; Bicameralism</b> in Provinces (in Bombay, Madras, Bengal, Assam, Bihar, United Provinces)</li> <li>• Introduced <b>Responsible governments</b> in Provinces (that is, Governor responsible to Provincial legislature)</li> <li>• Established a federal court having original, appellate &amp; advisory jurisdiction</li> <li>• Provided for the <b>protection of the rights &amp; privileges</b> of members of civil services.</li> <li>• Provided for establishment of not only a Federal Public Service Commission but also a <b>Provincial Public Service Commission</b> and <b>Joint Public Service Commission</b> for two or more provinces.</li> </ul>	<ul style="list-style-type: none"> <li>• Federation of India</li> <li>• Concurrent list added</li> <li>• Provincial autonomy</li> </ul>
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### Indian Independence Act, 1947

<ul style="list-style-type: none"> <li>• Declared India as independent &amp; sovereign state</li> <li>• Created 2 independent dominions, GG of each appointed by king</li> <li>• Established responsible government at both Center &amp; Provinces</li> <li>• Designated GG of India &amp; Provincial Governors as constitutional heads (nominal heads)</li> <li>• It assigned <b>dual functions</b> (i.e. constituent and legislative) to the Constituent Assembly formed in 1946. It declared this dominion legislature as a <b>sovereign body</b>.</li> </ul>	Till 1947, Government functioned under the provisions of 1919 Act as the provisions of 1935 Act relating to federation and Diarchy did not come into operation
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### LETS PRACTICE :: UPSC LAST 10 YEARS QUESTIONS

Which of the following is/ are the principal feature(s) of the Government of India Act, 1919?

1. Introduction of diarchy in the executive government of the provinces
2. Introduction of separate communal electorates for Muslims
3. Devolution of legislative authority by the centre to the provinces

Select the correct answer using the codes given below:

- a. 1 only
- b. 2 and 3 only
- c. 1 and 3 only
- d. 1, 2 and 3

Ans. C

The distribution of powers between the centre and the States in the Indian Constitution is based on the scheme provided in the

- a. Morley - Minto Reforms, 1909
- b. Montagu - Chelmsford Act, 1919
- c. Government of India Act, 1935
- d. Indian Independence Act, 1947

Ans. C

The Government of India Act of 1919 clearly defined

- a. The separation of power between the judiciary and the legislature
- b. The jurisdiction of the central and provincial governments
- c. The powers of the Secretary of State for India and the Viceroy
- d. None of the above

Ans. B

Samples from

# INDIAN GEOGRAPHY

# PHYSIOGRAPHY OF INDIA

	Overview
	<p>Imagine that you were born in Israel or Nepal. There are huge number of countries in the world that are either completely a desert or mountainous or simply plains. India is a blessed country. There are only a very few countries in the world which are geographically as blessed as India. You don't need to go anywhere else; a travel across India will give you an experience of almost all physiographic/geographical features on earth. A journey thru Physiography of India will show you the geographical features of India; and you must try to relate every feature to its vegetation/ people/ their lifestyles and the economy of that place.</p>

- Covering an area of more than 32 Lakhs Sq. km, India is the **7th largest** country in the world.

**Area-wise (in Million Sq Km)**

Russia	→	Canada	→	USA	→	China	→	Brazil	→	Australia	→	India
17		10		9.8		9.6		8.5		7.7		3.28

- It has a **land frontier** of about **15,200** km. The total length of the **coastline** of the mainland and Islands (Lakshdweep and Andaman & Nicobar Islands) is **7,516** km.
- Tropic of cancer** divides India in almost **2 equal parts**. The southern half coinciding with peninsular India lies in tropical zone, and the northern half, somewhat continental in nature, belongs to sub-tropical zone.
- Tropic of cancer passes through **8 states** of India (Gujarat, Rajasthan, M.P., Chhattisgarh, Jharkhand, W.B, Tripura and Mizoram)
- Countries having a common border with India** are Afghanistan, Pakistan, China, Bhutan, Nepal, Myanmar, and Bangladesh. Sri Lanka is separated from India by a narrow channel of sea formed by the Palk Strait and the Gulf of Mannar. **Total 7 countries** have common border with India.

<b>Longitudinal Extent (mainland)</b>	8°4'N - 37°6' N	3,214 km
<b>Latitudinal Extent (mainland)</b>	68°7'E - 97°25' E	2,933 km
India lies <b>entirely</b> in the <b>northern</b> hemisphere. India belongs to <b>Eastern Hemisphere</b> as it is situated to east of Prime Meridian. It occupies south central peninsula of Asian continent		
It has 2 time zones: <b>82°30' E forms standard Meridian</b>		

<b>EXTREME POINTS OF INDIA</b>		
Northernmost	Dafdar in Taghdumbash Pamir near Beyik Pass in J&K	37°05'N 74°40'E
Southernmost	Indira point	6°45'N 93°49'E
Westernmost	West of Ghuar Mota, Gujarat 68°34'E	23.67N 68.52E
Easternmost	Kibithu, Arunachal Pradesh 96°30'E	28°01'N 97°24'E

- Indira Point (N 6°45' E 93°49')** - Southernmost point of Indian Territory. Located on Great Nicobar. Indonesia lies few kilometers away from Indira Point. Great Channel

separates India from Indonesia. Indira Point is also known as **Parsons Point** or **Pygmalion Point**

- Order of countries sharing border with India (in **decreasing order of border length**)  
Bangladesh – China – Pakistan – Nepal – Myanmar – Bhutan – Afghanistan.
- Its total land frontier is 15200 kms.
- Maritime boundary – 6100 kms; it is 7516 km if we include Andaman and Nicobar and Lakshadweep.
- Kanyakumari – Southernmost point of Indian Mainland.
- Where the Himalayan mountains stand today, the region was under marine conditions about **60 crore years ago**. On the other hand, **Peninsula** dates back as far as **380 crore years**.
- With the opening of **Suez canal** (in year 1869), the distance of India and Europe has been reduced by **7000 Km**.
- Indian Subcontinent was originally part of Gondwana continent.

## MAJOR PHYSIOGRAPHIC REGIONS

- **Three Major Structural components –**
  - (1) The Great Mountains of North.
  - (2) The Northern Plains Subdivisions:-
    - (a) Great Plains
    - (b) Thar Desert
  - (3) The great peninsular plateau – Having Subdivisions.
    - (a) Central Highlands
    - (b) Peninsular Plateaus
    - (c) Coastal Plains
- Islands of Andaman & Nicobar and Lakshadweep form the fourth division of India.
- **Area wise** these subdivisions can be arranged as – Peninsular Plateaus, Northern Mts., Great Plains, Central Highlands, Coastal Plains, Thar Desert and Islands.

## GREAT MOUNTAIN WALL OF NORTH

### Trans Himalayas

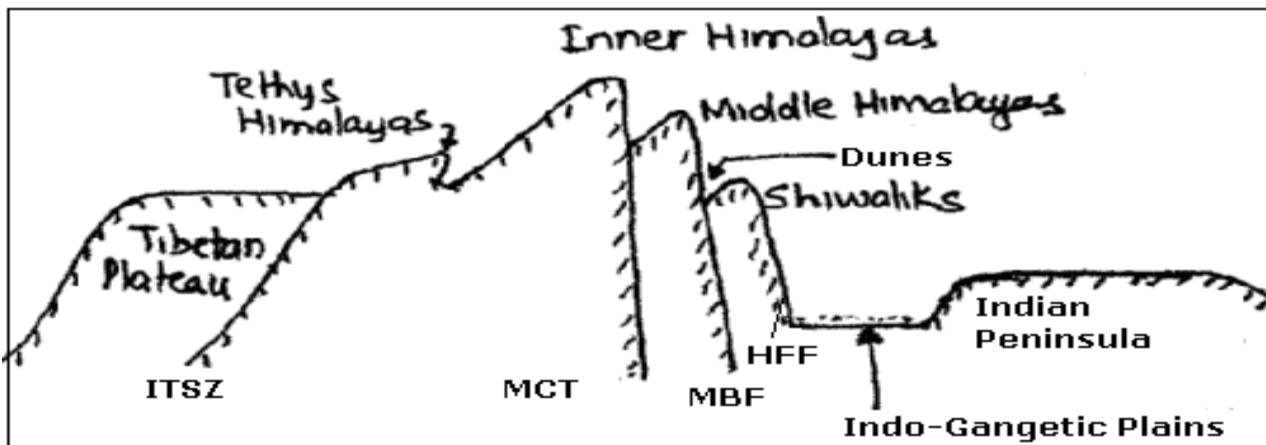
- From **Pamir Knot** (The **roof of the world**) run several mountain ranges. **Kunlun** run into Tibet, **Karakorum** enters Kashmir and runs S-E and includes the Plateau of **Aksai Chin**. It extends further east, known as **Kailas Range** in Tibet. **Pamir** is the connecting link between the Himalayas and the high ranges of Central Asia.
- Karakoram contains K<sub>2</sub> (**Godwin Austin**), second highest peak in the world. **Karakoram pass** is situated in Karakoram Range.
- **Baltoro** and **Siachin** are some of the glaciers in this area. **Length wise glaciers** of Karakoram are – Siachen (in Nubra valley), Hispar, Biafo and Baltoro.
- To the south of Karakoram lie two parallel ranges – **Ladakh** and **Zaskar**.
- Indus originates beside Kailash. Flows between Ladakh and Zaskar ranges from south-east to north-west. Indus forms **deepest gorge** of this region in **Gilgit**.
- **Nanga Parbat** overlooks Indus in the North.

### The Himalayas

- Himalayas emerged out of the Tethys Sea in **three different phases**. The first phase commenced about 120 million years ago, when the great Himalayas were formed. The formation was completed about 70 million years ago. The second phase took place about 25

to 30 million years ago when the Middle Himalayas were formed. The Shiwaliks were formed about 2- 20 million years ago.

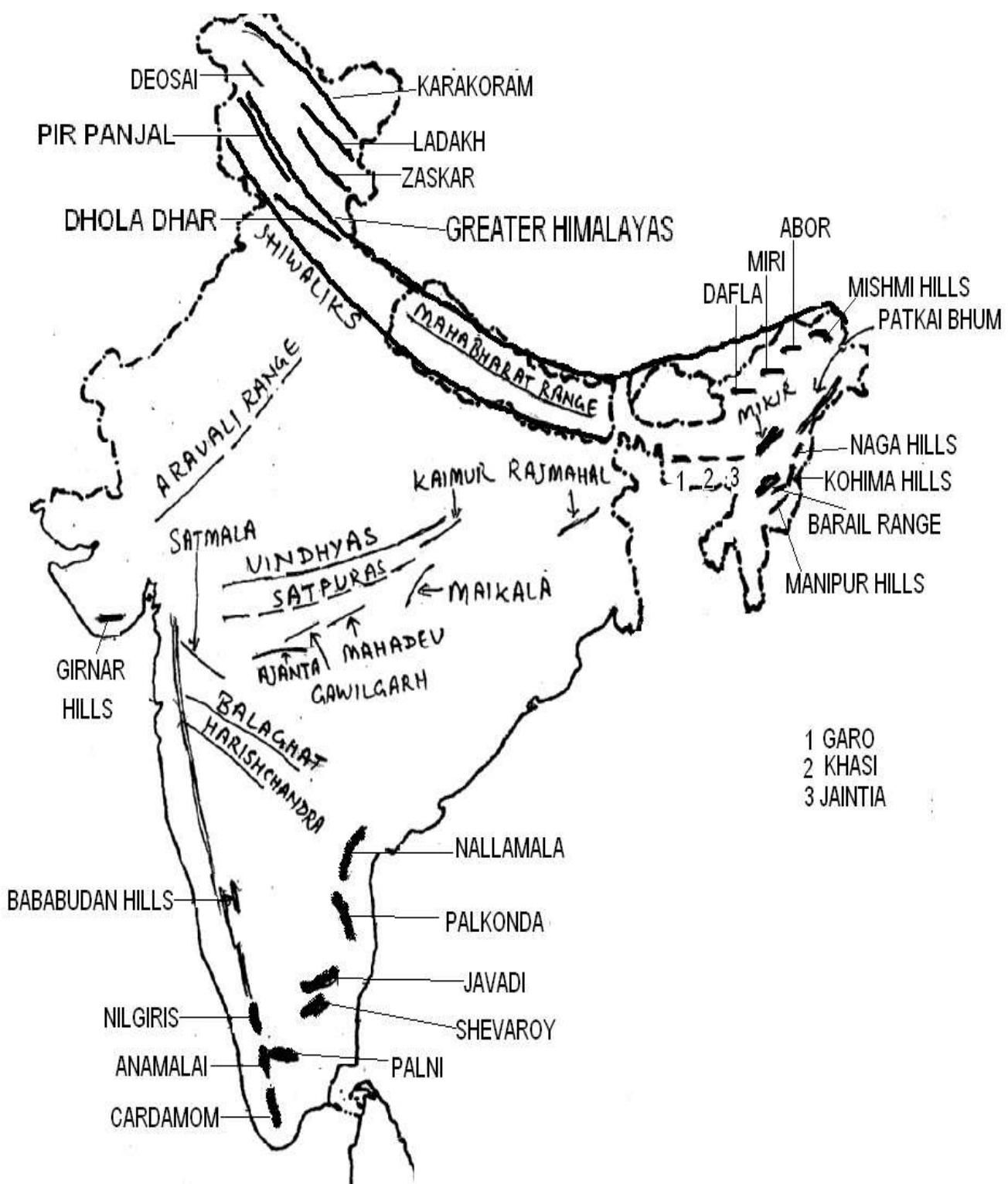
- Himalayas run for a distance of **2500 km** (over  $22^{\circ}$  longitudes) between Indus and Brahmaputra. Width of Himalayas varies from **400 km** in the **west** to **150 km** in the **east**.
- Himalayas are wide in the west and narrow towards the east. The height of the eastern half is greater than the western half.
- **Wider in west because of many parallel and oblique ranges.**
- Himalayas in J&K and H.P. are called us **western Himalaya**. In Uttarakhand and Nepal are known as **central Himalayas** and in W.B., Sikkim, Bhutan and Arunachal Pradesh they are known as **Eastern Himalayas**.
- Mountains along the **eastern boundary** of India are called **Purvanchal**. These are less spectacular them Himalaya. They are of medium height and comprise the Patkai Bum, and Naga Hills in the north and Mizo hills in the south.



### The Greater Himalayas

- Greater Himalayas or **Himadri** are the northern most and **loftiest** of all.
- **Mt. Everest** or **Sagarmatha** (8848 m) is the highest peak of the world, located in Nepal. Tibetans call it **Chomlungma**
- **Kanchanjunga** is the **second highest** peak of Himalaya and lies in Sikkim.
- **Namcha Bharwa** (located in China) is an important peak in east overlooking the **Brahmaputra** where this range takes a sudden turn (like a hairpin) towards south to enter India.
- The area where Himalayas stand today together with the northern plains of India was occupied by a Sea, called '**Tethys**'.
- Tethys was elongated and shallow sea sandwiched between two giant masses 'the **Angaraland**' in the **north** and 'the **Gondwanaland**' in the **south**.
- Tethys stretched from the present **Indo-Burmese** border in the east and covered the vast area including western Asia, North eastern and central parts of Africa before it joined the South Atlantic Ocean in the **Gulf of Guinea**.
- As the Himalaya began to gain in height, the rivers and the other agents of denudation became increasingly active in eroding them, and carrying huge amounts of silt deposits in the shrinking Tethys. Thus Northern plains or **Indo-Gangetic** Plains formed.
- Himalayas are **not an effective water divide** as the rivers like Indus, Satluj and Brahmaputra cut gorges through it in order to turn towards south.

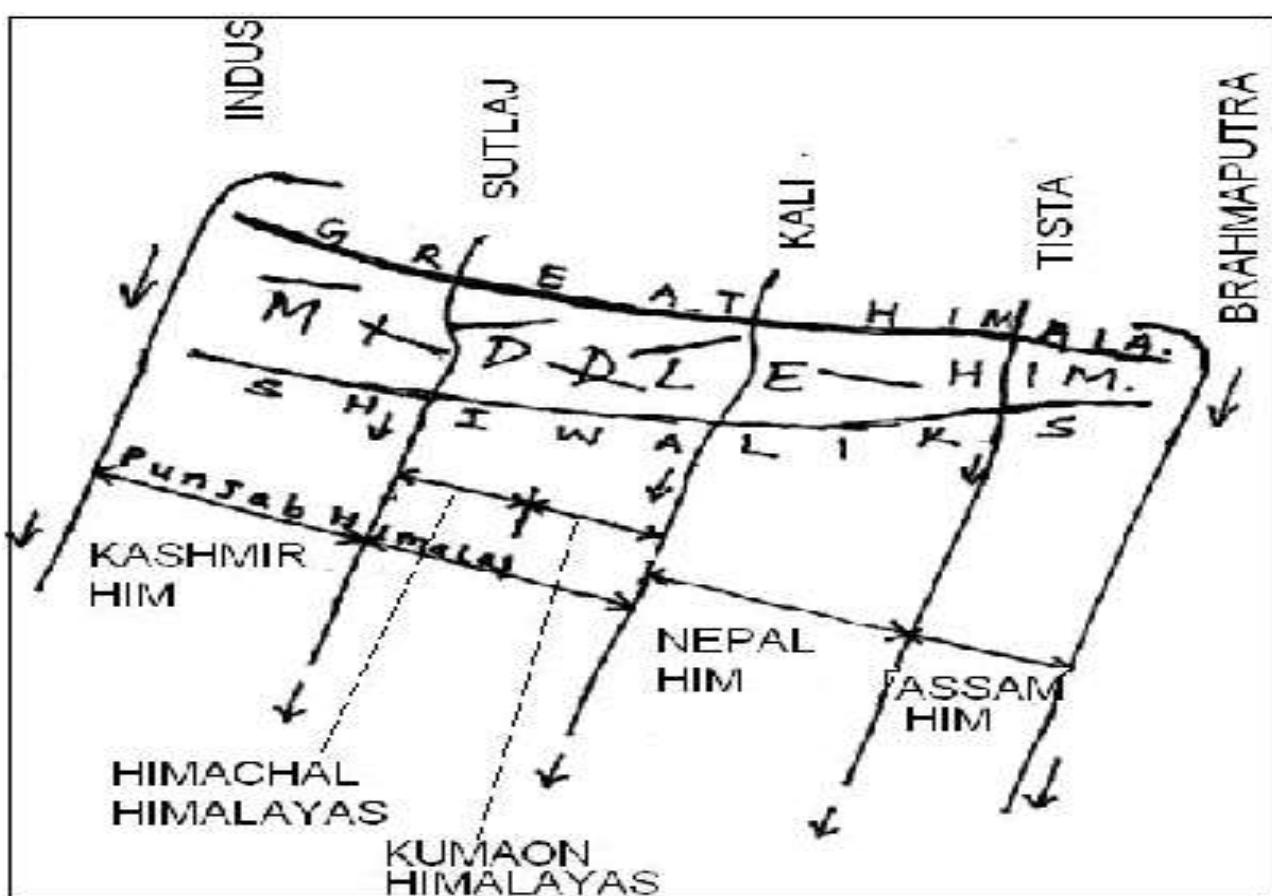
## MAJOR MOUNTAIN RANGES OF INDIA



### Middle/ Lesser Himalayas

- To the south of Great Himalayas, known as the **Himachal**. All the important **hill stations** such as Dalhousie, Dharamshala, Shimla, Mussoorie, Nainital – Darjelling.
- **Southernmost** ranges of Himalayas are called **Shivaliks** – made up of unconsolidated deposits of rivers are prone to **earthquakes** and **landslides**.

- **Shivalik** result of deposition of **Indo-Brahm river (hypothetical)** sediments at foothills of Middle Himalayas.
- Himalayas have “**ridge-and-valley-topography**”. The most outstanding valleys are the valley of Kashmir and the Karewas, the Kangra and Kulu valley in Himachal Pradesh; the Dun valley; the **Bhagirathi Valley** (near Gangotri) and the **Mandakini Valley** (near Kedarnath) in Uttarakhand and the Kathmandu Valley in Nepal.
- **Shivaliks** is an almost unbroken succession of low hills except for a gap of 80-90 km which is occupied by the valley of the **Tista River**. The **Churia Ghat Hills** of Nepal also form parts of the Shivalik Range.
- **Ranges of the Middle Himalayas are as follows:-**
  - Kashmir Section : Pir Panjal and Dhaola Dhar (Punjab Himalayas)
  - Himachal Section : Mussorie and NagTiba (Punjab Himalayas)
  - Nepal Section : Mahabharat Range (Nepal Himalayas)
  - Assam Section : Assam Himalayas



- **The arrangement of different ranges in Himalayas is classified according to the name of that region:**
  - a. Between Indus and Sutlej : Kashmir Himalayas
  - b. Between Sutlej and Kali : Himachal in west + Kumaon in East
  - c. Between Kali and Tista : Nepal Himalayas
  - d. Between Tista and Brahmaputra : Assam Himalayas
  - e. Kashmir + Himachal Himalayas make Punjab Himalayas

## NORTHERN PLAINS

- Length is about 3000 km from Indus to Brahmaputra; width varies from 150 km (Assam) to 400 km (Allahabad).
- It slopes south east, from Punjab towards W. Bengal.
- There are primarily **5 divisions of Plains:-**

### Punjab Plains

- **Indus** and its tributaries make these plains, with **5 Doabs** (area between two rivers). Punjab derives its name from 5 river waters. These are (from south to north):-
  - **BIST**: Between Sutlaj & Beas
  - **BARI**: Between Beas & Ravi
  - **RACHNA**: Between Ravi & Chenab
  - **CHAJ**: Between Chenab & Jhelum
  - **SIND SAGAR**: Between Jhelum & Indus
- Placed from South to North, these rivers are: Sutlej, Beas, Ravi, Chenab, Jhelum and Indus
- Northern hilly region has enormous gullying, resulting into **badlands** called **Chos**
- Less than **one-third** of the Indus basin is located in India (J&K, H.P & Punjab)

### Haryana Plains

- Act as a **water divide** of Indian Plains (Ambala distt.). These separate the **Indus** system from the **Ganga** system. Drained by River Yamuna (tributary of Ganga).
- The **outcrops of Aravalli** in the southern part have broken the monotony of these plains. This region is called **Bhavani Bangar**

### Ganga Plains

- Ganga after rising from Gangotri enters Northern plains at Haridwar, Yamuna joins it at Allahabad.
- Plains are dominated by the **confluence of cones** of the tributaries of Ganga.
- These consist of three sub-divisions, namely (from west to east): Rohailkhand Plains, Awadh Plains and Bihar Plains.

### West Bengal Delta

- Delta formed by Ganga, Brahmaputra and Damodar.
- Largest and fastest growing delta of the world and it is also the most fertile delta.
- Important for Jute and Rice cultivation. Three crops of rice per year.
- The marshes here are important for Sundari trees (Sunderbans)

### Brahmaputra Plains

- Lie in Assam, these plains are prone to floods, earthquakes and gullying

## LATITUDINAL DIVISIONS OF NORTHERN PLAINS

### Bhabar

- A **Narrow, Continuous** belt along the foothills of **Shivaliks**, from **Indus to Tista**
- Consists of degraded materials- **pebbles**. It's a **porous** zone.
- **Rivers are lost here** after emerging from Himalayas
- Consists of **alluvial cones** and inter-cones

### Terai

- Region (in **Uttar Pradesh**) where rivers **re-emerge** after being lost in Bhabar region
- Consists of **wetlands** and **marshes**. **Rice** cultivation practiced here
- Fertile soils, **only soil having nitrates in India**.
- In **Assam**, this region is called **Duars**, useful for **tea** cultivation

### Bhangar

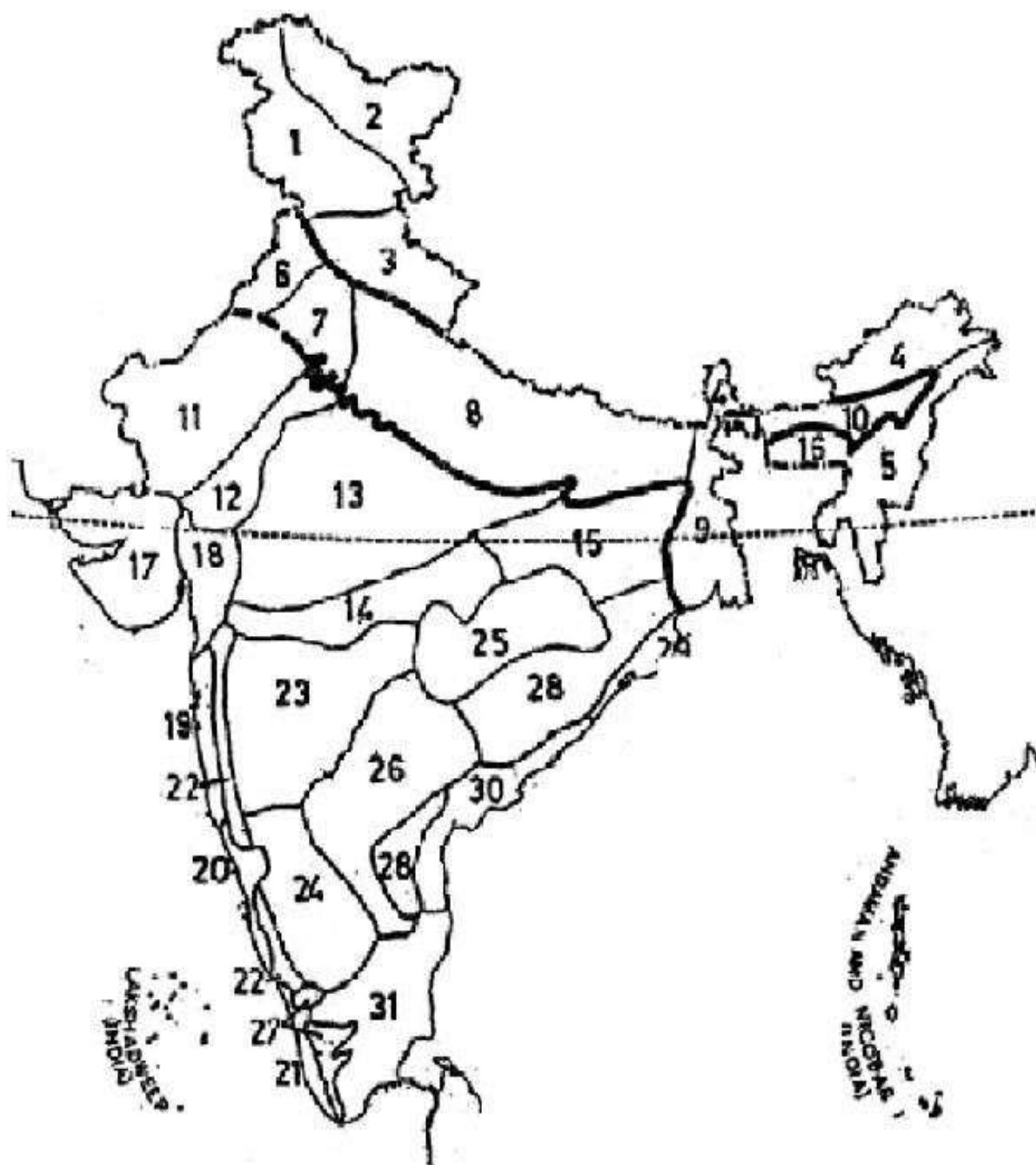
- **Alluvial Terraces** along the river floodplains; consists of **calcareous Kankars**.
- Known by **different names** in different regions
  - Barind : West Bengal
  - Bhur : Aeolian deposits in upper Ganga-Yamuna doab
  - Dhaiya : Punjab (highly gullied)
  - Dharos & Dhands : Indus (long & narrow)

### Khadar

- **New alluvium** in floodplains of rivers.
- **Highly fertile** soils consisting of **ox-bow lakes** and **meanders**



THE DETAILED DESCRIPTION OF PHYSIOGRAPHIC REGIONS OF INDIA IS AS FOLLOWS:



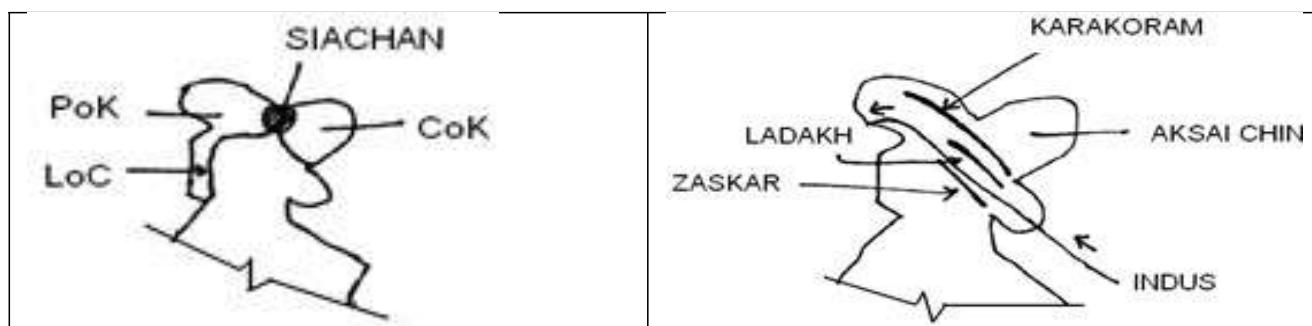
#### REGION 1: KASHMIR

- Relief: mountainous, rugged topography with parallel and oblique ranges interspersed by river valleys.
- Rivers: Jhelum, Chenab and Ravi. **Jhelum** cuts through **Pir Panjal** and makes **Baramula Pass**
- Lakes: **Wular** (Ox-bow lake of R.**Jhelum**), Dal

- Ranges: Shiwalik, Dhaola Dhar and Pir Panjal of Middle Himalayas, and Inner Himalayas i.e. Great himalayas.
- Peaks:**Nanga Parbat (8126 m)**
- Passes: Zozila, Banihal, Burzil, Bara Lacha La
- Vegetation: Alpine in north to **Montane sub Tropical** and Temperate in South
- Forested Area: J&K- 20% of total geographical area that falls within territory of India
- National Parks: Dachigam, Kishtwar, Salim Ali
- Tribes: **Gujjars & Bakarwals** – (They Experience **Transhumance**)
- Tourism Places: Amarnath, **Gulmarg (Ski resort)**, Srinagar
- HEPs: **Salal, Dul Hasti, Uri**
- Tilted beds of Lake Deposits called **KAREWAS** are found on the flanks of **Pir Panjal Range**

## REGION 2: KARAKORAM, LADAKH AND BALTISTAN

- Result of Collision between Peninsula and Eurasian Plate. Outcome was **Trans-Himalayas Ranges** (Ladakh & Zaskar Range) and Karakoram Range. Karakoram uplifted before the rise of Himalayas.
- **Relief** : General Elevation is more than 5000m (Ladakh Plateau – 5300 m)
- Peaks : K2 (8611m), Godwin Austin, Gasherbrum
- Rivers : Indus basin (tributaries **Shyok** & **Gilgit** join from **north**, **Zaskar** from **south**)
- Lakes : Pangong, Salt Lake, **Tso Morari**.
- Plains : Aksai Chin, Deosai, Baltistan
- Passes : Karakoram, Aghil
- Siachen : World's longest Glacier (72 km) and highest battlefield in the world Glacier
- Forest : Devoid of any forest (Cold desert)
- Single strategic road from **Srinagar to Leh** passes through **Zojila Pass**
- Most of it occupied as **CoK** (China occupied Kashmir) & **PoK** (Pakistan occupied Kashmir)



## REGION 3: KUMAON & HIMACHAL

- Narrow Longitudinal Valleys called **DUNES** between **Shiwaliks and Middle Himalayas**, for example Dehradun, Kothridun (Kumaon Himalayas), Patlidun (All in Uttranchal)
- Covers the states of Himachal Pradesh and Uttarakhand
- Highly Forested (HP-24%, Uttarakhand > 60%)
- **National Parks:** Valley of Flowers, Jim Corbett, Nanda Devi (All in Uttranchal); Great Himalayan & Pin Valley (in HP)
- **Tribes:** Gaddis (H.P.), Bhotias (Garhwal & Kumaon)
- Peaks: Nanda Devi, Kamet.
- Pilgrimage: Gangotri, Yamunotri, Badrinath, Kedarnath
- Tourism: Kullu, Manali, Shimla, Dehra Dun, Mussorie, Nainital

- HEPs: Naptha Jakri (Satluj in H.P.), Tehri (Bhagirathi in Uttarakhand), Thein (Ravi in H.P.)

#### **REGION 4, 5, 16: EASTERN HIMALAYAS, PURVANCHAL, MEGHALAYA PLATEAU**

- **Younger**, bolder and **steeper** than Western Himalayas with **abrupt rise**
- Protruding of hard peninsular rocks into Eurasian plate, therefore **syntaxial (knee like) bending**. Himalayas turn to **north-south direction** over here
- Distinction between parallel ranges is lost here, therefore **Narrower than Western Himalayas**
- Important Ranges/ hills:-
  - Dafla, Miri, Abor and Mishmi in E.Himalayas
  - Patkai Bum, Naga, Mizo, Barail, Rengma, Mikir in Purvanchal
  - Garo, Khasi, Jaintia in Meghalaya Plateau
- Peaks – **Kanchenjunga** (8598m), **Namcha Barwa** (7756m)
- Rivers: Dihang, Dibang, Lohit, Subansiri and Surma (All tributaries of Brahmaputra)
- Passes – **Diphu Pass (Tri-junction** of India, China and Myanmar), Bomdila, Nathu la, Jelepla
- Lakes – Loktak ( Manipur with floating island)
- HEP – **Loktak Lake HEP**
- Mynsynram receives more than 1000 cm rainfall annually.
- Highly Forested (Arunachal Pradesh > 94%)
- National Parks: Namdapha, Keibul Lamjao, Dampa, Nokrek.
- Agriculture: **Jhum (Shifting) Cultivation, Rice in Surma Valley**
- Population density of **Tripura** > 300 persons/ sq. km because deltaic plains of Bangladesh extend here.
- **Tribes** – Garo, Khasi & Jaintia (Meghalaya); Kuki (Manipur), Nagas, Lushai (Mizoram); Chakmas (Tripura), Abors (A.P.); Lepchas (Sikkim)
- Literacy – Low in Arunachal. High in Tripura and Mizoram

#### **REGION 12 – ARAVALLI REGION/ HILLS**

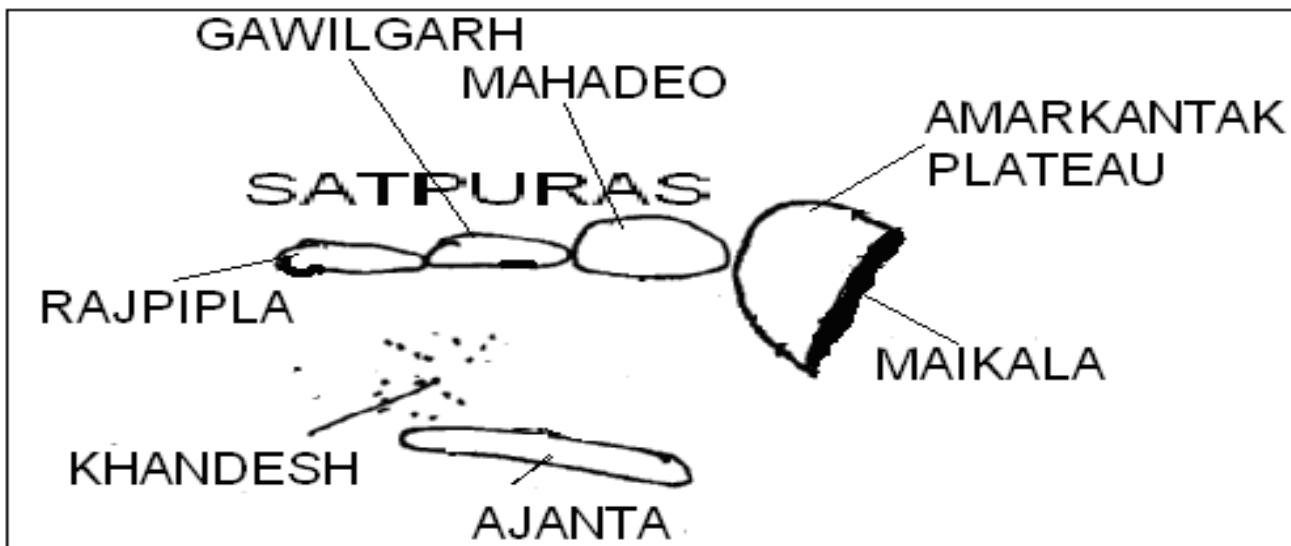
- **Fold mountain**- Highly dissected, denuded, a **Relic mountain**. Av. Elevation 800-900 m
- **Senile stage** of landform development. Older than Himalayas
- **Broader in south** as compared to north.
- Elevation goes on decreasing from south to north, quite pronounced in Udaipur. **Gurusikar** (in south): highest peak near **Mt. Abu**.
- Extends from Delhi Ridge to Ahmedabad from N-E direction to S-W direction.
- North of Ajmer, divide into several parallel ranges separated by longitudinal valleys: Delhi ridge and Ambala ridge.
- Acts as **Gangetic water divide**.
- **Nakki Lake**: Mt. Abu – famous for tourism
- **Rivers**: Luni and its small tributaries flow westward, and Banas and its feeders flow eastward
- Aravallis are **parallel to SW monsoon** and fall in the zone of subsidence; therefore, scanty rainfall & low humidity. High seasonal variation in rainfall
- **Rain fall**: Southern side faces more rainfall (broader)
- **Vegetation**– southern side- moist and dry deciduous to dry deciduous and thorny in north. Western face fairly rainy and forested. North of Ajmer- devoid of forest cover

## REGION 13: CENTRAL VINDHYAN UPLANDS

- Location: Aravallis in west, Vindhyan Range in south & plains in north.
- Vindhyan Range continues as **Bhander** and **Kaimur** hills in east. Forms watershed between Ganga system & Southern rivers
- **Malwa plateau** rolls down to north & finally merges with Gangetic Plains. Highly dissected by river valleys of Tributaries of Chambal: Sind, Betwa & Ken, therefore forming **Badlands**
- Majority of it lies in **M.P.**
- **Tribes:** Bhils, Kol, Gond

## REGION 14: KHANDESH & SATPURA – MAIKALA RANGE

- Satpuras are **Fold Mountains**. Known by different names at different sections. From west to east, it names as **Rajpipla**, **Gawligarh** and **Mahadeo** Hills
- **Mahadeo** Hills forms the **highest portion**. **Dhupgarh** Peak (1350m) near **Panchmarhi** (hill station) in M.P. is highest peak of Satpuras. **Tapi** rises from here.
- Maikala Range/ **Amarkantak** Plateau: Wet Forested Region is the **source of many rivers** like Narmada, Son, Mahanadi, and Wainganga.
- **Rivers:**
  - Narmada & Tapi – west flowing
  - Son – biggest Tributary of Ganga from south
  - Wainganga – major tributary of Godavari
- Highly forested area with national parks: Pench, Kanha, and Satpura.



## REGION 17, 18: KACHCHH & KATHIAWAR, GUJARAT PLAINS

- Mineral oil & Natural Gas – commercial production along western Gujarat plains. Kalol, Ankaleshwar, Gandhar are important ones

KACHCHH	KATHIAWAR	GUJARAT PLAINS
Consists of Great Rann along north. Little Rann on coast & south east. Prone to <b>earthquakes &amp; floods</b>	Central Tableland with Highest point: <b>Mt. Girnar.</b>	Alluvial Plains
Rivers: <b>Luni &amp; Banas</b>	Radial drainage pattern	Drained by Sabarmati, Mahi, Narmada & Tapi
<b>Wild Ass Sanctuary</b>	<b>Gir National Park:</b> Asiatic Lion (only place in the world for Asiatic lion)	

### REGION 23, 24, 26: DECCAN LAVA PLATEAU INCLUDING KARNATAKA & TELENGANA-RAYALSEEMA PLATEAUS

- Extends from Vindhya to the southern tip of Peninsula.
- It is triangular in shape and is widest in the north.
- **Important Ranges** in the northern part are Satmala, Ajanta, Balaghat & Harishchandra.
- Western Ghats lies on the western side of plateau.
- Deccan Plateau is highest along its western edge and **gently slopes towards the Bay of Bengal** in the east.
- Towards its south lies the **Karnataka Plateau**. The **western** part of this plateau is called **Malnad** while the **eastern** is called **Maidan**. Western part is higher and more rugged.
- **Baba Budan Hills** is an important Range along Karnataka Plateau.
- It lies in the **rain shadow zone** of Western Ghats, therefore, severely prone to droughts
- Important rivers of this region are – Krishna, Tungabhadra, Penneru and Cauvery
- **Tank irrigation** is widely practiced here
- Towards the South-East lies the **Telengana-Rayalseema Plateau** which is a low plateau, highly dissected and denuded. River **Krishna divides** it into two parts- Telengana in north and Rayalseema in south.
- It is also a **drought** prone area, lying in the rain shadow of Karnataka Plateau.
- Twin cities of **Hyderabad** and Secundrabad lie in the **Telengana** region.

### REGION 25: WAINGANGA AND MAHANADI BASINS

- Here lie the river valleys of Wainganga, Mahanadi and Indravati (a tributary of Godavari). **Chitrakoot** Falls lie on **Indravati**.
- It includes **Dandkarnaya** Plateau - Highly forested, denuded and undeveloped region (Bastar, Kalahandi and Koraput districts) of India.
- **Chattisgarh Plains** also lie here
- **National Parks:** Tadoba, Nawegaon, Indravati
- Important Mines: Dilli Rajhara, Bastar, Bailadila, Balaghat

### REGION 28, 22 & 27: WESTERN & EASTERN GHATS & SOUTHERN HILL COMPLEX

#### Western Ghats

- Form a **continuous barrier** from north to south, almost parallel to the Arabian Sea. General altitude is **900-1100 m**. These are **higher** in their **southern part**
- Known as **Sahyadri** in **Maharashtra** and **Karnataka**, **Nilgiris** in **T.N.**, **Anaimalai** and **Palni-Cardamom** Hills in **Kerala** and **Tamil Nadu**.

- Collectively Nilgiris, Anamalai Hills & Palni-Cardamom Hills form **Southern Hills Complex**.
- **Nilgiris** is the **meeting point** of Western Ghats, Eastern Ghats and Southern Hill Complex. **Doda Beta** (2637m) is the highest peak of Nilgiris. **Udagamandalam** (Ooty) is a hill station located in Nilgiris (Tamil Nadu). Temperate forests called **Sholas** are found here.
- **Anai Mudi** (2,695m) is the highest peak of **Western Ghats**. It is located in **Anamalai Hills** and falls in **Kerala**.
- Famous hill station of **Kodaikanal** (T.N) lies in **Palni Hills**. The source of Periyar River lies in **Cardamom Hills**. **Periyar Lake** is also situated here.

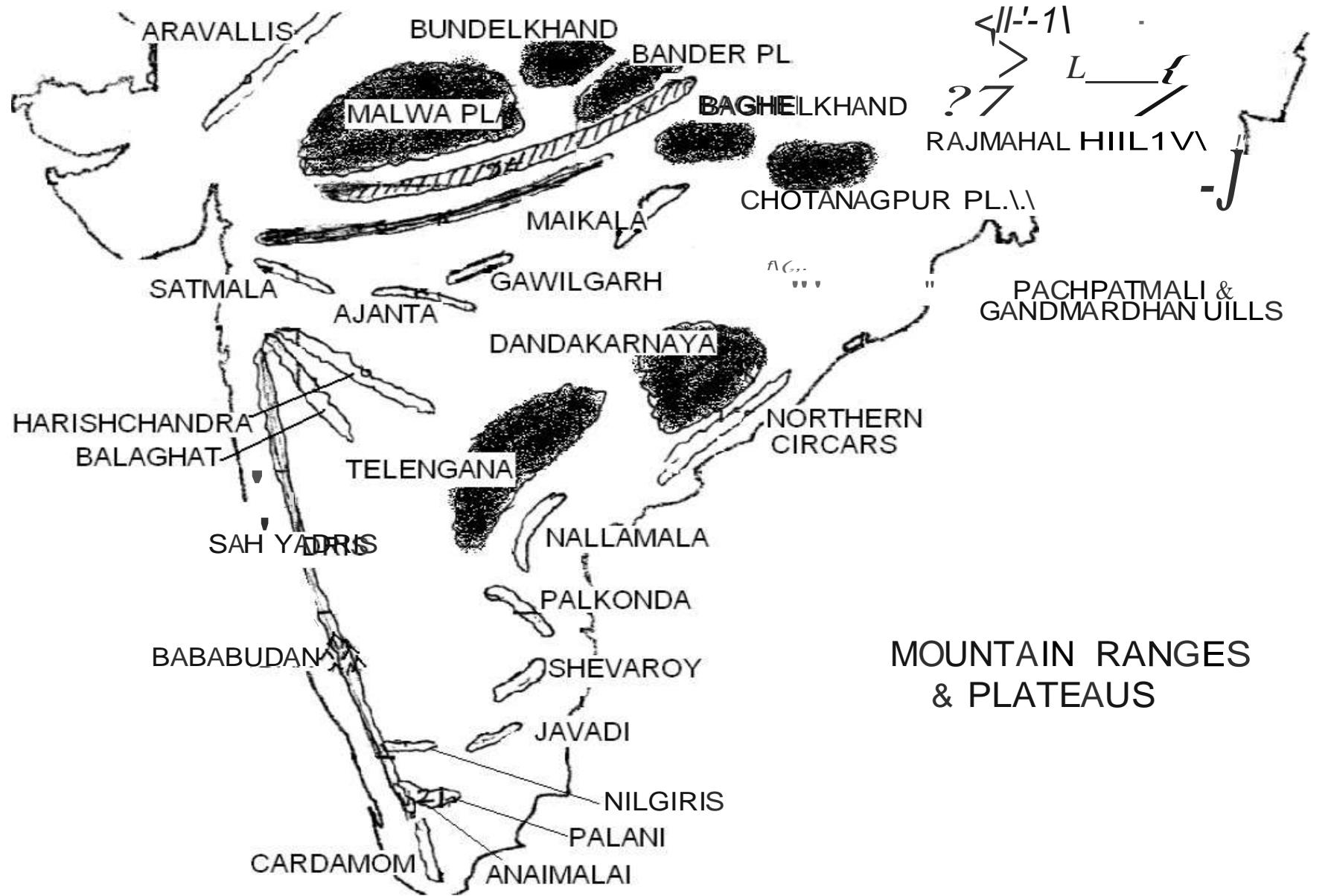
### **Eastern Ghats**

- Form a **discontinuous line** of hills parallel to E.Coast
- Known by different names at different places –
  - **Northern Circars** in north of Godavari
  - **Palkonda & Nallamala** between Godavari & Palar Rivers
  - **Shevaroy & Javadi** as T.N hills
- As opposed to Western Ghats, E. Ghats are **higher** in **northern** part. **Mahendra Giri** (1501m) is the highest peak of E.Ghats, lying in **Orissa**.

<b>Western Ghats</b>	<b>Eastern Ghats</b>
Higher average elevation than E. Ghats. Higher in Southern part	Higher in northern part
Source of many rivers. Act as a <b>water divide</b>	Not a source of any river
High rainfall (>200cm). higher in south	Less rainfall (<200cm). higher in north
Greater <b>HEP</b> potential. Many waterfalls	Lesser potential
Water falls in Western Ghats	Water falls in Eastern Ghats

n

# MOUNTAIN RANGES & PLATEAUS



IV

## REGION 19, 20, 21, 29, 30 AND 31: COASTAL PLAINS

### West Coastal Plain

- Extend from Gujarat to Kerala.
- Known as **Konkan** in the north (Daman to Goa), **Kanara** in Karnataka and **Malabar** in the Kerala.
- Plains are **narrower in the north** (Goa & Karnataka) and **wider in south** (Kerala)
- **Jog Falls/ Gersoppa Falls** (on R. **Sharavati**) on **Karnataka Coast** are the **Highest** in India.
- In **Kerala**, coast has salt water lakes called **Lagoons** or **Backwaters** or **Kayals**. Important Lakes here are **Ashtamudi** and **Vembanad**
- Lowlands during rains merge together to form **Patlas**; are used for cultivation

### East Coastal Plains

- Coastal strip along Bay of Bengal is **broader** as compared to the western coast.
- Known as **Utkal Plains** (in **Orissa**); wide and deltaic (Mahanadi & Brahmani delta). **Chilka** lagoon is located here
- Andhra Plains: Deltaic (Godavari & Krishna delta) in middle. **Kolleru** lake lies here
- **Coromandal** Coast (**Tamil Nadu**) in south; Deltaic (Cauvery delta); **Pulicat** lake lies here

<b>Western Coastal Plains</b>	<b>Eastern Coastal Plains</b>
Formed by <b>submergence</b> of western side of Western Ghats. <b>Retrograded</b> coastline	Formed by <b>alluvium</b> brought by rivers like Mahanadi, Godavari, Krishna & Cauvery. <b>Prograded</b> coastline
Less in width due to subsidence. <b>Continental Shelf</b> is <b>wide</b> because of the same reason	Wider coast & narrower shelf due to emergence
Rivers are smaller, swift and more erosive. Form <b>estuaries</b> .	Rivers are longer, gradual and less erosive. Form <b>deltas</b> .
Rainfall: 200-400 cm (SW Monsoon)	Rainfall: 100-200 cm (SW & NE Monsoon)
Less prone to cyclones	More prone to cyclones
Not prone to floods except Narmada estuary because of swiftness and small lengths of rivers	Prone to <b>floods</b> because of gradual lengths, deltaic formations & long lengths of rivers
More contribution to <b>marine food</b>	Less contribution
Prospects of <b>Wave Energy</b>	Prospects of <b>OTEC (Ocean Thermal Energy Conversion)</b>
More no. of <b>Natural Harbours</b>	Lesser no.
Ports important for <b>import</b> purposes	Ports important for <b>export</b> purposes

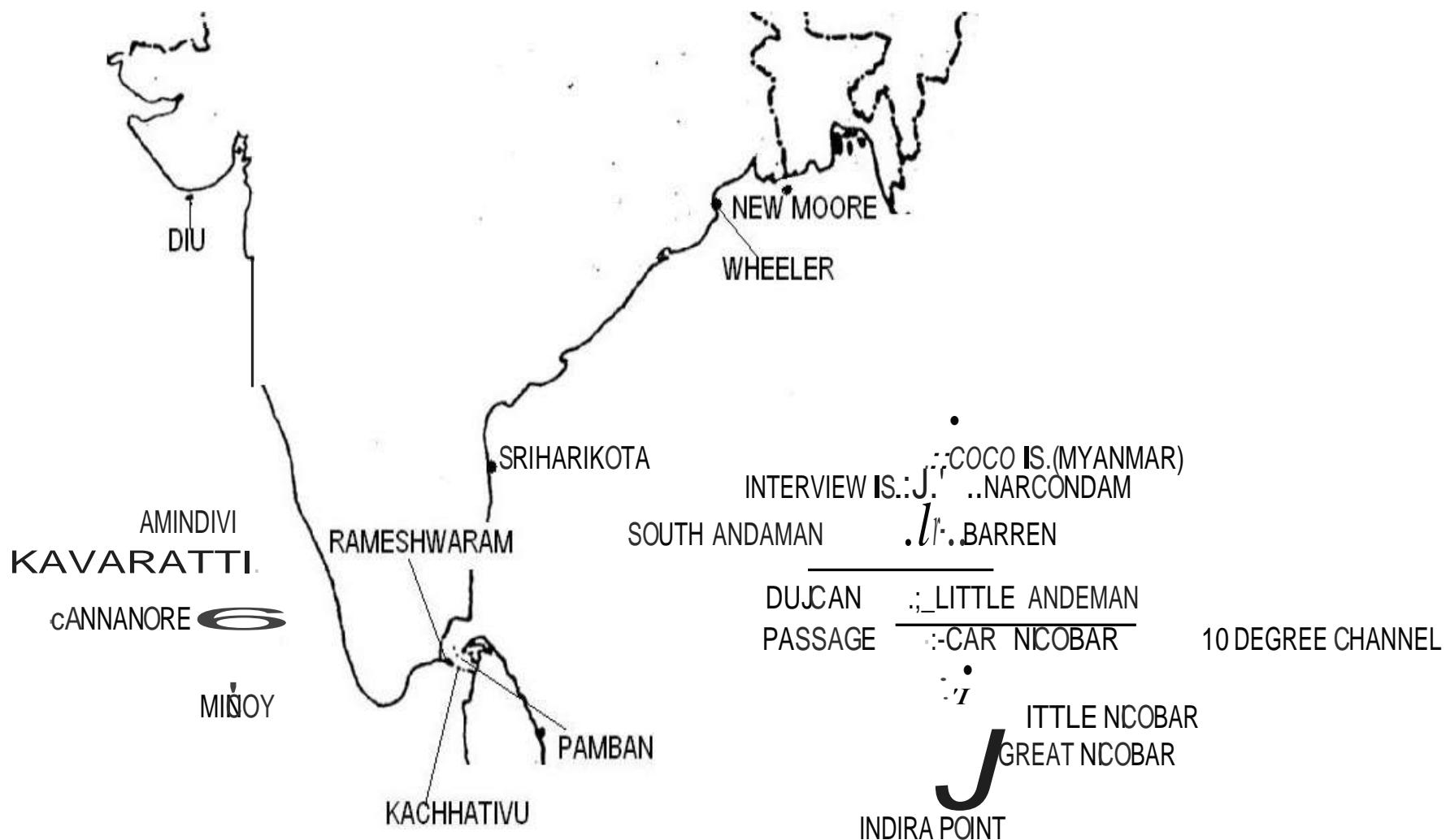
## REGION 32, 33: ISLAND GROUPS

### Lakshadweep Islands

- Extend from **8°N - 12°N**. Consists of 30 small islands, only 10 of which are populated.
- Population consists of **Mopilas (Muslims)** from **Kerala**
- **Coral** origin (made up by the organic activity of micro-organisms called coral **polyps**)
- Among Lakshadweep islands, some islands are **horse-shoe shaped** called **Atolls**.
- Lakshadweep Group consists of 2 sub-groups:
  - **Amandivi** Islands - North of 11° N Channel
  - **Cannanore** Islands - South of 11° N Channel
- **Minicoy** Islands lie to the extreme south

### Andaman and Nicobar Islands

- Extend from **6° 39'N - 13° 34'N**
- Consist of two groups – Andaman Group (Great & Little Andaman) – 204 islands, and Nicobar Group (Car, Little and Great) – 19 islands
- Continent in origin. They are submerged parts of mountain range called **Arakan Yoma** (Mayanmar).
- Some of them are of **volcanic** origin and only active volcano of India is located on these islands (**Barren** Island). **Narcondam** is the extinct volcanic island.
- 10° channel separates **Andaman** (Little) from Nicobar
- **Little Andaman** is separated from **Great Andaman** by **Duncan passage**
- Great Nicobar is the Largest Island in the group
- **Saddle Peak** in North Andaman – **highest** peak
- **Car Nicobar encircled by a Fringing Reef**
- Prone to **earthquakes** and **tsunamis**
- Main **Tribes** here are Great Andamanese, Onges, Senthelese, Jarawas and Shompens
- High potential for **wave power & OTEC**



## LETS PRACTICE: LAST 10 YEARS UPSC QUESTIONS

Which of the following hills are found where the Eastern Ghats and the Western Ghats meet?

- a. Anaimalai Hills
- b. Cardamom Hills
- c. Nilgiri Hills
- d. Shevoroy Hills

Ans. C

Which one of the following is the appropriate reason for considering the Gondwana rocks as most important of rock systems of India?

- a. More than 90% of limestone reserves of India are found in them
- b. More than 90% of India's coal reserves are found in them
- c. More than 90% of fertile black cotton soils are spread over them
- d. None of the reasons given above is appropriate in this context

Ans. B

Consider the following pairs: (Place of Pilgrimage: Location

- 1. Srisailam: Nallamala Hills
- 2. Omkareshwar: Satmala Hills
- 3. Pushkar: Mahadeo Hills

Which of the above is / are correctly matched?

- a. 1 only
- b. 2 and 3 only
- c. 1 and 3 only
- d. 1, 2 and 3

Ans. A

Which one of the following pairs of islands is separated from each other by the 'Ten Degree Channel'?

- a. Andaman and Nicobar
- b. Nicobar and Sumatra
- c. Maldives and Lakshadweep
- d. Sumatra and Java

Ans. A

Consider the following pairs: Hills Region

- 1. Cardamom Hills: Coromandel Coast
- 2. Kaimur Hills: Konkan Coast
- 3. Mahadeo Hills: Central India
- 4. Mikir Hills: North-East India

Which of the above pairs are correctly matched?

- a. 1 and 2
- b. 2 and 3
- c. 3 and 4
- d. 2 and 4

Ans. C

If there were no Himalayan ranges, what would have been the most likely geographical impact on India?

- 1. Much of the country would experience the cold waves from Siberia.
- 2. Indo - Gangetic plain would be devoid of such extensive alluvial soil.
- 3. The pattern of monsoon would be different from what it is at present.

Which of the statements given above is / are correct?

- a. 1 only
- b. 1 & 3 only
- c. 2 & 3 only
- d. 1, 2 & 3 only

Ans. D

Where were Shevaroy Hills located?

- a. Andhra Pradesh
- b. Karnataka
- c. Kerala
- d. Tamil Nadu

Ans. D

When you travel in Himalayas, you will see the following:

- 1. Deep gorges
- 2. U - turn river courses
- 3. Parallel mountain ranges
- 4. Steep gradients causing land-sliding

Which of the above can be said to be the evidences for Himalayas being young fold mountains?

- a. 1 and 2 only
- b. 1, 2 and 4 only
- c. 3 and 4 only
- d. 1, 2, 3 and 4

Ans. D

Which one of the following is the correct sequence of the given hills starting from the north and going towards the south?

- a. Nallamalai Hills - Nilgiri Hills - Javadi Hills - Anaimalai Hills
- b. Anaimalai Hills - Javadi Hills - Nilgiri Hills - Nallamalai Hills
- c. Nallamalai Hills - Javadi Hills - Nilgiri Hills - Anaimalai Hills
- d. Anaimalai Hills - Nilgiri Hills - Javadi Hills - Nallamalai Hills

Ans. C

Consider the following:

- 1. Mahadeo Hills
- 2. Sahyadri Parvat
- 3. Satpura Range

What is the correct sequence of the above from the north to the south?

- a. 1, 2, 3
- b. 2, 1, 3
- c. 1, 3, 2
- d. 2, 3, 1

Ans. C

Match List I with List II and select the correct answer using the code given below the lists: List I (Valley) List II (State)

- |                      |                      |
|----------------------|----------------------|
| A. Markha Valley     | D. Yumthang Valley   |
| B. Dzukou Valley     | 1. Sikkim            |
| C. Sangla Valley     | 2. Himachal Pradesh  |
| 1. Sikkim            | 3. Jammu and Kashmir |
| 2. Himachal Pradesh  | 4. Nagaland          |
| 3. Jammu and Kashmir |                      |
| 4. Nagaland          |                      |
- a. A-2, B-4, C-3, D-1
  - b. A-3, B-1, C-2, D-4
  - c. A-2, B-1, C-3, D-4
  - d. A-3, B-4, C-2, D-1

Ans. D

Consider the following statements:

- 1. Assam shares a border with Bhutan and Bangladesh.

2. West Bengal shares a border with Bhutan and Nepal.

3. Mizoram shares a border with Bangladesh and Myanmar.

Which of the statements given above is/are correct?

- a. 1, 2 and 3
- b. 1 and 2, only
- c. 2 and 3, only
- d. 1 and 3, only

Ans. A

Between which of the following was the ancient town of Takshashila located?

- a. Indus and Jhelum
- b. Jhelum and Chenab
- c. Chenab and Ravi
- d. Ravi and Beas

Ans. A

Which one of the following pairs is not correctly matched? Monastery: State

- a. Dhankar Monastery: Himachal Pradesh
- b. Rumtek Monastery: Sikkim
- c. Tabo Monastery: Himachal Pradesh
- d. Kye Monastery: Arunachal Pradesh

Ans. D

Which one of the following statements is NOT correct?

- a. The Western Ghats are relatively higher in their northern region
- b. The Anai Mudi is the highest peak in the Western Ghats
- c. Tapi river lies to the south of Satpura
- d. The Narmada and the Tapi river valleys are said to be old rift valleys

Ans. A

In which State is the Guru Shikhar Peak located?

- a. Rajasthan
- b. Gujarat
- c. Madhya Pradesh
- d. Maharashtra

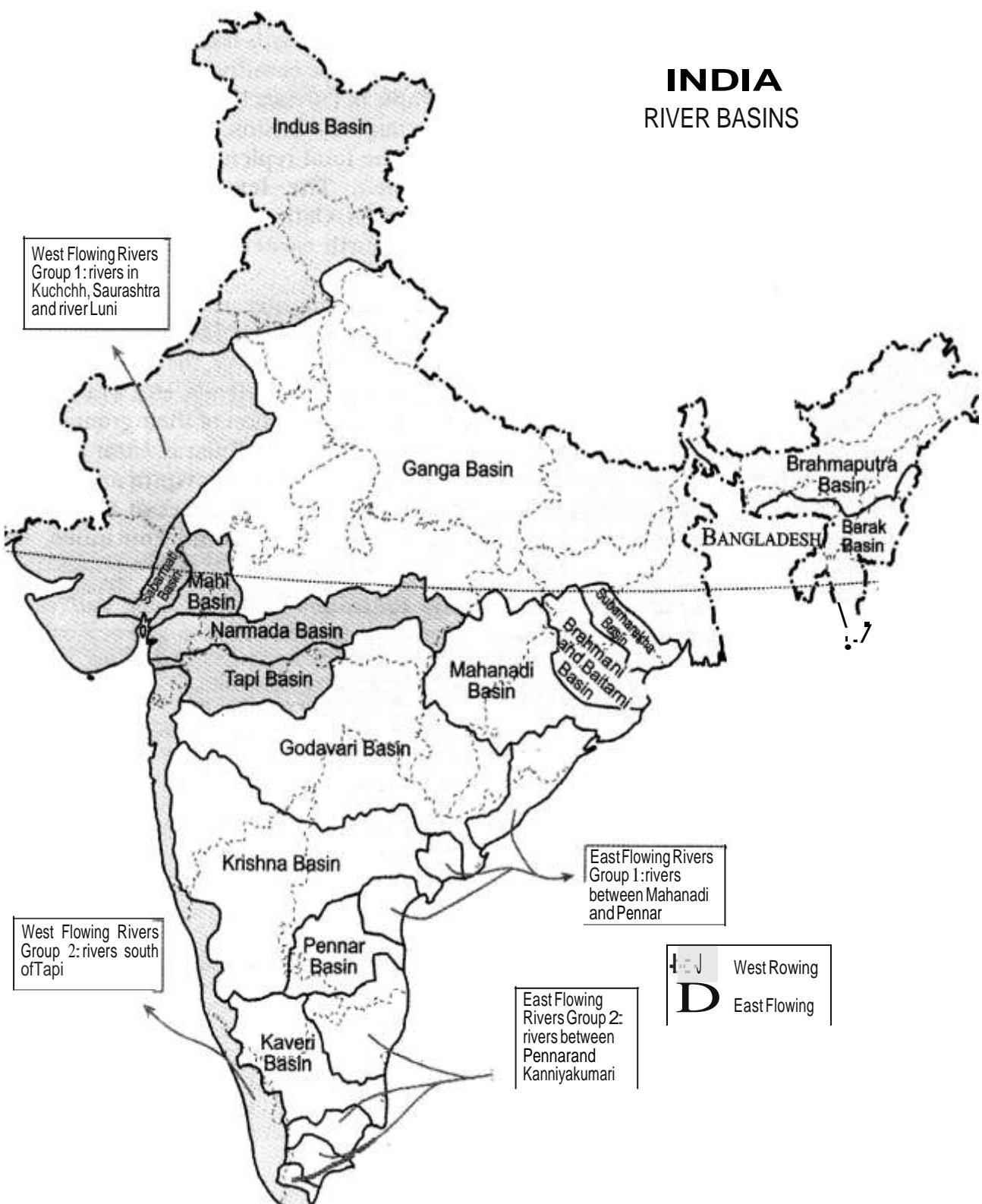
Ans. A

# INDIAN RIVER SYSTEM

	<b>Overview</b>
	<p>Rivers are the most critical component of a geographical ecosystem. After starting from mountainous regions, they flow through the country influencing everyone's life who come across them. They are so important that they are equated with goddess in Hindu religion. In earlier times, they were the cradle for civilisation and the most prosperous kingdoms evolved around rivers. Today, they play a very important role in people's lives and economies. India is a blessed country as far as rivers are concerned. Every part of India has some of world's most important rivers.</p>

- Himalayan Rivers are formed by melting snow & glaciers and flow throughout year.
- **Deccan** Rivers are **rain-fed** and therefore fluctuate in volume. Many of these are non-perennial. Coastal streams, especially on the **west coast** are **short** in length and most of them are **non-perennial**.
- The streams of inland drainage basin of western **Rajasthan** are few and far apart. Most of them are of an **ephemeral character**.
- About 77% of drainage is towards Bay of Bengal and rest is towards Arabian Sea.
- Bhagirathi and Alaknanda join at **Dev Prayag** to form the River Ganga. Ganga traverses through **Uttarakhand, Uttar Pradesh, Bihar** and **West Bengal**.
- **Indus** rises near **Mansarovar** in Tibet and finally falls in the Arabian Sea near Karachi.
- Indus is known as **Shiquan** in Tibet
- Son is the **largest tributary** of Ganga **from south**. Gandhi Setu on Son River near Patna is highest bridge in Asia.
- Brahmaputra is known as **Tsangpo** in Tibet, **Dihang** in Arunachal & **Jamuna** in Bangladesh.
- Near Passighat the Debang and Lohit join the river Brahmaputra crosses into Bangladesh downstream of Dhubri.
- It becomes **Padma** after meeting Ganga & finally discharges as **Meghna** in Bay of Bengal.
- Principal tributaries of Brahmaputra are Subansiri, Jia Bhareli, Dhansiri, Puthimari, Pagladiya and the Manas.
- **Barak** River, the **Head Stream of Meghna**, rises in the hills in Manipur. It continues in Bangladesh till the combined Ganga - Brahmaputra join it near Bhairab Bazar.
- Lohit makes **delta in reverse** when it joins Brahmaputra from south. **Majuli (Assam)** in Brahmaputra is the largest Riverine Island in the world. It has been declared world heritage site by UNESCO.
- **Chambal** is known for its **Badland** topography
- **Dhaunadar Falls** or **Marble Falls** lie on River **Narmada** near **Jabalpur**
- Godavari has the second largest river basin covering 10 per cent of the area of India.
- A few rivers in Rajasthan do not drain into the sea. Few of them drain into the Salt lakes while others like Luni, Machhu, Rupen, Saraswati, Banas and Ghaggar are lost in the desert.
- **Narmada** forms traditional boundary between North and South India, and drains M.P., Gujarat and Maharashtra. Existing irrigation projects in the Narmada are Matiyari, Rani Avantibai Sagar, Barna, Tawa and Sukta- all in Madhya Pradesh, and Karjan project in Gujarat. Important Projects under implementation are Kolar, Man, Omkareshwar, Maheshwar and Sardar Sarovar.

- **Tapi** drains M.P, Maharashtra and Gujarat. Kakrapara, Utsai are major projects, alongwith Hatnur Dam in Maharashtra and Ukai Dam in Gujarat. Tapi is known as the **twin or hand-made** of Narmada
- The **Godavari River** has a drainage area in six states- Maharashtra, Andhra Pradesh, Karnataka, Madhya Pradesh, Chattisgarh and Orissa. It has "Sriramsagar project" in Nizamabad District. Aruthur Cotton, Trimbakeshwar are Waterfalls on it. Godavari is called as **Ganga of South or Bridh Ganga**.



IMPORTANT RIVERS OF INDIA		
REMARKS	SOURCES	IMPORTANT TRIBUTARIES
<b>INDUS SYSTEM</b>		
<b>Indus</b>	Snow ranges of Himalayas at an altitude of 5000 m in Tibet, near <b>Mansarovar Lake</b> .	The <b>Zanskar</b> is its left bank tributary in Ladakh. In the plains, its left bank tributary is the <b>Chenab</b> which itself has four major tributaries, namely, the Jhelum, the Ravi, the Beas and the Sutlej. Its principal right bank tributaries are the <b>Shyok, the Gilgit, the Kabul, the Gomal and the Kurram</b> .
<ul style="list-style-type: none"> <li>The Indus River is a major river in Asia which flows through <b>Pakistan, India and Tibet</b>. After flowing for &gt;700 km in India, flows in Pakistan</li> <li>Originating in the <b>Tibetan Plateau</b> in the vicinity of Lake Mansarovar, the river runs a course through the Ladakh region of Jammu and Kashmir, towards Gilgit and Baltistan and then flows in a southerly direction along the entire length of Pakistan to merge into <b>the Arabian Sea</b> near the port city of Karachi in Sindh.</li> <li>The total length of the river is 3,180 km (1,980 mi).</li> <li>It is <b>Pakistan's longest river</b>.</li> <li>The river is the 21st largest river in the world in terms of annual flow.</li> <li>The Indus forms the delta of Pakistan and India mentioned in the Vedic Rigveda as <b>Sapta Sindhu</b> and the Iranian Zend Avesta as <b>Hapta Hindu</b> (both terms meaning "seven rivers").</li> </ul>		
<b>Jhelum</b>	The river Jhelum rises from Verinag Spring situated at the foot of the Pir Panjal in the south-eastern part of the valley of Kashmir in India.	The <b>Neelum River</b> , the largest tributary of the Jhelum, joins it, at Domel Muzaffarabad, as does the next largest, the <b>Kunhar River</b> of the Kaghan valley.
<ul style="list-style-type: none"> <li>It flows through <b>Srinagar and the Wular Lake</b> before entering Pakistan through a deep narrow gorge.</li> <li>It also connects with rest of Pakistan and Azad Kashmir on Kohala Bridge east of Circle Bakote. It is then joined by the <b>Poonch River</b>, and flows into the <b>Mangla Dam</b> reservoir in the district of Mirpur.</li> <li>The Jhelum enters the Punjab in the Jhelum District. From there, it flows through the plains of Pakistan's Punjab, forming the boundary between the <b>Chaj and Sindh Sagar Doabs</b>.</li> <li>It ends in a confluence with the Chenab at Trimmu in District Jhang.</li> <li>The <b>Chenab merges with the Sutlej</b> to form the Panjnad River which joins the Indus River at Mithankot.</li> </ul>		
<b>Chenab</b>	Bara Lacha La Pass; originating from H.P, it goes towards north to enter J&K & then turns towards south	<ul style="list-style-type: none"> <li>Also called <b>Chandrabhaga</b>. The total length of the Chenab is approximately 960 kilometres.</li> </ul>
<ul style="list-style-type: none"> <li>It flows from the Jammu region of Jammu and Kashmir into the plains of the Punjab, forming the <b>boundary between the Rechna and Jech interfluves</b> (Doabs in Persian).</li> <li>It is joined by the <b>Jhelum River</b> at Trimmu and then by the <b>Ravi River</b> Ahmedpur Sial.</li> <li>It then <b>merges with the Sutlej</b> River near Uch Sharif, Pakistan to form the <b>Panjnad or the 'Five Rivers'</b>, the fifth being the <b>Beas River</b> which joins the Sutlej near Ferozepur,</li> </ul>		

India.		
<ul style="list-style-type: none"> <li>The Chenab then joins the Indus at Mithankot.</li> </ul>		
<b>Ravi</b>	Near Rohtang Pass (Bara Bhangal)	<ul style="list-style-type: none"> <li>Buddha Nala</li> </ul>
<ul style="list-style-type: none"> <li>It flows into the south-west, near Dalhousie, and then cuts a gorge in the <b>Dhauladhar Range</b>, before entering the Punjab plain near Madhopur and Pathankot.</li> <li>It then flows along the Indo-Pak border for 80 kilometres (50 mi) before entering Pakistan and <b>joining the Chenab River</b>.</li> <li>The total length of the river is about 725 kilometres.</li> <li><b>Ujh River</b> is another major tributary of the Ravi River.</li> </ul>		
<b>Beas</b>	Near Rohtang Pass	<ul style="list-style-type: none"> <li>The chief tributaries are <b>Parbati, Bain, Banganga, Luni and Uhal</b>. The Sutlej continues into Pakistani Punjab and joins the Chenab River at Uch near Bahawalpur to form the <b>Panjnad River</b>; the latter in turn joins the Indus River at Mithankot. The waters of the Beas and Sutlej rivers are allocated to India under the Indus Waters Treaty between India and Pakistan.</li> </ul>
<ul style="list-style-type: none"> <li>The river rises on the southern face of <b>Rohtang Pass</b> in Kullu.</li> <li>Near Reh in Kangra District it <b>divides into three channels</b>, which reunites after passing Mirthal, 1,000 feet above sea-level.</li> <li>After touching the Jullundur district for a few miles the river forms the <b>boundary between Amritsar and Kapurthala</b> district.</li> <li>Finally the Beas <b>joins the river Satluj</b> at the south-western boundary of Kapurthala district of Punjab after a total course of 290 miles.</li> </ul>		
<b>Satluj</b>	Mansarover – Rakas Lakes	<ul style="list-style-type: none"> <li>The Sutlej is the <b>longest</b> of the five rivers that flow through the historic crossroad region of Punjab in northern India and Pakistan.</li> <li>It is the <b>easternmost tributary</b> of the Indus River.</li> <li>The waters of the <b>Sutlej are allocated to India</b> under the Indus Waters Treaty between India and Pakistan, and are mostly diverted to irrigation canals in India.</li> <li>There are several major hydroelectric projects on the Sutlej, including the 1,000 MW <b>Bakra Dam</b>, the 1,000 MW <b>Karcham Wangtoo</b> Hydroelectric Plant, and the 1,530 MW <b>Nathpa Jhakri Dam</b>.</li> </ul>
<p style="text-align: center;"><b>From north to south, these are Indus, Jhelum, Chenab, Ravi, Beas and Satluj</b></p>		
<h3 style="margin: 0;">GANGA SYSTEM</h3>		
Ganga consists of 2 headstreams	Alakananda & Bhagirathi.	<ul style="list-style-type: none"> <li>Yamuna, Ram Ganga, Ghaghara, Kosi, Burhi Gandak, Damodar, Son.</li> </ul>
<ul style="list-style-type: none"> <li>Ganga after entering Bangladesh, the main branch of the Ganges is known as <b>the Padma</b>.</li> <li>The Padma is joined by the <b>Jamuna River</b>, the largest distributary of the Brahmaputra.</li> <li>Further downstream, the Padma joins the <b>Meghna River</b>, the second largest distributary of the Brahmaputra, and takes on the Meghna's name as it enters the Meghna Estuary, which empties into the Bay of Bengal.</li> <li>The Ganges Delta, formed mainly by the large, sediment-laden flows of the Ganges and</li> </ul>		

<p>Brahmaputra rivers, <b>is the world's largest delta</b>, at about 59,000 km<sup>2</sup> (23,000 sq mi).</p> <ul style="list-style-type: none"> <li>Only the <b>Amazon and Congo rivers</b> have a greater average discharge than the combined flow of the Ganges, the Brahmaputra, and the <b>Surma-Meghna</b> river system.</li> </ul>		
<b>Yamuna</b>	Yamunotri	▪ Chambal, Sind, Betwa, Ken.
		<ul style="list-style-type: none"> <li>Starting catchment area of river lies in Himachal Pradesh, and an important tributary draining the Upper Catchment Area is the <b>Tons</b>, Yamuna's largest and longest tributary.</li> <li>Other tributaries in the region are the <b>Giri, Rishi Ganga, Kunta, Hanuman Ganga and Bata tributaries</b>, which drain the Upper Catchment Area of the vast Yamuna basin.</li> <li>After passing the Sikh pilgrimage town <b>of Paonta Sahib</b>, it reaches Tajewala in Yamuna Nagar district, of Haryana, where a dam built in 1873, is <b>the originating place of two important canals</b>, the Western Yamuna Canal and Eastern Yamuna Canal, which irrigate the states of Haryana and Uttar Pradesh.</li> <li>The Yamuna also creates <b>natural state borders between the Himachal Pradesh and Uttarakhand states</b>, and further down between the state of Haryana and Uttar Pradesh.</li> </ul>
<b>Ramganga</b>	Near Nainital in Garhwal Distt.	
		<ul style="list-style-type: none"> <li>The Ramganga River flows to south west from Kumaun Himalaya.</li> <li>It is a <b>tributary of the river Ganges</b>, originates from the high altitude zone of 800m-900m.</li> <li>Ramganga flows by the <b>Corbett National Park</b> near Ramnagar of Nainital district from where it descends upon the plains.</li> <li><b>Bareilly and Badaun city</b> of Uttar Pradesh is situated on its banks.</li> </ul>
<b>Ghaghra</b>	From Central Himalayas	▪ In Nepal it is known as Narayani.
		<ul style="list-style-type: none"> <li>Ghaghara is a perennial trans-boundary river originating on the Tibetan Plateau near Lake Mansarovar.</li> <li><b>It cuts through the Himalayas</b> in Nepal and joins the <b>Sarda River</b> at Brahmghat in India.</li> <li>Together they form the Ghaghra River, a major <b>left bank tributary of the Ganges</b>.</li> <li>With a length of 507 kilometres it is the <b>largest river in Nepal</b>.</li> <li>It is the <b>largest tributary</b> of the Ganges by volume and the second longest tributary of the Ganges by length after Yamuna.</li> </ul>
<b>Kosi</b>	From Tibet Nepal Border	▪ Arun and Tamur.
		<ul style="list-style-type: none"> <li>The Kosi River drains the southern slopes of the Himalayas in Nepal and is <b>formed by three main streams</b>: the <b>Tamur Koshi</b> originating from Mt. Kanchenjunga in the east, <b>Arun Koshi</b> from Mt. Everest in Tibet, and <b>Sun Koshi</b> from Mt. Gosainthan farther west.</li> <li>From their confluence north of the Chatra Gorge onwards, the Kosi River is also known as <b>Saptakoshi</b>.</li> <li>After flowing through the Chatra Gorge the Saptakoshi is controlled by the <b>Koshi Barrage</b> before it drains into the Gangetic plain.</li> </ul>
<b>Son</b>	Amarkantak Plateau	▪ Rihand, Gopat, North Koel
		<ul style="list-style-type: none"> <li>The Son parallels the <b>Kaimur hills</b>, flowing east-northeast through <b>Uttar Pradesh, Jharkhand and Bihar</b> states to join the Ganges just <b>above Patna</b>.</li> <li>Geologically, the lower valley of the Son is an <b>extension of the Narmada Valley</b>, and the Kaimur Range an <b>extension of the Vindhya Range</b>.</li> <li><b>Dehri</b> on sone is the major town situated on Son River.</li> </ul>
<b>Chambal</b>	Near Mhow (M.P) in Janapao Hills in Vindhayas	Banas (from Aravallis), Parbati and Kali Sindh
		<ul style="list-style-type: none"> <li>The Chambal River is a <b>tributary of the Yamuna River</b> in central India, and forms part of the greater Gangetic drainage system.</li> <li>The river forms the <b>boundary between Rajasthan and Madhya Pradesh</b> before turning southeast to join the Yamuna in Uttar Pradesh state.</li> </ul>

- The Chambal and its tributaries drain **the Malwa region** of northwestern Madhya Pradesh, while its **tributary, the Banas**, which rises in the Aravalli Range, drains southeastern Rajasthan.

From **west to east**, Rivers are Ramganga, Gomti, Sarda, Ghaghra, Gandak and Kosi  
 From **west to east**, Rivers are Banas, Chambal, Kali Sindh, Parbati, sind, Betwa, Ken & Son

### BRAHMAPUTRA SYSTEM

<b>Brahmaputra</b>	Rises from Chema-Yungdung glacier in Tibet	▪ Dibang & Lohit from south; Subansiri, Tista & Manas from north.
<ul style="list-style-type: none"> <li>It flows southwest through the Assam Valley <b>as Brahmaputra</b> and south through Bangladesh as the <b>Jamuna</b> (not to be mistaken with Yamuna of India).</li> <li>In the vast Ganges Delta it <b>merges with the Padma</b>, the main distributary of the Ganges, then the <b>Meghna</b>, before emptying into the Bay of Bengal.</li> <li>The average depth of the river is <b>124 feet</b> (38 m) and maximum depth is 380 feet (120 m).</li> <li>The river is prone to <b>catastrophic flooding</b> in spring when the Himalayan snows melt.</li> <li>It is a classic example of a <b>braided river</b> and is highly susceptible to channel migration and avulsion.</li> <li>This river is often called <b>Tsangpo-Brahmaputra River</b>.</li> </ul>		

### PENINSULAR RIVERS (WEST FLOWING)

<b>Narmada</b>	Amarkantaka Plateau, Shahdol district (M.P.)	▪ Burhner, Tawa (biggest), Sher, Dudhi, Barna, Hiran, Lohar
<ul style="list-style-type: none"> <li>The Narmada is <b>5th longest</b> river in the Indian subcontinent.</li> <li>It forms the <b>traditional boundary between North India and South India</b>.</li> <li>It is the one of the rivers in India that flows in a <b>rift valley</b>, flowing west between the <b>Satpura and Vindhya ranges</b>.</li> <li>It flows through the states of <b>Madhya Pradesh</b> and Maharashtra, then along the border between Madhya Pradesh and Maharashtra and the border between <b>Madhya Pradesh and Gujarat</b> and in Gujarat.</li> </ul>		
<b>Tapi</b>	Multai in Betul (M.P.)	▪ Purna River (Major tributary), Girna River, Panzara, Waghur, Bori, Aner, Kolar, Amravati, Betul, Veghai
<ul style="list-style-type: none"> <li>The Tapti River is <b>one of the major rivers of peninsular India</b>.</li> <li>The river rises in the <b>eastern Satpura Range</b> of southern Madhya Pradesh state, and flows westward, draining <b>Madhya Pradesh's Nimar region</b>, Maharashtra's <b>Kandesh</b> and east <b>Vidarbha</b> regions in the northwest corner of the Deccan Plateau and south Gujarat, before emptying into the <b>Gulf of Cambay</b> of the Arabian Sea, in the Surat District of Gujarat.</li> <li>The river, along with the northern parallel Narmada River, <b>forms the boundaries</b> between North and South India.</li> <li>The Western Ghats or <b>Sahyadri range</b> starts south of the Tapti River near the border of Gujarat and Maharashtra.</li> </ul>		
<b>Luni</b>	Emerges from Annasagar (Ajmer). Only salty river in India.	▪ Patki, Jojri, Sukri.
<ul style="list-style-type: none"> <li>The Luni is a <b>river of western Rajasthan state</b>, India.</li> <li>It originates in the <b>Pushkar valley</b> of the Aravalli Range, near Ajmer and ends in the</li> </ul>		

<p>marshy lands of Rann of Kutch in Gujarat, after travelling a distance of 495 km.</p> <ul style="list-style-type: none"> <li>▪ It is first known as <b>Sagarmati</b>, then after passing Govindgarh, it meets its tributary Sarsuti, which originates from Pushkar Lake, and from then on it gets its name Luni.</li> </ul>		
<b>Sabarmati</b>	Rises from the Jai Samand lake of Udaipur	▪ Sabar, Hathmathi, Vakul.
<ul style="list-style-type: none"> <li>▪ The Sabarmati River is a river in western India and one of the <b>biggest rivers of north Gujarat</b>.</li> <li>▪ River Sabarmati is one of the major <b>West flowing river</b> of Gujarat</li> <li>▪ It meets the <b>Gulf of Cambay</b> of Arabian Sea after travelling 371 km from the origin.</li> <li>▪ The Sabarmati basin has a maximum <b>length of 300 km</b>. and maximum width of 105 km.</li> <li>▪ The catchment area lies in <b>Rajasthan</b> and Gujarat State.</li> </ul>		
<b>Mahi</b>	Vindhayas	▪ Drains Gujarat Plains, parts of M.P & Rajasthan. Empties into Gulf of Khambhat
<ul style="list-style-type: none"> <li>▪ The Mahi is a river in western India.</li> <li>▪ It rises in <b>Madhya Pradesh</b> and, after flowing through the Vagad region of Rajasthan, enters <b>Gujarat</b> and falls into the sea.</li> <li>▪ It has given its name to the <b>Mahi Kantha agency of Bombay</b>, and also to the mehwasis, marauding highlanders often mentioned in Arabian chronicles.</li> </ul>		
<b>PENINSULAR RIVERS (EAST FLOWING)</b>		
<b>Mahanadi</b>	Dandkaranaya near Sihawa in Raipur District (Chhattisgarh)	▪ Sheonath, Hasdo, Mand.
<ul style="list-style-type: none"> <li>▪ Like many other seasonal Indian rivers, the Mahanadi too is a combination of <b>many mountain streams</b> and thus its precise source is impossible to pinpoint.</li> <li>▪ However its farthest headwaters lie 6 km from <b>Pharsiya village</b> 442 m above sea level south of Nagri town in Dhamtari district of Chhattisgarh.</li> <li>▪ The hills here are an extension of the Eastern Ghats and are a source of many other <b>streams which then go on to join the Mahanadi</b>.</li> </ul>		
<b>Brahmini</b>	Sorrow of Orissa	▪
<ul style="list-style-type: none"> <li>▪ The Brahmani is a <b>major seasonal river</b> in the Odisha state of Eastern India.</li> <li>▪ The Brahmani is formed by the confluence of the <b>Sankh and South Koel</b> rivers, and flows through the districts of Sundargarh, Kendujhar, Dhenkanal, Cuttack and Jajapur.</li> <li>▪ Together with the <b>rivers Mahanadi and Baitarani</b>, it forms a large delta before entering into the Bay of Bengal at Dhamra.</li> </ul>		
<b>Godavari</b>	From Trambak plateau in Nasik .	▪ From north- Penganga, Wardha, Wainganga, Indravati and Sabari ( <b>arranged west to east</b> ). Parvara & Manjra join from south. Others are Pranahita, Kinnerasani, Sileru, Bindusar, Moosi, Taliperu
<ul style="list-style-type: none"> <li>▪ The Godavari is a river in the south-central India.</li> <li>▪ It starts in the <b>western state of Maharashtra</b> and flows through the southern state <b>Andhra Pradesh</b> before reaching the Bay of Bengal.</li> <li>▪ It forms one of the <b>largest river basins in India</b>.</li> <li>▪ With a length of 1465 km, it is the <b>second longest</b> river in India, after the The Ganges, and the longest in southern India.</li> <li>▪ It flows east <b>across the Deccan Plateau</b> into the Bay of Bengal near Yanam and Antarvedi in East Godavari district of Andhra Pradesh.</li> </ul>		

<b>Krishna</b>	Rises near Mahabaleshwar	▪ Koyna, Yerla, Musi, Panchganga, Dudhganga, Ghatprbha, Malprabha, Bhima, Tungbhadrā
<ul style="list-style-type: none"> <li>▪ The Krishna River is <b>the third longest river in India</b> after the Ganges and the Godavari.</li> <li>▪ It flows through the <b>state of Karnataka</b> before entering <b>Andhra Pradesh</b>.</li> <li>▪ The delta of this river is one of the most <b>fertile regions</b> in India and was the home to ancient <b>Satavahana and Ikshvaku</b> Sun Dynasty kings. Vijayawada is the largest city on the River Krishna.</li> <li>▪ <b>Sangli is the biggest city</b> on the river Krishna in Maharashtra state.</li> </ul>		
<b>Tungbhadrā</b>	Rises near Gomantak Peak	▪ Tunga, Bhadra, Hagari
<ul style="list-style-type: none"> <li>▪ <b>The Tungabhadra River is formed</b> by the confluence of the Tunga River and the Bhadra River which flow down the <b>eastern slope of the Western Ghats</b> in the state of Karnataka.</li> <li>▪ The rivers originate in <b>Chikmagalur District</b> of Karnataka along with the <b>Nethravathi</b> (west-flowing River, joining the Arabian Sea near Mangalore), the <b>Tunga and the Bhadra rise at Gangamoola</b>, in Varaha Parvatha in the Western Ghats forming parts of the <b>Kuduremukh Iron Ore Project</b>, at an elevation of 1198 metres.</li> <li>▪ The Bhadra River flows through the <b>industrial city Bhadravathi</b>.</li> </ul>		
<b>Cauvery</b>	Brahmagiri Hills. The river thrice forks into 2 streams & reunites a few miles farther on, thus froming the islands of Srirangapattanam, Sivasamudram and Srirangam in the eastern part of Tamil Nadu.	▪ Hemavati, Lokpavani, Suvarnavati and Kabani.
<ul style="list-style-type: none"> <li>▪ The origin of the river is traditionally placed at <b>Talakaveri, Kodagu</b> in the Western Ghats in <b>Karnataka</b>, flows generally south and east through <b>Karnataka and Tamil Nadu</b> and across the southern Deccan plateau through the southeastern lowlands, emptying into the Bay of Bengal through two principal mouths.</li> <li>▪ The river's basin covers <b>4 states and Union Territories</b> - Karnataka (34,273 km<sup>2</sup>), Tamil Nadu (43,856 km<sup>2</sup>), Kerala (2,866 km<sup>2</sup>) and Puducherry (160 km<sup>2</sup>).</li> <li>▪ Rising in <b>southwestern Karnataka</b>, it flows southeast some 800 km to enter the Bay of Bengal.</li> <li>▪ East of Mysore it <b>forms the island of Shivasamudra</b>, on either side of which are the scenic <b>Shivasamudra Falls</b> that descend about 320 ft (100 m).</li> </ul>		

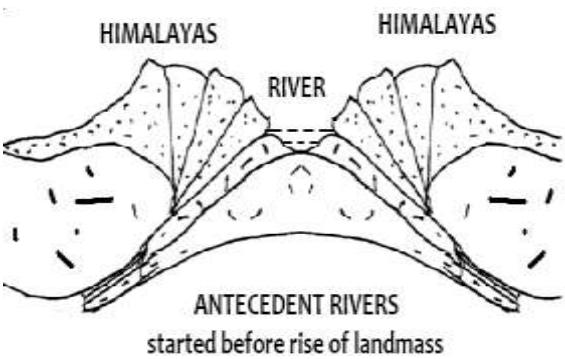
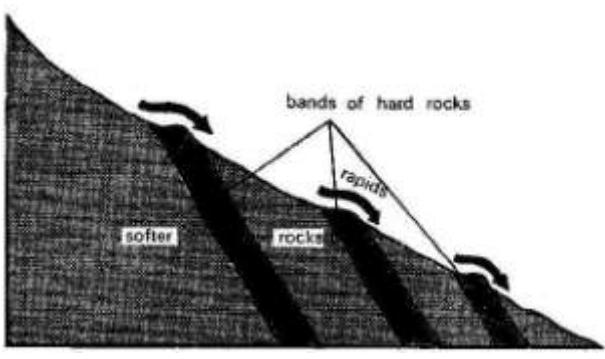
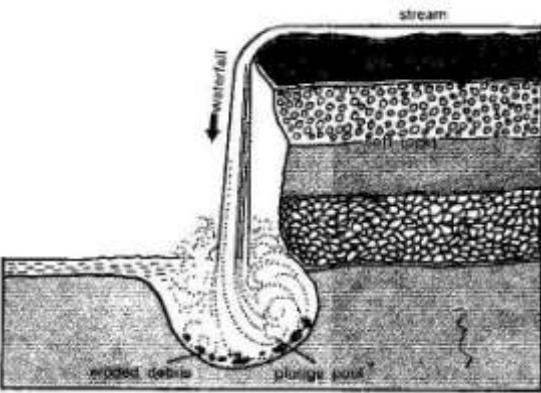
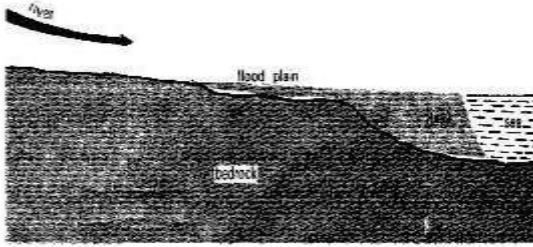
#### CATCHMENT AREAS OF RIVER BASINS (IN DECREASING ORDER) →

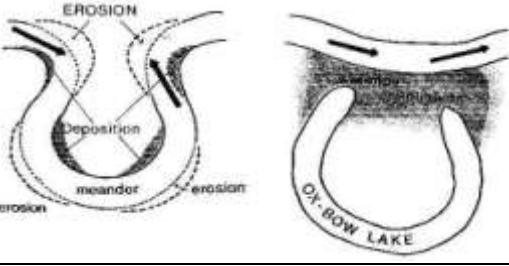
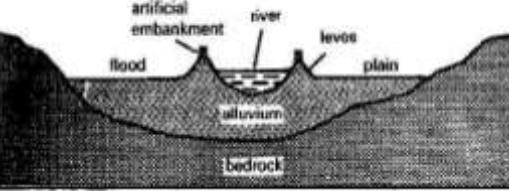
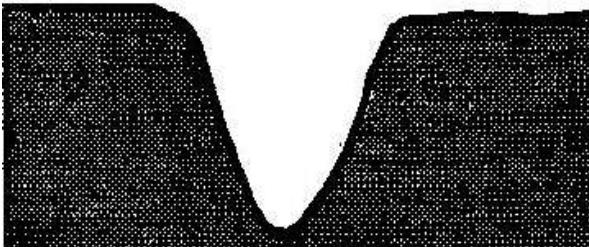
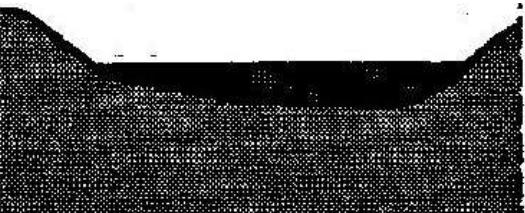
Ganga > Godavari > Indus > Krishna > Brahmaputra > Mahanadi > Narmada > Cauvery

#### LENGTHS OF RIVERS (IN DECREASING ORDER) →

Ganga > Godavari > Krishna > Yamuna > Mahanadi >  
Narmada = Cauvery > Brahmaputra > Ghagra > Chambal

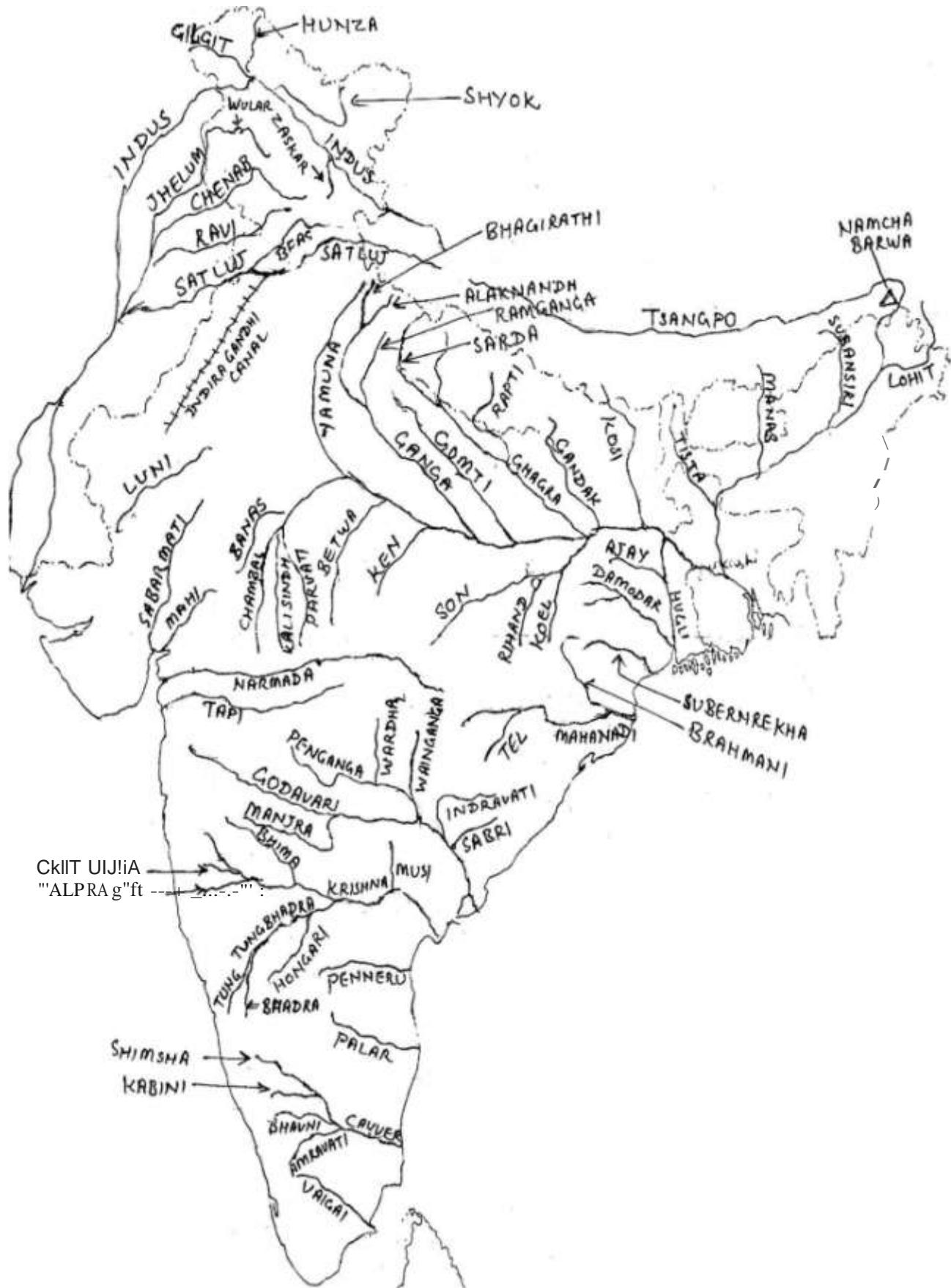
## COMPARISON OF HIMALAYAN AND PENINSULAR RIVERS

HIMALAYAN RIVERS	PENINSULAR RIVERS
<p>1. These are <b>antecedent rivers</b> i.e. these flowed before the rise of Himalayas and kept cutting them with time, as evident from the existence of <b>deep gorges</b>.</p>  <p style="text-align: center;">HIMALAYAS                            RIVER ANTECEDENT RIVERS started before rise of landmass</p>	<p>1. These are <b>consequent rivers</b> i.e. these start flowing after the rise of peninsular landmasses. There are no deep gorges here.</p>  <p style="text-align: center;"><b>CONSEQUENT RIVERS</b> started after rise of landmass</p>
<p>2. Characterised by <b>waterfalls</b>, rapids, cataracts etc. Therefore have a <b>pronounced relief</b>.</p>  <p style="text-align: center;">bands of hard rocks softer rocks rapids</p>  <p style="text-align: center;">stream waterfall eroded debris plunge pool</p>	<p>2. These have graded profiles and lack these characteristics.</p>  <p style="text-align: center;">head plain bedrock</p>

<p>3. These have <b>meandering courses</b>, thereby forming the <b>Ox-bow lakes</b></p> 	<p>3. <b>Linear &amp; straight courses</b> with smooth long profiles. Hard rocks prevent any sort of meandering.</p> 										
<p>4. These rivers have <b>large basins</b></p> <table border="0"> <tr> <td>Indus</td> <td>&gt; 11 lac sq km</td> </tr> <tr> <td>Ganga</td> <td>&gt; 10 lac sq km</td> </tr> <tr> <td>Brahmaputra</td> <td>&gt; 5 lac sq km</td> </tr> </table> 	Indus	> 11 lac sq km	Ganga	> 10 lac sq km	Brahmaputra	> 5 lac sq km	<p>4. Comparatively smaller basins</p> <table border="0"> <tr> <td>Narmada / Tapi</td> <td>&lt; 1 lac sq. km</td> </tr> <tr> <td>Godavari / Krishna</td> <td>2-3 lac sq km</td> </tr> </table> 	Narmada / Tapi	< 1 lac sq. km	Godavari / Krishna	2-3 lac sq km
Indus	> 11 lac sq km										
Ganga	> 10 lac sq km										
Brahmaputra	> 5 lac sq km										
Narmada / Tapi	< 1 lac sq. km										
Godavari / Krishna	2-3 lac sq km										
<p>5. These are in <b>Young stage</b>. These make <b>V-shaped valleys</b> because of their high erosive power</p> 	<p>5. These are in <b>Mature stage</b> of development. These have subdued gradient with <b>lateral erosion and shallow valleys</b>.</p> 										
<p>6. <b>Erosive power is high</b> due to their young age, thus carry huge sedimentary load. These have resulted in great alluvial deposits, forming the <b>North Indian Plains</b>. The sediment load is further added due to soft nature of sedimentary rocks that make Himalayas.</p>	<p>6. Hard rocks of peninsula made up of volcanic extrusions restrict the erosive power of rivers. Further the gradual slope of Deccan plateau and lesser erosive power result in low amount of <b>sediment loads</b></p>										
<p>7. These are <b>perennial rivers</b> due to high rainfall and snow melt from snow covered peaks of Himalayas.</p>	<p>7. These are <b>seasonal rivers</b> due to less rainfall in their catchment areas. Even the big rivers like Godavari and Krishna dry up in summers. The lesser rainfall is because these rivers emanate from the points which lie on the <b>leeward side</b> of Western Ghats.</p>										
<p>8. These carry high value vis-à-vis <b>irrigation</b></p>	<p>8. These are not that good for irrigation</p>										

<p>due to their perennial nature. A <b>network of canals</b> has been laid in the northern plains of Punjab, Haryana, UP and Bihar to fetch their potential. This has led to the green revolution in these areas making them the <b>granary of India</b>.</p>	<p>purposes owing to their <b>seasonal nature</b>.</p>
<p>9. <b>More navigable</b> owing to their flat topography and perennial nature. This is true in the middle and lower courses of these rivers and not in the upper course where these rivers have steep slopes. <b>National Waterway-1</b> links Allahabad – Haldia covering a distance of 1620 km. national Waterway-2 links Sadia-Dubri.</p>	<p>9. Less navigable due to their <b>seasonal nature</b> and <b>lesser quantity of water</b> in rivers to support big vessels. Also the <b>gradient of peninsula</b> is steeper than the northern plains that support the navigational facilities.</p>
<p>10. These have high <b>HEP potential</b>- perennial nature and steep slopes. Indian Himalayan Region (IHR), also known as the water tower of the world, hold <b>potential of 1,48,700 MW</b></p>	<p>10. West flowing rivers have more potential due to more water and steep slopes.</p>
<p>11. <b>HEP development</b> lesser compared to peninsula; of huge potential, just around 22.4% has been utilized</p>	<p>11. More, because of greater economic development &amp; more demand.</p>

## INDIA RIVERS



## IMPORTANT HYDROELECTRIC PLANTS IN INDIA

### Overview

God has gifted the nature with bountiful of features and brains to humans to use them to their benefit. HEPs or Multipurpose Projects (not just electricity generation) on rivers is a beautiful example of this. Since time immemorial, humans have used the rivers for various purposes like irrigation, generation of power etc. using innovative techniques. Did you watch the movie – Mohanjodaro – featuring Rithik Roshan; you will find the answer!

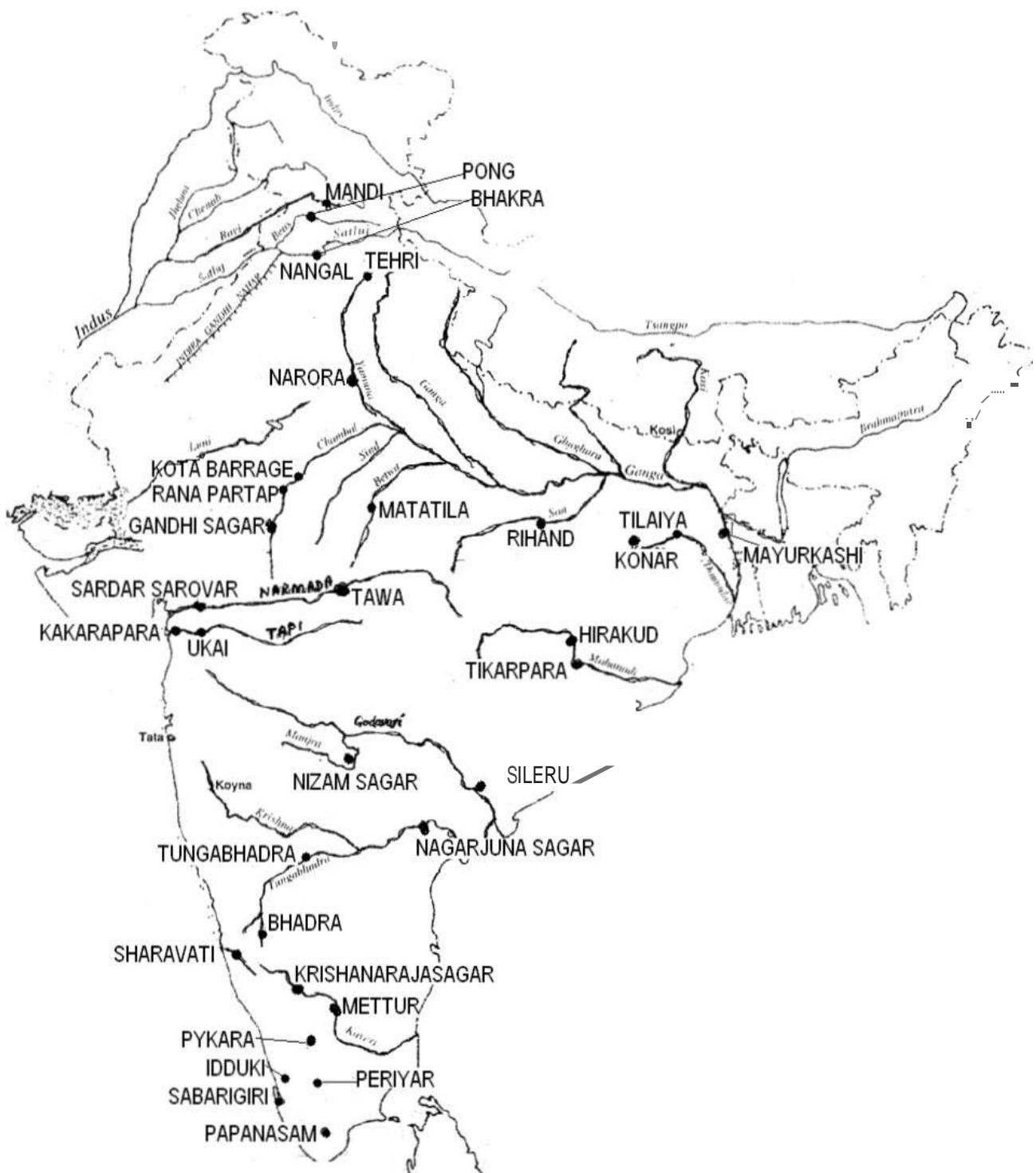
<b>States</b>	<b>Name of the Hydroelectric Plants</b>
J&K	Lower Jhelum, Uri, Salal and Dulhasti
Punjab and H.P.	Bhakara Nangal ( <b>Satluj</b> ), Pong on Beas, Rongtong, Nathpa Jhakri ( <b>biggest hydel power project in India</b> ) on river <b>Satluj</b> , Chamera and <b>Thien on Ravi</b> .
Uttarakhand	Tehri Dam on <b>Bhagirathi</b>
U.P.	Rehand, Khodri on Tons.
Rajasthan	Rana Pratap Sagar and Jawahar Sagar on <b>Chambal</b> .
M.P.	Gandhi Sagar on <b>Chambal</b> , Pench, Sardar Sarovar on <b>Narmada</b> .
Bihar	Kosi
Jharkhand	Subarnrekha; Maithon, Panchet, Tilaiya, (all three under <b>DVC</b> ).
W.B.	Panchet
Orissa	Hirakud on <b>Mahanadi</b> , Balimela.
North East	Loktak (Manipur), Kopili (Assam), Khandong (Meghalaya)
Gujarat	Ukai and Kakrapara ( <b>Tapi</b> ), Kadana ( <b>Mahi</b> )
Maharashtra	Koyana Bhivpuri ( <b>Tata</b> Hydroelectric Works).
A.P.	Sileru, Nizamsagar ( <b>Manjra</b> ), Nagarjun Sagar & Srisailam ( <b>Krishna</b> )
Karnataka	Tungabhadra, Sharavati, Mahatma Gandhi ( <b>Jog Fall</b> ), Siva Samudram ( <b>Kaveri</b> ), Lungnamakkki.
Kerala	Idukki ( <b>Periyar</b> ), Sabarigiri, Ponniar.
T.N.	Mettur, Papanasam, Kundah
MP, UP and Bihar	Banasagar Project (On Son river)
India and Bhutan	Chukka Project
J&K	Dul Hasti (On the rive Chenab)
Bihar and UP	Gandak Project (On the river Gandak)
Karnataka (Bijapur)	Ghataprabha Valley
Maharashtra	Jayakwadi Project (On rive Godavari)
Gujarat	<b>Kakrapara</b> Project (On <b>Tapi</b> River)
Karnataka (Belgaum)	Malaprabha Project (Malaprabha river)
TN and Kerala	Parambikulam Aliyar
Andhra Pradesh	<b>Poochampad</b> (On river <b>Godavari</b> )
MP & UP	Rajghat Dam Project (On Betwa River)
J&K	Salal Project (Chenab)
Hoshangabad district (MP)	<b>Tawa</b> Project (Tawa river, a tributary of the <b>Narmada</b> )
Tamil Nadu	<b>Papanasam</b> Scheme ( <b>Tambraparni</b> river)
Kerala, TN	Sholayar Project (Sholayar River)
Andhra Pradesh	Srisailam power project (Krishna River)
Andhra Pradesh and	Balimela Hydro-Electric Project (Sileru River)

Orissa	
Meghalaya	Umiam Project (Umiam River)

MULTIPURPOSE PROJECTS OF INDIA	
Location Of Dams	Special Features (Note The Purposes Served)
<b>Bakra Nangal (Satluj)</b>	
Bakra Nangal	<ul style="list-style-type: none"> <li>Joint venture of Punjab, Haryana and Rajasthan. <b>2 dams</b> – Bakra and Nangal. <b>Power</b> houses with combined installed capacity of 1204 MW.</li> <li>Bakra canal system of <b>irrigation</b>.</li> <li>One of the highest Gravity Dams in the world (226m).</li> <li>Huge reservoir (<b>Gobind Sagar Lake</b> in Bilaspur District of Himachal Pradesh).</li> </ul>
<b>Damodar Valley Project (Damodar)</b>	
Tilaiya (R. Barakar) Maithon (R. Barkar) Konar (Konar River) Panchet Hill (R. Damodar)	<ul style="list-style-type: none"> <li>Damodar also called as River of sorrow, or <b>sorrow of Bengal</b>, Tributary of <b>Hugli</b>; drains the <b>Chotanagpur</b> plateau.</li> <li>This was the <b>First</b> multipurpose river project in India.</li> <li>In <b>1948</b> – Project executed on the model of <b>TVA</b> (Tennessee Valley River Project) of USA.</li> <li>Durgapur Barrage – created for the storage of <b>irrigation</b> water.</li> <li>Bakaro and Durgapur Thermal <b>Power</b> Stations are the important link to DVC Power Station System, another purpose is <b>Flood control</b></li> </ul>
<b>Hirakund (Mahanadi)</b>	
Hirakund (in Sambalpur Distt), Orrisa	<ul style="list-style-type: none"> <li>One of the longest dams in the world (4,801m long)</li> <li>Two other dams on Mahanadi are at <b>Tikrapara</b> and <b>Naraj</b>.</li> <li>3 canals have been taken out for <b>irrigation</b>.</li> <li>It also provides for <b>navigation</b> facility besides <b>power</b> generation.</li> </ul>
<b>Rihand (Tributary Of Son)</b>	
Mirzapur Distt U.P	<ul style="list-style-type: none"> <li>Most important multipurpose project in U.P.</li> <li><b>Gobind Ballabh Pant Sagar</b> is <b>largest</b> man made reservoir in India.</li> </ul>
<b>Chambal</b>	
Gandhinagar (M.P) Rana Pratap Sagar (Rajasthan) Jawahar Sagar (Rajasthan)	<ul style="list-style-type: none"> <li>Gandhinagar – long masonry gravity dam.</li> <li>Rana Pratap masonry dam at Rawat Bhata.</li> <li>Jawahar Sagar is also called Kota Dam</li> </ul>
<b>Gandak</b>	
Balmokinagar (Bihar)	<ul style="list-style-type: none"> <li>Joint venture of <b>U.P. and Bihar</b>, though Nepal also get <b>irrigation</b> and <b>power</b> facilities.</li> </ul>
<b>Tungbhadrā (Tributary Of Krishna River)</b>	
Mallapur, Bellary distt. (Karnataka).	<ul style="list-style-type: none"> <li>Joint undertaking of <b>Andhra Pradesh and Karnataka</b>.</li> <li>Masonry Dam.</li> </ul>

<b>Kosi</b>	
Hanumannagar	<ul style="list-style-type: none"> <li>• Kosi – Sorrow of Bihar</li> <li>• Object of Project – <b>irrigation, flood control, power generation, land reclamation, fishing and navigation.</b></li> </ul>
<b>Narmada Valley</b>	
Sardar Sarovar Project on lower Narmada Valley in Gujarat. Narmada Sagar Dam Project at Narmada in Madhya Pradesh.	<ul style="list-style-type: none"> <li>• Joint venture of <b>Madhya Pradesh, Gujarat and Maharashtra, Rajasthan</b> is Beneficiary States.</li> <li>• Most controversial project in India.</li> <li>• Narmada has the largest no. of tributaries.</li> </ul>
<b>Nagarjunasagar Projct (River Krishna)</b>	
Nalgonda Distt. (Andhra Pradesh)	<ul style="list-style-type: none"> <li>• Lal Bahadur Canal had been taken off from it besides the Jawahar Canal</li> </ul>
<b>Tehri Project Confluence Of Bhagirathi And Bhilganga</b>	
Garhwal District (Uttarakhand)	<ul style="list-style-type: none"> <li>• One of the controversial projects in India.</li> </ul>

## **IMPORTANT HEPs OF INDIA**



## LETS PRACTICE: LAST 10 YEARS UPSC QUESTIONS

Which one of the following pairs is not correctly matched? (Dam/ Lake River)

- a. Govind Sagar: Satluj
- b. Kolleru Lake: Krishna
- c. Ukai Reservoir: Tapi
- d. Wular Lake: Jhelum

Ans. D

Consider the following rivers:

- 1. Vamsadhara
- 2. Indravati
- 3. Pranahita
- 4. Pennar

Which of the above are tributaries of Godavari?

- a. 1, 2 and 3
- b. 2, 3 and 4
- c. 1, 2 and 4
- d. 2 and 3 only

Ans. D

Consider the following rivers:

- 1. Barak
- 2. Lohit
- 3. Subansiri

Which of the above flows / flow through Arunachal Pradesh?

- a. 1 only
- b. 2 and 3 only
- c. 1 and 3 only
- d. 1, 2 and 3

Ans. B

The Narmada River flows to the west, while most other large peninsular rivers flow to the east. Why?

- 1. It occupies a linear rift valley
- 2. It flows between the Vindhya and the Satpuras
- 3. The land slopes to the west from Central India

Select the correct answer using the codes given below:

- a. 1 only
- b. 2 and 3
- c. 1 and 3
- d. None

Ans. A

Consider the following pairs: (Tributary River: Main River)

- 1. Chambal: Narmada
- 2. Sone: Yamuna
- 3. Manas: Brahmaputra

Which of the pairs given above is/ are correctly matched?

- a. 1, 2 & 3
- b. 1 & 2
- c. 2 & 3 only
- d. 3 only

Ans. D

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

- a. Alakananda
- b. Bhagirathi
- c. Dhauliganga
- d. Mandakini

Ans. B

Where the Tapovan and Vishnugarh Hydroelectric Projects located?

- a. Madhya Pradesh
- b. Uttar Pradesh
- c. Uttarakhand
- d. Rajasthan

Ans. C

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

- a. Chambal
- b. Narmada
- c. Tapi
- d. Bhima

Ans. B

Rivers that pass through Himachal Pradesh are

- a. Beas and Chenab only
- b. Beas and Ravi only
- c. Chenab, Ravi and Sutluj only
- d. Beas, Chenab, Ravi, Sutluj and Yamuna

Ans. D

With reference to the River Luni, which one of the following statements is correct?

- a. It flows into Gulf of Khambhat
- b. It flows into Gulf of Kuchchh

- c. It flows into Pakistan and merges with a tributary of Indus
- d. It is lost in the marshy land of the Rann of Kuchchh

Ans. D

Consider the following statements:

1. There are no east flowing rivers in Kerala
2. There are no west flowing rivers in Madhya Pradesh

Which of the above statements is / are correct?

- a. 1 only
- b. 2 only
- c. Both 1 & 2
- d. Neither 1 nor 2

Ans. D

Which one of the following rivers does not originate in India?

- a. Beas
- b. Chenab
- c. Ravi
- d. Sutlej

Ans. D

At which one of the following places do two important rivers of India originate; while one of them flows towards north and merges with another important river flowing towards Bay of Bengal, the other one flows towards Arabian Sea?

- a. Amarkantak
- b. Badrinath
- c. Mahabaleshwar
- d. Nasik

Ans. A

Which one of the following rivers originates at Amarkantak?

- a. Damodar
- b. Mahanadi
- c. Narmada
- d. Tapti

Ans. C

**Assertion (A):** River Kalinadi is an east-flowing river in the southern part of India.

**Reason (R):** The Deccan Plateau is higher along its western edge and gently slopes towards the Bay of Bengal in the east.

Ans. D

Which one of the following statements is NOT correct?

- a. Mahanadi River rises in Chhattisgarh
- b. Godavari River rises in Maharashtra
- c. Cauvery River rises in Andhra Pradesh
- d. Tapti River rises in Madhya Pradesh

Ans. C

From north towards south, which one of the following is the correct sequence of the given rivers in India?

- a. Shyok - Spiti - Zaskar - Satluj
- b. Shyok - Zaskar - Spiti - Satluj
- c. Zaskar - Shyok - Satluj - Spiti
- d. Zaskar - Satluj - Shyok - Spiti

Ans. B

Match List I with List II and select the correct answer using the code given below the lists: List I (Town), List II (River nearer to it)

- |              |
|--------------|
| A. Betul     |
| B. Jagdalpur |
| C. Jabalpur  |
| D. Ujjain    |
| 1. Indravati |
| 2. Narmada   |
| 3. Shipra    |
| 4. Tapti     |

- a. A-1, B-4, C-2, D-3
- b. A-4, B-1, C-2, D-3
- c. A-4, B-1, C-3, D-2
- d. A-1, B-4, C-3, D-2

Ans. B

Which of the following pairs are correctly matched? (Waterfalls: River)

1. Kapildhara Falls: Godavari
2. Jog Falls: Sharavati
3. Sivasamudram Falls: Cauvery

Select the correct answer using the code given below:

- a. 1 & 2 only
- b. 2 & 3 only
- c. 1 & 3 only
- d. 1, 2 & 3

Ans. B

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

Ans. B

Gandhi Sagar Dam is a part of which one of the following?

- a. Chambal Project
- b. Kosi Project
- c. Damodar Valley Project
- d. Bhakra Nangal Project

Ans. A

Lake Sambhar is nearest to which one of the following cities of Rajasthan?

- a. Bharatpur
- b. Jaipur
- c. Jodhpur
- d. Udaipur

Ans. B

Which one among the following major Indian cities is most eastward located?

- a. Hyderabad
- b. Bhopal
- c. Lucknow
- d. Bengaluru (Bangalore)

Ans. C



Samples from

**WORLD GEOGRAPHY,  
GEOGRAPHY THEORIES &  
ENVIRONMENT**

# REGIONAL GEOGRAPHY OF THE WORLD

## Overview

Have you ever gone to Shimla by train? No! You must go atleast once to have a lifetime experience of Himalayas. If you would have more time, take a bike and make a group trip from Chandigarh to upper reaches of Himalayas in J&K. You will find gigantic features - Indus destroying the great mountains creating 1 km deep gorges, something similar to Death Valley of California! Ask someone who visited Africa; just see his photos. The huge deserts in the background would open your yaws. The dense jungles of River Congo will make you feel like a night even during full sunlight. If someone known has gone to Europe for a honeymoon, just ask him his experience. The beautiful beaches and lakes of Europe are the proof that if man desires, he can maintain the endless beauty of our earth.

**Life is too short. Nature has given us bountiful features; regional geography is all about to live nature!**

# ASIA



- Asia accounts for one-third of world's land area and about **60% of its population**
- Asia- **Largest continent** both in **area** and in **population**.
- About 72.2% of people live in villages. **Japan** is the **only exception** where more than 75% people are **urban**.
- It has less than 20% land suitable for Agriculture
- **Tropic of Cancer** in **Middle East** passes through Saudi Arabia, U.A.E. and Oman. Muscat (Capital of Oman) is located on it. It also passes through India, Bangladesh & Myanmar besides China and Taiwan.
- **Persian Gulf touches** Saudi Arabia, U.A.E., Kuwait, Iraq & Iran, Oman & Bahrain

## PHYSICAL FEATURES

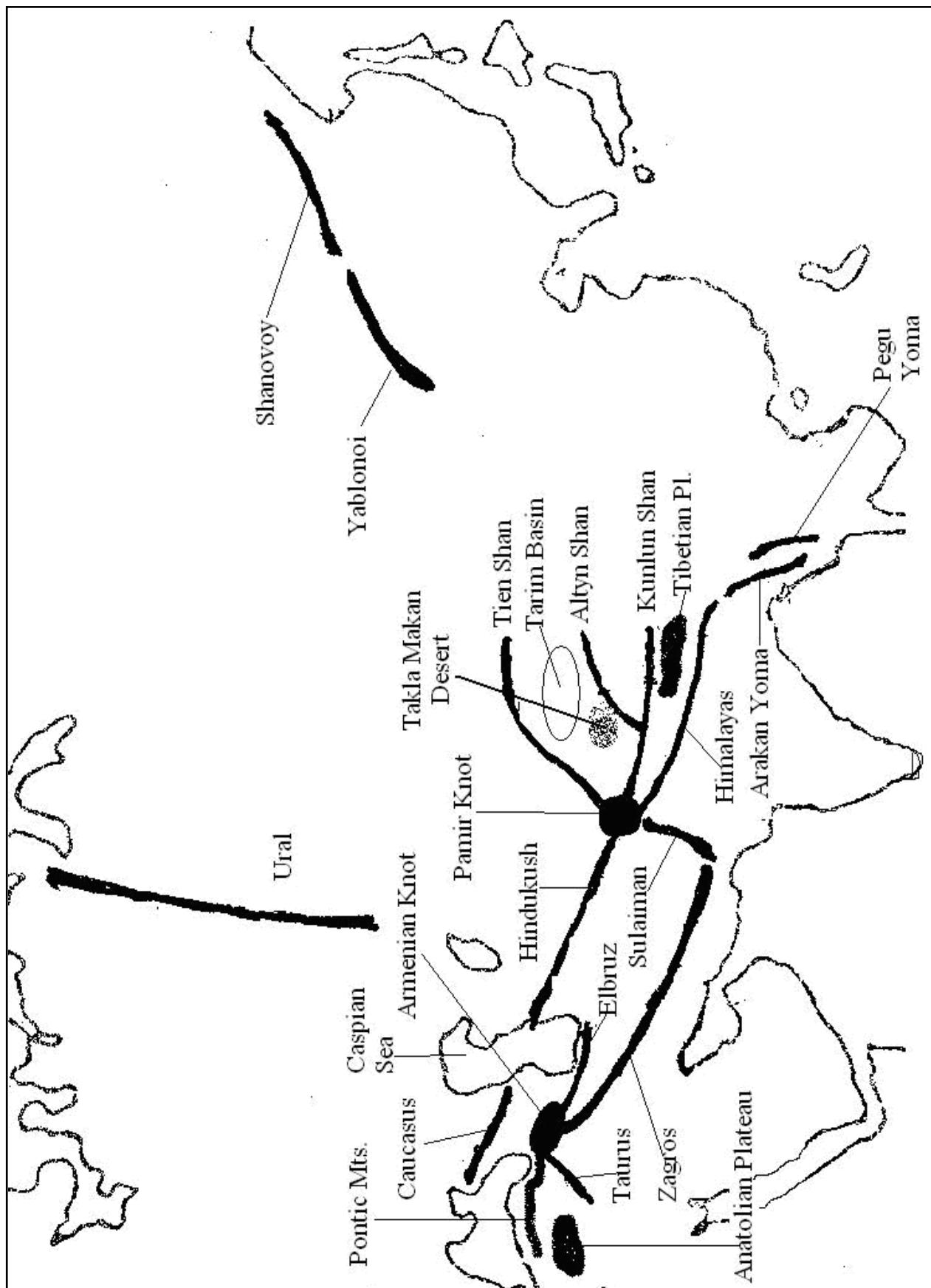
### NORTHERN LOWLANDS (SIBERIAN PLAINS)

- Plains between Ural Mountains in the West and Lena River in the east are called as **Siberian Plains**
- Drained by Rivers Ob, Yenisei and Lena.
- **Lake Baikal – deepest lake** of the world is located here

### MOUNTAINS

- **Pamir Knot (Plateau)** is the meeting place of several ranges of Asia
- This Plateau is highest in the world and known as "**Roof of the world**"
- **Hindu Kush** extends to the west, Tien Shan towards N. East, Kunlun to east and the Karakoram and Himalayas to the S-E.
- To the west of Hindu Kush, two ranges of Mountain ranges diverge. In North **Elburz** (extend along south of Caspian Sea) and in South **Zagros** Mountains (extend along Arabian Sea and Overlooks Persian Gulf).
- **Elburz** and **Zagros** Mountains enclose the **Plateau of Iran**
- These two ranges converge in the west at the knot of **Mount Ararat**
- Again two groups of Mountain ranges diverge westward from Mount Ararat, **Pontic** in the north and **Taurus** in the south.
- **Plateau of Anatolia** is enclosed between Pontic and Taurus.
- South Eastward of Pamir lies Karakoram Range and Himalayan range.
- **K2** (Godwin Austin in POK) is the highest Peak of Karakoram, whereas Mt. Everest is highest peak in the Great Himalayas.
- Between these two ranges in south and **Kunlun** in the north, is the **Tibetan** Plateau.
- Further north, **Tarim basin** is located **between Kunlun in south and Tien Shan** in north.

## THE SOUTHERN PLATEAUS



- Having **older rocks** than that of Mountains ranges

- Plateau of Arabia, Deccan Plateau and Plateau of Yunnan are its parts

## THE GREAT RIVER VALLEYS

- Tigris & Euphrates (Iraq).
- **Baghdad** is located on **river Tigris**. Both of these fall into Persian Gulf.
- Ancient Mesopotamian culture flourished between these two rivers.
- Indus (Pakistan)
- Ganga-Brahmaputra (India and Bangladesh)
- Ayeyarwaddy or Irrawaddy (Myanmar)
- Mekong (South-East Asian countries)
- Sikiang, Chang Jiang (Yang-Tse-Kiang) and Huang He (Hwang-Ho) in China

## THE ISLAND GROUPS

- Indonesia, Philippines and Japan.
- Most of these islands have Mountains core surrounded by narrow coastal plains, have extremely fertile soil (basically volcanic ash)

## CLIMATE

### WINTERS

- Interior part of Asia becomes extremely cold, temperature decreases, air contracts forming high pressure area over Mongolia. Dry winds blow outward. Therefore most of the parts of Asia do not get rain though while blowing over the sea, winds pick up moisture and cause rainfall in some areas.
- **Oymyakon** in N-E Siberia is the **coldest place** in the **Northern Hemisphere** [Mean January Temperature (- 45°)].

### SUMMERS

- Temperature rises in the interior parts of Asia, air expands, create low pressure areas. Now High Pressure areas are located over oceans and winds starts blowing towards low pressure areas, causing rainfall in most of the areas.
- **Mawsynram** in Meghalaya (India) is the **wettest place** in the world; however **Mt Waialeale in Hawaii Island (USA)** recorded highest annual average rainfall (11,680 mm) in the world in 2007.

## NATURAL VEGETATION & WILD LIFE

### TUNDRA BELT

- Lies along northern coast of Asia, covered with snow for major part of the year. Precipitation is about **30 cm annually**. Vegetation – Mosses and Lichens.

### TAIGA

- To the south of Tundra, belt of **coniferous forests (softwood-used for paper industry)**
- Found in Russia, Japan (also in Himalayan region)

- Precipitation – Between 25 and 50 cm
- Vegetation – **Pine, Fir and Spruce.** Used as timber and for making pulp and rayon
- **Animals – Fur bearing** e.g. fox, sable, mink

## STEPPE

- Temperate grasslands, next to taiga. Winters cold, summers hot.
- Rainfall – Between 20–40 cm
- Animals – Grass eating e.g. antelopes

## DESERTS

- Large parts of South West and Central Asia
- **Hot desert – Arabia and Thar.**
- **Cold desert – Gobi and Tibet.**

## MONSOON REGIONS

- South, S-E and East Asia
- Summers hot and humid
- Rainfall – Between 60 and 250 cm, mostly in summers
- **Vegetation – Teak, sal and sandal wood**
- In N-E Asia, the climate is generally cooler and hence monsoon forests give way to temperate woodlands.
- Extreme Southern portions, closer to the equator have equatorial rainforests, dense and contain variety of trees, plants and bushes.

## MAJOR CROPS

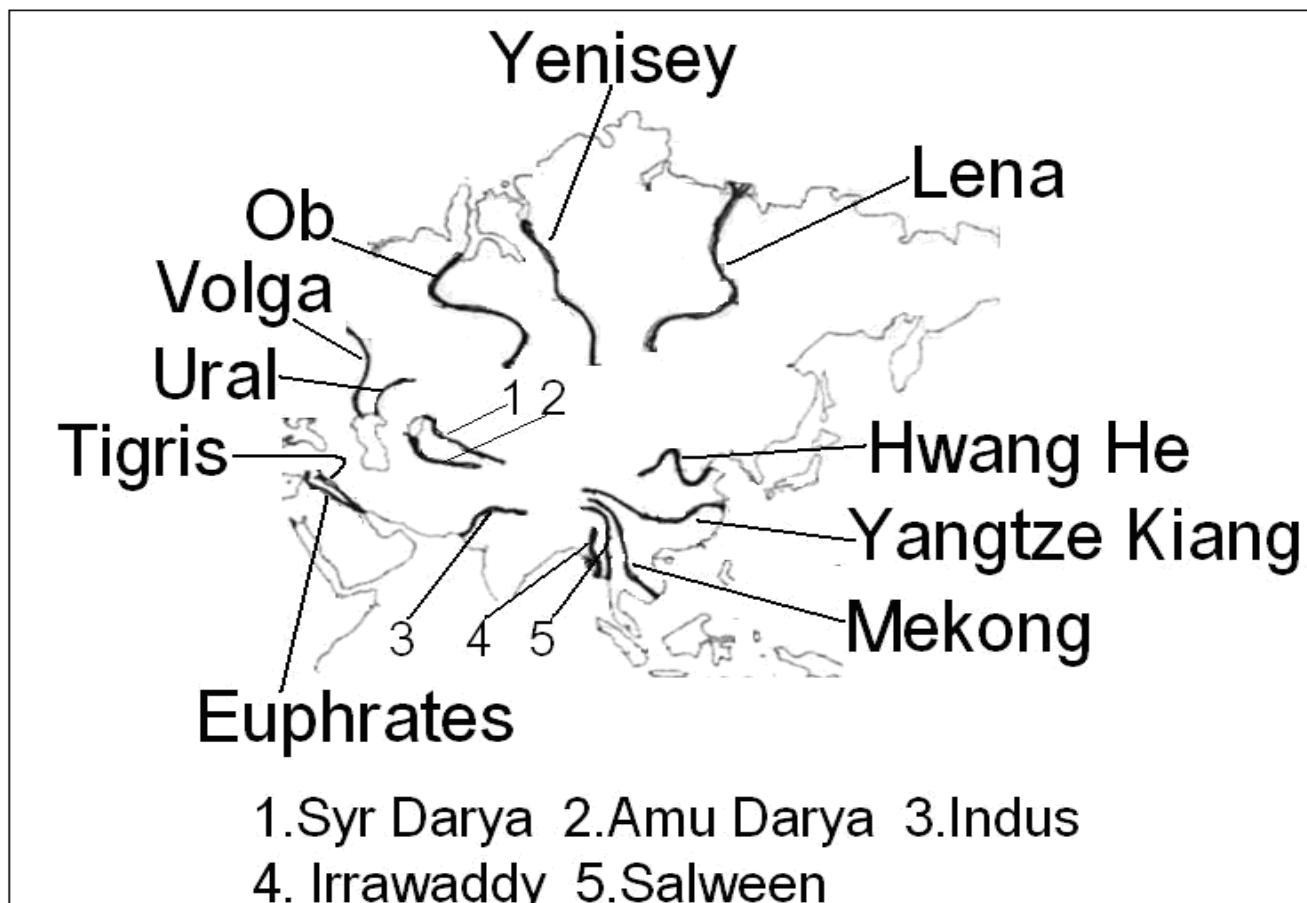
- Cultivation of **rice** is mainly confined to Monsoon Asia as it requires warm and humid climate
- **Wheat** is the main crop of sub-tropical and temperate parts of the continent. W-Siberia, Kazakhstan, China, North India, Pakistan and countries of S-W Asia are the main producers of the wheat.
- **Sugarcane** requires hot and moist climate and well-drained fertile soils. Grown in Pakistan, India, China, Thailand and Indonesia.
- **Tea** is grown in India, Sri Lanka, China, Japan and Indonesia
- **Cotton** is grown in dry areas. Major producers are China, countries of Central Asia, India and Pakistan.
- **Jute** is grown in fertile soil of the floodplains in Ganga-Brahmaputra delta
- **Rubber** is grown mainly in Malaysia and Indonesia, Thailand, India, China and Sri Lanka.

## DESERTS

- **Gobi:** World's **greatest temperate desert** lying in **China and Mongolia**. Inhabited by **Mongol nomads**
- **Lopnor:** Temperate desert lying in China, where **China's nuclear test centre** is located.
- **Taklamakan:** Temperate desert lying in Tarim basin, a center for **Buddhist culture**
- **Rub-Al-Khali:** **hot desert** situated South of **S. Arabia**, rich in **petroleum deposits**
- **Dast-E-Lut:** A hot desert in **E. Iran**, rich in **petroleum deposits**
- **Dast-E-Kabir:** A hot and saline desert in **N. Iran**, rich in **petroleum deposits**.

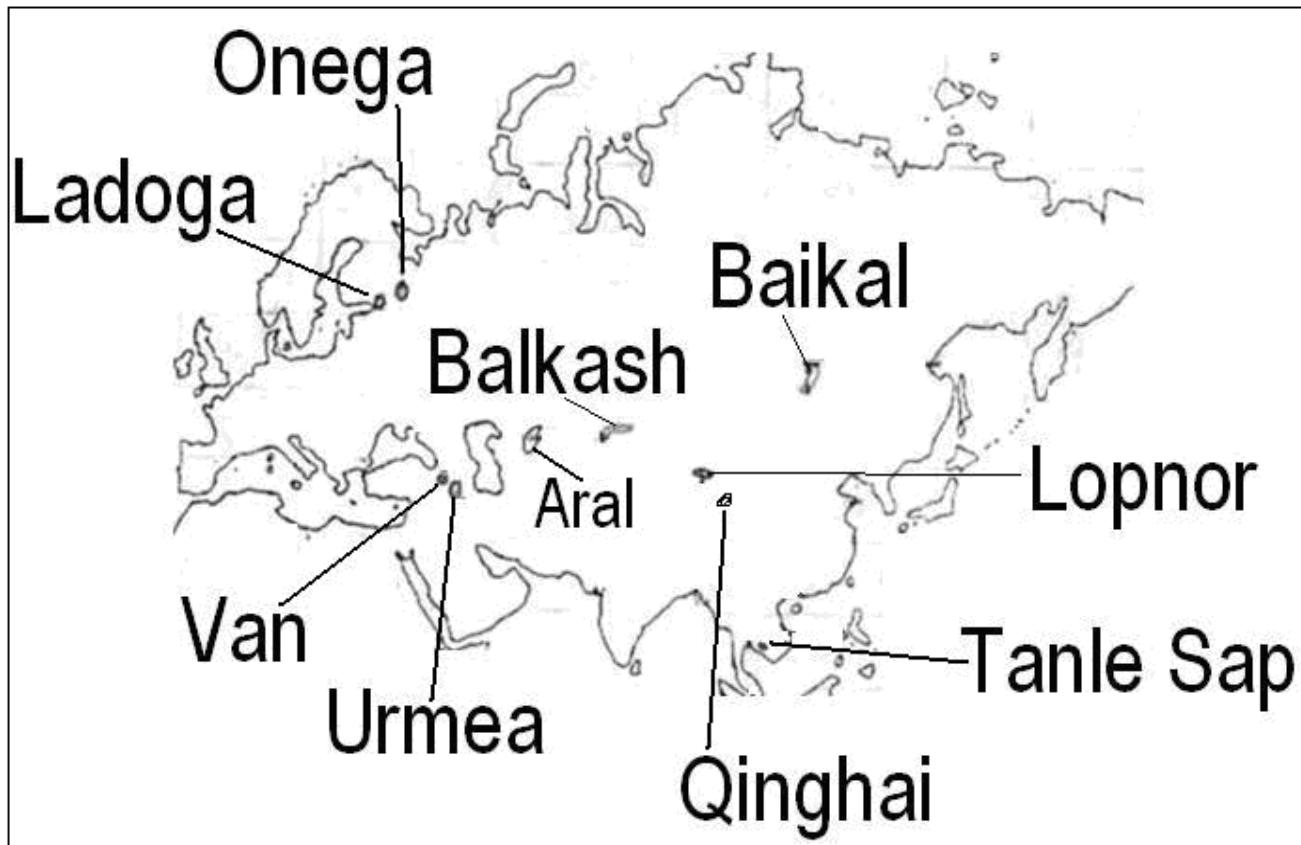
- **Kyzilkum**: A temperate desert extended in Uzbekistan and Kazakhstan
- **Karakum**: Temperate desert in Turkmenistan, transversed by Trans-Caspian railway

FEW IMPORTANT RIVERS OF ASIA		
RIVER	DRAINS INTO	SIGNIFICANCE
Hwang He	Gulf of Pohai	<b>Sorrow of China</b> (owing to frequent floods), Carries loess from Gobi desert
Yangtze Kiang	E. China Sea	<ul style="list-style-type: none"> <li>World's largest <b>3-gorges dam</b> on it, also city of Wuhan &amp; Shanghai on its banks</li> <li>The Three Gorges Dam Project was completed in <b>2009</b>.</li> <li>Located in the middle section of <b>Xiling Gorge</b>, one of the three gorges (the other two are Wu Gorge and Qutang Gorge)</li> <li>A <b>Yangtze Cruise</b> passes the Three Gorges Dam.</li> <li><b>Tanzi Ridge</b> is located in the surveying point for the Three Gorges Dam Project</li> <li>The long-term ecological effects of the Three Gorges Dam have been described as 'possibly catastrophic'.</li> </ul>
Mekong	South China Sea	Passes through China, Myanmar, Thailand, Laos, Cambodia & Vietnam; Makes <b>boundary between</b> Myanmar & Laos, Thailand & Laos.
Amu Darya	Aral Sea	
Syr Darya	Aral Sea	<b>Toshkent</b> located on it
Tigris	Persian Gulf	<b>Baghdad</b> is located on it; Passes through <b>Turkey &amp; Iraq</b>
Euphrates	Persian Gulf	<b>Mesopotamian</b> located between Tigris & Euphrates. Passes through Turkey, Syria & Iraq



## SEAS & LAKES

- **Okhotsk Sea:** An extension of Pacific Ocean, situated west of Kamchatka and frozen for 8 months
- **Sea of Japan:** Separates Japan from Mainland with rich petroleum deposits, with Vladivostok as ice-free port
- **Yellow Sea:** Named for its colour, at the mouth of Hwang He, separating Korea from China. Hwang He brings huge amount of sand to this sea.



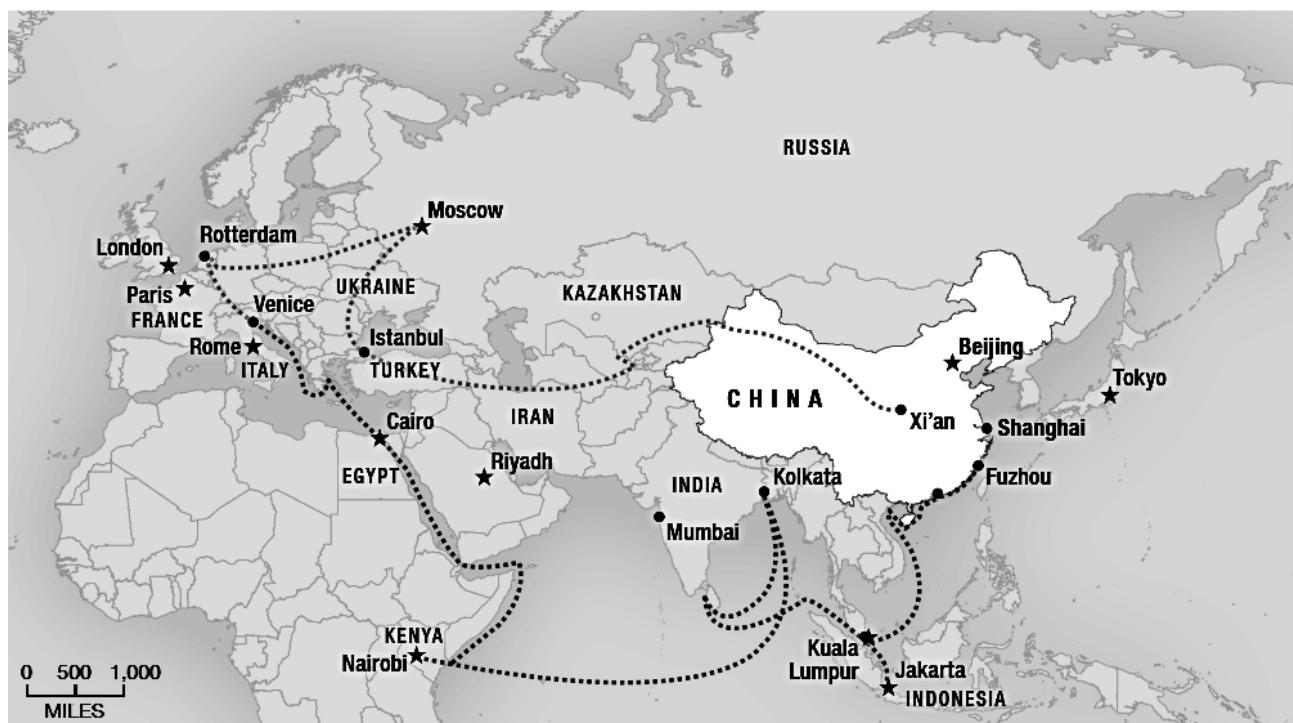
## PENINSULAS

- **Kamchatka:** Part of Russia with inhospitable climate and earthquakes, famous for petroleum deposits
- **Kola:** Part of Russia with **Murmansk** as ice free port throughout the year (washed by warm North Atlantic drift), rich in minerals
- **Kanin:** Part of Russia with rich mineral deposits
- **Malaya:** Part of Malaysia with rich tropical rainforest, and tin, rubber and oil deposits
- **Arabian:** Largest peninsula in the world, mostly desert and famous for oil reserves
- **Sinai:** Part of Egypt with rich petroleum deposits mostly covered by desert. Captured by Israel in 1967 and returned in 1979
- **Crimean:** Part of Ukraine with mineral resources and important port on Black Sea

## MAJOR INFRASTRUCTURE PROJECTS IN ASIA

<b>TRANS-ASIAN RAILWAY (TAR)</b>	<ul style="list-style-type: none"> <li>It is a project to create an <b>integrated freight railway network</b> across Europe and Asia.</li> <li>The Trans-Asian Railway Network Agreement is an agreement signed by seventeen Asian nations as part of a <b>United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)</b> effort to build a transcontinental railway network between Europe and Pacific ports in China.</li> <li>The plan has sometimes been called the "<b>Iron Silk Road</b>" in reference to the historical Silk Road trade routes.</li> <li>The Trans-Asian Railway network now comprises <b>117,500 km of railway lines</b> serving 28 member countries.</li> </ul>
<p>Only three of the main proposed North African routes are shown.</p>	
<b>ASIAN HIGHWAY (AH) PROJECT</b>	<ul style="list-style-type: none"> <li>It is also known as the <b>Great Asian Highway</b></li> <li>It is a cooperative project among countries in Asia and Europe and the <b>United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)</b>, to improve the highway systems in Asia.</li> <li>Agreements have been signed by <b>32 countries</b> to allow the highway to cross the continent and also reach to Europe.</li> </ul>
<b>SILK ROAD</b>	<ul style="list-style-type: none"> <li>China has launched a <b>massive \$79.8 billion infrastructure project</b> in the northwest province of Gansu, which will facilitate trade and people exchanges between China and central Asia as part of its ambitious Silk Road plan.</li> <li>The Silk Road projects involved a maze of roads and ports connecting <b>Asia, Europe and Africa</b>.</li> <li>Also known as the "<b>One Belt, One Road</b>," project</li> </ul>

-- Silk Road land route -- Silk Road sea route



0 500 1,000 MILES

<b>SUNDA STRAIGHT BRIDGE – INDONESIA</b>	<ul style="list-style-type: none"> <li>The Sunda Straight Bridge is a planned road and railway mega project between the two large Indonesian islands of Sumatra and Java.</li> <li>It includes several of the world's longest suspension bridges, across the 27 km (17 mi) Sunda Strait</li> </ul>
<b>KUNMING – SINGAPORE RAILWAY</b>	<ul style="list-style-type: none"> <li>The Kunming-Singapore Railway refers to a network of railways, under planning and construction that would connect China, Singapore and all the countries of mainland Southeast Asia.</li> <li>The idea was formally revived in 2006 when 18 Asian and Eurasian countries signed the Trans-Asian Railway Network Agreement, which designates the Kunming-Singapore Railway as <b>one of the Trans Asian Railways</b>.</li> <li>The proposed network consists of <b>three main routes</b> from Kunming, China to Bangkok, Thailand.</li> </ul>
<b>ARAB MASHREQ INTERNATIONAL ROAD NETWORK</b>	<ul style="list-style-type: none"> <li>It is an <b>international road network</b> between the Arab countries of Syria, Iraq, Jordan, Palestine (Israel included), Lebanon, Kuwait, Egypt, Saudi Arabia, Bahrain, Qatar, UAE, Oman and Yemen.</li> <li>The network is a result of the <b>2001 Agreement</b> on International Roads in the Arab Mashreq, a United Nations multilateral treaty that entered into force in 2003 and has been ratified by the 13 countries for which the network serves.</li> </ul>
<b>JAPAN-KOREA UNDERSEA TUNNEL</b>	<ul style="list-style-type: none"> <li>It is a proposed tunnel project to connect Japan with South Korea via an undersea tunnel crossing the Korea Strait using the strait islands of Iki and Tsushima</li> </ul>

## CONFLICT ZONES IN ASIA

### SYRIA

- Syria **borders** Turkey, Iraq, Jordan, Israel and Lebanon.
- The **highest point** in Syria is Mount Hermon (9,232 ft; 2,814 m) on the Lebanese border.
- **Lake Assad** is the largest lake in Syria.
- Al Lādhiqīyah along with Tartus are Syria's **main ports** on the Mediterranean Sea.
- The longest and most important **river** is the Euphrates, which represents more than 80 percent of Syria's water resources.
- Syria's **population** is about 90 percent Muslim, mostly Sunni—but the Alawite minority (12 percent of Syrians) is politically dominant.
- The Syrian **Civil War** is an ongoing-armed conflict-taking place in Syria. The unrest began in the early spring of 2011 within the context of Arab Spring protests, with nationwide protests against President Bashar al-Assad's government, whose forces responded with violent crackdowns. The conflict gradually morphed from prominent protests to an armed rebellion after months of military sieges.
- There are **four main factions** of fighting groups throughout the country: Kurdish forces, ISIS, other opposition and Assad regime.
- The majority of Syrian **refugees** are living in Jordan and Lebanon.



### IRAQ

- Iraq **borders** Turkey to the north, Iran to the east, Kuwait to the southeast, Saudi Arabia to the south, Jordan to the southwest, and Syria to the west.
- **Population:** Arab 75%-80%, Kurdish 15%-20%, Turkoman, Assyrian, or other 5%
- **Two major rivers**, the Tigris and Euphrates, run south through the center of Iraq and flow into the Shatt al-Arab near the Persian Gulf. The fertile region between these rivers has had many names throughout history like Al-Jazirah.

- The **desert zone** is a part of the Syrian Desert and Arabian Desert, which covers sections of Syria, Jordan, and Saudi Arabia and most of the Arabian Peninsula.
- Iraqi coastal waters** boast a living coral reef, covering an area of 28 km<sup>2</sup> in the Persian Gulf, at the mouth of the Shatt al-Arab river
- Iraq is second only to Saudi Arabia in **rich oil reserves**.
- Iraq War**, also called Second Persian Gulf War, (2003–11), conflict in Iraq that consisted of two phases. The first of these was a brief, conventionally fought war in March–April 2003, in which a combined force of troops from the United States and Great Britain invaded Iraq and rapidly defeated Iraqi military and paramilitary forces. It was followed by a longer second phase in which a U.S.-led occupation of Iraq was opposed by an insurgency.



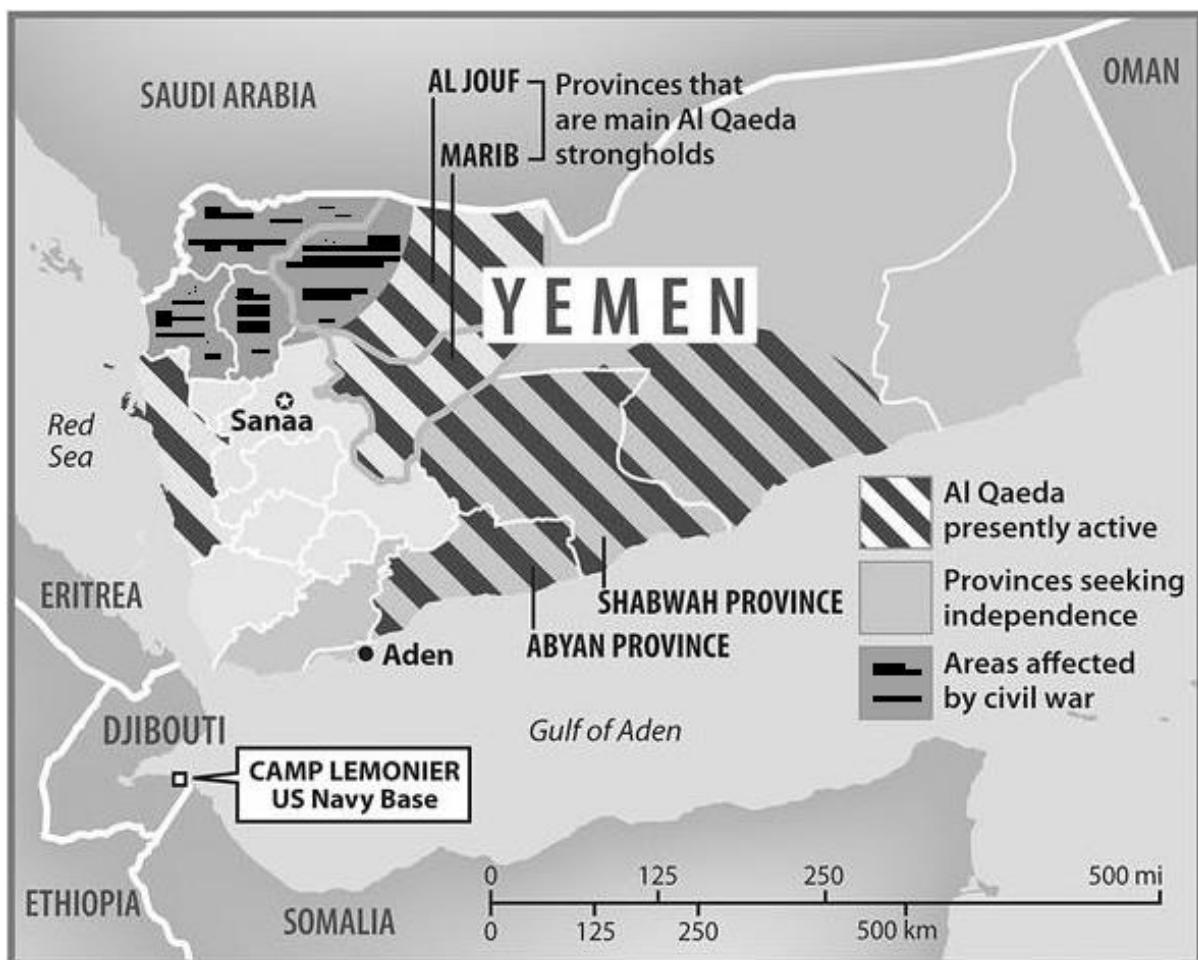
## AFGHANISTAN

- A **landlocked mountainous country**, It is bordered on the north by Turkmenistan, Uzbekistan, and Tajikistan, on the extreme northeast by China, on the east and south by Pakistan, and by Iran on the west.
- Its **longest border** is the poorly marked **Durand Line** and the shortest one, bordering China's Xinjiang province at the end of the **Wakhan Corridor**.
- Important passes** include the Unai Pass across the Safed Koh, the Kushan and Salang Passes through the Hindu Kush, and the Khyber Pass that connects Afghanistan with Pakistan.
- The **Amu Darya** on the northern border, the country's other major river, has the next largest drainage area.
- The **northeastern Hindu Kush Mountain range**, in and around the Badakhshan Province of Afghanistan, is in a geologically active area where earthquakes may occur almost every year.
- Afghanistan is a country of **ethnic minorities**: Pashtun (38 percent), Tajik (25 percent), Hazara (19 percent), and Uzbek (6 percent).
- After the **9/11 terrorist attacks**, the United States invaded Afghanistan, removed the Taliban and chased bin Laden into the mountainous region on the border of Afghanistan and Pakistan.



## YEMEN

- Yemen is an **Arab country** in Southwest Asia, occupying the southwestern to southern end of the Arabian Peninsula.
- It is **bordered** by Saudi Arabia to the north, the Red Sea to the west, the Gulf of Aden and Arabian Sea to the south, and Oman to the east.
- Yemen's territory includes **more than 200 islands**; the largest of these is Socotra. A number of Red Sea islands, including the Hanish Islands, Kamaran, and Perim belong to Yemen.
- Following years of dispute between Yemen and Eritrea over ownership of the **Hanish Islands** and fishing rights in the Red Sea, in 1999 an international arbitration panel awarded sovereignty of the islands to Yemen.
- Yemen is **strategically important** because it sits on the Bab al-Mandab strait, a narrow waterway linking the Red Sea with the Gulf of Aden, through which much of the world's oil shipments pass.
- Yemen is **one of the poorest countries** in the Arab world, due to declining oil resources.
- **Ethnic Groups:** Predominantly Arab, also Afro-Arab, South Asian, European
- Yemen has been in a **state of political crisis since 2011**. The Yemeni Civil War is an ongoing conflict that began in 2015 between two factions claiming to constitute the Yemeni government, along with their supporters and allies.



Some **other list of territorial disputes** over lands in Asia are as below:

Territory	Claimants	Notes
Several areas in the Fergana Valley	Kyrgyzstan Tajikistan Uzbekistan	
Demchok, Chumar, Kaurik, Shipki Pass, Jadh, and Lapthal	India People's Republic of China Republic of China (Taiwan)	Disputed areas located between Aksai Chin and Nepal, all administered by the PRC.
Preah Temple area (Phra Wihan)	Vihear (Khao)	Temple complex awarded to Cambodia by an International Court of Justice ruling in 1962; "promontory" measuring 0.3 km <sup>2</sup> immediately adjacent to temple awarded to Cambodia by ICJ ruling in 2013; both countries acknowledge continuing dispute over an additional 4.3 km <sup>2</sup> immediately northwest of the 2013 ruling's area.
Paracel Islands	People's Republic of China Republic of China (Taiwan) Vietnam	Entirely controlled by China but claimed by Vietnam and Taiwan
Pratly Islands	Republic of China (Taiwan) People's Republic of China Vietnam Philippines (part) Malaysia (part)	Each of the claimant countries except Brunei controls one or more of the individual islands.

	Brunei (part)	
Taiwan, Penghu, Jinmen, Matsu Islands, Pratas Islands	Republic of China People's Republic of China	
South Kuril Islands (Northern Territories)	Russia Japan	
Golan Heights, Gaza Strip, and West Bank	Syria Israel	
Jammu and Kashmir	India Pakistan	India and Pakistan have fought three wars over the region - 1947, 1965 and 1999. There was militant insurgency in Kashmir backed by Pakistan since 1990 since when hundreds of thousands of Pro-India Hindu Kashmiri Pandits have either been killed, converted to Islam or forced to vacate their homes and take refuge in Jammu and other areas of rest of India. UN has removed Kashmir from their list of unresolved disputes in 2010.

## REGIONAL GEOGRAPHY OF SOUTH-EAST ASIA

- Southeast Asia **extends** for more than 4,830 km from **Myanmar** on the west to **New Guinea** on the east.
- Although this region lies **near the Equator**, it stretches to almost 30° N in northern Burma, and a sizable part extends as far as 20° N.
- There are **2 main divisions** of Southeast Asia.
  1. The **mainland**: Myanmar, Thailand and Indochina (comprising Laos, Kampuchea or Cambodia and Vietnam).
  2. **Insular archipelago**- Philippines, Malaysia, Singapore, Indonesia, and Brunei.
- Between these two parts are **shallow** waters that lie over the **Sunda Shelf**.
- For most of **mainland** Southeast Asia, the dominant physical features are the **rugged cordilleras** that splay out from the Himalayas to the north and are to the south. These mountains are underlain by an **ancient crystalline mass** of stable granite material.
- The north-south Mountains of mainland Southeast Asia, although physically related to the Himalayas in the north, have been heavily **weathered and rounded** in the tropical, rainy climate. The ranges **run parallel** to one another and separate the major **river basins** that form the core-lands of the 5 countries of mainland Southeast Asia.
- From **west to east**, the main ranges are the **Arakan Yoma** of western Burma, the **Shan Highlands** of eastern Myanmar and western Thailand, which extend to length of the Malay Peninsula; and the **Annamite Chain** of Vietnam.
- **Archipelagic** Southeast Asia: A string of volcanic islands stretches from Sumatra and Java, towards east to Sulawesi & the Moluccas & towards north to the Philippines. Not only is this area one of the most **geologically active regions** on Earth, but it is also a highly diverse land surface. A good reflection of the newer processes of landscape formation is found in the circum-Pacific belt of volcanism known as the **Pacific Ring of Fire**.

## RIVERS OF SE-ASIA

1. **Irrawaddy** and its largest tributary, the Chindwin is a major river of Myanmar. Rangoon and Mandalay, the largest cities in Myanmar, are located on the banks of the Irrawaddy.
2. **Salween River** originates on the Plateau of Tibet and flows for about 1200 km through China before entering Myanmar. The delta and the flood plains of the Irrawaddy are much more extensive than those for the Salween, leaving room for the core of the country to develop.
3. The **Mekong River** flows in a valley to the east and parallel of the Salween. After leaving China, the Mekong makes the **boundary** between Thailand and Laos and then continues through the heart of Cambodia. It cuts across the southern tip of Vietnam, and finally empties into the **South China Sea**. The capital cities of Vientiane (Laos) & Phnom Penh (Cambodia) are located along bank of Mekong River.
4. Hanoi is on the banks of the **Red River**, and Bangkok (Thailand) is divided by the **Chao Phraya River**. The political cores and cultural hearths of all the mainland countries have developed along the rivers.

## VOLCANIC MOUNTAINS

- Volcanic action created most of the islands, and many individual peaks heights of many of the volcanoes are active today. Southeast Asia is the **most active volcanic region** of the "Ring of Fire" that surrounds the Pacific Ocean. Examples of some volcanic eruptions are Enchanting Islands of **Bali and Karakotoa**. The Younger active belt of volcanism is associated with the islands of Southeast.
- The **seas between the islands** of Southeast Asia generally are quite **shallow**; most are 150 to 200 feet deep.
- At the opposite extreme are the **great ocean trenches** to the outside of the island region. The **Philippine Trench**, east of the Philippines, is a 965 km long canyon on the bottom of the ocean.
- The **Java Trench** borders the region on the south off the coasts of Sumatra and Java and another ocean deep has been recorded on the east of the **Banda Sea**.
- **Active Volcanoes** in this area are as below
  - **Sakurajima, Japan** - A major eruption could have deadly consequences for the 700,000 residents of Kagoshima, who live just miles from the Volcano.
  - **Mt. Merapi, Indonesia** - Mt. Merapi has erupted regularly since 1548 and has been active for the last 10,000 years. Experts believe that its activity led to the demise of the Hindu Kingdom of Mataram.
  - **Ulawun, Papua New Guinea** - Ulawun is one of the most active volcanoes in Papua New Guinea. Eruptions from Ulawun originate from its central crater. There have been 22 eruptions recorded at Ulawun since the 1700s.
  - **Taal Volcano, Philippines** - The Taal Volcano is a cinder cone volcano. It is located on the island of Luzon, Philippines where it lies at the middle of Lake Taal. It lies just 31 miles from Manila – the capital of the Philippines.

## DEMOGRAPHY OF SE ASIA

- Most of Southeast Asia's people live, often in extremely dense clusters, in scattered areas of **permanent sedentary agriculture**.
- Such area form the core regions of the various countries and stand in striking contrast to the relatively empty spaces of the adjoining districts

- A superior degree of **soil fertility** appears to have been the main locational factor in most instances.
- South East Asian countries in **ascending order of population**.
 

1 Brunei	2 Singapore	3 Laos	4 Kampuchean
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- South East Asian countries in **descending order of population**

1 Indonesia	2 Philippines	3 Vietnam	4 Thailand
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- SE Asian country with **highest growth rate**: 1. Philippines 2. Malaysia
- SE Asian country with **least growth rate**: 1. Thailand 2. Vietnam
- Country with **highest population density**: Singapore
- Country with **least population density**: Laos

## Ethnicity

- The **Malays** are the **most prominent** ethnic group in Southeast Asia. Regional isolation and racial mixing have created differences among the countries of the region, but the people are basically Malay in origin.
- The **most conspicuous** ethnic minority is the **Chinese**. The sizable minorities of "overseas Chinese" are concentrated in the urban areas of nearly every country of Southeast Asia. These are **colonists** from China who live in the region, and sometimes they do not even become citizens of the countries where they settle.
- **Indigenous hill people**: Most of the indigenous tribal people of Southeast Asia are minorities within their own countries. These are the "hill people," various tribes of which are found in each country.
- In Myanmar live the **Karens**, the Shans, the Kachins and the Chins.

## MINERAL RESOURCES

### Tin

- It is found in Myanmar, Indonesia, Laos, Malaysia and Thailand.
- **China** is the **world's leading producer** of tin while Malaysia is second leadin producer of world. All the tin fields are in Peninsular Malaysia and the **Kinta valley** alone accounts for half the annual output. Tin is smelted in **Penang** and Singapore and ingots are exported.
- **Thailand's** tin is mined in the south, in the Kra Peninsula and on off shore islands such as Phuket.
- **Indonesia's** tin comes from islands off the northern coast of Sumatra including Bangka, Billiton and Singkep.

### Petroleum

- **Vast supplies** of petroleum also are found in Southeast Asia.
- **Foremerly, Indonesia** was one of the world's largest petroleum producers and about one third of Indonesia's **exports** were petroleum products.
- Indonesia has greatly expanded oil production, most of which comes from **Sumatra**. The **chief fields** are Palembang, Jambi, Minas (near Pekan Baru), and around Pengkalan. The oil is **refined** at Lutong, Sarawak, or sent to Japan or Singapore.
- Oil supplies nearly make the entire income of **Brunei** and provide the tiny country with very high standards of living. **Malaysia** has oilfields off shore of Sarawak and off the East Coast of Peninsular Malaysia.
- Regardless of all the mineral wealth, very little heavy **industry** is carried on in Southeast Asia – Partly because the **colonial** powers did not want industry to develop and partly

because both **coal and iron ore** have not been found within the same country. The European powers wanted to extract the resources for their own use and sell manufactured goods back to the colonies.

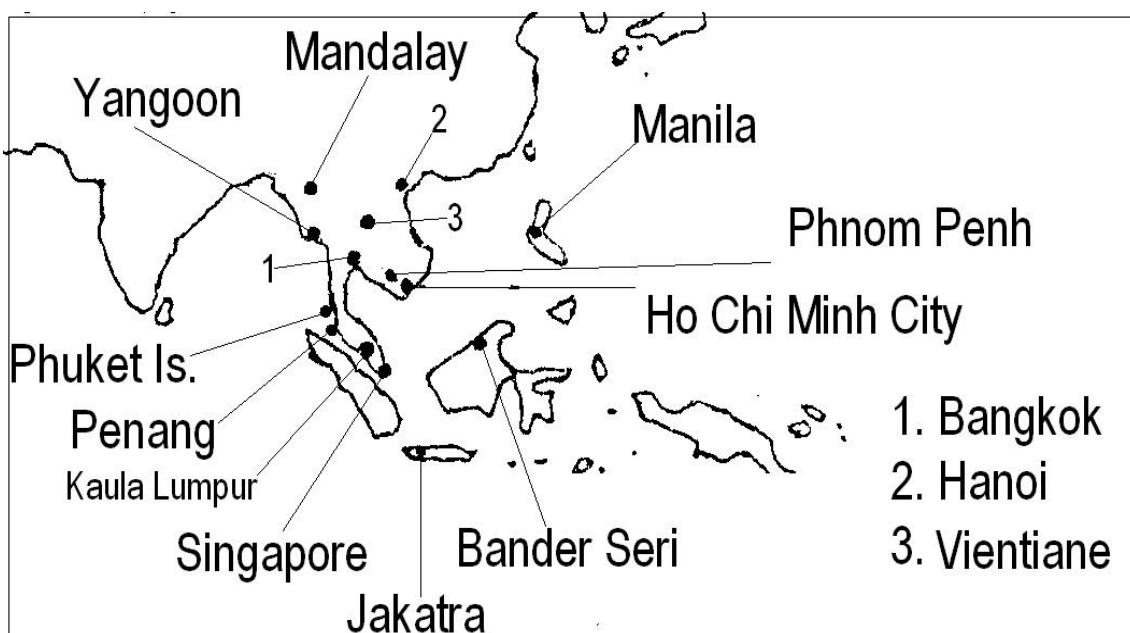
- **Highways:** Highways do cross between the countries on the mainland, but they are few and poor. The Burma and Ledo roads, carved out of the jungle during World War II, are typical of road construction in the region. The **Burma Road** winds for 1,126 km between Lashio in Myanmar and Kunming in China's Yunnan province. The **Ledo Road** covers less rugged terrain but crosses many rivers and smaller streams as it winds between Myanmar and the Assam region of India.

## INDONESIA

- Consists of more than **17,000 islands** of various sizes, about 6000 are inhabited.
- **Main islands** – Borneo (Kalimantan), Sumatra, Irian Java, Celebes (Sulawesi), Java, Madura and Bali.
- **Jakarta** is the capital city located on the **Java Island**.
- **Northern Borneo** is a part of **Malaysia**
- Indonesia's **only land frontiers** are with **Papua New Guinea** (to the east of Irian Jaya), and with **the Malaysia** (states of Sarawak and Sabah) which occupy the northern Borneo.

## Physical Features

- Islands generally have mountainous relief
- Earthquakes associated tidal waves called '**Tsunamis**' are quite common
- Climate – Monsoon, heavy rainfall
- Very **dense forests** are found in most of the parts of Indonesia
- **Agriculture** – Most important Activity. Less than 50% of population is engaged in it.
- Food Crops – Rice, Maize, Cassava and Sweet potato
- **Cash Crops** – Rubber, oil palm, coffee, tea, cocoa, sugarcane and Tobacco. All cash crops are export oriented.
- **Railways** are limited to Java, Madura and Sumatra
- **River transport** is important in several areas especially in Kalimantan & Eastern Sumatra



## People

- **Fourth in population** after China, India and USA
- Density of population is high in Java, Madura and Bali
- Nearly 90% of Population is Muslim
- **Bahasa Indonesia** is the **official language**

## MALAYSIA

- Located North of the **Equator**
- Consist of two widely separated areas –
  1. Malay Peninsula (part of Asian Mainland).
  2. Northern part of Borneo Island.
- **Northern Borneo** has two states, Sarawak and Sabah
- **Peninsular Malaysia** separated from Sumatra Island by **Strait of Malacca** and from Sarawak and Sabah by South China Sea.
- At the tip of **Malaya Peninsula**, lies **Singapore**
- Kuala Lumpur is the capital and the largest city of Malaysia

## Physical Features

- Central part of Malay Peninsula is mountainous & is surrounded by narrow coastal plains
- The **highest peak is Kinabalu**
- Climate – **Equatorial type**, high temperature and rains throughout the year
- Evergreen forests in Sarawak and Sabah are denser than that of peninsular Malaysia

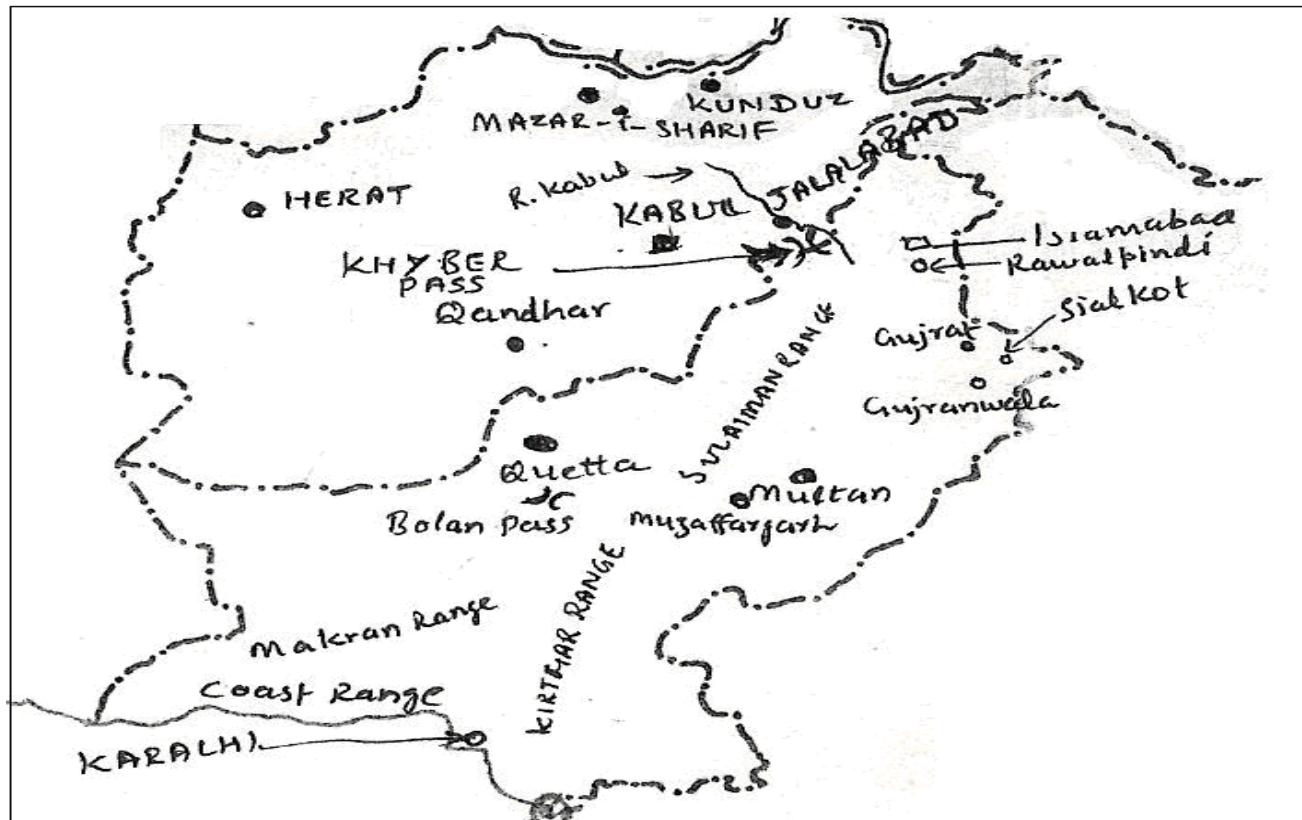
## Natural Resources

- **Tin, Copper & Uranium deposits** are found in Central highlands of Malay Peninsula
- **Plantation agriculture** is important activity and Malaysia has remained a leading producer of Rubber for a long time
- Road and Rail transport are better developed in Peninsular Malaysia than in Sabah and Sarawak
- **Major Seaport** of Peninsular Malaysia is **Pinang (Georgetown)**.

## REGIONAL GEOGRAPHY OF SOUTH ASIA

### PAKISTAN

- The country can be divided into **two physical units** –
  1. Mountains and Plateaus in the west
  2. Indus river basin in the east is the plain region
- From **South to North** are located - Baluchistan Plateau and Mountain Ranges of Kirthar, Sulaiman and Hindu-Kush in the same order
- There are **2 important passes** in these mountains – **Khyber Pass** in the **Hindu Kush** and **Bolan Pass** in the **Kirthar**.
- **Potwar Plateau** is located to Southeast of the Hindu Kush. Region is generally dry.



- **Climate** of Pakistan is hot & dry. Rainfall decreases from North to South. Average rainfall is 50 cm.
- Northern Mountain area is forested with **broadleaved evergreen oak** and chestnut. Southern part is steppe.
- Coal, Iron ore, Gold and Mineral oil are found in Baluchistan
- Mineral oil is also found in Potwar and Ghodak
- Most of the **industries** are located in Punjab
- **Urdu** is **National language**. Punjabi, Sindhi, Pushtu and Baluchi are other important regional languages.

### PoK

- POK (Pak Occupied Kashmir) is the area, which was forcefully occupied by Pakistan in the first Kashmir war in **1947**.
- The Pak government with its capital at **Muzaffarabad** rules this region. The region has its own **self-declared prime minister**. This region is defined by **LOC** (Line of Control) which came into effect when truce was decreed in **Shimla Agreement of 1972**.
- The northern part of **Azad Jammu and Kashmir** encompasses the lower part of the Himalayas, including Jamgarh Peak.
- **Sarwali peak** in the Neelum Valley is the highest peak in the state.
- Monsoon floods of the Jhelum and Leepa river are common.

### CoK

- **Aksai Chin** is one of the two main disputed border areas between China and India, the other being a part of Arunachal Pradesh.

- It is **administered by China**, but is also **claimed by India** as a part of the Ladakh region of the state of Jammu and Kashmir. In **1962**, China and India fought a brief war over Aksai Chin and Arunachal Pradesh, but in 1993 and 1996, the two countries signed agreements to respect the **Line of Actual Control**.
- The area is largely a **vast high-altitude desert** with a low point (on the Karakash River). In the southwest, mountains up to 22,500 feet (6,900 m) extending southeast from the Depsang Plains form the de facto border (Line of Actual Control) between Aksai Chin and Indian-controlled Kashmir.
- In the north, the **Kunlun Range** separates Aksai Chin from the Tarim Basin, where the rest of Hotan County is situated.
- Aksai Chin area has number of **endorheic basins** with many salt or soda lakes. The major salt lakes are Surigh yil ganning kol, Tso tang, Aksai Chin Lake, Hongshan hu, etc.



## NEPAL

- A small **landlocked** country, also known as **Himalayan Kingdom**
- Three Divisions:-**
  - Northern** part consists of Himalayan ranges- Great Himalayas (highest range of Himalayas) run along northern border of Nepal. Mt. Everest (8848m) - world's highest peak is located here, known as **Sagarmatha in Nepalese**. To the south lies the **Mahabharata Range of Middle Himalayas**
  - Central** Part – Occupied by Valleys – Katmandu and Pokhra
  - Southernmost** low lying plain called **Terai**, liable to flooding during Monsoon
- Nepal has **one of the greatest hydropower generation potentials** of the world. But only about 1.3% of this potential is being used.

- Traditional cottage industries constitute 60% of the industrial production.
- Tourism is the most important industry of Nepal. It is major source of earning foreign exchange.
- It imports manufactured good and exports forest and agro based products.

## Nepal Earthquake

- The **April 2015** Nepal earthquake was also known as the Gorkha earthquake, with a magnitude of 7.8Mw or 8.1Ms and a maximum Mercalli Intensity of IX (Violent).
- Its epicenter was east of the district of **Lamjung**, and its hypocenter was at a depth of approximately 8.2 km (5.1 mi). It was the **worst natural disaster** to strike Nepal since the 1934 Nepal-Bihar earthquake.
- The earthquake triggered an **avalanche on Mount Everest** and another huge avalanche in the Langtang valley.
- A **major aftershock** occurred on 12 May 2015 at 12:51 NST with a moment magnitude (Mw) of 7.3. The epicenter was near the Chinese border between the capital of Kathmandu and Mt. Everest.
- The tremor was caused by a sudden thrust, or release of built-up stress, along the **major fault line where the Indian Plate**, carrying India, is slowly diving underneath the Eurasian Plate, carrying much of Europe and Asia. Kathmandu, situated on a block of crust approximately 120 km (74 miles) wide and 60 km (37 miles) long, reportedly shifted 3 m (10 ft) to the south in a matter of just 30 seconds.

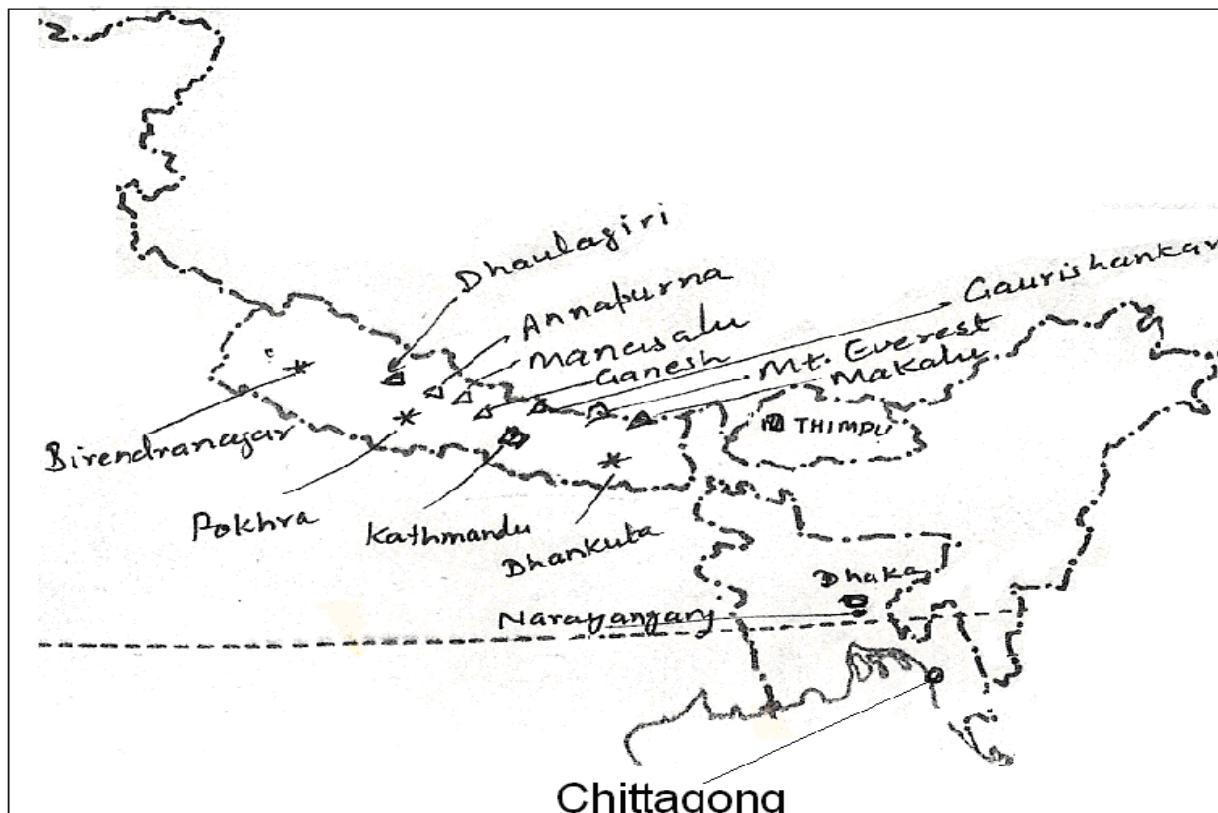
## Hydroelectric and Infrastructure Projects

### With China

- Under China's Three Gorges International Corp, a new hydropower project has been approved to be built in Nepal. The dam is to be built on the **West Seti River** in northwest Nepal.
- China plans to build a 540-kilometre **strategic high-speed rail link between Tibet and Nepal** passing through a tunnel under Mt Everest. The rail line is expected to be completed by 2020.
- Nepal has decided to join the **New Silk Road**, under which Nepal would be connected to a Chinese rail line in Tibet. China recently extended its **rail network from Lhasa to Xigaze** (Shigatse), a city just 253 km away from China's border with Nepal and India.

### With India

- India and Nepal signed an agreement for the **900 MW Arun III dam**, making India the largest hydropower developer in Nepal. Also **900 MW Upper Karnali dam** in western Nepal has been signed off with India.
- The 18.6 km long **Jogbani-Biratnagar (17.65 km) rail link** connecting Bihar and Biratnagar in Nepal is underway. Another project connecting Jaynagar (Bihar) to Bardibas (Nepal) and extension to Bardibas is in progress.
- The **Kathmandu-Tarai Fast Track Road** aims to link Nijgarh and Bara with capital Kathmandu. On completion, the road will be the shortest to link Kathmandu and India as Bara shares the border with India.



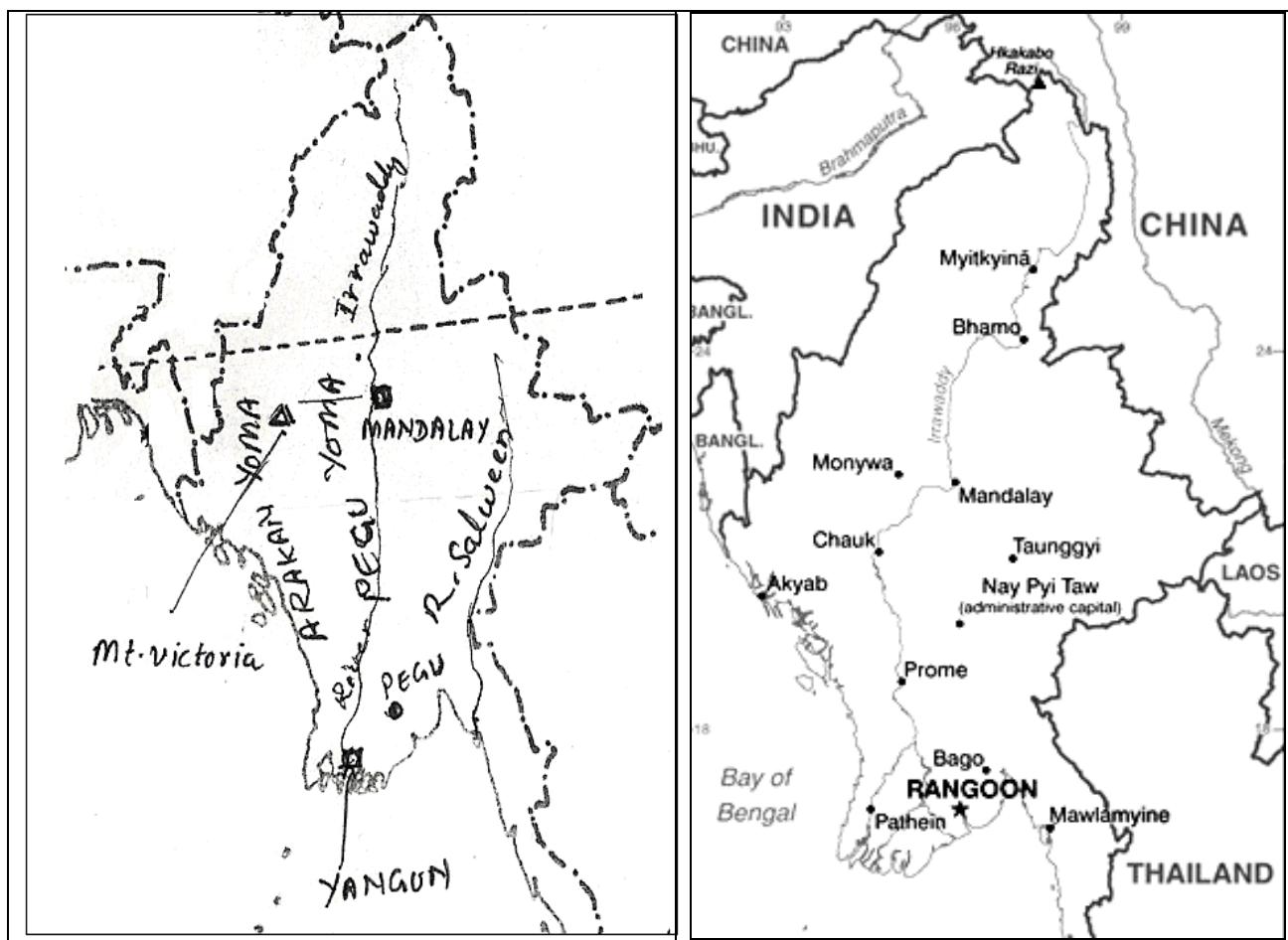
## BHUTAN

- Small **landlocked** country in eastern Himalayas
- To the north and NW, it adjoins Tibet (China). To its west, south & east, it is bordered by India.
- It is almost entirely mountains. Its terrain is among the most rugged in the world.
- From level plain area in south called **duars**, the land rises steadily towards the north.
- **Highest peak of Bhutan is Gangar Punsun**
- **Chukha hydroelectric project** is built with the help of **India** has a generation capacity of 336 MW
- Agriculture is the most imp. economic activity and includes rearing of Yak & Sheep
- Nearly 90% of the population is dependent on agriculture and farmlands are owned by the women mostly
- Bhutan and India are mutually working on joint construction of four hydropower projects in Nepal:
  - **Under construction**- Chamkarchu project (largest of all), Punatsangchu-I, Punatsangchu-II and Mangdechhu project
  - **Already Operational** - Chukha project, Kurichu project , Tala project
- **Mountain passes** between Bhutan and India are as follows-
  - Nathu La - It connects the Indian state of Sikkim with China's Tibet Autonomous Region.
  - Jelep La - is a high mountain pass between India and Tibet in the East Sikkim District of the Indian state of Sikkim. The Menmecho Lake lies below the Jelep La Pass.

## MYANMAR

- Formerly called as **Burma**, lies to east of India and Bangladesh and to S-W of China.

- **Myanmar** has transferred its **Capital from Yangon (Rangoon) to Pyinmana**. Yangon is located on southern coast while Pyinmana is in **central Myanmar**.
- **Structurally – three units:-**
  1. Young fold mountains of the west and north are the southward continuation of the Eastern Himalayas. From **North to South**, they are known successively as **Patkai, Naga, Chin** and **Arakan Yoma**. Altitude of Mountain Ranges decreases towards the south.
  2. **Eastern Part** is of upland and low hill - extend through the **Shan** and **Kayin Plateaus** to the Southern Part.
  3. **Alluvial Lowlands** – running North South between mountains of the west and the upland regions of the east. Important rivers – **Irrawaddy** and **Salween**



- Climate – Tropical Monsoon Type
- Most of the people follow Buddhism; Urbanization is low
- **Mandalay** is located in the interior on the bank of **Ayeyarmaddy (Irrawaddy)**
- **'Sundari Trees** are found in the delta regions
- Rubber trees grow in hot and humid coastal regions
- Teak– Most important species of Tree, alone constitute nearly **17% of country's total export**
- Precious stones e.g. Sapphires, emeralds, and rubies are found on the Shan Plateau.
- **Pearls are found in the Gulf of Martaban**
- Agriculture contributes about 60% of the GDP
- Rice is the major crop and occupies about 50% of all land under cultivation

## Infrastructure Projects

### With India

- **Kaladan multi modal project:** ensures sea connectivity to India's Northeast and roads connecting India to ASEAN and an alternate market for Myanmar's gas supplies. The sea link of the project is to **connect Kolkata with Sittwe**. The port of Sittwe is being developed by India.
- **Tamu-Kalewa-Kalemyo road:** to be handed over to Myanmar; nearly 71 bridges on this stretch are to be upgraded under the Trilateral Highway project. Trilateral Highway Project: The highway is expected to connect Moreh in India to Mae Sot in Thailand via Myamar.

### With China

- **Sino-Burma Pipelines-** A pipeline project that would allow transportation of oil and natural gas from the deep-water port of Kyaukphyu (Sittwe) in the Bay of Bengal to Kunming in China's Yunnan province.
- **Shwe Gas Project-** The Shwe Gas Project one of the major parts of the Sino Burmese Pipeline Project. The gas field is located in the Andaman Sea. Discovered in 2004 it began production in 2013.
- **Myitsone Dam-** The Myitsone Dam which literally translates Confluence Dam is a major hydroelectric power project which is located at the confluence of the Mali and N'Mai rivers and the source of the Irawaddy River.

## BANGLADESH

- Formerly called 'East Pakistan', became **independent in 1971**
- Bordered by India from three sides – West, north and east. Myanmar lies to its southeast. Bay of Bengal is to its south.

## Physical Features

- Almost all of it lies in the Ganga-Brahmaputra delta. These are alluvial plains.
- Southeast part of Bangladesh is hilly. The Chittagong Hills, in fact, are continuation of the hill ranges of Myanmar.
- **Cox's bazaar** – located on the eastern coast of Bangladesh is **the largest Sandy-beach in the world**.
- **Brahmaputra** is called '**Jamuna**' in Bangladesh and **after meeting Ganga**, the joint stream is called **Padma**.
- Other rivers are the Meghna, Surma and Karnaphuli
- Climate is of Tropical Monsoon Type
- Deltaic coast has **mangrove forests** containing '**Sundari**' trees. Wood is used for making boats.
- **Natural gas** is found in **Comilla and Sylhet districts**
- Rice and Jute are the major crops
- It has a small manufacturing sector. Most of the industries are small scale and cottage industries.
- Dhaka, Chandpur, Barisal and Khulna are inland ports
- **It has highest density of Population in South Asia**

## Indo – Bangaldesh Land Swapping

- The India–Bangladesh enclaves were the **enclaves along the Bangladesh–India border**, in Bangladesh and the Indian states of West Bengal, Tripura, Assam and Meghalaya.
- The prime ministers of India and Bangladesh signed the **Land Boundary Agreement in 1974** to exchange enclaves and simplify their international border. A revised version of the

agreement was adopted by the two countries in May 2015, when the Parliament of India passed the **100<sup>th</sup> Amendment** to the Indian Constitution.

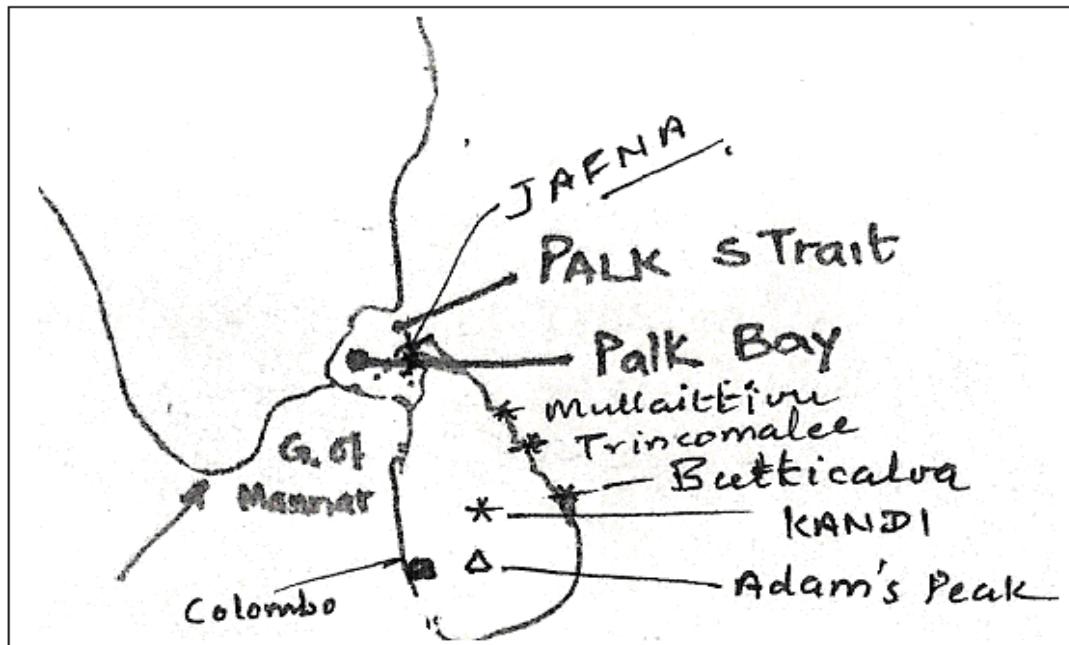
- Under this agreement, India received **51 Bangladeshi enclaves** (covering 7,110 acres (2,880 ha)) in the Indian mainland, while Bangladesh received **111 Indian enclaves** (covering 17,160 acres (6,940 ha)) in the Bangladeshi mainland.
- After the Land Boundary Agreement, India lost around 40 km<sup>2</sup> (10,000 acres) to Bangladesh
- Tin Bigha Border** is a strip of land belonging to India on the West Bengal-Bangladesh border. The corridor, which connects **Dahagram-Angarpota** (Bangladesh) with the mainland Bangladesh (Patgram) as well as Kuchlibari (India) with Mekliganj town, has turned into a veritable crossroads of friendship and harmony between India and Bangladesh.

### **South Talpatti or New Moore Island**

- South Talpatti or New Moore, was a **small uninhabited offshore sandbar landform** in the Bay of Bengal, off the coast of the Ganges-Brahmaputra Delta region.
- The island was situated only two kilometers from the mouth of the **Hariabhangha River**.
- The island was claimed by both Bangladesh and India, based on a case filed by the Government of Bangladesh in 2009 at the Permanent Court of Arbitration the dispute was settled in 2014 by a final verdict not open to appeal and **in favour of Bangladesh**.

### **SRI LANKA**

- Separated from India by Gulf of Mannar and the Palk Strait**
- Almost the entire Sri Lanka, except Jaffna Peninsula in the north and coastal strip in the Northwest is made of hard rocks.
- South – Central part is the highest land.
- Mahaveli Ganga** is the **longest river** which flows northeast and meets the Bay of Bengal
- It has hot and humid climate
- Rainfall divides country in two zones –**
  - Wet Zone**– Southwest of island receives rainfall from both southwest and northeast monsoons.
  - Dry Zone**– Northern and Eastern parts receive rainfall only from Northeast monsoon; inadequate thus falls in the dry zone.
- Agriculture – Most important activity. Rice is the major food crop.



- Tea, rubber and coconut are principal cash crops. Cocoa and Spices are grown for export.
- Graphite and gemstones are Sri Lanka's most valuable mineral products
- **Sea Ports – Trincomalee (Eastern Coast) and Colombo (Western Coast).**
- Kandy is a modern city and is famous Buddhist temple
- Sinhalese and Buddhists are the major groups, they speak Sinhalese. Other major group is of Tamils from India, settled in the northern and eastern parts of Sri Lanka.
- **Sethusamudram Shipping Canal Project** is a proposed project to create a shipping route in the shallow straits between India and Sri Lanka. This would provide a **continuously navigable sea route** around the Indian Peninsula. The channel would be dredged in the Sethusamudram Sea between Tamil Nadu and Sri Lanka, passing through the limestone shoals of Adam's Bridge. The proposed route through the shoals of **Adam's Bridge** is opposed by some groups on religious, environmental and economical grounds.

## **REGIONAL GEOGRAPHY OF EAST ASIA**

### **CHINA**

- World's most populous country (one-fifth of the world population). In area, China is **third largest**.
- Large part of China is **mountainous and arid**, thus it has one of the smallest areas of cultivable land per person in the world
- Intensive agriculture and horticulture is practiced, yield per hectare is high.
- **Rice** is the main crop, grown in southern and central China
- Silk, cotton, tobacco and tea are important cash crops
- **Shanghai is the largest city** of China. It is the **largest port and a big textile centre**.
- Most provinces of North China have coalfields, and Iron ore deposits are abundant in the anthracite fields of Hebei, Shanxi and Shandong.
- Nearly 70% of the energy is produced from coal. China is 2<sup>nd</sup> largest consumer of energy after USA.
- Loess Plateau is made of fine yellow sand called loess.
- Towards east lies the river valleys of Huang He, Chang Jiang and Xi Jiang interspersed with hills.
- Salween and Mekong originate from the eastern part of the plateau of Tibet, they flow into Southeast Asia.
- **Valley of Chang Jiang** is the **largest**.

### **Physiography and Relief**

China consists in broad terms of **3 physiographical divisions**:

- 1 **The Western Highlands:** The lofty mountains in the far west, bordering Szechaun and Yunnan are known as the **Szechuanese Alps** or **Great Snowy Mountains** and towering up to heights in excess of 4500 m culminate in **Minya Gongkar**, 7660 m; from these mountains great plateau and mountain spurs project eastwards, the most important being the separate northern from central China.
- 2 **The Eastern Uplands:** The uplands in the east margining the sea which though once probably connected together now form a series of detached massifs, the **Liaotung, Shantung and Chekiang-Fukien** Uplands, all of which are broken and much denuded.

- 3 The Lowlands:** In between the Western highlands and the Eastern Uplands lie a series of depressions forming the lowlands. These lowlands comprise the **Great Plain Of North China** and the **Middle Yangtze Basin**.

### Drainage

China is a region of **dense stream network**

- One of the contrasts that characterize China's physical environment lies in the **abundance of water** and the dense hydrographic network of the **eastern regions** as compared with the **great aridity** of the **western region**, where surface flows generally toward the exterior,
- The desert regions of the Gobi, the Qaidam basin, part of Dzungaria and the Takla Makan Region are devoid of any constantly flowing streams.
- The **great Chinese rivers**, the Hwang Ho and the Chang Jiang, descend from **Tibet**.
- **Hwang Ho:** Before the plains, the Hwang Ho passes through the **Loess Plateau** at the foot of the Qilian Shan range in Ganshu and Shanxi provinces. Here the river has dug **deep ravines** and carried downstream appreciable quantities of silt. Its irregular now, however, gives rise to unexpected and disastrous silting, often causing the course of its bed to be altered.
- **Yangtze Kiang River:** The **largest** river of China flows in the middle part of eastern China and drains into the East China Sea. **Shanghai** is located on the back of this river.
- **Si Kiang:** Rises in the eastern part of **Yunnan Plateau** flows through the southernmost part of China. It drains into **South China Sea** and its mouth is located near canton.

Major Rivers of China	Drains into
Yangtze Kiange	East China Sea
Hwang Ho or Yellow River	Yellow Sea
Sikiang	South China Sea

- The **Yun Ho (Grand) Canal** connects the Hwang Ho and Chang Jiang (Yangtze Kiang) rivers and runs northward to Beijing. It is the **main inland waterway** of China. Besides the complex network of canals that connect with the rivers, eastern China also has a number of lakes that are part of the inland waterway system.

### Natural Lakes of China

- Because of its **morphology**, China has a considerable number of natural lakes, remnants in many cases of older, more extensive basins, such as those located in the alluvial depressions traversed by the **Yangtze Kiang** (Chang Jiang).
- They are also common in the **interior areas** of western China, where they frequently have a seasonal or permanently brackish character owing to the intense evaporation (Lop Nor in Xinjiang and Qinghai, or Koko Nor, amid the ranges of the Nan Shan).

### Population

- The result of the geographical contrast between east and west is that if a line is drawn from Yunnan province in the south west to Heilungkiang province in the north east (in Manchuria) it is found that about **96% of the population** of China live on the 58% of the land to the east of the line.

- The only areas of **moderately dense population** to the west are where irrigation and lines of communication exist, as along the Kansu corridor or upper Hwang Ho.
- In **1990**, 23% of the world's population lived in China over 90% of these belonged to the dominant **Han people** the remainder comprise 56 small minority groups.
- By 1979, the government, in order to control the population growth, started giving inducements for restricting to **one child per family**.
- In **1987** the government began to relax its rigid policy in response to intermittent outrage about cases of coercion and brutality in implementing population goals. In urban areas, there is still the minimum age for marriage and restricts families to one child. However, a second child is allowed in rural areas if the firstborn is a girl and providing there is a 4 years gap between births.
- China's family size had fallen from 5.8 to 2.4 in 20 years, the figure is 1.7 in urban areas (better education, stronger state control), compared with 2.7 in rural areas.
- One Child Policy** is a population control policy of the People's Republic of China. The policy is enforced at the provincial level through fines that are imposed **based on the income of the family and other factors**. The policy was introduced in **1978** to alleviate social, economic and environmental problems in China. Since implementation in 1979, the one-child policy had many impact on China's demography:
  - It **reduced China's population** by an estimated 400 million people. In addition to creating a **gender imbalance**, numerically favoring men over women, the policy also skewed the age demographic.
  - Economists estimate that **China's elderly population** will increase 60 percent by 2020, even as the working-age population decreases by nearly 35 percent. This type of demographic shift is unprecedented and presents serious challenges to the economic health of the nation.
  - The one-child policy has had several **unintended consequences**, including a dearth of workers, a reduced female population due to gendercide, and fewer young people to take care of a quickly aging population.
  - Moreover, the policy has created conditions conducive to a **severe regional human-trafficking and human-smuggling epidemic** to compensate for the lack of Chinese women. It has already facilitated the practice of mail-order brides and created a burgeoning illegal-adoption market.

## Agriculture

There are **4 distinct production regions**:

- The Hwang Ho Plain:** Essentially a large alluvial plain created by the Hwang Ho River. It is the heartland of Chinese civilization. This lowland area has been under intense cultivation for centuries. The **major crops** produced are wheat, barley, corn, millet, and cotton. The region also produced most of China's apples, and hogs are found nearly everywhere.
- Loess hills of Northern China:** To the west of the Hwang Ho Plain lie the loess hills of Northern China. This region of **wind-blown soil** has been dissected by thousands of gullies, but the flat areas between the miniature canyons are farmed intensively.
- The Chang Jiang drainage basin:** The third major farming region of China is the rice-producing area. Rice is the major crop along the river from the **Szechwan Basin** to Shanghai. The region has also been noted for the production of silk and tea. Mulberry trees for feeding silk worms are still common, although the silk industry has declined.
- South China:** It is the poorest of the four major agricultural regions. The plain surrounding Canton is not large, and the rolling hills give way quickly to non-arable mountains.

## JAPAN

- It is called as '**Nippon**' in Japanese which means '**land of the rising sun**'
- It has 3,900 islands but 4 are large and important
- In **order of their size** they are – **Honshu, Hokkaido, Kyushu and Shikoku**.
- Archipelago forms an arc. Sea of Japan separates it from mainland Asia
- Mountainous area. Mountains account for 72% of Japan's total land area. Most of the mountains are of volcanic origin. **Mt. Fujiyama** near Tokyo is a famous mountain; it has **not erupted since 1707**. However it is **still considered** as an **active volcano**.
- Recreational resorts have **hot-springs**
- Japan lies at the margins of converging Pacific Plate and Eurasian Plate. Therefore earthquakes are frequent here.
- **Lowland area** – Kanto Plain, where lies the cities of Tokyo and Yokohama.
- **Nagoya** is also known as '**Detroit of Japan**' owing to its automobile industry

## Climate

- Mild and varies from place to place. Northern part is colder than the south.
- Winds from Siberia dominate the winter weather and causes heavy snow and rain in the northern and western parts of the country.
- In summers, oceanic winds cause rainfall on eastern and southern parts of Japan
- During September, violent tropical rain-storms originating in Philippines Sea or in the neighborhood of Caroline Islands called **Typhoons** strike the Southern part of Japan frequently.
- Plentiful rainfall and temperate climate produces rich forests and luxurious vegetation that cover the entire countryside.
- **Cold ocean current (Oya Shio)** from north and **the warm ocean current (Kuro Shio)** from the south meet on the eastern coasts of Japan. This **causes thick fog** and creates **ideal condition for fish** to thrive. This area is therefore, one of the **major fishing grounds** of the world (2<sup>nd</sup> largest). It contributes nearly **15% to the total fishing of the world**.

## Natural Resources

- Japan's main **mineral resource is coal**, which is of low grade. Hence basic minerals such as mineral oil, iron-ore, coking coal, and non-ferrous metal ores such as copper, nickel and bauxite have to be imported.
- It depends on **overseas sources** to meet roughly 85% of energy requirements
- Japan **is poorly endowed with** other **natural resources** also.
- Despite these limitations, Japan has emerged as a leading industrial nation of the world owing to highly developed human resources.
- Japan's major exports are automobiles, steel, ships, various kinds of machines and electronic goods.

## Agriculture

- Only 14% of total land of Japan is arable
- Farms are small in size but are intensively cultivated
- Only 7% of population is engaged in agriculture
- Rice is the main crop. Wheat, barley and soyabean are other important food crops.
- Nearly **two third** of the total area of **Japan is forested**

## Industry

- Japan has seen phenomenal industrial development. Many factors contributed to this phenomenal development.
- Japan has developed **hydro-electric power** as supplement of coal.
- The indented coastline has facilitated the development of many **large ports**, which helped import large quantities of raw materials from all over the world.
- Some of the **raw materials** like copper, manganese, as well as silk, kaolin and timber have been fully utilized.
- Nearness of Japan to the densely populated continent of Asia provides a big **readymade market**.
- The high density of population of Japan has proved a boon for the industrial development. Not only the **labour is cheap**, it is skilled as well.
- The extent of **government encouragement** can be imagined by the fact that apart from encouraging the industrialists, it has formulated a technically biased educational system.
- Other factors have been **generous aid from the U.S.A.** in post World War II period, the competitiveness of Japanese industries, technological innovations.
- There are 4 important industrial regions in Japan. They are- the **Kwanto Plain**, the **Kinki Plain**, the **Nagoya region**, and **Northern Kyushu**.

1. **Kwanto Plain:** The Kwanto Plain has attracted the largest urban agglomeration in Japan and in the world and contributes about 30% of nation's industrial output. It is the **largest plain of Japan** and provides ideal sites for setting up of industries. In this plain, **Tokyo** grew originally as a political capital and Yokohama developed as the area's main seaport.

Centres	Important Industries
Tokyo	Electrical engineering industries like television sets, refrigerators, computers.
Yokohama	Engineering, shipbuilding, oil refining, petrochemicals & port industries
Kawasaki	Marine engineering, cement works and glass works
Chiba	Integrated iron and steel works

2. **Kinki Plain:** Japan's 2<sup>nd</sup> largest urban agglomeration & industrial concentration is the Kinki Plain at the head of the **Osaka Bay**. The **3 important cities**- Osaka, Kobe, and Kyoto- together contribute about 20% of the country's industrial output. The local power supplies are inadequate and the region obtains coal from north Kyushu, Hokkaido and abroad.

Centres	Important industries
Osaka	Textiles, plastics, footwear and textile machinery
Kobe	Shipbuilding, oil refining and petrochemical industries
Kyoto	Traditional handicrafts, oriental porcelain, toy lacquer works

3. **Nagoya:** A huge metropolis, Nagoya, has developed as an important industrial centre, on the Nobi Plain at the head of the **Isa Bay**.
4. **Northern Kyushu:** On Northern Kyushu are the **Kitakyushu** (a collective name for several cities including Yawata, Kokura, and Moji) and Fukuoka agglomerations. Here heavy industries have developed on or near the **Chikugo coalfield**. It produces steel,

ships machine parts, chemicals and textiles. **Nagasaki** is also an important industrial centre in the region. Other industrial towns are Hakodate and Sapporo in Hokkaido.

<b>Centres</b>	<b>Important Industries</b>
Muroran	Iron and steel industry
Akita	Oil refinery
Niigata	Oil refinery
Hiroshima	Engineering industry
Kure	Shipbuilding
Okayama	Textiles industry

### Other Facts about Japan

- Japan has **both national and private railroad systems**. The national railroad is devoted mostly to carrying freight, while the private railroads carry mostly passengers.
- Tokyo** is by far the largest Japanese city; the urban area of Tokyo merges into two other millionaire cities of Japan. Kawasaki and its near neighbor, Yokohama, is Japan's second largest.
- The **Tokyo-Yokohama conurbation** contains more than 10% of the people of the entire country.
- Disputed islands with China**- The Senkaku Islands (Diaoyu Islands) are a group of uninhabited islands controlled by Japan in the East China Sea. They are located roughly due east of Mainland China, northeast of Taiwan, west of Okinawa Island, and north of the southwestern end of the Ryukyu Islands. The islands are disputed between China and Japan and between Japan and Taiwan

### People

- Ranks **10<sup>th</sup> in the world** vis-à-vis its **population** size
- It is one of the most densely populated country
- One of the most **urbanized nation** of the world. More than 60% of the population is concentrated in the major metropolitan areas of Tokyo, Yokohama, Osaka, Nagoya and Kitakyushu.
- Equal rights to women** were granted in 1947 and women are the major participants in the development of the nation

### Forest Resources

<b>COUNTRY</b>	<b>LAND UNDER FOREST</b>
S. Korea	64%
North Korea	63.25%
Japan	67%
China	18%
Mongolia	7%

# REGIONAL GEOGRAPHY OF SOUTH-WEST ASIA

## MAIN PHYSIOGRAPHIC FEATURES

- The South-West Asia **consists of the countries** of Iran, Iraq, Syria, Saudi Arabia, Oman, Yemen, Jordan, Israel and Turkey.
- The **main physiographic features** include the Armenian Plateau (between Caspian and Black Sea), Taurus, Pontic Mountains, Zagros and Elburz Mountains.
- Another major feature is the deserts of SW Asia. These include:
  - **Arabian Desert**, which is the continuation of the Sahara Desert covering an area of about 2.6 million km<sup>2</sup> of Arabian Peninsula. Its one-third area is covered with sand dunes, highest in the world.
  - **Iranian Desert**: the second largest

## DRAINAGE

### The Tigris and Euphrates

- The Tigris and Euphrates rivers flow through **Mesopotamia** and the lowland area in Iraq that some consider being the birthplace of civilization.
- **Babylon**, the world's first large city, was located along the Euphrates in the centre of Mesopotamia.
- The two rivers begin in the mountains of Turkey and flow roughly parallel to each other toward the southeast.
- The Euphrates cuts through **Syria**, both rivers flow through Iraq and they eventually empty into the Persian Gulf.
- The **Tigris** is actually a tributary of the Euphrates.
- The land of the Tigris and Euphrates has always been fertile and productive and with the economic property this region is known as '**Fertile Crescent**'.
- The lower part of the river has been used as the international **boundary between Iraq and Iran**, the two countries. **Baghdad**, the capital and largest city of Iraq is located on the banks of the **Tigris** River.

### The Jordan River

- The Jordan River, which is only 240 km, is one of the world's best known rivers because of its **location in the Holy Land** and significance for Christianity.
- Essentially, the river flows from the **Sea of Galilee** southward into the **Dead Sea**.
- The surface of the Dead Sea lies **375 below mean sea level** and the lowest place on earth.

## IRAQ

Covered above with Map

## IRAN

- The country is **bordered** to the northwest by Armenia and Azerbaijan; with Kazakhstan and Russia across the Caspian Sea; to the northeast by Turkmenistan; to the east by Afghanistan and Pakistan; to the south by the Persian Gulf and the Gulf of Oman; and to the west by Turkey and Iraq
- It is the only country that has **both a Caspian Sea and an Indian Ocean coastline**

- Iran has long been of **geostrategic importance** because of its central location in Eurasia and Western Asia, and its proximity to the Strait of Hormuz.
- The **eastern part** consists mostly of desert basins such as the Dasht-e Kavir, Iran's largest desert. The Elburz Mountains in the north rise to 18,603 ft (5,670 m) at Mount Damavend
- Iran is a **major regional and middle power**, exerting considerable influence in international energy security and the world economy through its large reserves of fossil fuels, which include the largest natural gas supply in the world and the fourth-largest proven oil reserves.
- **Ethnic Groups:** Persian 61%, Azeri 16%, Kurd 10%, Lur 6%, Baloch 2%, Arab 2%, Turkmen and Turkic tribes 2%, other 1%



## SYRIA

Covered above with Map

## SAUDI ARABIA

- Saudi Arabia is geographically the **second-largest state** in the Arab world after Algeria.
- Saudi Arabia is **bordered by** Jordan and Iraq to the north, Kuwait to the northeast, Qatar, Bahrain, and the United Arab Emirates to the east, Oman to the southeast, and Yemen to the south.
- It is the only nation with **both a Red Sea coast and a Persian Gulf coast**, and most of its terrain consists of arid inhospitable desert or barren landforms.
- Saudi Arabia occupies about 80% of the **Arabian Peninsula** (the world's largest peninsula)
- There are **virtually no rivers or lakes** in the country, but wadis are numerous. The few fertile areas are to be found in the alluvial deposits in wadis, basins, and oases.

- Saudi Arabia is the **world's largest oil producer and largest exporter**, and controls the world's **second largest hydrocarbon reserves**.
- The **ethnic composition** of Saudi citizens is 90% Arab and 10% Afro-Asian. Most Saudis live in Hejaz (35%), Najd (28%), and the Eastern Province (15%).



## YEMEN

Covered above with Map

## OMAN

- Holding a strategically important position at the mouth of the Persian Gulf, the nation is **bordered by** the United Arab Emirates to the northwest, Saudi Arabia to the west and Yemen to the southwest, and shares marine borders with Iran and Pakistan.
- The **coast** is formed by the Arabian Sea on the southeast and the Gulf of Oman on the northeast.
- The **Madha and Musandam exclaves** are surrounded by the UAE on their land borders, with the Strait of Hormuz and Gulf of Oman forming Musandam's coastal boundaries.
- **Tourism** is the fastest-growing industry in Oman.
- **Omani people** are predominantly Arab, Baluchi, South Asian (Indian, Pakistani, Sri Lankan, Bangladeshi), and African ethnic groups

## JORDAN

- Jordan is **bordered by** Saudi Arabia to the south and east, Iraq to the north-east, Syria to the north, and Israel and Palestine to the west.

- Jordan is **landlocked** except at its southern extremity, where nearly 26 kilometres (16 mi) of shoreline along the Gulf of Aqaba provide access to the Red Sea.
- The **Jordan Rift Valley** of the Jordan River separates Jordan from Israel and the Palestinian Territories. The highest point in the country is Jabal Umm al Dami
- The **Jordan River** is short, before reaching Jordanian territory the river forms the Sea of Galilee
- Jordan is classified by the World Bank as a country of "upper-middle income".
- **Phosphate mines** in the south have made Jordan one of the largest producers and exporters of this mineral in the world
- The vast majority of **Jordanians** are Arabs, accounting for 95–97% of the population



## ISRAEL

- Israel is a country in West Asia, situated at the **southeastern shore of the Mediterranean Sea** and the northern shore of the Gulf of Aqaba in the Red Sea.
- It **shares land borders** with Lebanon to the north, Syria in the northeast, Jordan on the east, the Palestinian territories (which are claimed by the State of Palestine and are partially controlled by Israel) comprising the **West Bank and Gaza Strip** to the east and west, respectively, and Egypt to the southwest.
- Israeli **sovereignty over Jerusalem** is internationally disputed.
- The **Jordan River** runs along the Jordan Rift Valley, from Mount Hermon through the Hulah Valley and the Sea of Galilee to the Dead Sea, the lowest point on the surface of the Earth
- The Jordan Rift Valley is the result of tectonic movements within the **Dead Sea Transform** (DSF) fault system.
- Israel is considered the **most advanced country in Southwest Asia** and the Middle East in economic and industrial development.

- Israel is a global leader in **water conservation and geothermal energy**, and its development of cutting-edge technologies in software, communications.
- 74.9% **population** are Jews and 20.7% of the population comprised of Arabs.



## TURKEY

- Turkey is **bordered by eight countries**: Syria and Iraq to the south; Iran, Armenia, and the Azerbaijani exclave of Nakhchivan to the east; Georgia to the northeast; Bulgaria to the northwest; and Greece to the west.
- The **Black Sea** is to the north, the Mediterranean Sea to the south, and the Aegean Sea to the west.
- The **Bosphorus, the Sea of Marmara, and the Dardanelles** demarcate the boundary between Thrace and Anatolia; they also separate Europe and Asia.
- Turkey's location at the **crossroads of Europe and Asia** makes it a country of significant geostrategic importance.
- Turkey has a sizeable **automotive industry**

- The majority of the **Turkish population** are of Turkish ethnicity. They are estimated at 70–75 percent
- The **three "Non-Muslim" minority groups** claimed to be officially recognized in the Treaty of Lausanne are Armenians, Greeks and Jews.



# **GEOGRAPHY THEORY**

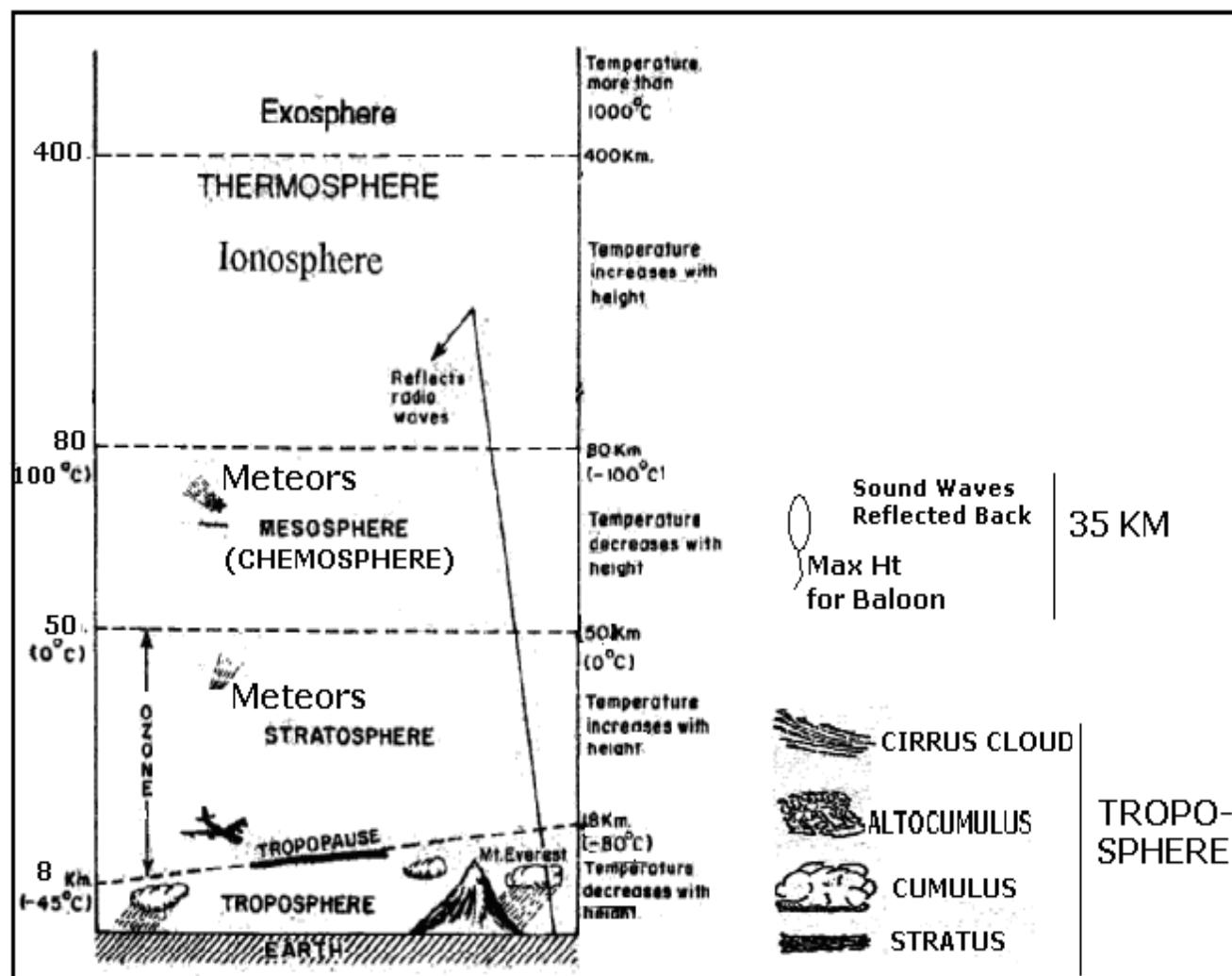


# ATMOSPHERE AND ITS TEMPERATURE

## LAYERS OF ATMOSPHERE

### Troposphere

- Layer immediately above the surface of earth & the **most important**.
- Height varies from 8 Km at poles to 18 Km at equator and height is **more in summer**
- Here **temperature decreases** with height at the rate of 1 degree for each 165 m rise. This is called normal **lapse rate**. At poles, it is  $-45^{\circ}\text{C}$  while at equator; it is  $-80^{\circ}\text{C}$ . It is a paradox that **lowest temperature** in the atmosphere lies **above equator** & not poles.
- **Densest** part of Atmosphere. All dust particles and water vapours of Atmosphere are found here, hence **weather phenomenon**.
- Mountains, **hot air balloon** etc are limited to this layer.
- **Jet aeroplanes avoid this layer** due to presence of bumpy air pockets & fly in Stratosphere



### Stratosphere

- Layer immediately above Troposphere, separated from it by **tropopause**.

- Extends upto **50 Km**, **temperature rises** with height here.
- **Ozone** layer is concentrated over here.
- **Clouds**, water vapour and dust are **absent** here.
- **Shooting Star**, Weather balloon.

### Mesosphere

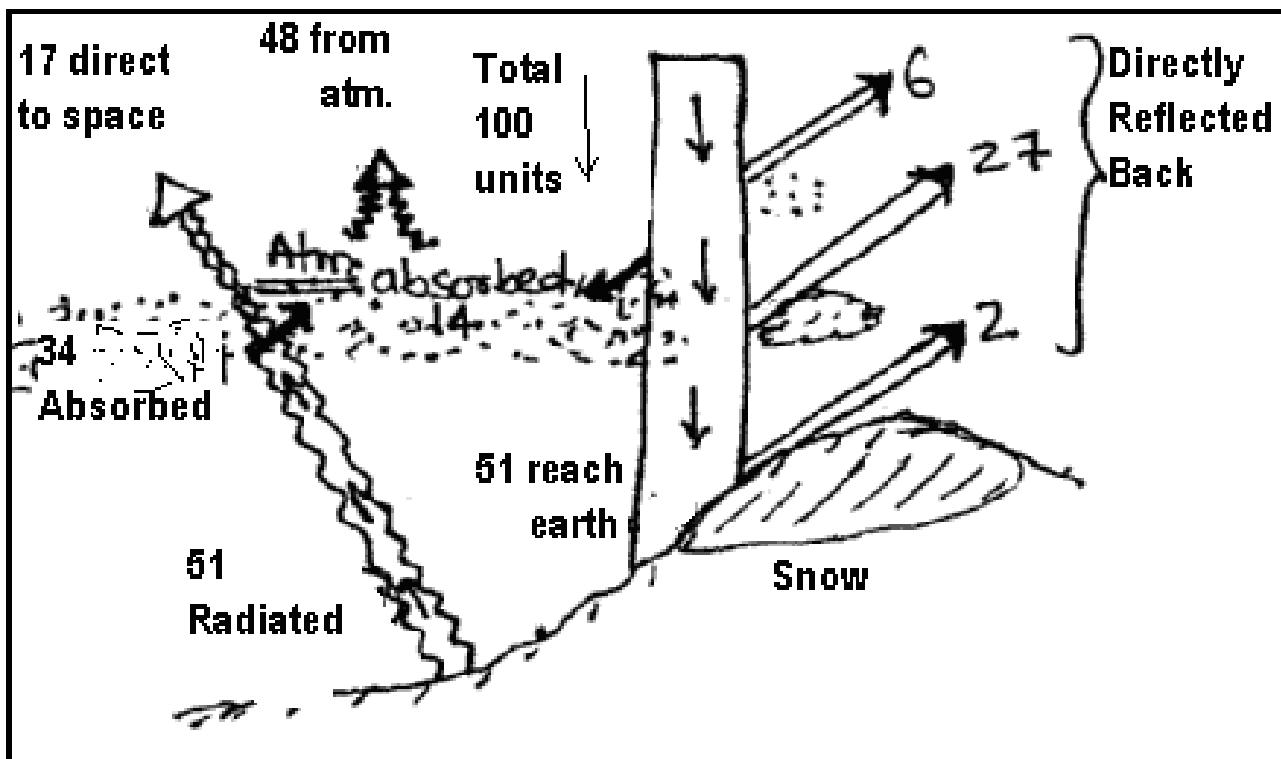
- Extends upto **80 Km** wherein **temperature decreases** with height (-100°C)

### Thermosphere

- Contains **electrically charged** layer **Ionosphere**. **Space Shuttle**, **Satellite** Aurora lie here.
- **Radio waves** transmitted from earth are **reflected back** by this layer.
- **Temperature here increases** with height due to radiation from sun.
- Upper part of it is called **exosphere**, which is highly **rarefied**.

### INSOLATION

- It is the amount of **Solar Radiation** received by the earth.
- The atmosphere is **heated mainly from below** by the heated surface of the earth. That is why the temperature in lower parts of atmosphere is usually higher.
- Atmosphere is heated more by **terrestrial radiation** than by incoming solar radiation.
- Factors that influence insolation are the Angle of sun's ray and the duration of a day.
- At Noon, sunrays strike earth's surface vertically, therefore, more heat. At morning and evening, it strikes obliquely. Heating effect of vertical rays is more than that of oblique ones.
- The sun's rays are almost vertical in lower latitudes. At poles, rays are more oblique.
- The amount of Insolation during summer is more than it is in winters.



- Temperature of Air Decreases with-
  1. Increase in latitudes. As we go away from equator, it is cooler.
  2. Height or Altitudes.
  3. Temperature is also influenced by distance of a place from sea. Maritime places having equable temperature during winters and summer. While continental places have extremes of temperature.

## **Temrature Contrasts On Land**

- **Land heats more rapidly** and to higher temperatures than water, and **cools more rapidly** and to lower temperatures than water.
- Reasons for the differential heating of land and water include the following:
  - **water is a liquid** and is mixed by waves and currents, while soil or rock are fixed; hence, heat is distributed through a **larger thickness** (mass) of water than land;
  - **land is opaque**, so all radiant energy is absorbed in a shallow surface layer, while water is more transparent, allowing solar radiation to penetrate to greater depths;
  - the **specific heat of water is higher** than the specific heat of land; and
  - **Evaporation is greater** from a water surface than that from a land surface.
- The atmosphere is heated chiefly by radiation from Earth's surface. Therefore, to understand variations in air temperatures, we must understand the **heating properties of various surfaces**.
- The annual **temperature range near the equator is very low**. With an increase in latitude, the annual temperature range **increases**.
- Reasons for the low annual range in the tropics include the following:
  - this region always has a fairly high noon-Sun angle (lowest noon-Sun angle at  $0^\circ$  is  $66\frac{1}{2}^\circ$ ) and
  - The tropics have more uniform lengths of daylight throughout the year.
- Places in the **middle and high latitudes**, however, have much **greater seasonal variations** in Sun angle and length of daylight, causing these locations to have much **greater annual temperature ranges**.
- The city along the windward coast will experience a relatively small annual temperature range because of strong marine influence.
- **The interior city will have the highest annual range** among the three cities because of its continental position.
- Because the winds are directed from the land toward the ocean, the city located along the leeward coast will **not experience a strong marine influence** and therefore will have an annual temperature range that is more similar to that of the interior city.

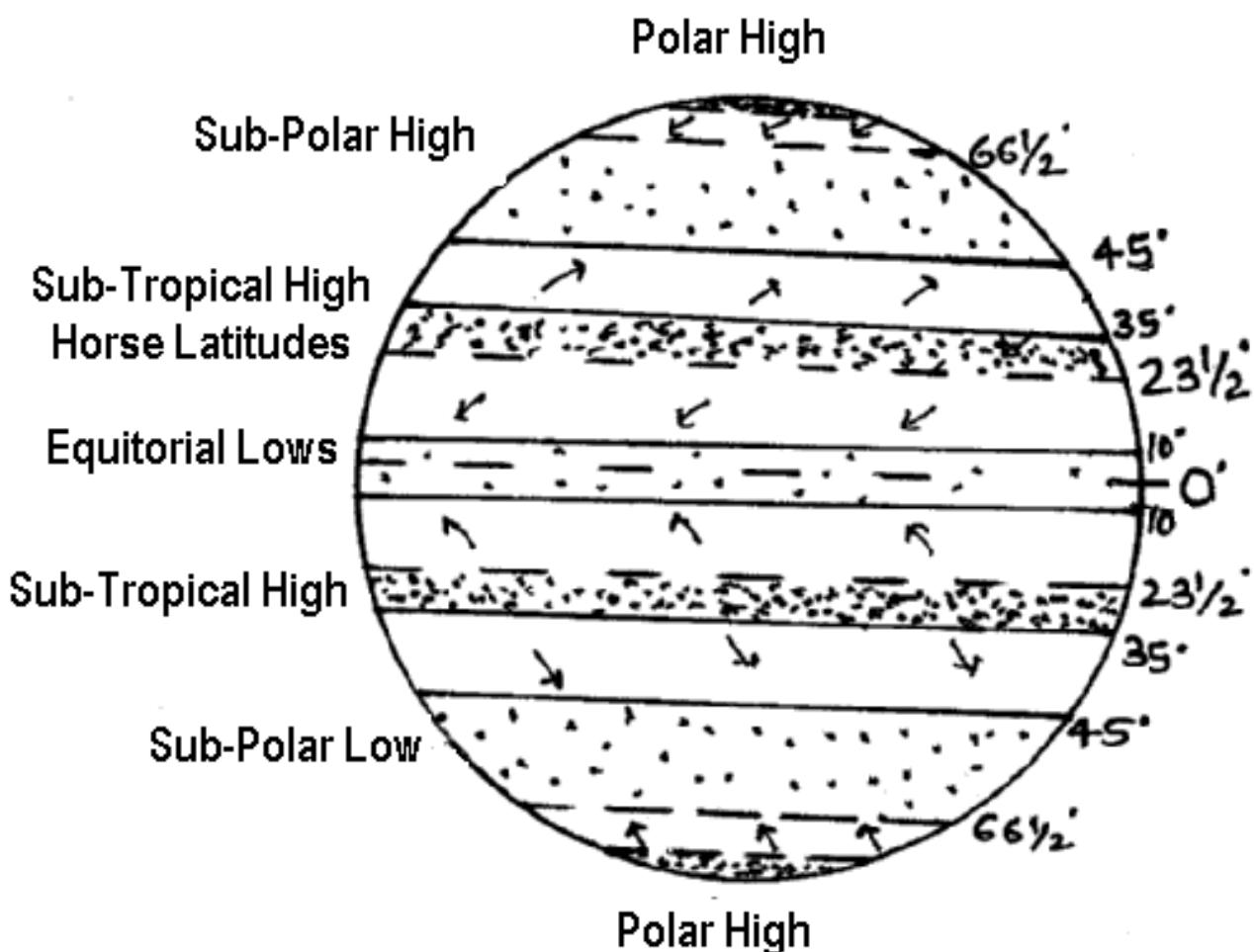
## **ATMOSPHERIC PRESSURE AND WINDS**

### **Equator Low**

- Temperature is high throughout year near equator. As a result lower layers get heated up and air rises to create low pressure zone.
- Extends between  **$10^\circ$  N&S**, characterized by extreme calm conditions called **Doldrums**.

### **Polar High**

- They are cold throughout year, subsidence of air takes place. Therefore Polar Highs.

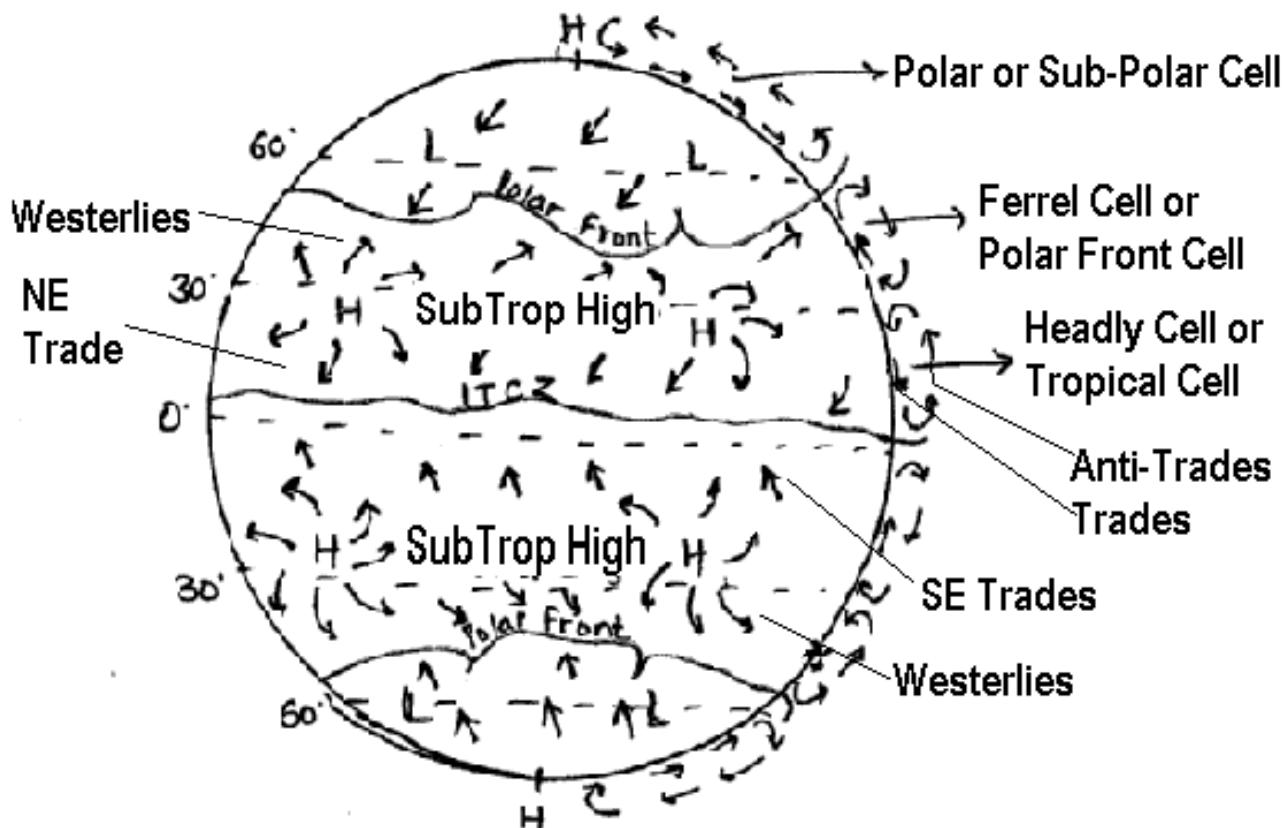


### **Sub Polar Low**

- Located between **45° N&S of Arctic & Antarctic Circles**.
- Here winds from polar and sub-tropical high pressure belts meet & rise up, creating low conditions.
- Due to high contrast in temperature between the two winds, **cyclonic conditions** are created in this zone.

### **Subtropical High**

- Rising air at equator cools down after reaching upper parts. The air starts sinking near **30°N, 30°S** and piles up there. That is why world's **tropical deserts** are located here.
- Characterized by **calm conditions** with variable and feeble winds.
- Also known as **Horse Latitudes**.
- From Sub-Tropical High to **Equatorial Low**, blow extremely steady winds called **Trade Winds**. Due to **Coriolis force**, these winds are deflected to right in the Northern Hemisphere and to left in the Southern Hemisphere.
- From Sub-Tropical High to **sub-Polar low**, blow the **Westerlies**. The Westerlies of **southern hemisphere** are **stronger** and more constant in direction because of the huge expense of water. These are best developed between **40°S to 65°S**, therefore called as **Roaring Forties, Furious Fifties and Shrieking Sixties**.



### Periodic and Local Winds

- **Monsoon Winds** are those winds, which reverse their direction with the change in season. Blow from Land to Sea in winter and Sea to Land in summer. Weak Monsoons exist over South West USA, Australia, South America, China, Japan and Parts of Africa.
- **Katabatic Wind** - During winters, areas adjacent to highland experience a local **cold** wind called katabatic wind (moving down from snowcapped mountains to valley). Very cold and dry e.g. **Mistral** over France **from Alps** flows through Rhone Valley towards Mediterranean Sea. It brings **temperature below freezing**.
- **Foehn** (in **Alps**) and **Chinook** (in USA & Canada in **Rockies**) are other **local** winds of importance, which blow down the mountains and get warm up. In the process, these melt the snow and hasten **ripening of grapes** (in Alps) and benefit ranchers in Rockies. **Chinook** is also called **snow-eater**.
- Local Wind in India – Loo (hot, dry and dusty wind)

### WATER IN THE AIR

- Water vapours are present in large amount in low latitudes and over oceans. These are less over polar areas and land. Water vapour content varies with seasons & altitudes as well.
- **Evaporation** – Highest during hot dry and windy conditions and lowest during cool, moist and calm weathers.
- **Humidity** is the amount of water vapour present in Air.
- When the air holds the maximum amount of water vapours it can carry at a given temperature, it is called **saturated**.
- Unsaturated air may become saturated if cooled. The phenomenon of rain, snow etc. happens due to same reason as it goes up.

- **Dew Point** is the temperature at which **air gets saturated**. At dew point, water vapour changes into minute droplets of water or ice crystals. This is called **condensation**.
- **Dust** in the atmosphere serves as surfaces for condensation, known as **condensation nuclear**.

### **Forms of Condensation**

- **Dew**: In **cold**, clear **nights** when comparatively **warm, moist air** comes in contact with **cold objects**, it cools down. The excess of moisture condenses into droplets of water called Dew. Frozen dew is called **Frost**.
- **Clouds**: The visible aggregates of minute droplets of water or ice crystals are known as clouds. These are of major 10 types:
  - **Low** Clouds (<2000m height): Stratocumulus, Stratus, Nimbostratus, Cumulus and Cumulonimbus.
  - **Medium** Clouds (2000-6000 m): Altocumulus and Altostratus
  - **High** Clouds (6000-12000 m): Cirrus, Cirrostratus and Cirrocumulus
  - **Cirrus** clouds are composed of **ice crystals** and give a **fibrous** & feathery appearance.
  - **Cumulus** clouds have a **flat base & dome shaped**/ cauliflower structure.
  - **Stratus** clouds are like **sheets**.
- **Fog**: is the cloud very near to the surface of earth. Created because of the cooling of air adjacent to the cold ground.
- Falling of this solid and liquid water on earth's surface is called **Precipitation** e.g. Rain, Snow, Hail.
- In calm air, the drops are very small called **Drizzle**.
- When condensation in air takes places at a temperature below freezing point, the water vapour changes into tiny ice crystals or flakes called **snowfall**.
- Sometimes **powerful air currents** may lift raindrops to a greater height, where temperature is below freezing point. Rain drops freezes. Currents may toss those frozen drops up again. The coating of water is frozen in concentric layer. This process repeated so many times and fall as **Hailstones**.
- At Equators, when land is heated, air is also heated & rises up. If moist, increase in height leads to cooling of air and its condensation, and therefore heavy rainfall.
- At Mid Latitudes, when wind blows from all sides towards centre of Low Pressure, they have spiral motion of air. If air has moisture, sudden uplifting of warm air may lead to rainfall.
- **Weather** is the state of Atmosphere at **any given place and time**, while **Climate** is the average weather of a place over a period of **30-35 years** or more.
- **Mercury or Alcohol** (at cold places like Russia) is used in **Thermometers**.
- **Six's Max And Min Thermometer** – Used to find out maximum and minimum temperature of a place within 24 hr. Thermograph s the instrument that continuously records temperature.
- Barometer/ **Aneroid Barometer** (without liquid) is used to measure atmospheric pressure (in milibars). **Anemometer** is used to find wind speed (km/hr). Anemograph records wind speed automatically.

# TROPICAL CYCLONES

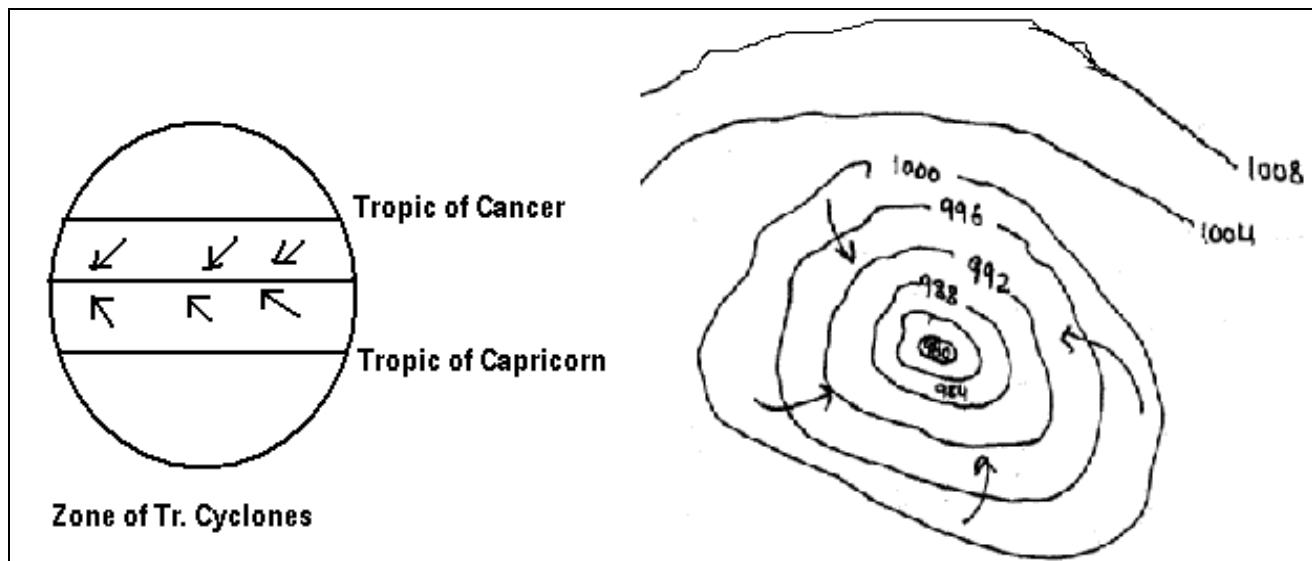
Man-nature interaction has yet another face where nature dominates over man as in the case of environmental hazards like cyclones. Though man has a little control over these natural processes, an understanding of these forces gives man a chance of exerting at least some limited control and make living condition safer. Tropical cyclones are the **low-pressure high velocity wind systems** originating within the tropics over the oceans. After their formation, these move towards land areas and cause high hue and cry.

## Causes

Ideal Conditions for formation of cyclones are **high temperature, quite air and highly saturated atmosphere**. These conditions prevail as:

- |                                |                             |
|--------------------------------|-----------------------------|
| a) High Temperature            | - Tropics: $27^{\circ}$ C   |
| b) Quite Air                   | - Equitorial doldrums       |
| c) Highly saturated atmosphere | - Western margins of oceans |

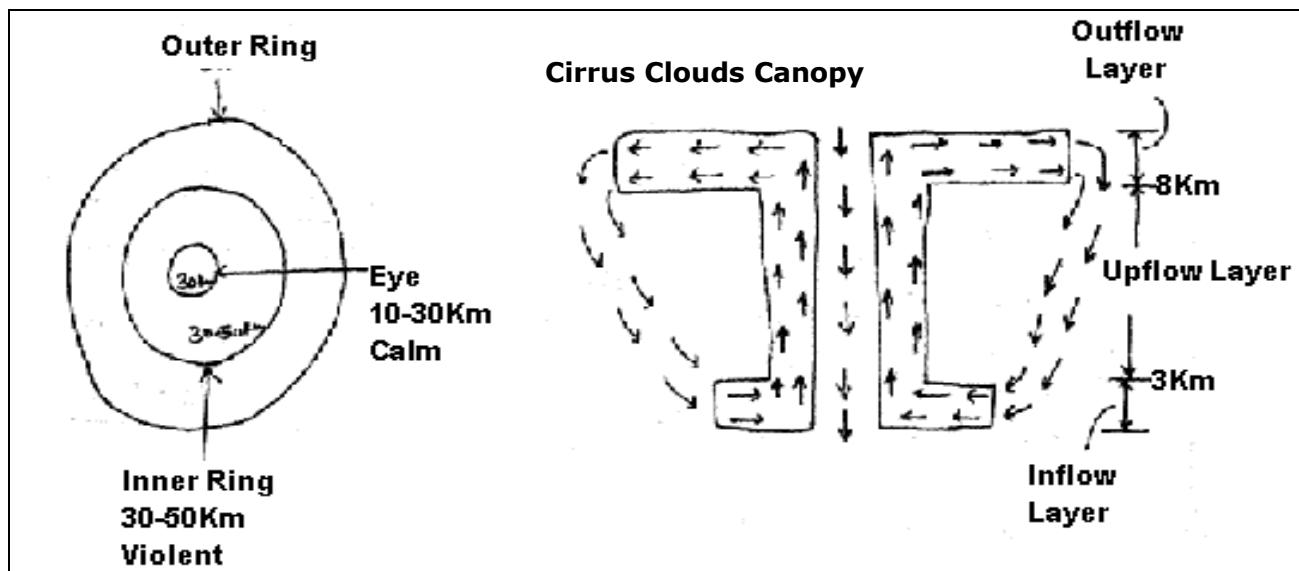
These conditions exist in Equitorial doldrums along the western margins of the oceans. Here **warm currents** supply abundance of moisture and saturate the air above. **Trade winds** continuously replace this saturated air. **Coriolis force** provides the required torque to the rising moisture and it moves towards land because of differential heating of land and sea. **Whirling movement** is enhanced when doldrums are farthest from equator (August/September in Northern hemisphere and March/ April in Southern hemisphere).



## Structure/ Characteristics

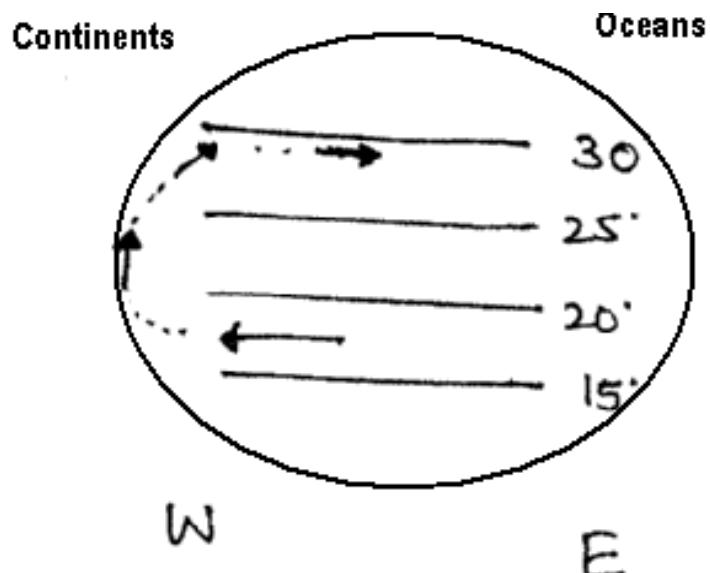
- **Isobars** are circular and close – means there is a steep pressure gradient
- **Diameter** of the whole cyclone varies from 150 to 300 km
- The center of the storm is called **Eye** having a restricted diameter of about **30 km**. In the eye, atmospheric pressure is excessively low. **Subsidence of air** takes place here causing calm air and clear sky.

- **Inner Ring:** violent winds of speed 120 km/hr circulate around the eye. **Wind is upwelling** here, forming a sort of Eye Wall. It is 30-50 km wide with torrential rainfall, thunderstorm and lightening.
- The **outer ring** i.e. area outside inner ring is characterized by **reduced rainfall** and wind speeds.
- The winds are **anticlockwise in NH**, reverse in SH. Winds move towards the core, and veer to right.



### Movement

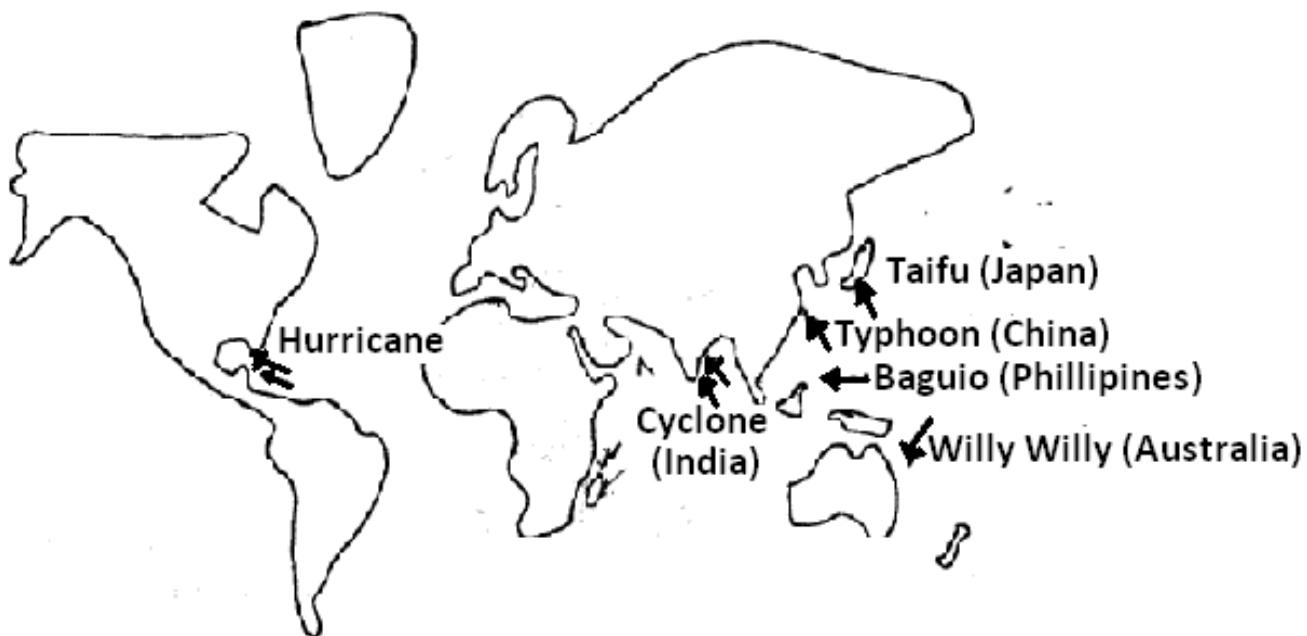
Follow fairly **well defined track**, moving at a speed of 15-25 km/hr covering a distance of 300-500 km a day. At about **20° latitude**, these move westward, then pole-ward between 20°-25° latitudes. Between 25°-30° latitude, these first move in north-easterly direction and then finally turn eastwards.



### Distribution on World Map

In the different region of tropical areas, these are known by different names

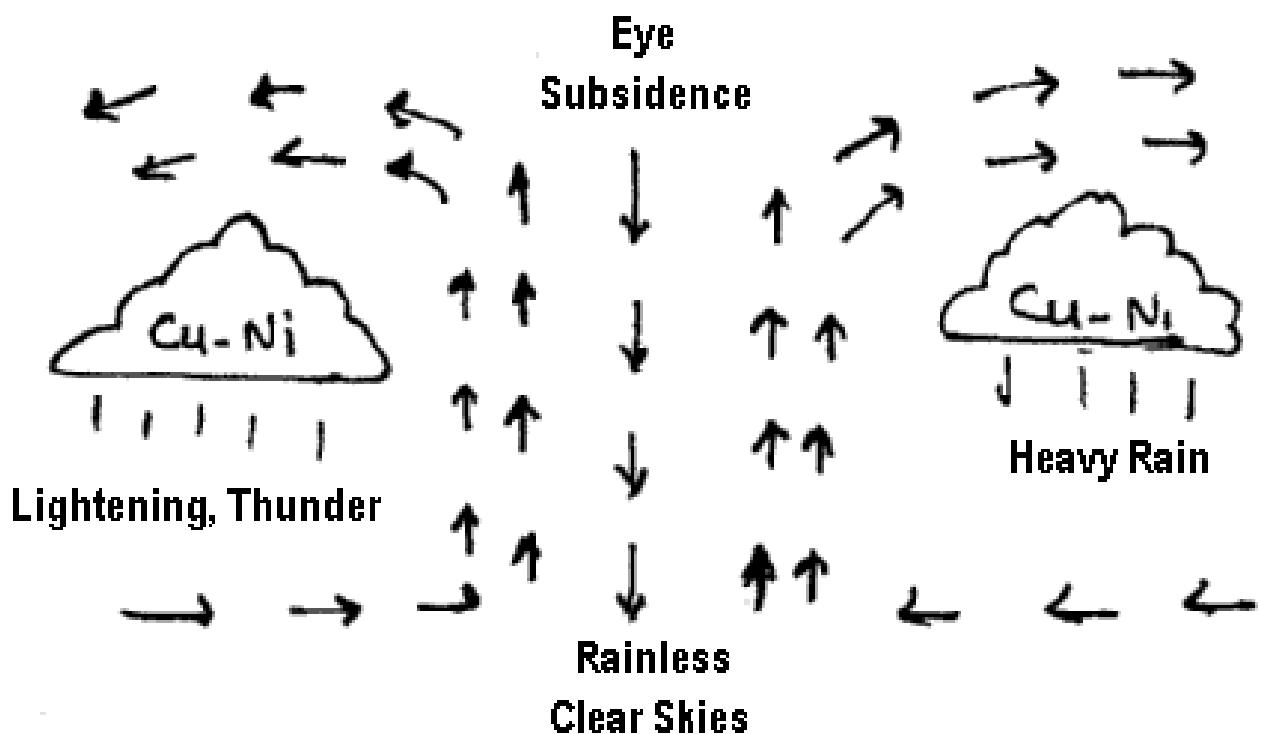
- **Tropical Disturbance:** Caribbean and Gulf of Mexico. Weak, sluggish, many times stationary
- **Tropical Depression:** India & North Australia. Close isobars, small size, Gale force
- **Tropical Storm:** Bay of Bengal & Arabian Sea. Closed isobars, circular, strong cyclones
- **Hurricanes/ Typhoons/ Willy-Willy/ Taifu:** China, Japan, USA, and Korea. Closed isobars, circular, violent heavy rain, feeble eye.
- **INDIAN ASPECT:** Tropical depression (or if intensified, tropical cyclones) form in Bay of Bengal. Each monsoon month has 1-4 of tropical depressions. These travel along ITCZ whose position keeps on changing because of changing pressure conditions. Much of rainfall in North and North West India occurs because of these. Maximum rainfall takes place along its path & goes on decreasing North & North West.



### Associated Weather

Tropical Cyclones show a pattern of weather change with their consequent movement. Each part of the cyclones is associated with a particular kind of weather phenomenon.

- When the **cyclone arrives**, **Eye Wall weather conditions** prevail with 100-250 mm rainfall in one storm along with lightning. It prevails for few hours with cumulonimbus (Cu-Ni) clouds.
- When **Eye arrives**, the weather is calm, sky is clear and rain stops. It takes around  $\frac{1}{2}$  hr for the eye to pass.
- When **Eye passes**, same weather conditions as that of arrival prevail with winds in opposite direction.
- Heavy rain continues even after winds become weak.
- The **energy of cyclones dissipates** as these moves landward because the source of energy (i.e. ocean) is cut off. The latent heat of condensation of cumulonimbus clouds provide them required energy. This is the reason that **maximum damage caused by cyclones is in coastal areas** as they fail to move too inside the land, and move back towards oceans in a curved trajectory.



### Impact

- These are very severe and disastrous natural hazards inflicting heavy loss to human and animal life alongwith crops, property and communication network. Trees are uprooted, economy is shattered and the people are left forever in trauma. Cause havoc in coastal areas. Approximately 80 Tropical Cyclones occur every year. Rainfall of 25cm/day is common.
- **Orissa cyclone** (1999) claimed 1 lakh precious lives while a similar cyclone in 1731 caused > 3 lakh deaths.
- Sea waves rise to a height of 20 m and cause damage by landward movement
- The storm surge is responsible for the greatest damage, 90% of the death are attributable to the sudden deluge owing to the instantaneous onrush of water and rise in water level with hurricane winds.
- River mouth appears to be the preferred areas of landfall of most cyclones, that too at the high tide epoch. The river mouths are usually flat alluvial plain devoid of trees, facilitating rapid and easy inflow of water.
- In **June 2010**, Cyclone **Agatha** struck the Mexico coast killing many hundred people.
- **Cyclone Phet** struck the Pakistan's Arabian Coast and adjoining countries in **2010** affecting many thousand people.

## THUNDER AND LIGHTENING

- Most thunderstorms occur from massively tall **cumulonimbus clouds**. The sun warms moist air near the earth's surface, and makes it rise. As this air moves upwards, it cools and can condense to form cumulus clouds. The **small, white fluffy cumulus clouds** can group together and form one larger cumulonimbus cloud if there is enough rising warm air.
- If tall enough to reach the cooler air of the stratosphere, strong winds may widen the top of the **cumulonimbus cloud**. This may have the appearance of a top-heavy, flattened, anvil shape and is a good indicator that a thunderstorm is on its way.
- The way thunderstorms form mean they are more common in the afternoons of **tropical regions** where there is more moist, warm air and more heat to make it rise. Most parts of the world have thunderstorms, especially mountainous areas, which help form **cumulonimbus clouds with increased uplift of air**. Only hot, dry deserts and extremely cold Polar Regions rarely see thunderstorms.

### Thunder

- Thunder is the rumbling or **crack of sound** that can usually be heard from the sky during a storm. Thunder is caused because lightning heats up the air, to about  $30\ 000^{\circ}\text{C}$ , causing it to expand quickly. The rumbling occurs as the sound passes through atmospheric layers at different temperatures.

### Lightning

- Lightning is thought to be due to the formation of **ice crystals in the top layers of the cumulonimbus** cloud as it reaches a cooler part of the atmosphere called the **stratosphere**.
- As these crystals bump into each other a tiny bit of **electrical energy**, (charge) may be created within a larger, storm-wide, electrical field. It works a bit like static electricity on your hair from a jumper, or from a desk chair wheeled across a carpet.
- Light, positive charged ice and water gathers at the top of the cloud and the heavier negative particles gather at the base. The ground below is **also positively charged**. The difference in electrical charges can become so great that energy is released as lightning.
- A typical discharge is usually **about 1.5 million volts and** most of this is changed into heat energy. Although these high temperatures only last a millenth of a second it is enough to vapourise the fluid of a tree and cause it to explode.
- Although lightning appears to move from clouds to the ground, the flash we see is actually returning to the storm clouds. Lightning can be **sheet lightning** occurring within the cloud or fork lightning between clouds. Lightning sensors have been used to track lightning since the 1980s. Satellites have been used to collect long-term data on all lightning since the 1990s, and the global average has been calculated at 30 – 40 flashes per second.
- **90% of lightning never reaches the ground**, but when it does it can strike twice.
- The Empire State Building in New York has been hit **48 times in one day**. Single trees on high, exposed ground are likely to be hit by lightning. You are safe inside a car as lightning is carried to the ground through the metal body of the car instead of through the person inside.

# TEMPERATE CYCLONES

(Extra-Tropical Cyclones/ Wave Cyclones/ Depressions/ Troughs/ Low Cyclones)

The **low-pressure wind systems blowing inwards in the extra-tropical regions** are known as temperate cyclones. These influence the weather conditions of the areas where these move and cause a significant impact on economics of these regions. These originate **both over land and ocean**, and move **anticlockwise in northern hemisphere** and clockwise in southern hemisphere. The causes of their origin could be-

1. Dynamic i.e. confluence of contrasting polar and tropical air masses and
2. Thermodynamic i.e. insolation of landmasses in summer

## ORIGIN OF TEMPERATE CYCLONES

### Thermodynamic Origin/ Insolation Cyclones

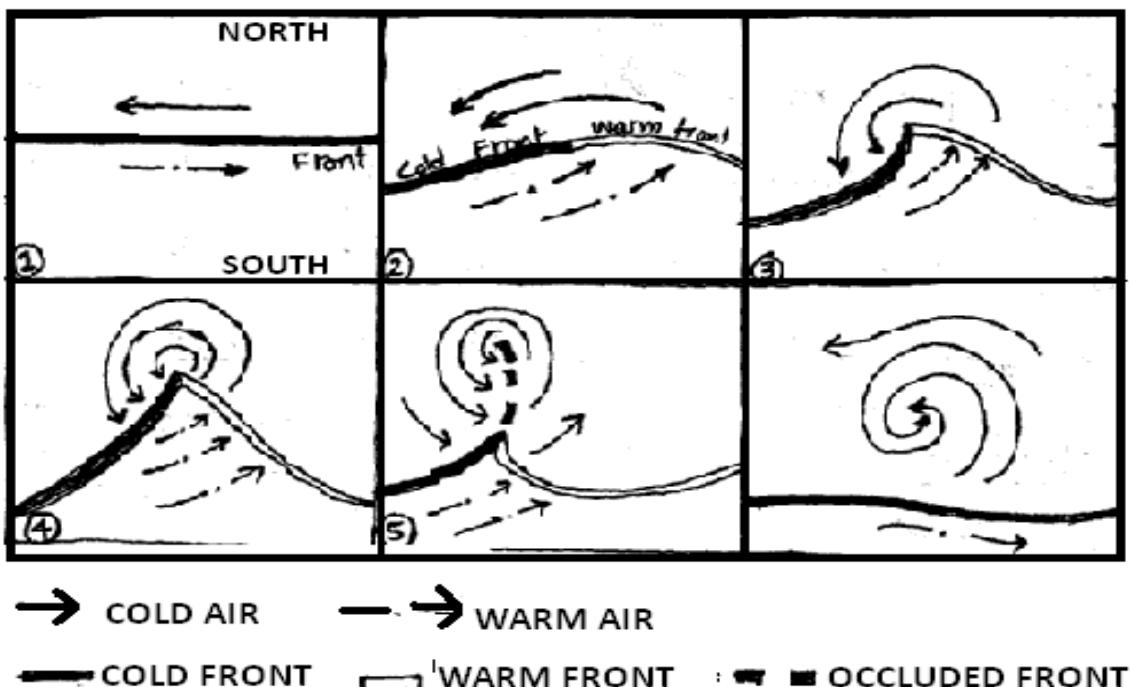
**Brunt Theory/ Humphreys Theory** provides an explanation to their origin. **In summer**, the sunrays heat up the huge landmasses in temperate zones viz. **North America, and Russia**. This creates **low pressure** over these areas and attracts winds from all direction, thus developing cyclones. These are **stationary over the areas of their formation**. These are formed over Iberian Peninsula, Alaska, SW USA and North-West Australia. Similar formation takes place **over oceans during winters** as low pressure develops over them surrounded by high-pressure cold airmasses over land. In winter, these are formed over Okhotsk Sea, Norwegian Sea, and North Atlantic.

### Dynamic Origin

**Polar Front Theory (PFT) of Bjerknes** provides fundamental explanation to the origin of temperate cyclones. **Convergence of two contrasting airmasses**- One, cold and dry polar airmass and other, warm, moist and maritime tropical airmass takes place. This leads to **formation of fronts**. The cold airmass pushes the warm air upwards. The **up-moving warm air creates a low-pressure shaft**, which attracts air from surroundings. The **earth's rotation** causes the winds to rotate and cyclonic formation takes place as shown in diagram. Polar Front Theory is an explanation of **Frontogenesis and Frontolysis**. Frontogenesis is **coming together of air masses** and formation of depression. Frontolysis is **horizontal divergence of air from frontal zone**, together with subsidence and gradual dissipation of frontal zone.

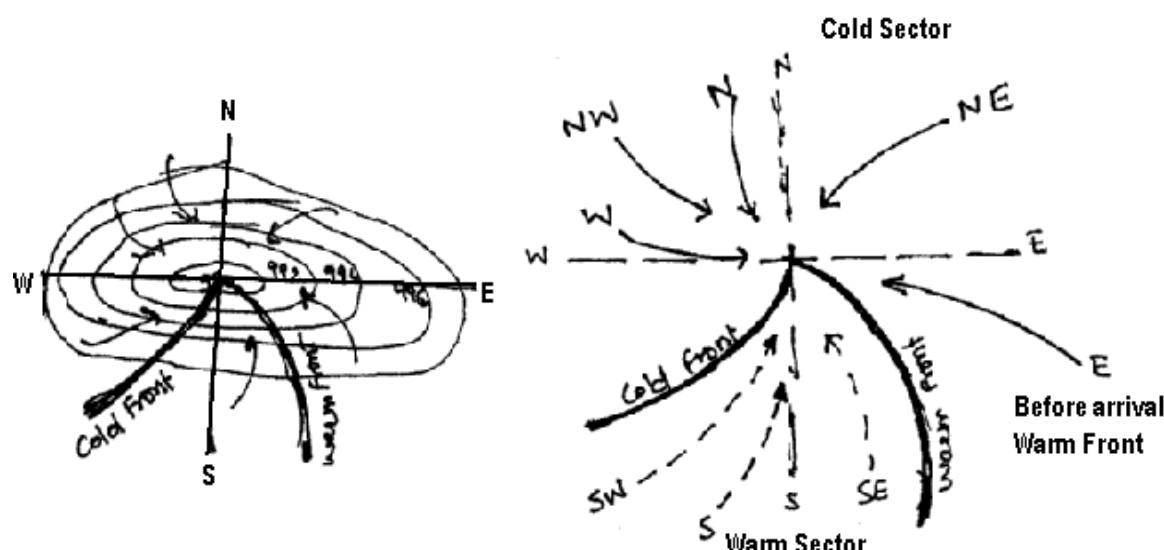
1. Two air masses with contrasting physical properties move parallel to each other and a stationary front is created
2. Warm and cold air masses penetrate into the territories of each other and a wave like front is formed. This is called **incipient stage**.
3. Cyclone becomes fully developed and isobars become almost circular. This is called **mature stage**.
4. Low pressure accompanied by convergence and rising air at the center and along the front. Cold front overtakes warm front.
5. Cold front finally overtakes the warm front and an occluded front is formed.
6. Warm sector completely disappears, occluded front is eliminated and ultimately cyclone dies out.

### "Life Cycle of cyclone"



### CHARACTERISTICS OF TEMPERATE CYCLONES

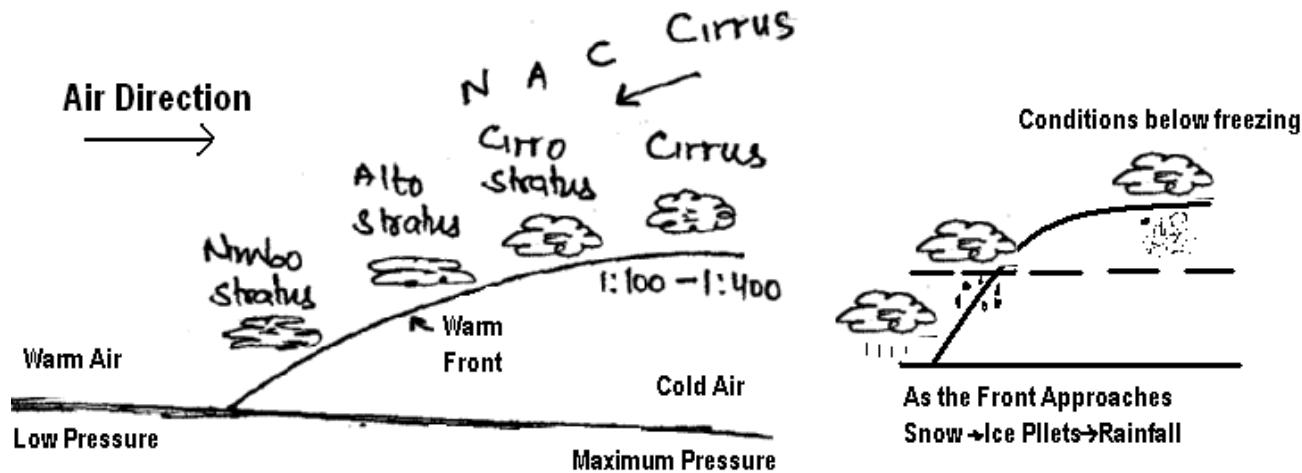
- **Size and Shape:** Isobars are oval or elongated in shape. In exceptional cases, these are circular. Their diameter varies from 150-3000 km.
- **Structure:** Lowest pressure occurs near the center. Winds rotate in anticlockwise direction in NH and clockwise in SH around the center.
- As it is formed by convergence of two contrasting airmasses, therefore, there is **variation in nature and direction of winds in different parts**. Tropical part is of westerly direction, polar part of easterly direction.
- **Movement and Direction:** These may be practically stationary or moving at 1000 km/day. **General direction of movement is west to east** in mid-latitudes under the influence of Westerlies. **Speed greater in winter** than in summer.
- **Warm front and warm sector** characterized by warm southerly and southwesterly winds which changes to west, north westerly and north at arrival of cold front and cold sector.



## ASSOCIATED WEATHER

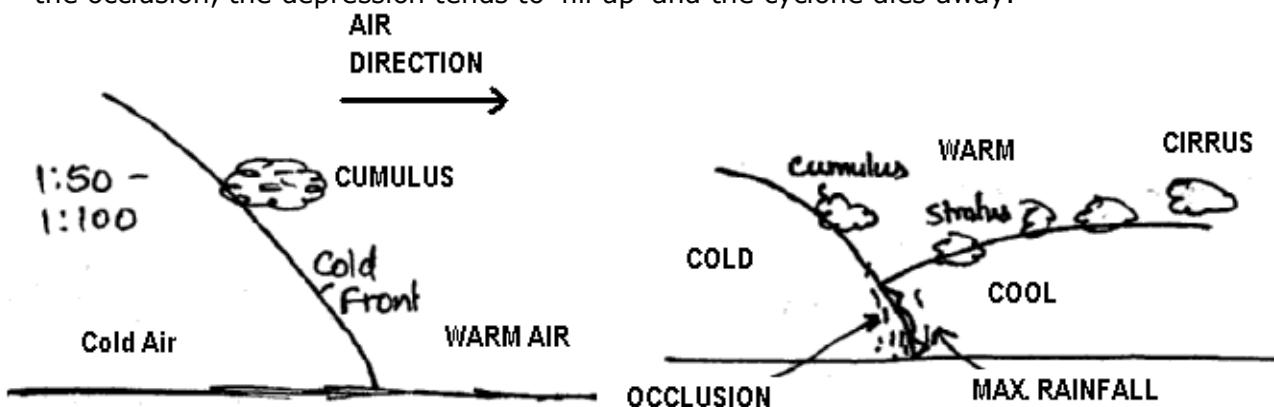
As the cyclone advances, the passage of each front is associated with a distinctive sequence of cloud, rain and temperature change. Because of convergence of two contrasting airmasses, different temperatures in different parts prevail. There is **dominance of warm air in southern parts**, while low temperatures occur in north, northeast and north-west. Western parts have the lowest temperatures.

- **Before the arrival of cyclone**, the **high wispy cirrus clouds** appear first on the western horizon.
- As the **front approaches**, **clouds lower and thicken** and the sky becomes overcast with cirrostratus, altostratus and nimbostratus clouds. The **warm front precipitation** continues for 2-3 days, moderate but spread over large areas. The wind direction changes from southeast to south. The wind coming from south is relatively warmer.



Warm air rises at this place, thereby creating a vacuum, which is readily filled by cold air, and so maximum wind speed. Further, since **there are no cumulous clouds** formed, precipitation is not very heavy. Further, cold air has lesser moisture holding capacity. Dew point is reached fast and thus condensation in cold air takes place in the form of fogs. Raindrops freeze as these travel through cold air and fall in the form of ice pellets.

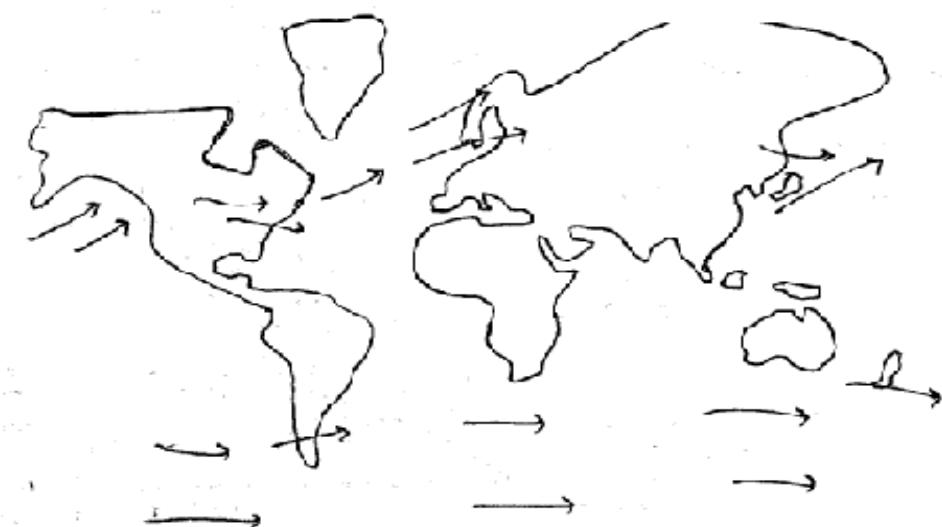
- When the **cold front approaches**, marked drop in temperature takes place. Clouds become **cumulus**. **Rainfall becomes heavy and limited** to smaller area. This is sometimes accompanied by violent thunderstorms and hails. The winds blow from north and north-westerly direction, a shift from southerly to south-westerly direction.
- Gradually the final uplift of warm sector takes place and the occluded front is formed. After the occlusion, the depression tends to 'fill up' and the cyclone dies away.



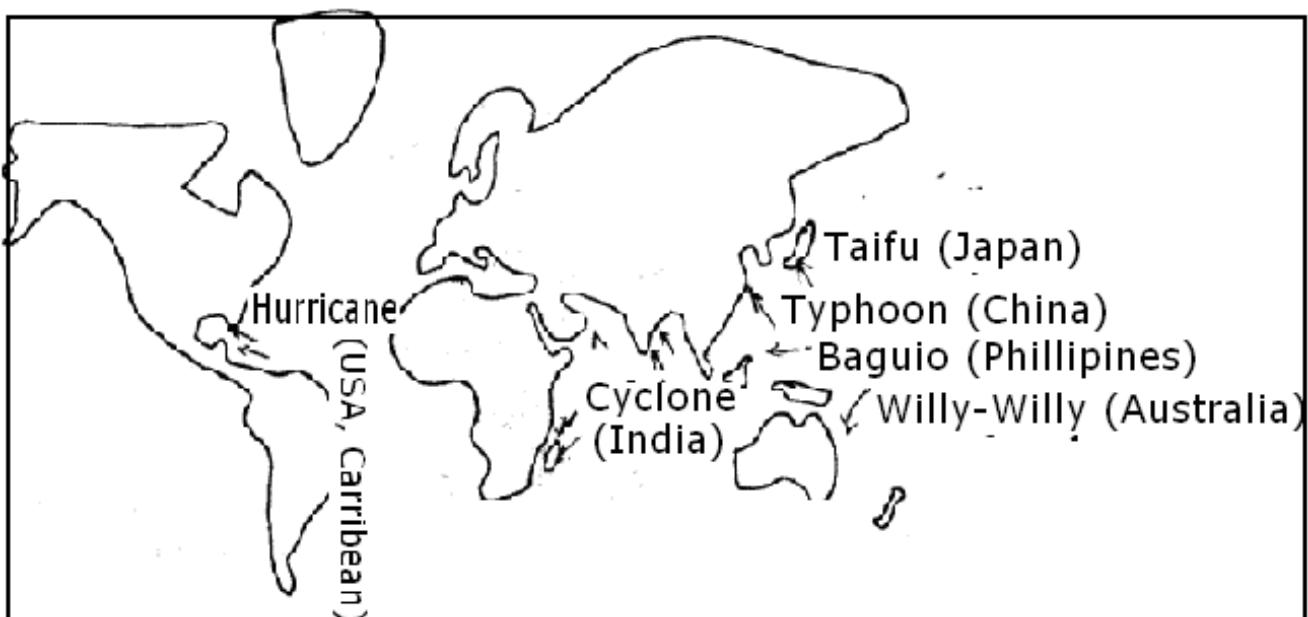
## DISTRIBUTION

Generally found between 30-50° N&S. Position shifts towards equator during winter and towards poles during summer. Some of favorable regions include:-

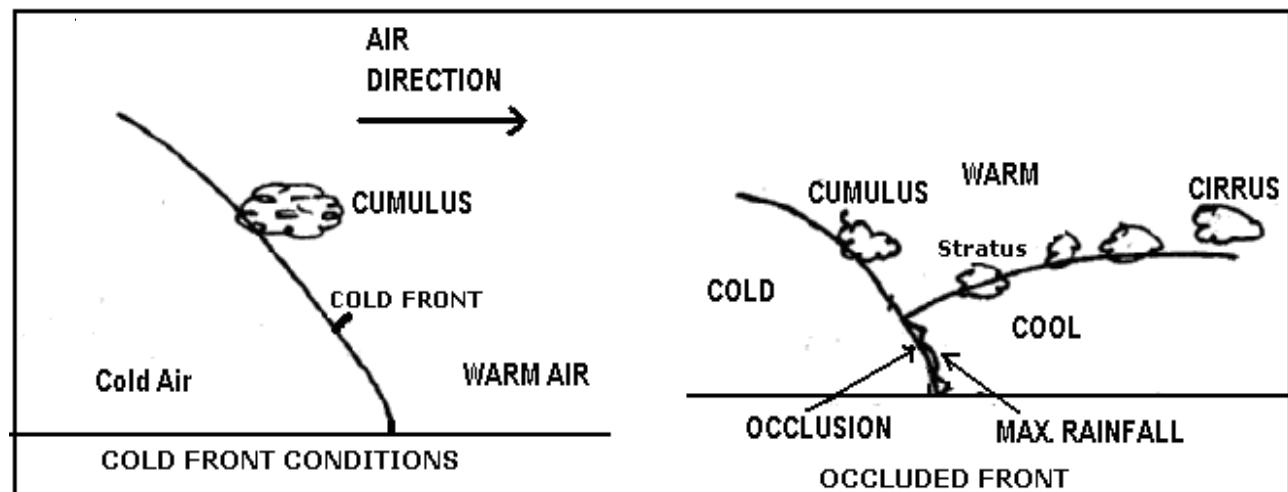
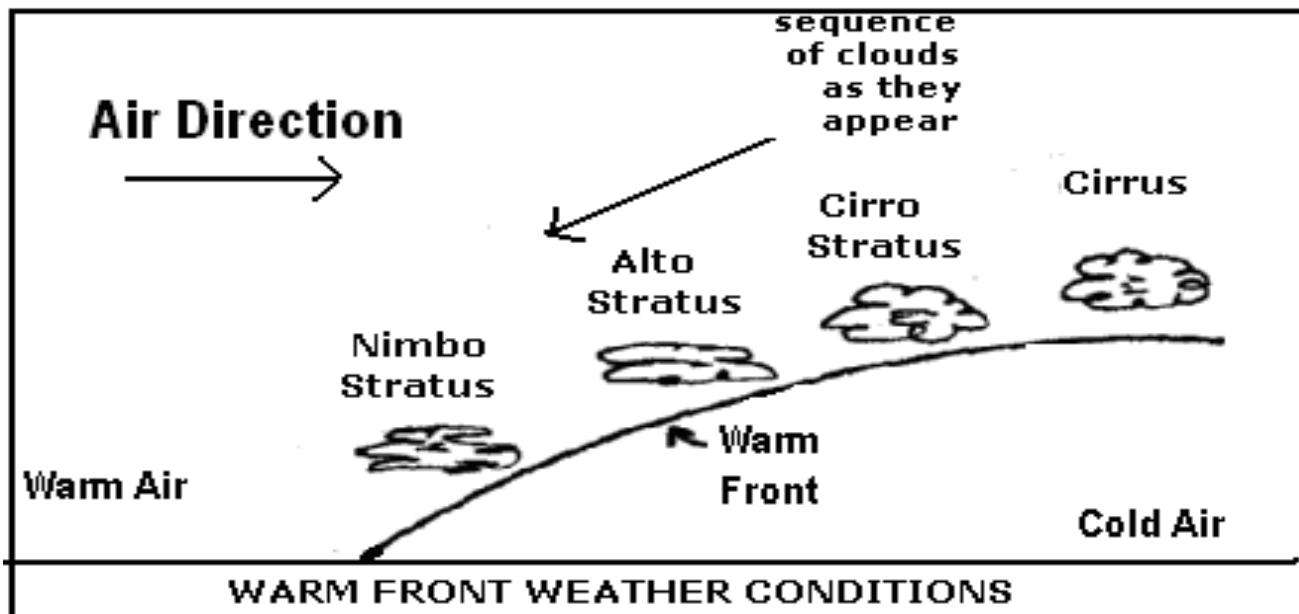
1. East of Sierra Nevada
2. East of Colorado
3. East of Canadian Rockies in Alberta
4. Great lakes region
5. West of Appalachians
6. Iceland and Barren Sea
7. Around Baltic Sea in Europe etc.



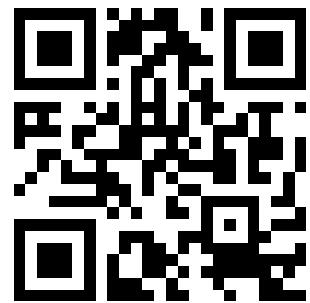
**Tornadoes:** Intense storms formed in Mississippi valley. It is formed over the land. These are narrow and funnel shaped.



### TEMPERATE CYCLONES



# Samples from BIODIVERSITY



## Overview

Earth is the only planet, among the nine around the sun which supports life. Despite the vastness of earth, **life exists only in a very thin layer enveloping the earth** called **biosphere**. Sun is the only source of energy which enables continuous interaction among various life forms. The variety of life on Earth, its biological diversity is commonly referred to as **biodiversity**. The number of species of plants, animals, and microorganisms, the enormous diversity of genes in these species, the different ecosystems on the planet, such as deserts, rainforests and coral reefs are all part of a biologically diverse Earth.

# MAJOR SANCTUARIES/NATIONAL PARKS

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## Nagarjunasagar - Srisailam Sanctuary

- Nagarjunasagar spreads over five districts - Nalgonda, Mahaboobnagar, Kurnool, Prakasam and Guntur - in the state of **Andhra Pradesh**.
- This sanctuary was established in the year **1982** under section 18 of the Wildlife Protection Act, (1972) for the conservation of flora and fauna of Central Deccan Plateau and Peninsular India. Subsequently it became one of the largest links in the Tiger Reserves designated under the **Project Tiger**.
- The area is an abode of **endangered species** like Tiger, Panther, Fishing cat, Indian Wolf, Rattle, Pangolin, Smooth Indian Otter, Black buck, Mouse deer, Chinkara and four horned antelope. The existing value of this Tiger Reserve is greatly enhanced by its geomorphological features.
- **Extensive plateau areas**, deep precipitous gorges with peculiar rock formations and serpentine ghats, cool valleys, cut with perennial streams, springs, moist forest patches and dry deciduous thorny shrub-lands presents diverse ecosystems for harbouring varied fauna of the area.

## Namdapha National Park

- Namdapha, a **Tiger Reserve** and **National Park**, a true wilderness and enchanting beauty of lush green vegetation, impenetrable pristine and virgin forests covered an area of 1985.23 square kilometers having diverse flora and fauna lies in the international border between **India and Myanmar** (Burma) within Changlang District in the state of **Arunachal Pradesh** in the northeast India.
- Namdapha National Park is located at a few kilometers away from Miao amidst misty blue hills along the turbulent Noa-Dihing river lies in the sprawling tropical rain forest. It was declared as Tiger Reserve by the Government in **1983**.
- Among the bird species, most notable are the **White winged Wood Ducks**, a rare and endangered species, the great **Indian hornbills**, jungle fowls and pheasants flop their noisy way through the jungle, and which harbours other colourful bird and animal species. The grandeur of the wet tropical rain forest is breeding ground for varieties of animals and birds which is remarkable and worth seeing.
- It is **only park in the World to have the four Feline species of big cat** namely the Tiger (*Panthera Tigris*), Leopard (*Panthera Pardus*), Snow Leopard (*Panthera Uncia*) and Clouded Leopard (*Neofelis Nebulosa*) and numbers of lesser cats.
- A number of primate species are seen in the park, such as Assamese macaque, pig-tailed macaque, stump-tailed macaque and number of the distinctive Hoolock Gibbons (*Hylobates Hoolock*), highly endangered and **only 'ape' species found in India** dwells in this impenetrable virgin forest.

## Kaziranga National Park

- The Kaziranga National Park is the only National Park in the State situated in **central Assam** with an area of 430sq. km. It is the home of the great Indian **one horned Rhinoceros (Unicornis)**.

- The landscape of Kaziranga is of sheer forest, tall elephant grass, rugged reeds, mellow marshes and shallow pools. One-horned rhinoceros, elephant, Indian bison, swamp deer, sambar, hot deer, sloth bear, tiger, leopard, pig, leopard cat, jungle cat, hog badger, capped langur, hoolock gibbon, jackal, porcupine, python, buffalo and birds like pelican, duck, geese, hornbill, ibis, cormorant, egret, heron, black necked stork, lesser adjutants, ring-tailed fishing eagles, etc are found in large numbers.
- Lush **coffee**, enchanting **tea gardens** and **rubber plantations** are situated nearby Karbi Anglong here.

### **Manas Tiger Reserve**

- Manas Tiger Reserve in **Assam** was created **in 1973 at the time of launch of the Project Tiger in India**. The Reserve area falls in six districts, Kokrajhar, Bongaigaon, Barpetan, Nalbari, Kamrup and Darrang.
- Rich in biodiversity of both flora and fauna, Manas has 22 species of fauna that are globally endangered. In **1985** it was declared a **world heritage site**.
- The moist sal forests, East Himalaya lower Bhabar sal and Eastern Terai sal forests, riverine successions, moist mixed deciduous forests and so many more include species like Tiger, leopard, clouded leopard, Golden cat, leopard cat, pangolin, Indian Elephant and Rhinoceros, Asian water buffalo, Gaur, Swamp deer and the Pygmy Hog.
- There are at least **two species of wild animals, endemic to this zone, Pygmy hogs** and the **Golden langur**. The pygmy hogs are found, now only in this Tiger reserve, into known former range of distribution, while the Golden langur (*Presbytis geei*) have never been recorded beyond the limits of this Tiger reserve.
- There are 21 recorded endangered species of mammals. These are Capped Langur, golden Langur, Slow Loris, Tiger, Black Panther, Leopard Cat, Clouded Leopard, Golden Cat, Fishing Cat, Bear cat, Sloth Bear, Asian Elephant, Indian Pangolin, one-horned rhinoceros, Asiatic Water Buffalo, Swamp Deer, Particoloured Flying Squirrel, Hispid Hare and Gangetic Dolphin.

### **Valmiki National Park**

- Valmikinagar is located nearly 100 kms from **Bettiah** in the northernmost part of the West Champaran district, (**Bihar**) bordering Nepal. It is a small town with scattered inhabitation, mostly within the forest area and a railroad station in the district of West Champaran close to the railhead of Narkatiyaganj.
- The park is bounded by the **Royal Chitwan National Park of Nepal** in the north and the **river Gandak** on the western side with the Himalayan Mountains as backdrop.
- One can see Tiger, Sloth Bear, Wolf, Deer, Serow, Leopard, Python, Peafowl, Chitals, Sambar, Nilgais, Leopards, Hyenas, Indian Civets, Jungle cats, Hog deer, Wild dogs One horned rhinoceros and Indian bison often migrate from Chitwan to Valmikinagar.

### **Bhimbandh Sanctuary**

- Bhimbandh Wild Life Sanctuary is located in the south west of Munger District (**Bihar**). The forest covers an area of 681.99 sq.km. It is situated at a distance of 56 km from Munger, 20 km from Jamui Railway Station and 200 km from Patna Airport.
- This forest is located in the famous **Kharagpur hill range**, south of river Ganga and is surrounded on all sides by non-forestry areas inhabited by dense population. The vegetation of these forests is very rich where Sal, Kend, Semal and other trees grow side by side the

hilly terrain, protecting from the sun's rays the forms and humble creepers which grow below.

- A host of animals such as Tiger, Leopards, Sloth Bear, Nilgai, Sambhar, Barking deer, Wild Beer, four horned Antelope used to abide by in these forests. In the valley portions and at the foothills are several hot springs of which the finest are at Bhimbandh, Sita Kund and Rishi Kund. All the hot springs maintain nearly same temperature round the year, and seasonal fluctuation of discharge is also nominal.

### Rajgir Sanctuary

- The Rajgir Sanctuary is located at **Patna (Bihar)**. The Sanctuary is stretched in an area of 35.84 sq. km.
- The Sanctuary area is **full of small hills** an undulating land. There are number of **hot water springs** in the area. **Sulphur content** in hot water is quite high.
- Among the wildlife found in the Sanctuary the notable ones are Leopard, Hyena, Barking Deer, and Nilgai etc. The birds, which have been identified, are peafowl, jungle fowl, partridge, black and grey quails, hornbill, parrot, dove, myna etc. Wild bear is very common to this area.
- In addition to the Sanctuary there is a **Bamboo Park (Venuvana)**. This was originally a park of **King Bimbisara**.
- The Forest Department constructed beautiful **Deer Park** with Cheetals, Nilgais and Sambhars. To add to all other beautiful places of historical importance there is an **Aerial Ropeway** that provides the link with a **hilltop Buddhist Stupa** built by the Japanese.

### Kaimur Sanctuary

- The Kaimur Wild Life Sanctuary is located in the District of Kaimur (**Bihar**). Area of the sanctuary is 1342 sq.km, which is mainly confined to hills and undulating ground.
- Black bucks, Nilgai, Chinkara, Tiger, Leopard, Hyena, Wild boar, sloth bear etc are the common species found in these forests.
- Other important tourist places in the adjacent area are **Mausoleum of Sher Shah** at Sasaram Dhuan Kund (a natural water fall), Karkat Gadh etc.

### Gautam Buddha Sanctuary

- The Sanctuary is located at a distance of 20 km from **Gaya** and 60 km from Bodh Gaya (**Bihar**). The area of the Sanctuary is 259 sq.km situated on either side off the NH2.
- The forest of the sanctuary is located on the hill and undulating tracts lying north of the hilly terrain which is an **extension of Chhotanagpur plateau**.
- Among the wild Life found here are Tigers, Leopards, Hyenas, Sloth Bear, Wolf, Wild Dog, Wild Boar, Sambhar, Spotted Deer and Nilgai etc.

### Udayapur Sanctuary

- Udaipur Wild Life Sanctuary is located in the district of West Champaran (**Bihar**) about 15 km from Bettiah. It covers an area of 8.87 sq.km. Spotted Deer, Barking Deer, Wild Boar, Nilgai, Wolf, Jungle Cat etc are found in the forest.

### **Kabar Jheel Bird Sanctuary**

- The Kabar Jheel (Lake) Bird Sanctuary is located 22 km north west of Begusarai (**Bihar**). Area of the sanctuary is 63.11 sq.km.
- This Lake is formed through the **meander of River Burhi Gandak** that supports about 59 types of migratory birds and 106 residential species as well as 31 species of fishes.

### **Gogabil Bird Sanctuary**

- This Sanctuary is situated at a distance of 26 km from **Katihar (Bihar)** and is spread over an area of about 217.99 km. By virtue of its global, national and regional significance the State Government has declared Gogabil Bird Sanctuary as a closed area.
- This wetland is rich in aquatic flora and fauna and is a fascinating wintering ground for the migratory birds.

### **Barnawapara Wildlife Sanctuary**

- Barnawapara Wildlife Sanctuary (**Chattisgarh**) is one of the finest and important wildlife sanctuaries in the region. **Established in 1976** under Wildlife Protection Act of 1972, the sanctuary is relatively a small one covering an area of only 245 sq km.
- The topography of the region comprises of flat and hilly terrain with altitudes ranging between 265-400 meters. The Barnawapara Wildlife Sanctuary is known for its lush green vegetations and unique wildlife.
- The flora of Barnawapara Wildlife Sanctuary chiefly comprises of **tropical dry deciduous forest** with Teak, Sal, Bamboo and Terminalia being the prominent trees. Other major plants found in the sanctuary include Semal, Mahua, Ber and Tendu.
- The major wildlife of the Barnawapara Sanctuary include **Tigers, Sloth Bear, Flying Squirrels, Jackals**, Four-horned Antelopes, Leopards, Chinkara, Black Buck, Jungle Cat, Barking Deer, Porcupine, Monkey, Bison, Striped Hyena, Wild Dogs, Chital, Sambar, Nilgai, Gaur, Muntjac, Wild Boar, Cobra, Python to name a few.
- The sanctuary also has a sizable bird population with prominent being the Parrots, Bulbul, White-rumped Vultures, Green Avadavat, Lesser Kestrels, Peafowl, Wood Peckers, Racket-tailed Drongos, Egrets, and Herons to name few.

### **Indravati National Park**

- Indravati National Park is the finest and most famous wildlife parks of **Chhattisgarh**. Also the **only Tiger Reserve in the state**, Indravati National Park is located in Dantewada district of Chhattisgarh.
- The Park derives its name from the **Indravati River**, which flows from east to west and forms the **northern boundary of the reserve** with the Indian state of Maharashtra.
- With a total area of approximately 2799.08 sq km, Indravati attained the status of a **National Park in 1981** and a **Tiger Reserve in 1983** under the famous Project Tiger of India to become one of the most famous tiger reserves of India.
- The flora in the Indravati National Park is mainly consists of **tropical moist and dry deciduous type** with high proportion of Sal, S and Bamboo trees. There are also well-off patches of excellent grasslands providing much required fodder to Wild buffalos, Chital, Barking Deer, Nilgai, Gaurs and other herbivores of the park.
- The most commonly found trees in the park are Teak, Lendia, Salai, Mahua, Tendu, Semal, Haldu, Ber and Jamun. The major wildlife in Indravati National Park include the rare Wild Buffalos, Barasinghas, Tigers, Leopards, Gaurs (Indian Bison), Nilgai, Sambar, Chausingsha

- (four-horned Antelope), Sloth Bear, Dhole (Wild Dog), Striped Hyena, Muntjac, Wild Boar, Flying Squirrel, Porcupine, Pangolins, Monkeys and Langurs among many others.
- The commonly found reptiles in the park are Freshwater Crocodile, Monitor Lizard, Indian Chameleon, Common Krait, Indian Rock Python, Cobra and Russell's Viper to name a few. The Park also gives shelter to the large variety of birds of which Hill Maina is the most important species here.

### **Sitanadi Sanctuary**

- Located in Dhamtari district of **Chhattisgarh**, Sitanadi Wildlife Sanctuary is one of the most famous and important wildlife sanctuaries in central India. Established in **1974** under Wildlife Protection Act of 1972, the sanctuary covers an area of approximately 556 sq km, comprising of highly undulating and hilly terrain with altitudes ranging between 327-736 meters.
- The beautiful sanctuary derives its name from the **Sitanadi River** that originates in the middle of sanctuary and **joins Mahanadi River near Deokhut**.
- Sitanadi Wildlife Sanctuary is known for its lush green flora and rich and unique and diverse fauna and has great potential to emerge as one of the finest wildlife destinations in central India.
- The flora in Sitanadi Wildlife Sanctuary chiefly comprises of moist peninsular Sal, Teak and Bamboo forests. Other major plants in the sanctuary include Semal, Mahua, Harra, Ber and Tendu. The rich and lush vegetation cover supports a wide variety of wildlife in the sanctuary.
- The major wildlife found in Sitanadi Sanctuary include Tigers, Leopards, Flying Squirrels, Jackals, Four-horned Antelopes, Chinkara, Black Buck, Jungle Cat, Barking Deer, Porcupine, Monkey, Bison, Striped Hyena, Sloth Bear, Wild Dogs, Chital, Sambar, Nilgai, Gaur, Muntjac, Wild Boar, Cobra, Python among many others.
- The sanctuary also has a sizable bird population with prominent being the Parrots, Bulbul, Peafowl, Pheasant, Crimson Breasted Barbet, Teetar, Tree Pie, Racket-tailed Drongos, Egrets, and Herons to name few.

### **Udanti Sanctuary**

- Located in Raipur district of **Chhattisgarh**, Udanti Wildlife Sanctuary is a small but an important wildlife sanctuary in the region.
- **Established in 1983** under Wildlife Protection Act of 1972, the sanctuary covers an area of approximately 232 sq km. the topography of the sanctuary comprises of broken mass of land traversed by innumerable hill ranges intercepted by stripes of plains.
- The beautiful sanctuary derives its name from the **Udanti River** flowing from the west to east covering major part of the sanctuary.
- Udanti Wildlife Sanctuary is famous for its population of the **endangered Wild Buffalos**. For their survival and growth many steps have been taken by the forest department officials. A large number of man-made tanks have been constructed all across the width and length of the sanctuary.
- The flora in Udanti Wildlife Sanctuary chiefly comprises of **Tropical Dry Peninsular Sal forests and Southern Tropical Dry Deciduous Mixed Forests**. Major flora in the sanctuary comprises of Teak, Sal, Salai, Bamboo, Mahul, Semal, Mahua, Aonwla, Tendu, Harra and Ber among others.
- The wildlife found in Udanti Sanctuary include Wild Buffalos, Panthers, Tigers, Chital, Four-horned Antelopes, Chinkara, Black Buck, Sambar, Nilgai, Jungle cat, Barking Deer, Sloth

- bear, Gaur, Wild dog, Porcupine, Monkey, Jackals, Bison, Striped Hyena, Fox, Cobras, Pythons etc.
- The sanctuary also has a sizable population of birds with prominent being the Parrots, Bulbul, Peafowl, Racket-tailed Drongos, Egrets, Heron, Magpie robin, Lesser whistling Teal, Pintail, Rollers and Herons to name few.

### **Kanger Ghati National Park**

- Located amidst the 34 km long and scenic Kanger Valley (**Chattisgarh**), a **Biosphere Reserve**, Kanger Valley National Park is one of the most beautiful and picturesque national parks of India. Known for its scenic beauty and the unique and rich biodiversity, Kanger Valley attained the status of a **National Park in 1982**.
- Besides wildlife and plants, there are many tourist attractions inside the park such as the **Kutamsar Caves, Kailash Caves, Dandak Caves and Tiratgarh Waterfalls**. Kanger Dhara and Bhaimsa Dhara (a Crocodile Park) are the two beautiful and exotic picnic resorts in the Park.
- The Park also has a sizable tribal population and can be an ideal destination for wildlife enthusiasts, nature lovers, researchers, anthropologists and for anyone who wants to discover the very best of Chhattisgarh wildlife and unique tribes of the region.
- The flora in the park chiefly comprises of mixed moist deciduous type of forests with predominance of Sal, Teak and Bamboo trees. In fact, the Kanger Valley is the only region in the Peninsular India where one of the last pockets of virgin and untouched forests still left.
- Major Wildlife of the Kanger Valley National Park are the Tigers, Leopards, Mouse Deer, Wild Cat, Chital, Sambar, Barking Deer, Jackals, Langurs, Rhesus Macaque, Sloth Bear, Flying Squirrel, Wild Boar, Striped Hyena, Rabbits, Pythons, Cobra, Crocodiles, Monitor Lizards and Snakes to name a few.
- The avian fauna at the Park includes Hill Myna, Spotted Owlet, Red Jungle Fowls, Racket-tailed Drongos, Peacocks, Parrots, Steppe Eagles, Red Spur Fall, Phakta, Bhura Teeter, Tree Pie and Heron among many others.

### **Achanakmar Wildlife Sanctuary**

- Achanakmar Wildlife Sanctuary (**Chattisgarh**), was constituted in the **year 1975** it comprises of 557.55 Sq.km. Achanakmar Wildlife Sanctuary in India is the proud owner of a rich fauna.
- Achanakmar Wildlife Sanctuary has numerous species of wild animals like the Chital, Wild Bear, Leopard, Tiger *Panthera*, striped Hyaena, *Canis aureus* jackal, sloth bear *Melursus ursinus*, Indian wild dog *Cuon alpinus*, Chital *Axis axis*, four-horned antelope or *Tetracerus quadricornis*, nilgai *Boselaphus tragocamelus*, Chinkara, Blackbuck, Wild Boar and many more.

### **Bhoramdeo Sanctuary**

- Bhoramdeo wild life sanctuary is one of the eleven wild life sanctuaries of **Chhattisgarh** state. It is located at kabirdham district. It is named after famous **Bhoramdeo temples**.
- Bhoramdev Wildlife Sanctuary in Chhattisgarh is composed of Sal, Saja, Teinsa, Kara and Haldu species. The fauna comprises mostly of wild animals like leopard, hyena, fox, bear, cheetal, wild buffalo, nilgai etc.
- The **river Sakari** flows through the sanctuary is the source of drinking water for wild animals.

## **Guru Ghasidas National Park**

- Guru Ghasidas National Park is actually a part of the **former Sanjay National Park**. This separate park was **formed when Chhattisgarh was bifurcated from Madhya Pradesh and formed a state** in itself.
- 60% of the park is located in the Koriya district of **Chhattisgarh**. It is named after the **reformist hero** of the place Guru Ghasidas.
- The vegetation of Guru Ghasidas National Park consists mainly of **mixed deciduous forest** with teak, sal and bamboo trees. The diverse vegetation of the region consists of a wide variety of mammal population.
- Tigers, Leopards, Chital, Nilgai, Chinkara, Jackals, Sambar, Four-horned Antelopes, Jungle Cat, Barking Deer, Porcupine, Monkey, Bison, Striped Hyena, Sloth Bear, and Wild Dogs are some of the common species found in this region. It is also an ideal place to watch migratory birds.

## **Badalkhol Wildlife Sanctuary**

- **Chhattisgarh** is one of the new members among the states of India. Out of the total area of the place **44% is covered with forests**. 12% of the total forest area of the country is in Chhattisgarh. It is rich in various wildlife species.
- The important species in the sanctuary are **deer, chinkara, gazelle** and the spotted dear.
- There are other species as well like Nilgai, Sambar, Chausingha, sloth bear, wild boar, jackal and hyena. Among the birds there are peacock, fowl, pigeon, quail, parrot and stork.
- At times the migratory birds also visit this place. Tigers and leopards are also there at the Badalkhol Wildlife Sanctuary Madhya Pradesh. They are however in **limited numbers**.
- A lot of rare birds can be seen in these sanctuaries and is considered to be a bird watchers paradise. At times you also get the opportunity to meet a bison.

## **Pameda Wildlife Sanctuary**

- Pameda Wildlife Sanctuary in **Chhattisgarh** in India is located in Dantewada District of Chhattisgarh. The total area is 260 sq km and there is mixed deciduous forest.
- Pameda Wildlife Sanctuary has some **precious trees like sal and teak**. There are mixed forests creating a different aura about the place.
- Deers can be easily sighted. Here you find the chital or the spotted deer, Indian Gazelle and the chinkara. Those who are interested in wildlife will never forget the images of the deer running all around the sanctuary like carefree creatures of nature.
- One can find sloth bear, wild boar, wild dog, jackal, wolf, hyena, bison, nilgai, and sambar.
- All those who are interested in birds the sanctuary provides with a chance to see a lot of them. There are beautiful peacocks, pigeons, quail, parrot, jungle fowl, and stork. Migratory birds are also visible in different parts of the sanctuary.

## **Salim Ali Bird Sanctuary**

- One of the **smallest bird sanctuaries** in India it is named after the noted ornithologist of India, Salim Ali. It is covered with **mangrove swamps** which offer an ideal habitat for migratory as well as local birds.
- There are a number of rare species of birds in this sanctuary. At the **confluence of Mapusa and Mandovi Rivers in Goa** lies the Salim Ali Bird Sanctuary.

## **Bhagwan Mahavir Wildlife Sanctuary**

- Lying on the eastern side of **Goa**, Bhagwan Mahavir Wildlife Sanctuary is the largest wildlife sanctuary in the state. Covering massive area of 240 square kilometers, the sanctuary is an ideal habitat for exotic species of wild animals such as Deers and Guars, Malayan Giant Squirrels, Cobras and Pythons.
- Habitat includes Sloth Bear, Flying Lizard, Leopard Cat, Elephants and Tigers.

## **Cotigao Wildlife Sanctuary**

- Spread within an area of 86.65 sq km and sixty kilometres from Panjim is Cotigao wildlife sanctuary (**Goa**). The sanctuary has thick deciduous forest and trees as long as thirty metres high.
- The forest is not exactly as raw as other sanctuaries since there are dwellings around.
- Sanctuary has Wild Boars, Langur, Deer, Bison, Pangolin and Black Panther.
- The sanctuary has a lake also, Bela lake and a Nature Interpretation Centre which has botanical and faunal exhibits.

## **Bondla Wildlife Sanctuary**

- The lush green and strikingly beautiful foothills shelter the Bondla Wildlife Sanctuary, which is the smallest wildlife reserve in **Goa**.
- The Bondla Wildlife Sanctuary is spread over an area of about 8 square kilometers.
- The sanctuary is **home to the sambar deer, Gaur (Indian Bison)**, the black-faced Langur, jackals and wild boar amongst other animals.
- Many times, elephants have also been spotted. The Bondla Wildlife Sanctuary provides refuge to numerous species of deer as well.

## **Velavadar / Black Buck National Park**

- This small part of Bhal region (34.52 sq.km.), **Gujarat** which was declared as **Blackbuck National Park in July 1976**, is open grassland. The sanctuary has been declared primarily for Blackbucks.
- The beauty of the grassland is enhanced by the **movements of blackbucks and nilgais**.
- The majestic blackbucks are less shy of human being here and one has a sure chance of watching them in their natural mood, leaping high in air, running, feeding drinking, rutting and chasing.
- The grassland lies between **two rivers** namely **Parvalia and Alang**, which drain into the **Gulf of Cambay**. During the monsoon the area is often flooded.
- The blackbuck herds are mostly to be found in the northern part of the sanctuary, while the southern part has patches of thorn forest providing excellent opportunities for bird watching (especially birds of prey).
- The **Alang River forms the southern border of the Park** and is the favourite retreat for wolves.

## **Nalsarovar Bird Sanctuary**

- Nalsarovar Bird Sanctuary located some 70 kilo meter away from Ahmedabad **in Gujarat** covers an area of 116 square kilo meter.
- Nalsarovar Bird Sanctuary is a **spectacular natural lake** with shallow waters and muddy lagoons, dotted by 360 islets.

- It offers an ideal wintering ground for thousands of migratory birds. These birds travel tiring lengths from Central Asia, Europe and Siberia to escape from severe cold of harsh winter there.
- In addition to migratory birds, many resident as well as local migratory birds also visit this place. This lake and the wetlands around it were **declared a bird sanctuary in April' 1969**.
- Migratory birds start arriving here in October and stay till April. Their population reaches its peak in mid winter. There are **360 islets** in the lake. Most of them lie exposed when the water level is low.
- The lake gets filled with water that drains from the adjoining Surendranagar and Ahmedabad districts in the monsoon. With this fresh water inflow, brackishness in the lake is reduced considerably.
- The sheer number of birds that is encountered in this beautiful place leaves the bird-watchers spellbound.
- Both the flamingos i.e. lesser and Greater inhabit Nalsarovar. The former frequents the sanctuary during monsoon and post monsoon periods whereas the latter becomes abundant as the salinity increases after the monsoon.

### **Sasan Gir National Park**

- Located in the south west of the **Saurashtra peninsula**, the Gir National Park **Gujarat** is a haven to about **300 Asiatic lions**.
- The 1,412.13 sq. km. Park has a rugged landscape and the sheer rocky hillsides are covered in mixed deciduous forests.
- The Gir National Park is the **only known home of the famous Asiatic Lion**. The park is one of the best wildlife sanctuaries in India.
- The Gir National Park is the **only place** where you can see the lion in its natural habitat.
- It was established as a **Forest Reserve in 1965**, with the primary motive of conserving the Asiatic lion, it sprawls over 2,450 hectares of land.
- Gir also has nearly **210 leopards** and numerous **chital, nilgai, chinkara**, the **four homed antelope and wild boar**. Marsh crocodiles are often seen along its rivers.

### **Rann of Kutch (Wild Ass)**

- The Wild Ass Sanctuary is located in the Little Rann of Kutch of the **Gujarat** State in India. It covers an area of 4954 km.
- The Sanctuary is named after a sub species of wild ass (*Equus hemionus khur*), the last population of which it harbours. The wild asses in the Little Rann of Kutch are active during the night, to maximize resource intake in the natural vegetation-agriculture interface.
- The vast cover of saline mudflats in the Sanctuary has no vegetation, except on the fringes and bets. Vegetation is **largely xerophytic** with the ground cover predominated by ephemerals. Their active growth is triggered by the advent of monsoon rains.
- The Sanctuary is territory to about 93 species of invertebrates, including 25 species of zooplankton, 1 species of annelid, 4 crustaceans, 24 insects, 12 molluscs and 27 spiders.
- Totally 4 species of amphibians (frogs and toads) and 29 species of reptiles (2 species of turtles, 14 species of lizards, 12 snakes and 1 crocodile) occur.
- The sanctuary provides an important feeding, breeding and roosting habitat for a large number of birds due to its **strategic location on bird migration** route and its connection with the dynamic Gulf of Kutch.

### Ratan Mahal Sloth Bear

- Ratan Mahal Sloth Bear is spread in 56 sq km. It is situated on the Gujarat-Madhya Pradesh border and only exclusive sloth bear sanctuary in **Gujarat**. Apart from the sloth bear, it is also home to **leopards, the blue bull (nilgai)**, wild boars and the Indian gazelle.

### Sultanpur Bird Sanctuary

- Sultanpur Bird Sanctuary **Haryana** is a haven to a variety of domestic and migratory birds.
- **Artificial mound**, have turned into a green glade. The marsh has been converted into a water body. And with the years, hundreds of species of migratory birds have winged in to stay. Winter brings in birds from as far as Siberia. Flock of geese from Europe wing in too.
- The bird population includes **darters, egrets, shovellers, gadwell** and **geese** dominate. Teals, kingfishers, lapwings, sandpipers, demoiselle cranes and many more water birds nestle in.
- Local species include plovers, red-wattled lapwings, herons, cormorants, white ibises, spoonbills and painted storks.
- Other wildlife in the park include blackbuck, nilgai, hog deer, sambar, wild dog or dhole, caracal, wild cat, hedgehog, mongoose, striped hyena, Indian porcupine, rattle/honey badger, leopard, wild pig, and four horned antelope.

### Great Himalayan National Park

- The National Park with an area of **Himalayan Brown Beer 620 sq. km.** is located in Kullu District and has the representative area of temperate and alpine forests of **Himachal**. It has some the virgin coniferous forests of the State. Vast areas of alpine pastures and glaciers cap this park.
- This area has many important wildlife species of Western Himalayas, like Musk deer, Brown bear, Goral, Thar, Leopard, Snow leopard, Bharal, Serow, Monal, Kalij, Koklas, Cheer, Tragopan, Snow cock etc.
- Trekking of **Rakti-Sar, origin of Sainj River** and camping in alpine pastures is unforgettable. Similar is the trekking route to **Tirath the origin of Tirthan River**.

### Dachigam National Park

- Spread over an area of 141 sq. kms this **picturesque Dachigam valley (JK)** is bliss on earth, full of natural beauty with its surrounding mountainside, contains the rare **Kashmir stag (Hangul)**.
- The park is famous as the **only home for the highly endangered Hangul or Kashmir Stag**. Rich and much unpolluted, Dachigam National park lies **very close to Srinagar town**, nestled in the dazzling slopes of the Kashmir Himalayas.
- The other wildlife at Dachigam National park consist of the Himalayan Black Bear, few species of the Goat including Markhor and Ibex, Leopard and the rare snow Leopard, Musk deer and the Himalayan Marmot.
- There are over **150 species of birds** like - koklas, bearded vulture, griffon vulture, monal, golden eagle, grey heron, golden oriole, paradise flycatcher, starling, western yellow-billed blue magpie, kestrel, peregrine falcon, black bulbul, etc.
- The Dachigam Wildlife Sanctuary has over fifty species of trees, twenty of shrubs and five hundred species of herbs.

## **Kishtwar National Park**

- Kishtwar National Park, **Jammu and Kashmir** is located in the district of Doda at the high altitude of 1,700 meters to 4,800 meters. Wide range of floras and faunas are available at the Kishtwar National Park.
- Some of the wild animals, which are available in this national park, are **brown bear, leopard, snow leopard, Himalayan musk deer, hangul, ibex, serow, brown bear** and others.
- There are some 14 species of mammals present in this national park. There are 28 species of avifauna that enliven the whole forested area. Some of them include pheasants, Himalayan monal, koklass, Himalayan snowcock and western tragopan.

## **Hazaribagh National Park**

- Nestling in low hilly terrain, at an average altitude of 615 meters in the Indian state of **Jharkhand**, the Hazaribagh National Park has an abundance of wild animals like the **wild boar, sambar, nilgai, chital, sloth bear, tiger and panther**.
- Sighting of wild boar, sambar, nilgai, cheetal, and kakar is assured especially near the waterholes at dusk.
- The sanctuary stretches over 184 square km of undulating country and steep hills with dense tropical forests and grass meadows. The sanctuary is surrounded by **tribal habitation**.

## **Bandipur National Park**

- Bandipur Tiger Reserve situated in Mysore District of **Karnataka** was among the **first nine Tiger Reserves created in India** at the launch of Project Tiger in 1973.
- It is contiguous to **Madhumalai Wildlife Sanctuary in Tamil Nadu** state to south and **Wynad Wildlife Sanctuary in Kerala** state to the south-west.
- To the north-west lies **Nagarhole National Park**. The **highest peak is Gopalswamy hill**.
- A Sanctuary of 90 sq. km. area was created in **Bandipur Reserve Forest in 1931. Venugopala Wildlife Park was constituted in 1941**, extending over 800 sq. km.
- The Park was named after the deity, Venugopala of the shrine atop this hill. Bandipur Tiger reserve was formed by including most of the forest area of the then Venugopala Wildlife Park and its sanctum sanctorum at Bandipur, in the year 1973 and **named Bandipur National Park**.
- All the forests included in the Reserve are reserved forests notified prior to independence.
- The area is an abode of **endangered species like Tiger, Leopard, Elephant, Gaur, Sambar, Spotted deer, Sloth bear, Mouse deer, Wild dog, four horned Antelope**.

## **Nagarhole National Park**

- Covering an area of 644 sq km, the Nagarhole National Park **Karnataka** is situated between the **Kabini River** and the **Bandipur National Park**.
- The Nagarhole National Park derives its name from two words 'Naga' meaning snake and 'hole' meaning streams.
- The Nagarhole National Park mainly consists of **moist deciduous forest** in the northern and western parts and dry deciduous forest in the south-eastern part.
- Nagarhole is among a few wildlife sanctuaries in India, which are considered to be **safe haven for elephants**. Nagarhole National Park is **primarily an elephant territory**.

- The Nagarhole National Park is also home to tiger, sloth bear and hyena, leopard, wild dog, spotted deer, sambar, barking deer, four-horned antelope, wild boar and gaur.
- Among 250 bird species found in park, the most common are the common bulbul, babbler, bee-eater, crested serpent, dove, hornbill, alexandrine, peacock, woodpecker, Malabar pied, warbler, great Indian reed, crested hawk, eagle, golden-back parakeet, and the southern tree pie.

### **Periyar National Park**

- The Periyar Tiger Reserve, named after the **Periyar River**, is one of our prestigious possessions on the High Ranges of Western Ghats.
- The Periyar Tiger Reserve **Kerala** spreads over 777 sq km of tropical evergreen, semi-evergreen and moist deciduous forests. It was declared a **Project Tiger Reserve in 1978** under the famous scheme, Project Tiger.
- Numerous small islets in the large 50 year old **artificial lake** remind us of the intricate, inherent interrelationship among the terrestrial aquatic and subterranean life forms.
- The evergreen forests have **lofty tree and the canopy is closed**. The varied habitat naturally supports a variety of species of mammals, birds, reptiles, amphibians and fishes.
- Tiger, panther and wild dog, elephant, gaur, sambar, barking deer, wild boar, sloth bear, Nilgiri tahr langur, lion tailed macaque, otter, Malabar giant squirrel, civets etc. are generally sighted. There are several kinds of poisonous and non-poisonous snakes including the **king cobra**.
- Tortoise may often be seen asking on rocks and tree-trunks by the lake. **The Masheer, the most famous game fish of India** exists in large numbers.
- The common aquatic birds are the **Indian darter**, little cormorant kingfisher, and the black-necked stork, the great Indian hornbill, peafowl, brahminy kite and black winged kite.

### **Eravikulam National Park**

- A sanctuary for the endangered mountain goat of South India, **the Nilgiri Tahr (Hemitragus hylocrionis)**, the Eravikulam National Park **Kerala** stands out for the stark beauty of its rolling grasslands and sholas, spread over 97 sq km in the **Rajamalai hills**.
- Anamudi, the highest peak** (2695 m) south of the Himalayas, towers over the sanctuary in majestic pride.
- The slopes of the hills abound in all kinds of rare flora and fauna. The **Atlas moth**, the largest of its kind in the world, is a **unique inhabitant of the park**.
- Other rare species of fauna found here are the **Nilgiri Langur**, the **lion-tailed macaque**, leopards, tigers, etc.

### **Idukki National Park**

- Located in the southern state of India, **Kerala**, Idukki National Park is one of Kerala's finest havens for wildlife and is home to vast herds of Elephants, bisons, bear, wild boars, sambar wild dogs, jungle cats, tiger, wild boar and has a very large concentration of various species of snakes including cobra, viper, kraits and numerous non-poisonous ones.
- The bird life in the sanctuary is equally impressive. Important birds include myna, jungle fowl, black bulbul, laughing thrush, woodpecker, peafowl, kingfisher etc.

## **Wayanad Wildlife Sanctuary**

- Established in **1973**, the Wayanad Wildlife Sanctuary **Kerala** is contiguous to the protected area **network of Nagarhole and Bandipur** of Karnataka on the north-east and Mudimalai of Tamilnadu on the south-east.
- Rich in bio-diversity, the sanctuary is an **integral part of the Nilgiri Biosphere Reserve**, which has been established with the specific objective to save the biological heritage of the region.
- The animal population of the sanctuary is varies. Elephant, tiger, Panther, jungle cat, civet cat, monkeys, wild dog, bison, deer, bear, etc. inhabit the sanctuary.
- Reptiles like monitor lizard and a variety of snakes are seen. Peacock, babblers, cuckoos, owl, wood pecker and jungle fowl are only a few among the different types of birds seen in the area.

## **Bandhavgarh National Park**

- This is a **small National Park**; compact, yet full of game. The **density of the Tiger population at Bandhavgarh is the highest known in India**.
- Considering the importance and potentiality of the National park, it was included in the Project Tiger Network in 1993.
- The reserve named after the **highest hill Bandhavgarh** (807 m) **Madhya Pradesh** in the centre of it, falls between the **Vindhyan hill range** and the eastern flank of **Satpura hill range** and is located in Shahdol and Jabalpur districts of Madhya Pradesh.
- There are more than 22 species of mammals and 250 species of birds. Common Langurs and Rhesus Macaque represent the primate group. Carnivores include the Asiatic Jackal, Bengal Fox, Sloth Bear, Ratel, Gray Mongoose, Striped Hyena, Jungle Cat, Leopard and Tiger.
- The artiodactyls frequently sighted are Wild Pigs, Spotted Deer, Sambar, Chousingha, Nilgai, Chinkara and Gaur. Mammals such as Dhole, the small Indian Civet, Palm Squirrel and Lesser Bandicoot Rat are seen occasionally. Among the herbivores, **Gaur is the only coarse feeder**.
- The vegetation along streams and marshes is rich in bird life. The common ones are Little Grebe, Egret, lesser Adjutant, Sarus Crane, Black Ibis, Lesser Whistling Teal, White-eyed Buzzard, Black Kite, Crested Serpent Eagle, Black Vulture, Egyptian Vulture, Common Peafowl, Red Jungle Fowl, Dove, Parakeets, Kingfishers and Indian Rollers.
- Reptilian Fauna include Cobra, Krait, Viper, Rat-snake, Python, Turtle and a number of lizard varieties, including Varanus.

## **Kanha National Park**

- Kanha Tiger Reserve, comprising parts of the Mandla & Balaghat districts of **Madhya Pradesh**, and located in the "**Maikal" hills of the Satpuras**", is internationally renowned for its rich floral and faunal attributes.
- Kanha's sal and bamboo forests, rolling grasslands and meandering streams stretch over 940 sq km in dramatic natural splendour which form the core of the Kanha Tiger Reserve created in 1974 under Project Tiger.
- The park is the **only habitat of the rare hardground Barasingha** (*Cervus Duvauceli Branderi*).
- Kanha has some 22 species of mammals. Those most easily spotted are the Striped Palm Squirrel, Common Langur, Jackal, Wild Pig, Chital or Spotted Deer, Barasingha or Swamp

- Deer, Sambar and Black Buck. Less common species are Tiger, Indian Hare, Dhole or Indian Wild Dog, Barking Deer, Indian Bison or Gaur.
- Patient watching should reward the visitor with a sight of: Indian Fox, Sloth Bear, Striped Hyena, Jungle Cat, Leopard, Mouse Deer, Chousingha or four horned antelope, Nilgai, Ratel and Porcupine.
  - The Reserve is a **part of the Gondwana tract** inhabited traditionally and chiefly by the Gond and Baiga tribes, the latter confining themselves largely to the upper valleys and dadars near the **main Maikal range**.

### **Madhav National Park**

- Madhav (Shivpuri) National Park **Madhya Pradesh** 156 sq km in area, the park is open throughout the year. The park enforces the conservation which the area enjoyed when it was the private shooting reserve of the Maharaja of Gwalior.
- It was established as the **Shivpuri National Park in 1958** simultaneously with the creation of the State of Madhya Pradesh. It now enjoys further protection under the Wildlife Protection Act of 1972.
- Altitude ranges from 360-480m. With a varied terrain of wooded hills, the forest being dry, mixed and deciduous with flat grasslands around the lake, offers abundant opportunities of sighting a variety of wildlife.
- The **predominant species** that inhabits the park is the **deer**, of which the most easily sighted are the **graceful little Chinkara**, the Indian gazelle, and the Chital.
- Other species that have their habitat in the park are Nilgai, Sambar, Chousingha or four-horned Antelope, Blackbuck, Sloth Bear, Leopard and the ubiquitous common Langur.
- Tiger *Panthera tigris* (occasional), leopard *Panthera pardus*, striped *Hyaena*, jackal *Canis aureus*, jungle cat *Felis chaus*), chital *Axis axis*, sambar *Cervus unicolor*, nilgai *Boselaphus tragocamelus*, four-horned antelope (chowsingha) *Tetracerus quadricornis*, wild boar *Sus scrofa*, chinkara (mountain gazelle) *Gazella*, crocodile and others.

### **Panna National Park**

- Situated in the central Indian state of **Madhya Pradesh** at a distance of around 57 km from **Khajuraho** is the Panna National Park. The region, which is **famous for its diamonds**, is also home to some of the best wildlife species in India and is one of the better Tiger Reserves in the country.
- The park is known worldwide for its **wild cats**, including **tigers as well as deer** and antelope.
- Tiger (*Panthera tigris*), the king of the jungle, roams freely in this secure, though a bit small habitat along with his fellow beings - leopard (*Panthera pardus*), wild dog (*Cuon alpinus*), grey wolf (*Canis lupus*), hyaena, caracal (*Felis caracal*) and smaller cats.
- The wooded areas are dotted with sambar the largest of Indian deer, chital and chowsingha.
- One can easily see nilgai and chinkara in most open areas in the grasslands, especially on the periphery. Varieties of snakes, including the python and other reptiles are found here.
- The avifauna comprises more than 200 species, including a host of migratory birds. One can see white necked stork, barheaded goose, honey Buzzard, King vulture, Blossom headed Parakeet, Paradise flycatcher, Slaty headed Scimitar babbler to name a few.

## Karera Bird Sanctuary

- The Karera Bird Sanctuary is located in the central Indian state of **Madhya Pradesh**. The vegetation is reverie and swamp with **mixed deciduous forests**. Ber bushes and other wild plants are found in abundance.
- There are no trees except acacia throughout this forest. The thorny open country of the Karera Sanctuary houses the **haughty Great Indian Bustard** and the equally snooty **blackbuck**. There are many other varieties of birds and animals that have made it their habitat.
- The **blackbuck and Indian gazelle** are the prominent habitants of this open country. There are many migratory birds that settle here in the season. There are pintails, teals, and gadwalls snoozing in the sun or squatting meditatively in the mud.
- There are resident water birds too like the black-bellied river terns, egrets, and spoonbills. Other birds found here are herons, Indian robins, as also insects like dragonflies, damselflies, and butterflies.

## Bori Wildlife Sanctuary

- Bori Wildlife Sanctuary is located in Hoshangabad District of **Madhya Pradesh**. This wildlife sanctuary is one of the **oldest forest reserves**, with an area of 518 sq kms. This wildlife reserve is conveniently placed on the northern **foothills of Satpura Range**.
- The sanctuary is mostly covered by **mixed dry deciduous forest**. Teak, dhaora, bamboo, tendu are the main vegetation in this reserve forest. There are shrubs and other climbing plants that have added to the wonderful flora of reserve.
- Different floras and vegetation of the sanctuary is the homeland for various animals like the tiger, leopard, hyena, jackal, wild dogs, and Indian fox, chital Axis, sambhar, nilgai, chinkara, gazelle, jungle cat and four horned antelopes, all of which can be seen roaming in their natural habitat.

## Dajipur Bison Sanctuary

- The Dajipur Bison Sanctuary **Maharashtra** is situated on the border of Kolhapur and Sindhudurg districts, near the **backwaters of the Radhanagari dam**. Surrounded by rugged mountains and dense forests, this secluded area is completely cut-off from human habitation.
- A home to bison, wild Deers, Chital, Gawa and many more spectacular wild animals and birds, Dajipur is an exciting and beautiful holiday getaway. The forest is famous for "**Gava**" **buffalo**.
- Bison, wild deer, chital, gava etc. can be spotted here. Also one can find Gagangiri Maharaja's Math in the forest area.

## Dhakana - Kolkaz National Park

- Chikhaldara Wildlife Sanctuary is located in **Amravati district** of Vidarbha region. The only hill station in the Vidarbha region offers one an abundance of wildlife, viewpoints, lakes and waterfalls.
- This sanctuary is named after "**Keechaka**". This is the place where Bhima killed Keechaka and threw him into the valley. It thus came to be known as "Keechakadara" and Chikhaldara is its corruption. This is the only coffee growing area in **Maharashtra**.
- Tourists can find Panthers, Sloth Bears, Sambar, and Wild Boar. One can even spot **Wild Dogs** over here.

- Close by is the famous **Melghat Tiger Project** in Dhakana-Kolkaz National Park, a natural habitat centre for about 82 tigers. Chikaldhara's cool breezy climate makes it an excellent place to repose.

### **Sanjay Gandhi National Park**

- Sanjay Gandhi National Park, better known as "Borivali National Park" is set in hill ranges around the suburb of Borivali in Mumbai **Maharashtra**.
- Notified in 1974, it offers a pleasant change from the usual sights and attractions of the big city.
- One can have encounters with several species including Spotted Deer, Black Naped Hare, Barking Deer, Porcupine, Palm Civet, Mouse Deer, Rhesus Macaque, Bonnet Macaque, Hanuman Langur, Indian Flying Fox, and Sambar. The reptilian world has 38 species to show off. Tourists can see crocodiles in the Tulsi Lake, and Pythons, Cobras, Monitor Lizards, Russell's Viper, Bamboo Pit Viper and Ceylonese Cat Snake here.

### **Nokrek National Park**

- Located in West Garo Hills District in **Meghalaya**, The Nokrek National Park and **Biosphere Reserve** is about 45 kms from Tura.
- Nokrek is the **highest peak in Garo Hills** and home to different species of wild animals including Elephants and Hoolock Gibbons.
- The Nokrek National Park has been established at Nokrek and it abounds in various wildlife including **herds of wild elephants**, rare varieties of birds and pheasants, beside rare orchids.
- The park is also home to a very rare species of citrus-indica endemic to this place which the locals call memang narang ('orange of the spirits').
- Nokrek is also believed to be the home of Mande Burung (jungle man or ape man) and reported cases of sightings abound in and around the villages of Nokrek.

### **Balpakram National Park**

- It is a national wild life park, about 167 kms from Tura **Meghalaya**. It is home to one of the rarest animals in the world - the Lesser Panda or the Red Panda as it is commonly known.
- Balpakram (a place of perpetual winds) covering an area of about 220 sq km with a variety of wildlife including tigers, elephants, bison, black bear, leopards, sambar deer, situated near Baghmara in south Garo Hills district of Meghalaya. The western part of the park adjoins with Siju bird sanctuary along the banks of Simsang River.

### **Dampa Tiger Reserve**

- Dampa Tiger Reserve, the biggest Wildlife Sanctuary in **Mizoram** was notified in 1985. It is situated in the western part of Mizoram state on the international border with Bangladesh about 127 km. from Aizawl.
- It covers an area of approximately 550 Sq. Km. The tropical Forests of Dampa is home to rich Flora and Fauna.
- Wildlife protected over here are **Rhesus macaque, Leaf monkey (Dawr), Pigtail macaque(Chengker Zawng), Stumptail macaque(Zawngmawt), Tiger(Keipui)**, Leopard(Keite), Indian Elephant(Sai), Gaur(Sele), Serow(Saza), Barking deer(Sakhi), Wild boar(Sanghal), Porcupine(Sakuh)), Sloth bear(Mangtir), Himalayan black bear(Savawm), Great Indian hornbill(Vapual), Malbar pied hornbill(Vahai), Peacock pheasant(Varihaw), Red

jungle fowl(Ramar), Crested serpent eagle(Muvanlai), Emerald dove(Ramparva, Hill myna(Vaiva), Python(Saphai), King Cobra(Chawngkawr), Monitor lizard(Tangkawng), and Hill Tortoise(Satel).

### Murlen National Park

- Murlen National Park is one of the best National Parks of **Mizoram**. It is situated about 245 km east of Aizawl.
- This park lies close to the Indo-Myanmar and is significant because of its proximity to the **Chin Hills**. It covers an area of approximately 100 sq. km.
- The Tropical, Semi evergreen and Sub montane Forests of Murlen are home to a rich variety of Flora and Fauna.
- About 15 species of mammals, 150 species of birds, 35 species of Medicinal plants, 2 species of bamboos & 4 species of orchids so far have been recorded in this Park.
- The vegetation is admixture of Quercus, Schima wallichii, Betula specie, Michelia champaca, Pinus Khasia, Prunus Myrica, Rhodendron, Arundinaria callosa, Canes and variety of orchids.
- Animals like **Tiger, Leopard, Sambar, Barking deer**, Himalayan Black Bear, Serow, Hoolock gibbon, Rhesus macaque, Malayan giant, squirrel, Hume's Pheasant, Kallej Pheasant, Common partridges, Hill myna, dark rumped swift are found here.

### Ngengpui Wildlife Sanctuary

- Ngengpui Wildlife Sanctuary is situated in South-Western **Mizoram**. It is close to Indo-Myanmar and Indo-Bangladesh border. The total area of the Sanctuary is 110 Sq. Km. and ranges in altitude from 200meters to about 1200meters above sea level.
- The wild animals found in this Sanctuary are **Tiger, Clouded leopard, Elephant, Guar, Barking deer, Sambar, Wild boar**, Hoolock Gibbon, Rhesus macaque, Leaf monkey, Common langur, etc.

### Khawnglung Wildlife Sanctuary

- Khawnglung Wildlife Sanctuary **Mizoram** is situated approximately 170 km from Aizawl. It covers an area of about 35 Sq. Km. and ranges in altitude from 400m to 1300m. Animals commonly found here are **Wild boars** etc.

### Lengteng Wildlife Sanctuary

- Lengteng Wildlife Sanctuary is situated in the Eastern part of **Mizoram** adjacent to **Murlen National Park**. The approximate area of the Sanctuary is 60 Sq. Km. and ranges in altitude from 400meters to about 2300meters above sea level.
- Within this park is the **second highest Peak in Mizoram**. The important wild animals and birds found in this Sanctuary are Tiger, Leopard, Sambar, Goral, Serow, Hume's Bartaile Pheasant, Kaleej Pheasant, Barking deer, Wild boar, Hoolock gibbon, Rhesus macaque, etc.

### Thorangtlang Wildlife Sanctuary

- Thorangtlang Wildlife Sanctuary is situated approximately 240 km from Aizawl via Thenzawl village in the Western Part of **Mizoram** and is adjacent of Dampa.
- The Sanctuary acts as a **corridor for elephants** which **migrate from Bangladesh**.

- The area of this Sanctuary is 50 Sq. Km. Important animals found in this Sanctuary are Tiger, Leopard, Hoolock gibbon, Leaf Monkey, Sambar, Barking Deer, and variety of Birds, etc.

### **Phawngpui National Park**

- Phawngpui National Park is situated in South Eastern **Mizoram** adjacent to Myanmar border. The **highest peak in Mizoram, the Phawngpui** (2360m) is located within this Park.
- The total area of the Park is 50 Sq. Km. The important wild animals and birds found in this Park are Ghoral, Serrow, Barking deer, Sambar, Leopard, Blyth's tragopan, Kaelej Pheasant, Hoolock Gibbon, Common Langur, Rhesus macaque, Stump tail macaque and variety of birds and orchids.

### **Simlipal National Park**

- Simlipal National Park, 320 km from Bhubaneswar (**Odisha**), is a 2,750 sq km sanctuary and a Project Tiger Reserve.
- Simlipal Tiger Reserve is located in Mayurbhanj district in the northern part of Odisha, close to the Bengal-Bihar border. It is a thick hilly area of forests spread over 2,750 sq km. It occupies an important position as the habitat of the Royal Bengal tiger.
- There **are 7 major rivers**. There are approximately 1,076 plant species, 231 bird species and 42 mammal species and 29 reptiles and 12 species of amphibians.
- One can find tiger, leopard, elephant, sloth bear and spotted deer. Bird species are peafowl, jungle fowl, hill hynah, eagle and parakeet. Reptiles like crocodile, lizards, turtles and cobras are commonly found.

### **Nandankanan Sanctuary & National Park**

- Situated along the Kolkata-Chennai railway line near Barang railway station, the Nandankanan Zoological Park **Odisha** was established on December 27, 1960.
- Nandan Kanan means "garden of pleasure", and this combination of zoo, botanical garden and sanctuary 20 km from Bhubaneswar, in the splendid environs of the **Chandaka Forest**, along the rippling waters of the **Kanjia Lake**, fits the description.
- Within its perimeters the Zoological Park covers 362 hectares of undulating forest areas, natural wasteland and Kanjia Lake which itself covers 66 hectares.
- It nurtures 46 species of mammals, 59 species of birds and 21 species of reptiles. In addition to the **white tigers**, endangered species such as the **Asiatic Lion, three Indian crocodilians, sanghai, lion tailed macaque, Nilgiri langur, Indian pangolin, mouse deer and countless birds, reptiles, and fish** have been breeding successfully here.
- The Nandankanan Zoological Park is one of the major tourist attractions of Odisha. It has the distinction of being the **host zoo in the world for captive breeding of white tigers** which originated in Rewa, Madhya Pradesh.
- Internationally acclaimed for its large collection of white tigers, Nandankanan is also the **first-ever captive breeding centre of endangered species** for creating awareness towards wildlife.
- The unique natural ambience of Nandankanan with a wide variety of animals also serves as a rehabilitation centre of problematic wild animals. It also acts as a rescue centre for abandoned, injured and incapacitated animals.

## Bhitarkanika Wildlife Sanctuary

- Bhitarkanika Wildlife Sanctuary **Odisha** is spread in an area of 672 square kilometers. The Sanctuary comprising mangrove forests meandering rivers, innumerable criss-crossed tidal inundated creeks provide last refuge to the already endangered **salt water Crocodile (Crocodile Porosus)**.
- Besides estuarine Crocodile, the sanctuary is rich in avifauna, mammalian and reptilian population.
- These mangrove forests are good habitat for **King Cobra, Indian Python and Water Monitor Lizard**.
- A large number of water birds visit this area. Most of the Birds are asian openbill, egrets, black Ibis, cormorants, darters and others.

## Chilka Lake Bird Sanctuary

- The Chilka Lake is situated in Puri, in **Odisha**. It is considered to be Asia's largest inland salt-water lagoon. The pear-shaped lake spreads across 1,100 sq km, and has a unique ecosystem with a range of aquatic flora and fauna found in and around its brackish waters.
- Other than the birds, Chilka's shores are home to blackbuck, spotted deer, golden jackals, hyenas.
- The lake is rich in aquatic life - its waters harbour around 160 species of fish, crustaceans and other marine creatures, including the famous **Chilka dolphin**, prawn, crab and mackerel fishing are an important source of livelihood for the local people.

## Keoladeo Ghana National Park

- Keoladeo Ghana National Park **Rajasthan**, commonly known as Bharatpur Bird Sanctuary, It is one of the smallest parks in the country and one of the **finest bird parks in the world**.
- This magnificent bird haven in actual came into being paradoxically as a duck shooting preserve for Maharaja Suraj Mal of Bharatpur.
- He transformed the shallow depression formed by the confluence of **river Gambhir and river Banganga** into a reservoir by damming the rainwater in monsoons. Flooding of water created shallow wetland ecosystem causing it to be a perfect habitat for an astounding variety of birds.

## Ranthambore National Park

- Ranthambore National Park is in Sawai Madhopur District of **Rajasthan** state. Ranthambhor Tiger Reserve is located at the **junction of the Aravalli and Vindhya hill range**, this is one of the finest places to view animals, especially as they are used to being stared at here.
- The park covers an area of Approximately 400 sq Km and if combined it with the area of **Sawai Man Singh sanctuary area**, it is around 500 Sq km.
- Ranthambore national park was declared a wildlife sanctuary in 1957 and in 1974 it gained the protection of "Project Tiger". It got its **status of a National Park in 1981**.
- **The tiger** is not the only attraction at Ranthambhor. A variety of birds including owlets, the ubiquitous langur (monkey), leopard, caracal, hyena, jackal, jungle cat, marsh crocodiles, wild boar, bears and various species of deer are the other attractions.
- A significant geological feature within the park is the 'Great Boundary Fault' where the Vindhya plateau meets the Aravali range.

- The **Rivers Chambal** in the South and the **Banas in the north** bound the National Park. The park is dotted with steep rocky hills and the dominating architecture of Ranthambhor Fort (built in the 10th century), adds to its landscape.

### **Sariska Tiger Reserve**

- Sariska Tiger Reserve lies in the Alwar district of the **Rajasthan** state of India. It is prime tiger country. The reserve was declared a wildlife sanctuary in 1958 and came under the "Project Tiger" as a Sariska tiger reserve in 1979.
- The forest is **typical dry deciduous**, dramatically changing with the change in season. Dhok (*Anogeissus pendula*) is the dominant tree species covering over 90 per cent area of the forest. *Boswellia serrata* and *Lannea coromandelica* grow at rocky patches. Kattha (*Acacia Catechu*) and Bamboo are common in the valleys.
- The Northern Aravali Hills dominate the skyline with their mixture of sharp cliffs and long narrow valleys. The landscape of Sariska comprises of hills and narrow valleys of the Aravali hill range.
- Sariska Park is home to numerous carnivores including Leopard, Wild Dog, Jungle Cat, Hyena, Jackal, and Tiger. These feed on an abundance of prey species such as Sambar, Chital, Nilgai, Chousingha, Wild Boar and Langur.
- Sariska is also well known for its large population of **Rhesus Monkeys**, which are found in large numbers around Talvriksh.

### **Desert National Park**

- The Desert National Park is situated in the West Indian state of **Rajasthan** near Jaisalmer. This is one of the **largest national parks**, covering an area of 3100 sq. km. The desert sanctuary being a fragile ecosystem has its own flora and fauna.
- Birdlife in this sandy habitat is vivid & spectacular. The **great Indian bustard** is another magnificent bird found in relatively fair numbers. It migrates locally in different seasons.
- The region is a haven for migratory and resident birds of the desert. One can see many eagles, harriers, falcons, buzzards, kestrel and vultures.
- Short-toed eagles, tawny eagles, spotted eagles, lagger falcons and kestrels are the commonest of these. Sandgrouses are spotted near small ponds or lakes. Sea shells and massive fossilized tree trunks in this park record the geological history of the desert.

### **Khangchendzonga (High Altitude) National Park**

- Khangchendzonga (High Altitude) National Park **Sikkim** extends from the cold deserts of Lhonak Valley and the ridges of Lachen in the North District to the historical place at **Yuksom**. The Western Boundary of the park runs along the international boundary with **Tibet**.
- The park covers an area of 1,784 sq.kms and occupies as much as 25.14% of the land area of Sikkim. This area lies within reserved forests and except for a small Tibetan Village community at Tsoka, there are no other village settlements inside the park.
- The park is a reservoir of diverse habits - including some rare and endangered species like the Snow Leopard, Red Panda, Musk Deer, Bharal or the Blue Sheep, Himalayan Tahr, the Shapi of Sikkim, Leopard, Goral Serow, Barking Deer, Lesser Cats, Tibetan Wolf, Fox, Tibetan Fox, Himalayan Black Bear and Monkeys.

## Himalayan Zoological Park

- Himalayan Zoological Park **Sikkim** is spread over an area of 205 ha of mountainous land encompassing steep terrain suitable for **Musk Deer and Blue Sheep**; gentle slopes for Himalayan Black Bear, Barking Deer; a vision valley for Red Panda, Danphay-Munial (bird) and many other endangered Himalayan fauna.
- List of animals found protected here is: Himalayan Red Panda, Himalayan Black Bear, Snow leopard, **Clouded leopard**, **Leopard Cat**, Himalayan Palm Civet, Large Indian Civet, Marbled Cat, Musk Deer, Barking Deer, Blue Sheep, Serow, Himalayan That, Himalayan Yellow-throated Marten, Himalayan Weasel, Tibetan Wolf, Red fox, Common Otter, Common Langur, Wild Boar, Porcupine, Spotted Deer, Yak, Goral, Pheasants (8 species), Reptiles (Pythons, Snakes, Lizards), Pangolin, and Aquatic habitat dwellers.

## Kyongnosla Alpine Sanctuary

- Kyongnosla Alpine Sanctuary **Sikkim** is located at a distance of 31 km east of Gangtok, the capital of Sikkim, on the way to Natu La. This 'La or pass is on the old 'silk trade route from Lhasa to Calcutta. Earlier just occupying 4 sq km, this sanctuary has now been extended.
- The sanctuary is rich both in flora and fauna. Rare, endangered ground orchids and rhododendrons interspersed among tall junipers and taller silver firs are among the important plants present.
- Rhododendron nevium the State Tree of Sikkim and Cypripedium tibeticum the ground slipper orchid on the verge of extinction have been introduced here.
- Ground flora includes different species of primulas, wild strawberries, irises, poppies and the rarely seen Panax pseudo-ginseng.
- **Medicinal plants** such as 'Kutki Picrorhiza scrophulariflora,jatamansi Nardostachys phulum emodi and even the wild onion are not hard to see here. The lower levels of the sanctuary are occupied by the soil binding bamboo Arundinaria sp.

## Fambong Lho wildlife Sanctuary

- Fambong Lho wildlife Sanctuary is located at a distance of 25 km from Gangtok town, the capital of **Sikkim**. The famous **Rumtek Monastery** is located at the southeast boundary.
- The main vegetation is Oak Quercus sp 'Katus Castanopsis sp., champ, Michelia sp. 'Kawlo Machilus sp., 'Kimbu Morus sp., thicket bamboo forests, ferns and lone fir Tsuga dumosat at Tinjurey.
- The sanctuary is also home to large number of **wild orchids, moses and Lycopodium sp.** **Mammals** found here are Serow, Goral, Barking Deer, Himalayan Black Bear, Red Panda, Weasels, Martens, Leopard-cat, jungle Cat, Marbled Cat, Largen Indian Civet, Palm civer, Binturong.

## Aignar Anna Zoological Park

- Aignar Anna Zoological Park is situated at Vandalur which is 32 Km away from the metropolitan city of Chennai (**TN**). The Zoo maintains a viable population of threatened and endangered species of the Western and the Eastern Ghats.
- It has many threatened exotic species also. The Zoo plays the role of **Species Bank** and **Gene Bank** for a wide variety of flora and fauna.
- It is an **Educational Centre** and offers tremendous scope for Eco-awareness and conservation education to the public. It serves as a site for basic and applied research on

- many aspects like animal behaviour, nutrition, ecology, biology, diseases and contributes significantly in conservation of Bio-diversity.
- The Zoo has the scientific and technical facilities for propagation and introduction of endangered species to its original habitat.

### **Indira Gandhi Wildlife Sanctuary**

- Indira Gandhi Wildlife Sanctuary (**TN**) and National Park **formerly called Anamalai Wildlife Sanctuary** is a protected area named after Prime Minister Indira Gandhi who visited here on October 7, 1961.
- An Ecological Paradise, this sanctuary encompasses a **National Park** with an area of 108 sq.km.
- About 800 species of South Indian flora are distributed here. This sanctuary **nurtures arboreal animals like lion tailed macaque, bonnet macaque, common langur, nilgiris langur, malabar giant squirrel and grizzled giant squirrel.**
- The ground animals listed are: Tiger, Panther, Elephant, Gaur, Pangolin, Sambar, Spotted Deer, Barking Deer, Mouse Deer, Wild Boar, Dhole, Sloth Bear, Porcupine, Nilgiris Tahr, Civet Cat and Toddy Cat.
- The Avifauna includes Racket Tailed Drongo, Black Headed Oriole, Paradise Flycatcher, Whistling Thrust, Emerald Dove, Green Pigeon, Tickell's Flower Pecker, Rufus Wood Pecker, Rose Ringed Parakeet, Black Eagle, Great Indian Malabar pied Horn Bill, Fiary Blue Bird and green Billed Malkoha etc.

### **Srivilliputhur Grizzled Squirrel Wildlife Sanctuary**

- The Grizzled Squirrel Wildlife Sanctuary at Sirvilliputhur in southern **Tamil nadu**, was declared as a sanctuary in December 1989.
- It spreads over 480 sq. KM. This sanctuary is contiguous to Periyar Tiger Reserve on the South western side and the **Megamalai Reserve Forest** on the north western side and its southern limit is contiguous with the Sivagiri Reserved Forest of Tirunelveli Forest Division.
- The sanctuary has a wide range of habitats - from the higher elevation Upper Montane forests and grasslands, mid elevation Wet Evergreen, Semi Evergreen, Moist Deciduous, Open Deciduous, Closed Deciduous forests and grasslands with scrub jungles in the foot hills.
- There is a wide range of herbivores, carnivores and omnivores in the Grizzled Squirrel Sanctuary. Resident and migrating elephants are common.
- The **other important animals are Tiger, Leopard, Gaur, Nilgiri tahr, Spotted deer, Barking deer, Sambar, Wild-boar, Porcupine, Nilgiri langur, Lion-tailed macaque, Common langur, Slender loris, Bonnet macaque, Sloth bear, Indian Giant Squirrel and Flying Squirrel.** The Sanctuary has 18 species of snakes, 15 species of lizards, over 10 species of amphibians and over 56 species of butterflies now.

### **Guindy National Park**

- Guindy National Park is situated in the Mambalam, Guindy taluk **in Chennai(TN)**. It is spread over an area of 270 hectares of dry evergreen scrub and thorn forests and is the smallest national park in the country.
- Guindy National Park is home to **400 black bucks, 2000 spotted deer, 24 jackals, a variety of snakes**, geckos, a wide variety of snakes tortoises, geckos and over 100 species of birds, over 60 species of butterflies and spiders each, a wealth of different invertebrates- grasshoppers, ants, termites, crabs, snails, slugs, scorpions, mites, spiders, earthworms,

- millipedes, etc A snake park within this park supports a variety of snakes, crocodiles and turtles.
- About 22 acres of GNP has been carved out into a zoo for **ex-situ conservation**. This entails keeping different species in captivity on view to public.
  - Children's park - the zoo was started with the idea of providing children a natural environment, to educate them about animals and create awareness on conservation.

### **Gulf of Mannar Marine National Park**

- The Gulf of Mannar Marine National Park (**TN**) has the core area of about 560 sq KM from Rameswaram to Tutucorin lying within the Gulf of Mannar Biosphere Reserve covering an area of 10,500 Sq KM. on the south-east coast of India.
- It covers the coast of Rameswaram, Tutucorin, Tirunelveli and Kanyakumari. It is one of the world's richest regions from marine bio diversity perspective and the first marine Biosphere Reserve in Southeast Asia.
- The **Biosphere Reserve** comprises 21 islands with estuaries, mudflats, beaches, forests of the near shore environment, including **marine components like algal communities, sea grasses, coral reefs, salt marshes and mangroves**.
- In each island, straight line-transect ranging from 500-1000 m depending upon the size and shape of the island and a plots of 15 m radius were laid at equal intervals and visual estimation of the vegetation types at species level and area covered were recorded in each transect.
- This was then extrapolated to find out the vegetation cover of each island. While introduced Prosopis was found to be dominant tree species in all islands, Memphis acidula was the only endemic species in the island group of GOMMNP. A total of 10 true mangrove and 24 mangrove associated species were recorded from these islands.
- A total of 92 wild and 9 introduced species of vegetations were recorded in the islands. **Peculiar animal like Balanoglosses** living -fossil linking invertebrates and vertebrates is endemic here.
- Sandy shores of islands is feeding ground for five endangered marine turtles - **Green turtle, Olive ridley turtle, Hawksbill turtle, Leatherback turtle and Loggerhead turtle** and the first two breed here too.

### **Kalakkadu Wildlife Sanctuary**

- It is situated in an area of 223 sq kms in the Thirunelveli District(**TN**), at the foothills of Western Ghats and the adjoining areas.
- The flora ranges from forests of the tropical wet evergreen to the tropical dry deciduous and thorn forests in the lower hills.
- Kalakadu wildlife sanctuary is **very popular with botanists and ornithologists** as it has a great variety of fauna and bird lives.
- The Lion tailed Macaque, Nilgiri Langur, Bonnet Macaque, Common Langur, Nilgiri Tahr, Sambhar, Sloth Bear, Gaur, Elephant, Tiger, Flying Squirrel, Panther, Wild Dog and Pangolin are some of the wild life seen in this sanctuary.

### **Point Calimere Wildlife Sanctuary**

- Point Calimere Wildlife Sanctuary was created in **1967 for conservation of Blackbuck**, an **endangered and endemic species of India**. The sanctuary is located in Nagapattinam district of **Tamil Nadu**.

- This vast swampy tract of Point Calimere is the scene of one of India's greatest avian spectacles. Point Calimere encompasses 17.26 sq KM of sandy coast fringed by saline swamps and thorny scrub around the backwaters.
- Point Calimere is associated with Hindu religion and mythology. The forests of Point Calimere, earlier known as **Vedaranyam forests**, mean forests (aranyam) of the Vedas (sacred text of the Hindus).
- The climate of the area is monsoonal, but it is not typical of monsoonal climates due to its asymmetrical rainfall regimes. The main contribution to the rainfall is from the Northeast Monsoon, and to a lesser degree, the Southwest Monsoon.
- **Blackbuck, locally called Velimann**, is the key species of the sanctuary. They are mostly seen grazing in the open grassland area.
- Other important animals of the sanctuary include spotted deer, Jackal, Civet, Wild boar, Jungle Cat, Bonnet Macaque, Black-naped Hare and the Common Indian Mongoose. A notable feature of the sanctuary is the presence of feral horses.

### **Mudumalai Wildlife Sanctuary**

- Mudumalai Wildlife Sanctuary & National Park (**TN**) is situated at the tri-junction of Tamil Nadu, Kerala and Karnataka on the North Eastern Slopes of the Nilgiris part of Western Ghats descending to the Mysore Plateau.
- With **Bandipur Tiger Reserve (Karnataka)** in the north and **Wynad Wildlife Sanctuary (Kerala)** in the west the region forms a single, continuous viable habitat for a varied range of wildlife and is **a part of the Nilgiri Biosphere Reserve**.
- Dawn is the time of day when birds are most active and at their chirpiest best. River and stream margins are good places to listen to bird choruses. Reptiles are also well represented.
- There are several species of poisonous and non-poisonous snakes, including python. Some pythons are so large that they do not hesitate to throw their coils round medium sized deer and bison calf.
- **The Flying lizard is a rare and interesting reptile** that is found in the sanctuary. Animals that are commonly seen by casual visitor are spotted deer, Elephants, Common langur, an occasional Sambhur and Gaur.

### **Mukurthi National Park**

- Mukurthi National Park is another major attraction of the Nilgiris (**TN**). It is located on the south eastern corner of the **Nilgiris Plateau**. The area contains a viable population of Nilgiri Thar (Hemitragus hylocrius).
- It is spread over an area of 78.46 km. A fascinating feature of the Mukurthi National Park is its endemism and relationship with the Himalayan flora and fauna.
- The natural vegetation consists of vast stretches of grasslands interspersed with numerous isolated, compact sharply defined and **small woodland "Shoals"**. Only two storeys of tree layers are seen.
- Lianas are quite common, Epiphytes are abundant and consists mostly of lichens, ferns, bryophytes and various orchids. Several plants native to Nilgiris plateau have their nearest relatives in the Himalayas. The Rhododendrons, Black berries, Raspberries etc. are not found anywhere in peninsular India, between the Nilgiris and the Himalayas.
- Mukurthi's wild animals are a fascinating mixture of plain and mountain animals. The close encounters with wild animals, are rare in the open Mukurthi Country.
- The common mammalian species met with here include **Nilgiri Tahr Sambar, Barking deer, Elephant, Blacknaped hare, Jungle cat**, Wild dogs, Jackal, Stripe-necked

mongoose, Nilgiri Martin, Otters, Giant squirrel etc., The Avifauna are mostly hill birds, such as Kestrel, Black Eagles, Grey jungle fowls, wood cock and Thrushes.

### Mundanthurai Wildlife Sanctuary

- The Mundanthurai-Kalakad wildlife sanctuary in Tirunelveli district (**TN**) is developed as a **National Tiger Reserve** from the year 1988 with a total area of 817 sq. km in the south most western ghat ranges.
- The nearest stations are Cheranmahadevi, and Ambasamudaram which are 20kms and 15 kms respectively from Tirunelveli. The mountainous undulating to topography is the characteristic feature leading to tropical dry deciduous forest on the lower slopes and tropical wet evergreen forests on the upper reaches.
- The **climate is dry, humid and hot** at plains and pleasant cold in the higher elevations. The reserve is the southernmost habitat of the tiger. Other predators like panthers, jungle cats, civets, dholes, jackals, striped hyenas are also found here.
- We can also come across reptiles and amphibians like king cobra, common krait, russels, viper, darkpit viper, monitor lizard, garden lizard, tortoise, crocodiles and rare species of frogs. Regarding avifauna there are more than 80 species of birds found in this region.
- To mention a few spotted frequently here are egrets, herons, jungle fowl, spur fowl, partridge, quails, emerald dove, minivets, bee cathers, sparrows, owls, night jars, kites, paradise fly catchers, and parakeets etc.
- There are 24 identified nature trails which are spread over the reserve. It gives a thrilling experience to trekkers.

### Vedanthangal National Park

- Vedanthangal bird sanctuary (**TN**) is one of the **smallest and oldest** in the country with a unique history.
- The local people have been protecting the sanctuary for centuries now because they have realized that the bird droppings falling into the **tank increases nitrogen** content of the water and when used to irrigate crop increases the yield greatly and saves the cost of fertilizers.
- As far back as 1798, the village folk convinced the authorities to give protection to the birds of the 30 ha area of the Vedanthangal tank.
- Around 30000 birds come every season even though the area is just 30 ha It then attracts multitudes of herons, egrets, storks, ibises and spoon bills.
- If the monsoon is heavy, these trees can be partially submerged. Despite its compact size, Vedanthangal is worth a visit, especially between October and January, for the experience of seeing nesting birds in the thousand within close range.
- One of the first birds to arrive at Vedanthal are Open billed storks and breed twice during the same season before leaving the sanctuary.
- Egrets, Spot billed pelican, Painted stork, Great cormorant, Indian Cormorant, Darter, **Eurasian spoonbill, Asian open bill**, Black-headed Ibis, Grey Heron, Purple Heron, Great Egret are seen in large numbers.
- Some of the other commonly seen waterfowl are the white ibis, night heron, darter, pond heron and ducks like Comb duck, pintails, common teals, dabchick, shoveller, and black-winged stilt.

## **Sepahijala Wildlife Sanctuary**

- Sepahijala Wildlife Sanctuary **Tripura** was constituted on 2nd February 1987. The sanctuary has 456 plant species of monocotyledon and dicotyledon. Trees of Sal, Chamal, Garjan and Kanak exist predominantly.
- The secondary species consist of Pichla, Kurcha, Awla, Bahera, Hargaja, Amlaki, Bamboos and grasses.
- Sanctuary has the 4489 cum per ha.of timber biomass. Sanctuary has abundant Rauwalfia serpentina and home to other endangered and endemic species.
- Agar (aggeraria aglocha) (the state tree), Nageshwar (Mesua ferrea- state flower), Dukul (the green Imperial pegin-state bird) and groups of Spectacled langur (Phary's leaf monkey-State animal) Spectacle monkey can easily be sighted inside the sanctuary area.
- **Tropical moist deciduous Forest** of Sepahijala harbours five different species of primates like Rhesus macaque, pigtailed macaque, Capped langur, spectacled langur, slow Lories and a lot of many other wild animals.
- More than 100 species of birds are found here. Wonderful habitat of Sepahijala attracts lot of migratory birds of which lesser whistling teal, white ibis, open billed stork is of prime importance.

## **Trishna Wildlife Sanctuary**

- Trishna wildlife Sanctuary **Tripura** was notified in the year November 1988. Total area of the Sanctuary is 194.704 Sq. Km. **Trishna Sanctuary** has diversity in its floral and faunal contents.
- The Sanctuary is famous for Bison locally **known as "Gaba"** and home to several species of "Primates".
- Sanctuary has a numbers of perennial water rivulets, water bodies, and grass land. One species of Bamboo (Oxtenanthera Nigrocilliate) locally known as Kaillai is plenty here, leaves of which are liked by Bison.

## **Gumti Wildlife Sanctuary**

- Gumti Wildlife Sanctuary is the second sanctuary of the South Tripura district located in the south-east corner of the state **Tripura**. Its area is 389.54 km. Close to the sanctuary, there is a vast water reservoir covering almost 300 sq km of an area.
- This water reservoir attracts several resident and migratory water birds. **Gumti Wildlife Sanctuary in Tripura** has Elephants, Bison, Sambar, Barking deer, Wild goat or Sarow apart from many other animals and reptiles.
- This is a very ideal destination for the tourists interested in eco-tourism. The sanctuary boasts of a rich flora and fauna. One can find numerous medical and therapeutical botanical species in abundance in the surroundings of the sanctuary.

## **Rowa Wildlife Sanctuary**

- Rowa Wildlife Sanctuary, situated in the north of the district, can be approached from Panisagar and is adjacent to the National Highway.
- Rowa Wildlife Sanctuary in **Tripura** is a small wildlife sanctuary covering an area of 85'85 hectares and it is one of the few remains of the natural forests left. This sanctuary is easily accessible to the tourists from all around.
- Rowa Wildlife Sanctuary provides plenty of scope for study by the botanists, ecologists, environmentalist and students of wildlife system.

- Rowa Wildlife sanctuary provides shelter to numerous species of birds, wild animals as well as primates and reptiles. Ornithologists, etymologists, botanists as well as wildlife enthusiasts have a merry time exploring the sanctuary and its offerings.

### **Assan Barrage Bird Sanctuary**

- The Asan Barrage **Uttarakhand**, popularly known as Dhalipur Lake, was created in the year 1967 as a result of the construction of Asan barrage at the confluence of the river Yamuna & Asan through Dhalipur power house.
- Asan Barrage is **famous for bird watching**.
- The Asan reservoir attracts 53 species of water birds of which 19 are winter migrants from Eurasia.
- During winter months 90% of the water bird population comprises the following 11 migratory species, namely Brahminy Duck, Pintail, Red Crested Pochard, Gadwall, Common Pochard, Mallard, Coot, Wigeon, Common Teal, Tufted Duck, and Shoveller.

### **Corbett National Park**

- Corbett has aptly been described as the land of the Roar, Trumpet and Song. It represents a scene of remarkable beauty. Corbett National Park lies in two districts - Nainital and Pauri - in the hill state of **Uttarakhand** in northern India.
- It covers an area of 521 sq. km and together with the neighbouring **Sonanadi Wildlife Sanctuary** and Reserve Forest areas, forms the Corbett Tiger Reserve over 1288 sq. km.
- Corbett had the proud distinction of being chosen as the venue for the inauguration of Project Tiger in India. The rich biodiversity of the Reserve is partly attributed to the variety of habitat found here.
- Due to the location of the Reserve in the foothills of the Central Himalayas both Himalayan and peninsular flora and fauna is found in the Reserve.
- Corbett is the site for three nationwide conservation projects aimed at saving prominent endangered species from extinction and providing a safe habitat for them. **These are: Project Tiger, Crocodile Conservation Project, and Project Elephant.**
- There is a great diversity in the fauna of Corbett National Park, you can find more than 575 Species of birds, 25 Species of reptiles, 50 species of mammals and 7 species of amphibians abundant food sources and shelter and protection from human disturbance for over half a century.
- Some of the major mammals that can found in Corbett National Park are Chital, Elephant, Wild pig, Barking Deer, Sambar, Tiger, Common Langur, Rhesus Macaque, Jackal, and Leopard Panther etc.

### **Govind National Park**

- The Govind Wildlife Sanctuary, situated in the Uttarkashi district of **Uttarakhand**, was established on **1st March, 1955**. It spreads over an area of 957.969 sq. kms. The entire area of the national park is subjected to light to heavy snowfall.
- The area is home for a lot of endangered animals and its large area along with the contiguous forests of the neighbouring forest divisions helps in maintaining genetic diversity. The area is very rich in medicinal plants, many of which form the basis for certain life saving drugs.
- Over 15 species of mammals and 150 species of birds exists in the sanctuary. The important mammals are Snow leopard, Black bear, Brown bear, Musk deer, Bharal, Himalayan Thar, Serow and Common leopard.

- **Snow Leopard** inhabits inner Himalayas above altitude of 3500 m. In the Eighth Plan, the Govt. of India launched the Snow Leopard Project for the long term conservation of this elusive cat.
- The endangered birds found in the area are Monal pheasant, Koklas pheasant, Western Tragopan, Himalayan Snow cock, Golden eagle, Steppe eagle, Black eagle and Bearded vulture. Other important bird groups are pigeons, parakeets, cuckoos, owls, minivets, bulbuls, tits, warblers, thrushes, finches, buntings, etc.

### **Nandadevi National Park**

- The Sanctuary has been converted to a National Park **Uttarakhand** and temporarily closed for visitors on environmental considerations. It has an average altitude exceeding 4500 m., and is surrounded by as many as seventy lofty peaks, the **Nandadevi (7817 m.) being the highest.**
- It is in the form of cup with lush green meadows, white waterfalls, and rich wild flora and fauna.
- Sir Edmund Hillary described the Sanctuary as a god-gifted wilderness - India's training ground for adventure - and truly so.
- The wildlife to be found in the park include Snow Leopard, Brown and Himalayan Black Bears, Bharal, Himalayan Tahr, Serow, Monal and Chir Pheasants.

### **Valley of Flowers National Park**

- Valley of Flowers National Park is nestled in the Himalayan ranges of **Uttarakhand**. The park spreads over an area of 87.50 sq km and was declared as a **national park** in the year 1982.
- In 1988, **UNESCO** declared Valley of Flowers National Park of India, together with Nanda Devi National Park, as Nanda Devi and Valley of Flowers National Park **World Heritage Site**. The altitude of the park ranges between 3,250 m and 6,750 m.
- Over 300 species of wild flowers can be seen at the Valley of Flowers National Park. These include Marsh Marigold, Lilium, Campanula, Pedicularis, Arisaema, Geranium, Bistorta, Ligularia, Epilobium, Rhododendrons, Corydalis, Inula, Brahma Kamal, Cypripedium, etc. The wildlife found comprises of Snow Leopard, Himalayan Bear, Himalayan Mouse Hare, Musk Deer, Blue Sheep, etc. A number of butterfly species also inhabit this park.

### **Dudhwa National Park**

- Dudhwa (**UP**) spreads over 811 sq. kms near the border of India and Nepal encompassing Northern tropical semi evergreen forests, moist deciduous forests, moist Savannah forests and tropical, seasonal swamp forests.
- One of the rarest species of deer is found in this area. The Swamp deer are supposed to number 1,500. There are at least 37 species of mammals, 16 species of reptiles and 400 species of avifauna.
- **Dudhwa is said to have 101 tigers and 4 leopards.** Recently the Hisspid Hare has been sighted from this area.
- In 1984, major rhino rehabilitation project was started here. Dudhwa came under Project Tiger in 1988.
- The Reserve has a range of fascinating wildlife. Included are sloth bear, rattle, civet, jackal, the lesser cats like the leopard cat, fishing cat and jungle cats; varieties of deer - the beautiful spotted deer or chital, hog deer and barking deer.

- A bird watchers' haven, Dudhwa is also noted for its wide variety-about 400 species. Its swamps and several lakes attract varieties of waters fowl. Being close to the Himalayan foothills, Dudhwa also gets its regular winter visitors - the migratory water birds.

### National Chambal Sanctuary

- The National Chambal Sanctuary, located in **Etawah, near Agra** is spread over an area of 635 sq. kms. Established in 1979, the park has a rare collection of exotic rarely found species.
- The unusual gangetic dolphin is the main attraction of National Chambal sanctuary.
- The rare Gangetic dolphin is the main attraction of National Chambal Sanctuary. The other inhabitants of this sanctuary are magar (crocodile) and gharial (alligator), chinkara, sambar, nilgai, wolf and wild boar.
- Founded in 1979 the sanctuary is a part of a large area **co-administered by Rajasthan, Madhya Pradesh and Uttar Pradesh**.

### Buxa Tiger Reserve

- Buxa Tiger Reserve lies in Alipurduar sub-division of Jalpaiguri district of **West Bengal**. Buxa nestled in the eastern Himalayan foothills with sprawling Terai landscapes and tea gardens encompass 759.26 sq. kms.
- In this mosaic of evergreen wet mixed, dry mixed, hill and riverine forests that border Assam and Bhutan live a rich selection of flora and fauna. The core area is 315 sq. kms.
- **Project Tiger was launched in February 1983** but demarcation of the area took place in 1986 and only in 1992 did the Core and buffer come into the control of the field director.
- In the Reserve 390 species of birds, 73 species of mammals, 76 species of snakes, 5 species of amphibians have been identified so far.
- The area is an abode of endangered species like **Asian Elephant, Tiger, Gaur, Wild boar, Sambar**.
- In the Reserve 390 species of birds, 73 species of mammals, 76 species of snakes, 5 species of amphibians have been identified so far.
- More than 300 species of trees, 250 species of shrubs, 400 species of herbs, 9 species of cane, 10 species of bamboo, 150 species of orchids, 100 species of grass and 130 species of aquatic flora including more than 70 sedges (Cyperaceous) have been identified so far. There are more than 160 species of other monocotyledons and ferns.

### Sunderbans National Park

- The Sunderbans **West Bengal** covers 10,000 km<sup>2</sup> of land and water (more than half of it in India, the rest in Bangladesh) in the Ganges delta. It contains the **world's largest area of mangrove forests**.
- A number of rare or endangered species live in the park, including tigers, aquatic mammals, birds and reptiles.
- A **UNESCO World Heritage Site**, the Sunderbans is a vast area covering 4264 square km in India alone. The Indian Sunderbans forms the largest Tiger Reserve and National Park in India.
- The Sunderbans forest is home to more than **250 tigers**. The Bengal Tigers have adapted themselves very well to the saline and aqua environs and are **extremely good swimmers**. Also there are **chital deer and rhesus monkey**.

- The aqua fauna of Sunderbans include a variety of fishes; red fiddler crabs and hermit crabs. There are **crocodiles**, which can be often seen along the mud banks. Sunderbans National Park is also noted for its **conservation of the Ridley Sea Turtle**.
- There is an incredible variety of reptiles also found in Sunderbans, which includes king cobra, rock python and water monitor.
- The endangered **river Terrapin, Batagur baska** is found on the Mechua Beach, while the **Barking Deer** is found only in **Holiday Island** in Sunderbans.

### **Wandur National Park**

- Wandur National Park comprises of about 12 islands and is located about 30 km southwest of Port Blair, the capital city of **Andaman and Nicobar Islands** and are also the home to India's best marine parks.
- Most of the islands in the park are densely forested; the open spaces are covered with scrub and creepers.
- A casual glance around and **one can spot brilliant tropical flowers** including orchids, broken branches and fallen leaves spread over the jungle pathways. One can also hear the bird calls, but unless in the open, it is difficult to spot the terns, gulls, ospreys, serpent crested eagles, wood pigeons and of course the swifts.
- The **most striking feature** of all these islands is the **vegetation. Very dense**, it comes right down to the shore, seeming to merge into the sea. Branches and creepers overhang and dip into the seawater.

### **NATIONAL PARKS OF INDIA**

India's first national park (an IUCN category II protected area) was established in **1935** as **Hailey National Park**, now known as Jim Corbett National Park. By 1970, India only had 5 national parks. In 1972, India enacted the Wildlife Protection Act and Project Tiger to safeguard the habitats of conservation reliant species. Further federal legislation strengthening protections for wildlife was introduced in the 1980s. All national park lands encompass a combined **38,029.18 km<sup>2</sup>, 1.16% of India's total surface area**.

<b>NAME</b>	<b>STATE</b>	<b>YEAR</b>	<b>AREA (Km<sup>2</sup>)</b>
Corbett National Park	Uttarakhand	1936	520
Kanha National Park	Madhya Pradesh	1955	940
Tadoba National Park	Maharashtra	1955	116
Madhav National Park	Madhya Pradesh	1959	375
Mount Abu Wildlife Sanctuary	Rajasthan	1960	288
Panna National Park	Madhya Pradesh	1973	542
Bandipur National Park	Karnataka	1974	874
Bannerghatta National Park	Karnataka	1974	104
Kaziranga National Park	Assam	1974	471
Gir National Park	Gujarat	1975	258
Navegaon National Park	Maharashtra	1975	133
Pench National Park, Madhya Pradesh	Madhya Pradesh	1975	292
Pench National Park	Maharashtra	1975	257
Dalma Wildlife Sanctuary	Jharkhand	1975	195
Blackbuck National Park, Velavadar	Gujarat	1976	34
Guindy National Park	Tamil Nadu	1976	2
Nandankanan National Park	Orissa	1976	
Dudhwa National Park	Uttar Pradesh	1977	490

Keibul Lamjao National Park	Manipur	1977	40
Khangchendzonga National Park	Sikkim	1977	1784
Eravikulam National Park	Kerala	1978	97
Mollem National Park	Goa	1978	107
Vansda National Park	Gujarat	1979	23
Van Vihar National Park	Madhya Pradesh	1979	4
Desert National Park	Rajasthan	1980	3162
Gulf of Kachchh Marine National Park	Gujarat	1980	162
Gulf of Mannar Marine National Park	Tamil Nadu	1980	6
Ranthambore National Park	Rajasthan	1980	392
Simlipal National Park	Orissa	1980	845
Dachigam National Park	J & K	1981	141
Hemis National Park	J & K	1981	4100
Indravati National Park	Chhattisgarh	1981	1258
Keoladeo National Park	Rajasthan	1981	28
Kishtwar National Park	J & K	1981	400
Sanjay National Park	Chhattisgarh	1981	1471
Sanjay National Park	Madhya Pradesh	1981	466
Satpura National Park	Madhya Pradesh	1981	585
Bandhavgarh National Park	Madhya Pradesh	1982	448
Kanger Ghati National Park (Kanger Valley)	Chhattisgarh	1982	200
Nanda Devi National Park	Uttarakhand	1982	630
Periyar National Park	Kerala	1982	350
Sariska National Park	Rajasthan	1982	273
Sirohi National Park	Manipur	1982	0.41
Valley of Flowers National Park	Uttarakhand	1982	87
Fossil National Park	Madhya Pradesh	1983	0.27
Mahatma Gandhi Marine National Park (prev: Wandur National Park)	Andaman & Nicobar	1983	281
Namdapha National Park	Arunachal Pradesh	1983	1985
Rajaji National Park	Uttarakhand	1983	820
Sanjay Gandhi/ Borivili National Park	Mumbai, Maharashtra	1983	86
Great Himalayan National Park	Himachal Pradesh	1984	754
Silent Valley National Park	Kerala	1984	89
Sundarbans National Park	West Bengal	1984	1330
Balphakram National Park	Meghalaya	1986	220
Betla National Park	Jharkhand	1986	231
Mouling National Park	Arunachal Pradesh	1986	483
Neora Valley National Park	West Bengal	1986	88
Nokrek National Park	Meghalaya	1986	47
Anshi National Park	Karnataka	1987	250
Gugamal National Park	Maharashtra	1987	361
Kudremukh National Park	Karnataka	1987	600
Middle Button Island National Park	Andaman & Nicobar	1987	0.64
Mount Harriet National Park	Andaman & Nicobar	1987	46
North Button Island National Park	Andaman & Nicobar	1987	0.44
Pin Valley National Park	Himachal Pradesh	1987	675
Saddle Peak National Park	Andaman & Nicobar	1987	32
South Button Island National Park	Andaman & Nicobar	1987	0.03
Kanwar Lake Bird Sanctuary	Bihar	1987	67
Bhitarkanika National Park	Orissa	1988	145
Rajiv Gandhi National Park (prev: Nagarhole)	Karnataka	1988	643
Gangotri National Park	Uttarakhand	1989	1552
Indira Gandhi National Park (prev: Annamalai)	Tamil Nadu	1989	117
Sri Venkateswara National Park	Andhra Pradesh	1989	353
Sultanpur National Park	Haryana	1989	1.43

Valmiki National Park	Bihar	1989	335
Govind Pashu Vihar	Uttarakhand	1990	472
Manas National Park	Assam	1990	500
Mudumalai National Park	Tamil Nadu	1990	103
Mukurthi National Park	Tamil Nadu	1990	78
Murlen National Park	Mizoram	1991	200
Buxa Tiger Reserve	West Bengal	1992	117
Campbell Bay National Park	Andaman & Nicobar	1992	426
Galathea National Park	Andaman & Nicobar	1992	110
Salim Ali National Park	J & K	1992	9
Singalila National Park	West Bengal	1992	78
Intanki National Park	Nagaland	1993	202
Gorumara National Park	West Bengal	1994	79
Kasu Brahmananda Reddy National Park	Andhra Pradesh	1994	1.42
Mahavir Harina Vanasthali National Park	Andhra Pradesh	1994	14
Mrugavani National Park	Andhra Pradesh	1994	3
Rani Jhansi Marine National Park	Andaman & Nicobar	1996	256
Phawngpui Blue Mountain National Park	Mizoram	1997	50
Nameri National Park	Assam	1998	200
Dibrugarh National Park	Assam	1999	340
Orang National Park	Assam	1999	78
Kalesar National Park	Haryana	2003	100
Mathikettan Shola National Park	Kerala	2003	12
Chandoli National Park	Maharashtra	2004	317
Darrah National Park	Rajasthan	2004	250
Vikramshila Gangetic Dolphin Sanctuary	Bihar	2009	250
Hazaribag National Park	Jharkhand	N/A	183
Palani Hills National Park	Tamil Nadu	Proposed	736

### WILDLIFE SANCTUARIES OF INDIA

NAME	STATE	YEAR	AREA (KM <sup>2</sup> )
Manas	Assam	1928	391
Sonai Rupai	Assam	1934	175
Gamgul Siahbehi	Himachal Pradesh	1949	105.46
Kalatop & Khajjiar	Himachal Pradesh	1949	30.69
Periyar	Kerala	1950	472
Pakhal	Andhra Pradesh	1952	879.3
Pocharam	Andhra Pradesh	1952	130
Eturnagaram	Andhra Pradesh	1953	803
Govind Pashu Vihar	Uttar Pradesh	1954	481.04
Kanawar	Himachal Pradesh	1954	61.57
Manali sanctuary	Himachal Pradesh	1954	31.27
Khokhan	Himachal Pradesh	1954	17.6
Kais	Himachal Pradesh	1954	12.2
Darah	Rajasthan	1955	265.83
Kheoni	Madhya Pradesh	1955	134.778
Van Vihar	Rajasthan	1955	59.93
Jaisamand	Rajasthan	1956	52
Chandra Prabha	Uttar Pradesh	1957	78
Radhangiri	Maharashtra	1958	371.88
Neyyar	Kerala	1958	128
Peechi Vazhani	Kerala	1958	125
Simbalbara	Himachal Pradesh	1958	17.2

Mountabu	Rajasthan	1960	288.84
Sechu Tuan Nala	Himachal Pradesh	1962	655.32
Tundah	Himachal Pradesh	1962	419.48
Kugti	Himachal Pradesh	1962	330
Nargu	Himachal Pradesh	1962	243.13
Bandli	Himachal Pradesh	1962	239.47
Gobind Sagar & Naina Devi	Himachal Pradesh	1962	120.67
Darlaghat	Himachal Pradesh	1962	98.71
Shikari Devi	Himachal Pradesh	1962	71.19
Raksham Chitkul	Himachal Pradesh	1962	38.27
Naina Devi	Himachal Pradesh	1962	37.19
Talra	Himachal Pradesh	1962	36.16
Majathal	Himachal Pradesh	1962	31.64
Lippa Asrang	Himachal Pradesh	1962	29.53
Daranghati	Himachal Pradesh	1962	27.01
Kolleru	Andhra Pradesh	1963	673
Gir	Gujarat	1965	1153.42
Kawal	Andhra Pradesh	1965	893
Bhagwan Mahavir	Goa	1967	148.52
Bhagwan Mahavir	Goa	1968	105
Yawal	Maharashtra	1969	177.52
Nal Sarovar	Gujarat	1969	120.82
Nagzira	Maharashtra	1970	152.81
Bor	Maharashtra	1970	61.1
Tansa	Maharashtra	1970	30.41
Kumbhalgarh	Rajasthan	1971	578.26
Nelapattu	Andhra Pradesh	1972	404
Kedarnath Wild Life Sanctuary	Uttar Pradesh	1972	975.24
Gomardah	Madhya Pradesh	1972	277.82
Kishanpur	Uttar Pradesh	1972	227.12
Bondla Wildlife	Goa	1972	8
Wild Ass	Gujarat	1973	4953.7
Waynad	Kerala	1973	344.44
Parambikulam	Kerala	1973	285
Sitanadi	Madhya Pradesh	1974	553.36
Bhadra	Karnataka	1974	492.46
Sharavathi Valley	Karnataka	1974	413.23
Shettihally	Karnataka	1974	395.6
Gandhi Sagar	Madhya Pradesh	1974	368.62
Mukambika	Karnataka	1974	247
Bramhagiri	Karnataka	1974	181.29
Ranebennur	Karnataka	1974	119
Someswara	Karnataka	1974	88.4
Narsingarh	Madhya Pradesh	1974	57.19
Melkote Temple	Karnataka	1974	49.82
Nugu	Karnataka	1974	30.32
Ghataprabha	Karnataka	1974	29.78
Noradehi	Madhya Pradesh	1975	1034.52
Achanakmar	Madhya Pradesh	1975	551.55
Sanjay (Dubri)	Madhya Pradesh	1975	364.69
Intanki	Nagaland	1975	202.02
Abohar	Punjab	1975	188.24
Badankhoh	Madhya Pradesh	1975	104.35
Bhitarkanika	Orissa	1975	70
Bir Shikargarh	Haryana	1975	10.93
Satkosia Gorge	Orissa	1976	795.52

Palamau	Jharkhand	1976	767
Ratapani	Madhya Pradesh	1976	688.79
Bhimbandh	Bihar	1976	681.9
Pulicat	Andhra Pradesh	1976	500
Kateraniaghat	Uttar Pradesh	1976	400.09
Singhalila	West Bengal	1976	362.4
Singhori (Sindhari)	Madhya Pradesh	1976	287.91
Gautam Buddha	Bihar	1976	259.48
Barnawapra	Madhya Pradesh	1976	244.66
Dalma	Jharkhand	1976	193.22
Hazaribagh	Jharkhand	1976	186.25
Murti Wildlife	West Bengal	1976	127.22
Chail	Himachal Pradesh	1976	110.04
Idukki	Kerala	1976	77
Tirthan	Himachal Pradesh	1976	68.25
Mahuadaur	Bihar	1976	63.25
Senchal	West Bengal	1976	38.88
Lothian Island	West Bengal	1976	38
Halliday Island	West Bengal	1976	5.95
Pakhui	Arunachal Pradesh	1977	861.95
Kinnerasani	Andhra Pradesh	1977	655.41
Bori	Madhya Pradesh	1977	518.25
Pachmarhi	Madhya Pradesh	1977	461.85
Ranipur	Uttar Pradesh	1977	230.31
Barren Island	Andaman & Nicobar Islands	1977	8.1
Narcondum Island	Andaman & Nicobar Islands	1977	6.81
North Reef Island	Andaman & Nicobar Islands	1977	3.48
South Sentinel Island	Andaman & Nicobar Islands	1977	1.61
Nagarjunasagar Srisailam	Andhra Pradesh	1978	3568
Kaimur	Bihar	1978	1342.22
Tamor Pingla	Madhya Pradesh	1978	608.52
Papikonda	Andhra Pradesh	1978	590.68
Bagdogra	Madhya Pradesh	1978	478.9
Valmikinagar	Bihar	1978	461.6
Samarsot	Madhya Pradesh	1978	340.35
National Chambal	Madhya Pradesh	1978	320
Coringa	Andhra Pradesh	1978	235.79
Lawalang	Bihar	1978	211.03
Hadgarh	Orissa	1978	191.06
D'ering Memorial	Arunachal Pradesh	1978	190
Jessore	Gujarat	1978	180.66
Itanagar	Arunachal Pradesh	1978	140.3
Siwaram	Andhra Pradesh	1978	36.29
Rajgir	Bihar	1978	35.84
Manjira	Andhra Pradesh	1978	20
Great Indian Bustard	Maharashtra	1979	8496.44
Simlipal	Orissa	1979	845.7
National Chambal	Uttar Pradesh	1979	635
Sita Mata	Rajasthan	1979	422.94
Barda	Gujarat	1979	192.31
Laokhowa	Assam	1979	70.14
Dr Salim Ali Bird Sanctuary	Goa	1979	1.8
Marine (Gulf of Kutch)	Gujarat	1980	293.03
Mehao	Arunachal Pradesh	1980	281.5
Pranahita	Andhra Pradesh	1980	136.02
Jawahar Sagar	Rajasthan	1980	100

Nahargarh	Rajasthan	1980	50
Barnadi	Assam	1980	26.22
Narayan Sarovar (Chinkara)	Gujarat	1981	765.79
Ghatigaon	Madhya Pradesh	1981	512
Kotgarh	Orissa	1981	399.05
Palpur - Kuno Wildlife Sanctuary	Madhya Pradesh	1981	344.68
Karera	Madhya Pradesh	1981	202.21
Baisipalli	Orissa	1981	168.35
Ken Gharial	Madhya Pradesh	1981	45
Sone Gharial	Madhya Pradesh	1981	41.8
Surinsar-Mansar	Jammu & Kashmir	1981	39.58
Nandini	Jammu & Kashmir	1981	33.72
Nongkhylliem	Meghalaya	1981	29
Ramnagar	Jammu & Kashmir	1981	12.9
Schoolpaneshwar	Gujarat	1982	607.7
Kaimoor	Uttar Pradesh	1982	500.75
Rupi Bhabha	Himachal Pradesh	1982	354.14
Ramgarh Bundi	Rajasthan	1982	307
Jamwa Ramgarh	Rajasthan	1982	300
Chandaka Dampara	Orissa	1982	175.79
Khalasuni	Orissa	1982	116
Ratanmahal	Gujarat	1982	55.65
Harike Lake	Punjab	1982	43
Keladevi	Rajasthan	1983	676
Phulwari	Rajasthan	1983	511.41
Todgarh Raoli	Rajasthan	1983	495.27
Sardarpur Florican	Madhya Pradesh	1983	348.12
Pong Dam Sanctuary	Himachal Pradesh	1983	322.7
National Chambal	Rajasthan	1983	280
Pamed Wild Buffalo	Madhya Pradesh	1983	262
Udanti Wild Buffalo	Madhya Pradesh	1983	247.59
Panpatha	Madhya Pradesh	1983	245.84
Bhensrodgarh	Rajasthan	1983	229.14
Bhairamgarh	Madhya Pradesh	1983	138.95
Fensatallite	Madhya Pradesh	1983	110.24
Shergarh	Rajasthan	1983	98.71
Peppara	Kerala	1983	53
Thattekkad Bird	Kerala	1983	25
Crocodile (Lohabrrack)	Andaman & Nicobar Islands	1983	22.21
Sailana Florican	Madhya Pradesh	1983	12.96
Kuldiha	Orissa	1984	272.75
Chimony	Kerala	1984	105
Sawai Mansingh	Rajasthan	1984	103.25
Shenduruny	Kerala	1984	100.32
Chinnar	Kerala	1984	90.44
Balukhand Konark	Orissa	1984	71.72
Aralam	Kerala	1984	55
Barsey Rhododendron Sanctuary	Sikkim	1984	51.76
Fambong Lho	Sikkim	1984	51.76
Parasnath	Bihar	1984	49.23
Shingba Rhododendron	Sikkim	1984	32.5
Melghat	Maharashtra	1985	597.23
Dampa	Mizoram	1985	500
Koyna	Maharashtra	1985	423.55
Debrigarth	Orissa	1985	346.91
Chandoli	Maharashtra	1985	308.97

Nakti Dam	Bihar	1985	206.4
Baretha	Rajasthan	1985	192.76
Lakhari Valley	Orissa	1985	185.87
Koderma	Jharkhand	1985	177.95
Nameri	Assam	1985	137.07
Interview Island	Andaman & Nicobar Islands	1985	133
Bhimashankar	Maharashtra	1985	130.78
Orang	Assam	1985	72.6
Churdhar	Himachal Pradesh	1985	56.59
Arabithittu	Karnataka	1985	13.5
Sagershwar	Maharashtra	1985	10.87
Tilanchang Island	Andaman & Nicobar Islands	1985	6.83
Battimalve Island	Andaman & Nicobar Islands	1985	2.23
Kutch Desert	Gujarat	1986	7506.22
Askot	Uttarakhand	1986	599.93
Andhari	Maharashtra	1986	509.27
Kalsubai Harishchandra	Maharashtra	1986	361.71
Jaikwadi	Maharashtra	1986	341.05
Painganga	Maharashtra	1986	324.62
Gautala Autramghat	Maharashtra	1986	260.61
Buxa	West Bengal	1986	251.89
Kabar	Bihar	1986	204
Chaprala	Maharashtra	1986	134.78
Nandpur Madmeshwar	Maharashtra	1986	100.12
Aner Dam	Maharashtra	1986	82.94
Phansad	Maharashtra	1986	69.79
Hastinapur	Uttar Pradesh	1986	20.73
Changthang	Jammu & Kashmir	1987	4000
Lachipora	Jammu & Kashmir	1987	800
Biligiri Rangswamy Temple	Karnataka	1987	539.52
Cauvery	Karnataka	1987	510.51
Sohagabarwa	Uttar Pradesh	1987	428.2
Overa-Aru	Jammu & Kashmir	1987	425
Sonanandi	Uttar Pradesh	1987	301.18
Spike Island	Andaman & Nicobar Islands	1987	211.7
Gulmarg	Jammu & Kashmir	1987	186
Trishna	Tripura	1987	170.56
Chautala	Haryana	1987	113.96
Hirpora	Jammu & Kashmir	1987	110
Talakaveri Wildlife Sanctuary	Karnataka	1987	105
Pushpagiri Wildlife Sanctuary	Karnataka	1987	102.59
Pobitora Wildlife Sanctuary	Assam	1987	38.83
Maenam	Sikkim	1987	35.34
Overa	Jammu & Kashmir	1987	32.37
Landfall Island	Andaman & Nicobar Islands	1987	29.48
Malvan Marine	Maharashtra	1987	29.12
Limber	Jammu & Kashmir	1987	26
Sepahijala	Tripura	1987	18.53
Chilka Lake (Nalaban)	Orissa	1987	15.53
Defence Island	Andaman & Nicobar Islands	1987	10.49
Cinque Island	Andaman & Nicobar Islands	1987	9.51
Flat Island	Andaman & Nicobar Islands	1987	9.36
Buchaan Island	Andaman & Nicobar Islands	1987	9.33
Kyd Island	Andaman & Nicobar Islands	1987	8
Shearme Island	Andaman & Nicobar Islands	1987	7.85
Paget Island	Andaman & Nicobar Islands	1987	7.36

West Island	Andaman & Nicobar Islands	1987	6.4
East Island	Andaman & Nicobar Islands	1987	6.11
Ranger Island	Andaman & Nicobar Islands	1987	4.26
Swamp Island	Andaman & Nicobar Islands	1987	4.09
East (Inglis) Island	Andaman & Nicobar Islands	1987	3.55
Benett Island	Andaman & Nicobar Islands	1987	3.46
Talabaicha Island	Andaman & Nicobar Islands	1987	3.21
Point Island	Andaman & Nicobar Islands	1987	3.07
Baltal	Jammu & Kashmir	1987	3
Bondoville Island	Andaman & Nicobar Islands	1987	2.55
Table (Delgarno) Island	Andaman & Nicobar Islands	1987	2.29
James Island	Andaman & Nicobar Islands	1987	2.1
Reef Island	Andaman & Nicobar Islands	1987	1.74
Table (Excelsior) Island	Andaman & Nicobar Islands	1987	1.69
Sandy Island	Andaman & Nicobar Islands	1987	1.58
Roper Island	Andaman & Nicobar Islands	1987	1.46
Pitman Island	Andaman & Nicobar Islands	1987	1.37
South Brother Island	Andaman & Nicobar Islands	1987	1.24
South Reef Island	Andaman & Nicobar Islands	1987	1.17
Bluff Island	Andaman & Nicobar Islands	1987	1.14
Sir Huge Rose Island	Andaman & Nicobar Islands	1987	1.06
Temple Island	Andaman & Nicobar Islands	1987	1.04
Ross Island	Andaman & Nicobar Islands	1987	1.01
Sunabema	Orissa	1988	600
Gumti	Tripura	1988	389.54
Badrama	Orissa	1988	304.03
Kanji	Jammu & Kashmir	1988	250
Katepurna	Maharashtra	1988	73.69
Binsar	Uttarakhand	1988	45.59
Rampura	Gujarat	1988	15.01
Kamlang	Arunachal Pradesh	1989	783
Balaram-Ambaji	Gujarat	1989	542.08
Eaglenest	Arunachal Pradesh	1989	217
Yagoupokpi Lokchao	Manipur	1989	184.8
Sessa Orchid	Arunachal Pradesh	1989	100
Dipor Beel	Assam	1989	40
Paniya	Gujarat	1989	39.63
Jaldapara	West Bengal	1990	216.51
Purna	Gujarat	1990	160.84
Jambughoda	Gujarat	1990	130.38
Dibang Valley	Arunachal Pradesh	1991	4149
Ngengpui	Mizoram	1991	150
Kane	Arunachal Pradesh	1991	55
Khawnglung	Mizoram	1991	41
Karlapat	Orissa	1992	147.66
Karakoram	Jammu & Kashmir	ND	1800
Gundlabrahmeswaram	Andhra Pradesh	ND	1194
Dandeli	Karnataka	ND	834.16
Rollapadu	Andhra Pradesh	ND	614
Mundanthurai	Tamil Nadu	ND	567.38
Srivenkateshwara	Andhra Pradesh	ND	506.94
Srivilliputhur	Tamil Nadu	ND	485.2
Srilanka Malleswara	Andhra Pradesh	ND	464.42
Pulicat	Tamil Nadu	ND	461.02
Kaundinya	Andhra Pradesh	ND	357
Kuno - Palpur	Madhya Pradesh	ND	345

Mudumalai	Tamil Nadu	ND	321.55
Kalakkadu	Tamil Nadu	ND	223.58
Krishna	Andhra Pradesh	ND	194.81
Sundha Mata	Rajasthan	ND	107
Mukkurthi	Tamil Nadu	ND	78.46
Pabha	Assam	ND	49
Tongri	Jammu & Kashmir	ND	20
Point Calimere	Tamil Nadu	ND	17.26
Indira Priyadarshini	Delhi	ND	13.2
Hokarsar	Jammu & Kashmir	ND	10
Ranganthittu	Karnataka	ND	0.67
Bir Motibagh	Punjab	ND	ND
Bhagmara	Meghalaya	ND	ND
Tal Chappar	Rajasthan	ND	ND
Renuka	Himachal Pradesh	ND	ND
Shilli	Himachal Pradesh	ND	ND
Bir Bunnerheri	Punjab	ND	ND
Bassi	Rajasthan	ND	ND
National Garhial	Rajasthan	ND	ND
Khijadiya	Gujarat	ND	ND
Bir Gurdialpura	Punjab	ND	ND
Asan Bradge Bird Watching	Uttar Pradesh	ND	ND
Chilla	Uttar Pradesh	ND	ND
Mahavir Swamy	Uttar Pradesh	ND	ND
Nawabganj	Uttar Pradesh	ND	ND
Samaspur	Uttar Pradesh	ND	ND
Dhakna Kolkaz	Maharashtra	ND	ND
Gandhari	Maharashtra	ND	ND
Wainganga	Maharashtra	ND	ND
Dhumkhal	Gujarat	ND	ND
Ushakothi	Orissa	ND	ND
Chandra Prabha	Bihar	ND	ND
Topchanchi	Bihar	ND	ND
Bibhutibhushan	West Bengal	ND	ND
Bethudahari	West Bengal	ND	ND
Ballabhpur	West Bengal	ND	ND
Chapramari	West Bengal	ND	ND
Gorumara	West Bengal	ND	ND
Jore Pokhri	West Bengal	ND	ND
Mahananda	West Bengal	ND	ND
Parnadhan	West Bengal	ND	ND
Ramnabagan	West Bengal	ND	ND
Raiganj	West Bengal	ND	ND
Kyongasia Alpine	Sikkim	ND	ND
Garampani	Assam	ND	ND
Siju	Meghalaya	ND	ND
Pulebatze	Nagaland	ND	ND
Fakim	Nagaland	ND	ND
Charilam	Tripura	ND	ND
Lanjamadugu	Andhra Pradesh	ND	ND
Karikili	Tamil Nadu	ND	ND
Vedantangal	Tamil Nadu	ND	ND
Vettangudi	Tamil Nadu	ND	ND
Vallanadu	Tamil Nadu	ND	16.41
Kumarakom	Kerala	ND	ND
Sukhna	Chandigarh		25.42

## BIOSPHERE RESERVES OF INDIA

BIOSPHERE RESERVES OF INDIA (AREA WISE)						
	Year	Name	Location	State	Type	Area (km <sup>2</sup> )
<b>1</b>	2008	Rann of Kachchh/ gyan bharati Reserve	Part of Kutchh, Rajkot and Surendranagar District	Gujarat	Desert	12454
<b>2</b>	1989	Gulf of Mannar	Indian part of Gulf of Mannar between India and Sri Lanka	Tamil Nadu	Coasts	10500
<b>3</b>	1989	Sunderbans	Part of delta of Ganges and Brahmaputra river system	West Bengal	Gangetic Delta	9630
<b>4</b>	1988	Nanda Devi	Parts of Chamoli District, Pithoragarh District & Bageshwar District	Uttarakhand	West Himalayas	5860
<b>5</b>	1986	Nilgiri Biosphere Reserve	Part of Wynad, Nagarhole, Bandipur and Mudumalai, Nilambur, Silent Valley and Siruvani Hills	Tamil Nadu, Kerala and Karnataka	Western Ghats	5520
<b>6</b>	1998	Dehong Deband	Part of Siang and Debang valley	Arunachal Pradesh	East Himalayas	5112
<b>7</b>	1999	Pachmarhi Biosphere Reserve	Parts of Betul District, Hoshangabad District and Chhindwara District	Madhya Pradesh	Semi-Arid	4926
<b>8</b>	1994	Simlipal	Part of Mayurbhanj district	Orissa	Deccan Peninsula	4374
<b>9</b>	2005	Aruchanakamar - Amarkantak	Part of Annupur, Dindori and Bilaspur districts	Madhya Pradesh, Chhattisgarh	Maikala Range	3835
<b>10</b>	1989	Manas	Part of Kokrajhar, Bongaigaon, Barpeta, Nalbari, Kamrup and Darrang District	Assam	East Himalayas	2837
<b>11</b>	2000	Kanchanjunga	Parts of Kanchanjunga Hills	Sikkim	East Himalayas	2620
<b>12</b>	2001	Agasthyamalai Biosphere Reserve	Neyyar, Peppara and Shenduruny Wildlife Sanctuary and their adjoining areas	Kerala	Western ghats	1828
<b>13</b>	1989	Great Nicobar Biosphere Reserve	Southern most islands of Andaman and Nicobar Islands	Andaman and Nicobar Islands	Islands	885
<b>14</b>	1988	Nokrek	Part of Garo Hills	Meghalaya	East Himalayas	820
<b>15</b>	1997	Dibru-Saikhowa	Part of Dibrugarh and Tinsukia district	Assam	East Himalayas	765
<b>16</b>	2009	Cold Desert	Pin Valley National Park and surroundings; Chandratal and Sarchu & Kibber Wildlife Sanctuary	Himachal Pradesh	Western Himalayas	7770

Samples from

# SCIENCE & TECHNOLOGY

# BODY PARTS AND PROCESSES

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## BLOOD

- The chief transport system of animals is **blood vascular system**. It includes blood, the pumping organ – heart and blood vessels.
- Blood **transports following types of materials** –
  - **Wasteful** and Poisonous by-products of metabolism transported to kidneys for excretion.
  - **Hormones**, which regulate activities of metabolism, growth and development, are carried from organs where they are produced to other places.
  - **Oxygen** from lungs to tissues &  $\text{CO}_2$  from tissues to lungs
  - Digested food from 'Small Intestine' i.e. ileum get into blood plasma in the form of various salts, amino acids etc. to liver and into circulatory system.
  - The substances carried by blood fight diseases, clotting of blood, healing of wounds.
  - **Temperature** is controlled to a constant value through distribution of heat by blood.
- There is 5-6 litre blood in normal human body, which makes about 7% of total weight
- **pH of blood is 7.4** (alkaline)
- Blood consists of following components:
  1. Plasma – 60%
  2. Corpuscles – 40% (RBCs & WBCs)
  3. Platelets

### Plasma

- It is the **liquid part** of blood. It consists of 90% Water and rest is **protein (Albumin, "GammaGlobulin", Fibrogen)**, Glucose and Salts. Gamma Globulin – Rich in **antibodies** and provide immunity to certain infectious diseases. **Fibrogen** helps in **blood clotting**.

### Corpuscles

- **RBC** (Red Blood Corpuscles) are also called **Erythrocytes**. Produced in **Red Bone Marrow** and worn out RBCs are destroyed by **Liver** and **Spleen**. Blood contains a 'protein' molecule called **hemoglobin**; a carrier of  $\text{O}_2$  and  $\text{CO}_2$  in human system.
- **WBC** (White Blood Corpuscles) or **Leucocytes** move through tissue spaces by a process called '**Diapedesis**'. These work as a military- Destroy harmful bacteria and dead cells. These are **larger** than RBCs. An overproduction of WBCs results into a disease called **leukemia**.
- Ratio of RBC: WBC in our body is **600: 1**.
- Hemoglobin (Hb) **is red respiratory pigment present in RBC**. Hemoglobin in Males is 14-18 gm/ 100 ml of blood and in Females is 11-14 gm/ 100ml. Maximum Hemoglobin content is found in New born baby. Its 24.4-34.4 gm/ 100 ml of blood
- The organs, which produce blood corpuscles are called hemopoietic tissues and the process of their formation is called **hemopoiesis**
- People living in high attitudes have more RBCs. The **count** sharply **falls** in **anaemia** and **rises** in **polycythemia**.

RBCs	WBCs	BLOOD PLATELETS
Rounded or disc-like. Contain Hb, & thus transport oxygen	Colourless and amoeba like, much larger than RBCs. Provide immunity to body	Small, spherical; Clotting of blood
No nucleus	One nucleus each	Enucleated
50 lacs in no	9000	2 to 3 lacs
120 days life	1-2 weeks	Few hours

## Platelets

- Also called **Thrombocytes**, help in clotting of blood. Much smaller than RBCs
- Blood Platelets** occur only in mammals. They are also named as megakaryocytes and having essential role in blood coagulation. They are derived in red bone marrow.

**Serum:** It is the residue blood from, which blood-clotting protein called fibrinogen has been removed. Therefore, this plasma cannot clot and stored in blood banks. Thus, Serum (plasma) **lacks Fibrinogen** (a protein).

## ANTIBODIES

- IgM – first to come
- IgG – longest acting
- IgE – work in allergic reactions

## BLOOD VESSELS

- Blood vessels are of three types connected to form one continuous '**Closed' system or a 'Loop**'. These are **Arteries** – Widest and carry blood from heart elsewhere. Arteries branch out into thinner tubes called **Arterioles** and further into even thinner **Capillaries**.
- The walls of Capillaries are just one cell thick, and so permeable to water, small molecules, dissolved food, waste products, O<sub>2</sub> and CO<sub>2</sub>, which are exchanged with tissues surrounding the capillaries. Through this process, liver is in contact with blood and the substances transported thereby. Also Alveoli of lungs picks up and expels air through these.
- Capillaries join to form **Venules** and finally veins and return the blood to the heart.

## BLOOD GROUPS

- Concept given by Carl **Landsteiner**. It is divided into four groups A, B, AB & O, based on formation of antigens and antibodies (Plasma) in the blood.
- Blood compatibility depends upon chemicals called **agglutinogen** or **antigens** on the surface of the red cells, and chemicals called **agglutinin** or **antibodies** in the plasma. There are two types of antigen: A and B; and two types of antibody: anti-A and anti-B.
- Antigens** are the **foreign substances** that help production of antibodies.

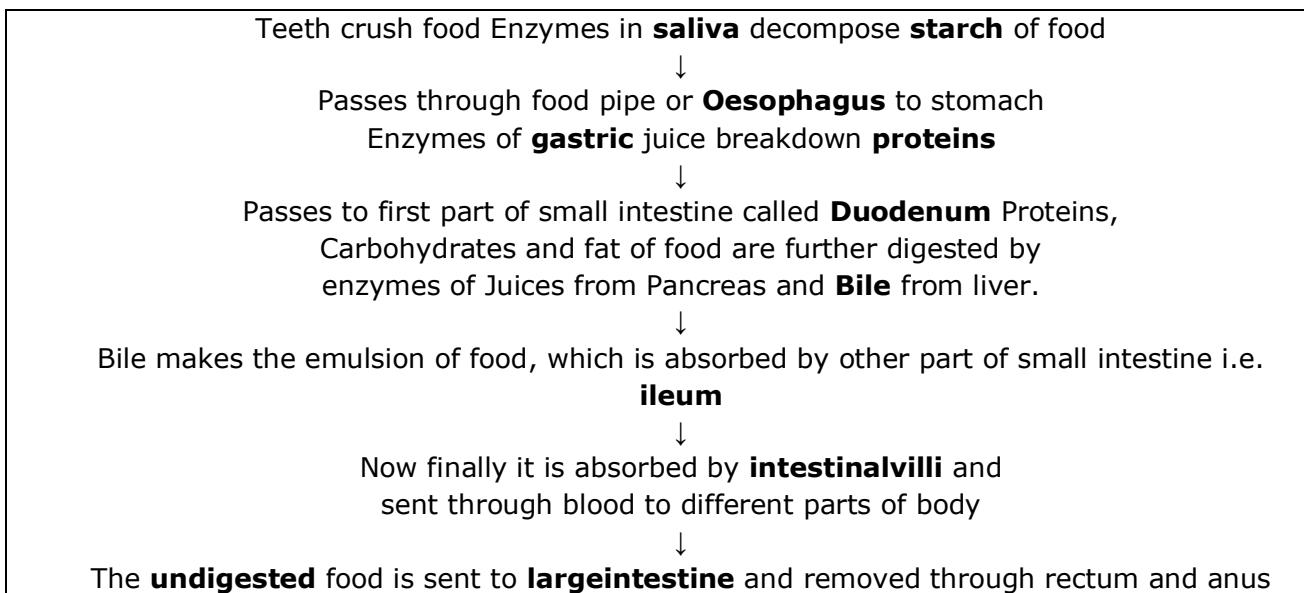
Blood Group	Rbc Antigen	Plasma Antibody	Can Donate Blood To	Can Receive Blood From
A	A	b	A, AB	A & O
B	B	a	B, AB	B & O
AB	A & B	-	Only AB	<b>Universal acceptor</b> (because no Antibody)
O	-	a & b	<b>Universal donor</b> (no antigen)	Only from O
<b>O<sup>+</sup> Most Common, AB<sup>-</sup> Rarest, O<sup>-</sup> Universal Donor, AB<sup>+</sup> Universal recipient</b>				

## CLOTTING OF BLOOD

- **Heparin (antithrombin)** prevents blood from clotting inside the body. It is produced naturally inside the body.
- Preservative added to blood in blood bank to prevent clotting is **SodiumCitrate** [Heparin can also be added]. **SodiumOxylate/ PotassiumOxylate** (Chelating Agents) are also used.
- **Vitamin K** helps in the production of **Prothrombin** –, which helps in blood clotting.
- Optimum **temperature** for preserving blood in blood bank is **4°C**.
- **Clottingtime** of blood for a normal human is 3-4 min.
- **Donatedbloods** are used within 15 days, otherwise RBC gets reduced.
- **Rh Factor**- name taken from Rhesus monkey [experiment done on Rhesus monkey]
  - In persons with Rh Factor, **3rd antigen** besides A & B is also found.
  - Person with this antigen are said to have Rh (+) ve. **90% male** have Rh (+) ve.
  - Person without this antigen are said to have Rh (-) ve. Most Female are Rh (-) ve.
- Rh (-) patients can receive **onetransfusion of Rh (+) blood without harm** because their plasma does not have an antibody to react with the incoming red cells. Subsequent transfusion, however, may be dangerous because first Rh (+) transfusion stimulates the body of the Rh (-) recipient to produce plasma antibody, which agglutinates Rh (+) blood. Rh (-) blood can be transfused into Rh (-) people any number of times without harm
- If it enters a **pregnantwomen's** blood, perhaps through a fault in the placenta, it will produce more antibodies and there is a danger that this will reach the embryo, destroy its red cells, a condition known as **erythroblastosis foetalis**.
- The danger can now be avoided. Rh (-) mother with a new born Rh (+) child can be injected with chemicals, which stop her body producing the Rhesus antibody.

## DIGESTION OF FOOD

- **Enzymes** are the **proteins** and share common properties. Enzymes **catalyze** every **chemicalreaction** that occurs in the living system.
- Digestion mainly occurs in stomach and small intestine while absorption of food takes place in small intestine. Egestion of food occurs through large intestine and anus.



- **HCl** secreted in stomach leads to a lot of **acidic** character. To neutralize this, **mucus** is continuously secreted on walls of stomach.
- **Stomach** decomposes **Protein, LightFat**.
- **SmallIntestine** has an alkaline Medium, it decomposes **Carbohydrates, Protein** and **Fat**
- **Pigments** present in bile are Bilirubin and Biliverdin.
- Yellow colour of bile is because of these pigments.
- Excess deposition (or) no decomposition of **Bilirubin** causes **Jaundice**.
- **Yellowcolour** of urine is because of **urochrome**.

## LIVER

- The liver is found only in **vertebrates**. Newly absorbed food materials pass through the liver before being transported round the body. An **exception** is the **emulsifiedfat** in the **lacteals**, which bypasses the liver. The liver **stores** carbohydrate as glycogen, lipids, mineral salts, vitamins A, D and B<sub>12</sub>. The liver helps to keep the **bloodsugar** (glucose) level constant, which in turn helps to keep the **osmoticpressure** of the blood constant.

DIGESTIVE ACTIONS			
PLACE OF ACTION	ENZYMES	SUBSTANCE → PRODUCT ATTACKED FORMED	
Saliva in <b>Mouth</b> (slightly Acidic)	Amylase	Starch → Maltose (disaccharide)	
Gastric Juice in <b>Stomach</b> (Acidic)	Pepsinogen (inactive)+ HCl – pepsin (active)	Protein → Peptones	
	Prorennin (inactive)+ H – rennin (active)	Milk protein (casein) → Paracasein	
	Lipase	Light fat → Fatty acid and glycerol	
S M A L L  I N T E S T I N E	Juices from Pancreas (Alkaline medium)	Amylase Maltase Lactase Sucrase Lipase Trypsinogen + enterokinase – trypsin (inactive) Chymotrypsinogen + (inactive) Trypsin – chymotrypsin (active) Carboxipeptidase	Starch → Maltose Maltose → Glucose Lactose → Glucose + Galactose Sucrose → Glucose + Fructose Fat → Fatty acids + Glycerol Protein → Polypeptides Protein → Polypeptides Polypeptide → Amino acid
	Bile from liver (Alkaline medium)	It activates Lipase to emulsify fat. Makes Fat-Soluble substances water-soluble	
	Self Juices of the intestine (Alkaline medium)	Erepsin Maltase Lactase Sucrase Lipase	Peptides → Amino acids Maltose → Glucose Lactose → Glucose + Galactose Sucrose → Glucose + Fructose Fat → Fatty acids + Glycerol

- Liver manufactures a wide variety of the products. These include most of the **plasmaproteins** and bile. **Bile** is stored in the **gallbladder** and passed into the **duodenum** to help in digestion. Bile contains salts, which help in **emulsification** of fats and absorption of food. The liver converts **toxinsintoharmless** substances. Many of the toxic by-products of the body's own metabolism are made harmless in liver.

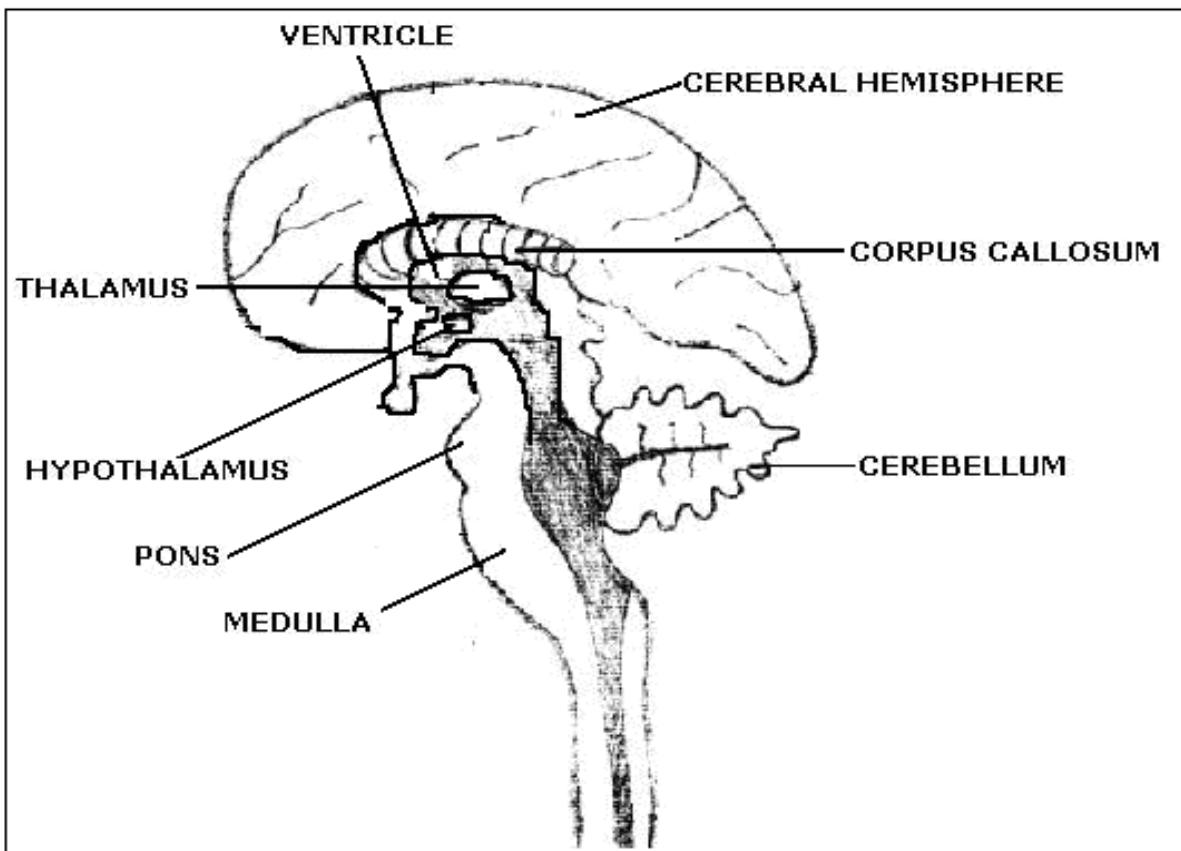
- The **small intestine absorbs about 90% of digested food** and 10% of water and minerals. In order to enhance the absorption capacity of the small intestine its epithelial lining is thrown into a number of the folds called **villi**.
- The villi have a rich supply of blood capillaries. Simple sugars and amino acids are absorbed, through the intestinal wall into the blood capillaries. These are then carried to the liver before release into general circulation. The glycerides and fatty acids are transported usually, via the lymph vessels (lacteals) and thoracic duct to the blood.

## BIO-COMMUNICATION

- For communication, two systems work in organisms- nervous and endocrine. Both of these release chemicals. The chemicals released by **nervous system** act quickly and help body to **respond immediately** and are called **neurotransmitters**. Chemicals released by **endocrine** act **slowly** and are called **hormones**.
- Nervous System consists of-
  - Central nervous system – comprising brain and spinal cord
  - Peripheral nervous system – comprising cranial and spinal nerve
  - Autonomic nervous system- comprising parasympathetic and sympathetic nervous system

## Brain

- Brain measures 1500 cm<sup>3</sup> in volume and 1.36 kg in weight. It is covered with a soft protective membrane called **Meninges** and further by **Cranium**. Thus, Cranium is the **Brain Box**.
- Cerebrum** is **largest part** of brain and constitutes 2/3<sup>rd</sup> of it. It consists of two cerebral hemispheres. Cerebrum is the seat of **Consciousness**, Intelligence, Memory, Imagination and Reasoning. Receives impulses from various parts of body and initiates all **voluntary activities**.
- Cerebral Cortex** or **Grey Matter** is the outer region of Cerebrum. It consists of Grayish nerve cells, consists of **furrows and ridges**.
- Corpus Callosum** is a sheet of nervous tissues at the base of Cerebrum, **joining** its two lateral lobes. Regulates and **coordinates** the **group movements of muscles** as in actions like walking. Here, like Cerebrum, **grey matter** lie **outside** and white inside.
- Hypothalamus** contains many regulatory centres for many **physiological activities** like **feeling-Hunger, Thirst, Sexual etc.**
- Thalamus** is a group of nerve cells acting as a **Relay Station** for incoming and outgoing impulses to Cerebrum.
- Pons** acts as a bridge that ensures the **coordination** of muscular movements on two sides of the body.
- Medulla** is the **posterior-most part** of the brain where it merges with **Spinal Cord**. Here nerve fibers of left and right cerebral hemispheres cross each other. It controls the working of **heart and respiratory movements**.
- Ventricles** are the cavities that contain a **nutritive fluid** i.e. Cerebrospinal Fluid



- Each part of brain has a **specific role to play**:
 

○ Frontal Lobe	-	Voluntary Activities
○ Parietal Lobe	-	Sensory like Pain, Touch
○ Temporal Lobe	-	Speech, Smell
○ Occipital Lobe	-	Vision
○ Hippocampus	-	Memory
○ Amygdala	-	Anger
○ Cerebellum	-	Coordinates group movements of Muscles (Walking)
○ Medulla + Pons-	-	Involuntary Activities (Breathing, Circulation, Respiration)
- ARAS (Ascending Leticular Activating System) – Alertness, Wakefulness
- If Anterior Damages – Polio, that is why, its called Asymmetrical Placid Paralysis.
- If Posterior Damages – Sensory Capacity Lost

### **Spinal Cord**

- Like a **tube** in shape, it is the downward extension of brain with same **Menings** as that of brain.
- Outer region– white matter while the **inner** region is **Grey** Matter
- Two functions:
  1. Conduct **impulses** to and from brain.
  2. Acts as a **ReflexCentre**
- Two Enlargements:
  1. **Cervical** – where nerves to upper limbs originate.
  2. **Lumbar** – where nerves to lower limbs originate.
- It is housed in **NeuralCanal** within Vertebral Column. Running along mid ventral line is **Anterior Median Fissure** and running along mid-Dorsal line is **Posterior Median**

**Septum.** Running along Centre of Spinal Cord is Central, which is continuation of Ventricles of brain and contains same fluid.

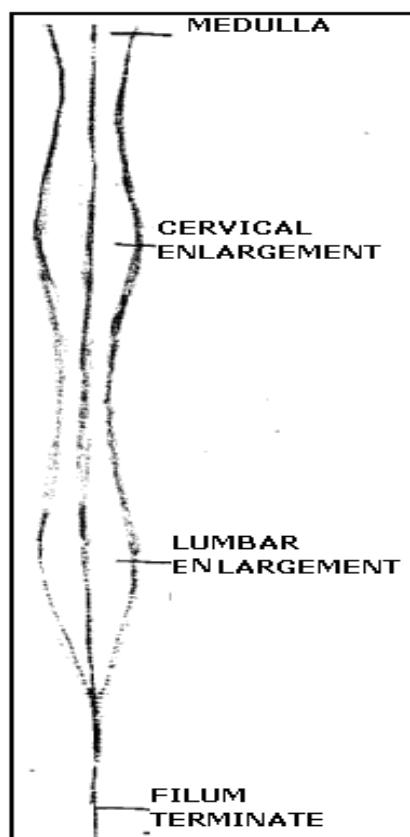
- Posterior Portion known as **FilumTerminale**

## Peripheral Nervous System

- **Spinal Nerves** are those nerves that emerge from the spinal cord. There are 31 pairs of spinal nerves, all of, which are mixed nerves (nerve consisting of both sensory and motor neurons)
- **Cranial Nerves** are those nerves that emerge from the brain. There are 12 pairs of them, some are sensory, some are motor and some are mixed nerves.

## Automatic Nervous System

- It controls the functions of the internal organs of the body automatically and unconsciously. It mainly controls heartbeat, secretion of glands and size of pupils.
- **Sympathetic** involved in Excitation and **Emotional Stress**, while the **parasympathetic** in **relaxation** of organs particularly during **sleep**.
- **Sensory Neurons** that carry impulse from **sense organs to Central Nervous System**
- **Motor Neurons** carry impulse from Central Nervous System to a muscle/ gland.
- **Mixed Nerves** are the nerves, which consist of both Sensory and Motor Neurons.
- **Nerve Impulse** travels at the speed of 50-100 m/s. These are **Electro-Chemical Messages**. Neurons are specialized to conduct them at high speed. Brain and Spinal Cord act as Central Clearing Houses for information furnished and Coordinate Activities of Body.
- **Reflex Action:** No deliberate effort on part of body is involved in any of these actions.



- **Synapse** is the **junction between two neurons** where one transmits the signal to other. There is no continuity between the two neurons at the synapse. These transmit the impulse only in one direction i.e. from axon of one neuron to cell body of other and never reverse.
- **Basic Unit**
  - Nervous System - Neuron
  - Kidney - Nephron

## KIDNEYS

**Renal Artery** from Aorta feeds blood into the kidney (**bean shaped**) inside, which, it branches up into millions of capillaries called **glomeruli** which filter the impure blood through the walls.



Filtered liquid waste or serum is collected in tiny cups called **Bowman's Capsules** and contains glucose, salts and nitrogen compounds



Sent to **bladder** from where it is sent to **Urethra** for excretion



But before it reaches urethra, it passes through tiny tubes where much of the **glucose** and useful substances of it are reabsorbed and sent back to the blood in the renal vein



Renal Vein takes the filtered blood back to the **heart** for recirculation. This process of filtering out small molecules while keeping larger ones like proteins is called **dialysis**

- The **glomeruli** of the kidneys act as **dialysis bags**. The dialysis principle is used in construction of **artificial kidneys**.
- **Structural and functional unit** of Kidneys is **nephron**.

## HORMONES

- **Mixed Glands** contains both endocrine and exocrine Islands.
- The special **chemicals**, which regulate **physiological processes** in humans, called '**Hormones**' are produced in special Organs called **endocrine glands**. These do not have ducts and secrete their Hormones directly to places where they are required.

Effects Of Over And Under Secretion Of Hormones		
Hormone	Over-Secretion	Under-Secretion
Growth hormone	<b>Gigantism:</b> persons grow unusually tall.	<b>Dwarfism:</b> person remains unusually small.
Thyroxine	Increased metabolic rate, leading to <b>loss of weight</b> and increased heart rate	<b>Simple goiter:</b> In <b>children</b> , physical & mental development is retarded, leading to <b>cretinism</b> . In <b>adults</b> , metabolic rate slows down, leading to mental and physical slowness & weight gain. This condition is called <b>Myxoedema</b> .
Insulin		<b>Diabetes mellitus:</b> blood sugar level becomes abnormally high- <b>hyperglycemia</b> . Sugar is excreted in the urine. This condition is also referred as <b>glycosuria</b>
Gluco-	<b>Cushing's syndrome:</b>	<b>Addison's disease:</b> bronze like pigmentation of

corticoid & Mineralo-corticoids	High blood sugar, sugar in urine, obesity, washing of limb muscles	skin, low blood sugar, low plasma sodium & high plasma potassium, increased urinary sodium, nausea & diarrhea
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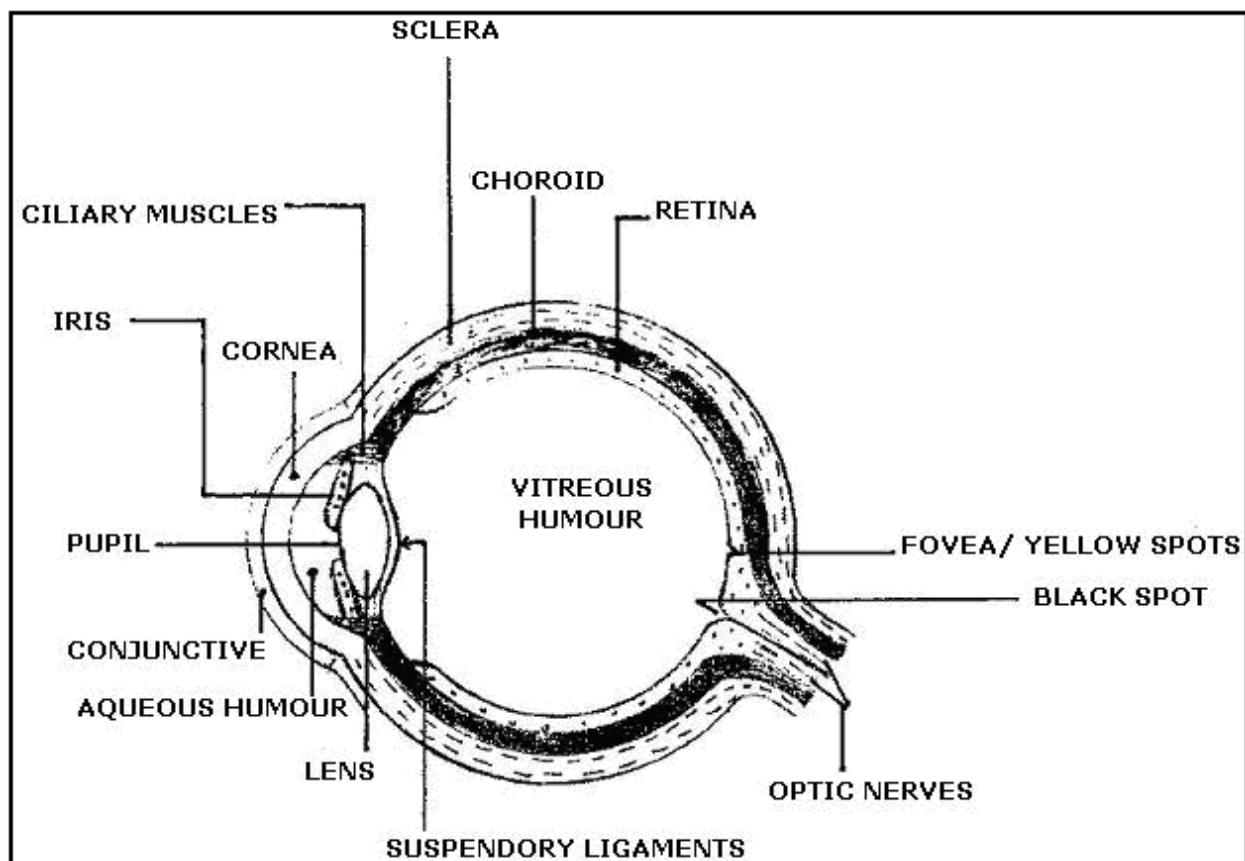
ENDOCRINE GLANDS AND THEIR HORMONES	
<b>PITUITARY GLAND – the 'master gland'</b>	
Several of its Hormones <b>activate other glands</b>	
However it depends on <b>Hypothalamus</b> for its own activity	
<b>Posterior lobe</b>	<b>Antidiuretic or vasopressin-</b> controls re-absorption of water from <b>kidneys</b> <b>Oxytocin</b> causes uterine contractions and active <b>expulsion of milk</b> during and after birth
<b>Middle lobe</b>	<b>Melanophore</b> stimulating hormone: controls growth and development of melanocytes, which gives the <b>skin its colour</b>
<b>Anterior Lobe</b>	<b>Thyroid Stimulating</b> Hormone influence secreting activities of thyroid <b>Growth hormone</b> stimulates growth of the body <b>Andreno-corticotrophic</b> hormone influences adrenal cortex & defends body against <b>physiological stress</b> <b>Follicle stimulating</b> hormone: controls development and release of <b>sperm</b> , production of female sex hormones, <b>oestrogen</b> and development of <b>follicles in the ovary</b> . <b>Leutinizing</b> hormone: stimulates production of male sex hormone <b>testosterone</b> , release of <b>ovum</b> and <b>oestrogen</b> <b>Leutotrophic</b> hormone or <b>Prolactin</b> : maintains <b>pregnancy</b> , helps in secretion of female sex hormone <b>progesterone</b> and stimulates <b>secretion of milk</b> from the mammary glands.

OTHER IMPORTANT GLANDS AND THEIR HORMONES	
<b>Thyroid</b>	Releases Thyroxin- controls general <b>metabolic rate</b>
<b>Parathyroid</b>	Releases <b>Parathormone</b> that controls distribution of <b>calcium</b> and <b>phosphates</b> - important for <b>bone development</b>
<b>Adrenal Cortex</b>	<b>Glucocorticoids</b> : regulates the metabolism of carbohydrates, proteins and fats- helps to <b>overcome stress</b> <b>Mineralocorticoids</b> : prevents passage of <b>sodium</b> and <b>water in the urine</b> and increase potassium excretion
<b>Adrenal Medulla</b>	Releases <b>Adrenaline</b> (epinephrine)- help controlling <b>emergencies</b> Releases <b>Noradrenalin</b> (norepinephrine)- help controlling <b>emergencies</b>

EXOCRINE GLANDS, THEIR HORMONES AND FUNCTIONS	
GLANDS	HORMONES SECRETED
<b>Pancreas</b>	α-cells secrete <b>glucagon</b> that elevates blood glucose level β-cells secrete <b>insulin</b> helps to lower blood glucose level
<b>Testes</b>	Secretes <b>testosterone</b> that controls development and maintenance of male secondary sex characteristics
<b>Ovaries</b>	<b>Oestrogen</b> controls female secondary sex characteristics like menstrual cycle <b>Progesterone</b> controls changes in pregnancy.
Bulk of pancreas constitutes <b>exocrine</b> part called <b>pancreatic acini</b> . <b>Patches</b> of cells of <b>islets of Langerhans</b> is the <b>endocrine</b> part.	

## EYE

- **Ciliary Muscles:** These support the Iris & Suspensory Ligaments.
- **Iris:** It is a circular sheet consisting of two sets of muscles. Colour of eye depends upon its colour.
- **Pupil:** It is a circular opening at the centre whose size increases or decreases depending upon Iris. It may be of different colour in different people.
- **Conjunctiva:** Lines the Inner Walls of eyelids and front of the eye
- **AqueousHumour:** Small Chamber in front of lens filled with 'Watery Fluid'. Large posterior chamber behind lens filled with 'Gelatinous Matter' called Vitreous Humour.
- **Sclera:** It is white portion of eye. It is tough, opaque & protective. Cornea is the extension of this layer, which is visible to us.
- **Choroid:** It is a thin & black membrane having a network of Capillaries. It not only nourishes eye but also prevents reflection of extra light within the eye by absorbing it. This layer ends up near Iris as Ciliary muscles. Iris is an extension of this layer.
- **Retina:** It is the light sensitive portion of eye. It consists of **Rods & Cones**. Rods are more numerous & found near the periphery of retina. These are sensitive to dim light but insensitive to colour.
- **BlackSpot:** Where the optic nerve leaves the eye, retina has no rods and cones. Images falling in this area can't be perceived.
- **SuspensoryLigaments:** Keep the lens in position and attached to ciliary muscles.
- **Fovea/ YellowSpot:** The cones are found at the back of retina especially in Fovea. Fovea is a yellow spot. It is the region of most distinct vision responsible for (cones):
  - Bright light vision
  - Colour vision
  - Perception of detail



## Important Facts about Eye

- **Selera:** Movement of eyeball in various directions
- **Rods:** 120 million (Rhodopsin); **Cones:** 6 million.
- Eye: Most sensitive to Blue-Green light of 5500 A; Respond to lights 4000-7000 A
- **Astigmatism:** person can't distinguish horizontal & Vertical Lines.
- **Presbyomia:** In Old age wherein lens losses elasticity.
- **Daltonism:** Colour blindness. Ishiara Chart and Snellens Chart are used to detect it
- Tear: produced by **LacrimalGland**
- **Hypercapnia**-increase in concentration of CO<sub>2</sub> in blood-Yawning, Asthma, Bronchitis
- **Hypoxia:** Low O<sub>2</sub> in blood – Anaemia (Blood's Capacity reduces)

## Eye and Camera

- **Similarities:** Lens Transparent; Real and Inverted Image; Control of Light.
- **Differences**
  1. Focal Length of eye lens can be changed by Ciliary Muscles
  2. Retina retains image only for 1/20 of a second after removal of object. While in camera, it is permanent.
  3. Retina can be used repeatedly for forming image while film cannot.

## RESPIRATION

- Food molecules have **low energy packets** (Glucose). **Respiration** is an Energy Intensifying Process during, which 'High Energy Packets' (**ATPs**) are produced.
- **Tissue Respiration** involves three steps –

### GLYCOLYSIS

Breaking of Glucose molecule (6 carbon) into two **PyruvicMolecules** (3 carbon). **Anaerobic** process (in absence of Oxygen). **2 ATP** energy is released

### KREBSCYCLE

Breaking of Pyruvic Molecules into Acetyl group after entering **Mitochondria**. **Aerobic** process (in presence of oxygen). **30 ATP** energy released

### RESPIRATORYCHAIN

Series of Enzyme-Coenzyme reactions in the Mitochondria.  
**Aerobic** process. **6 ATP** released.

Net gain from Aerobic Phase = 30+6 = 36 ATP

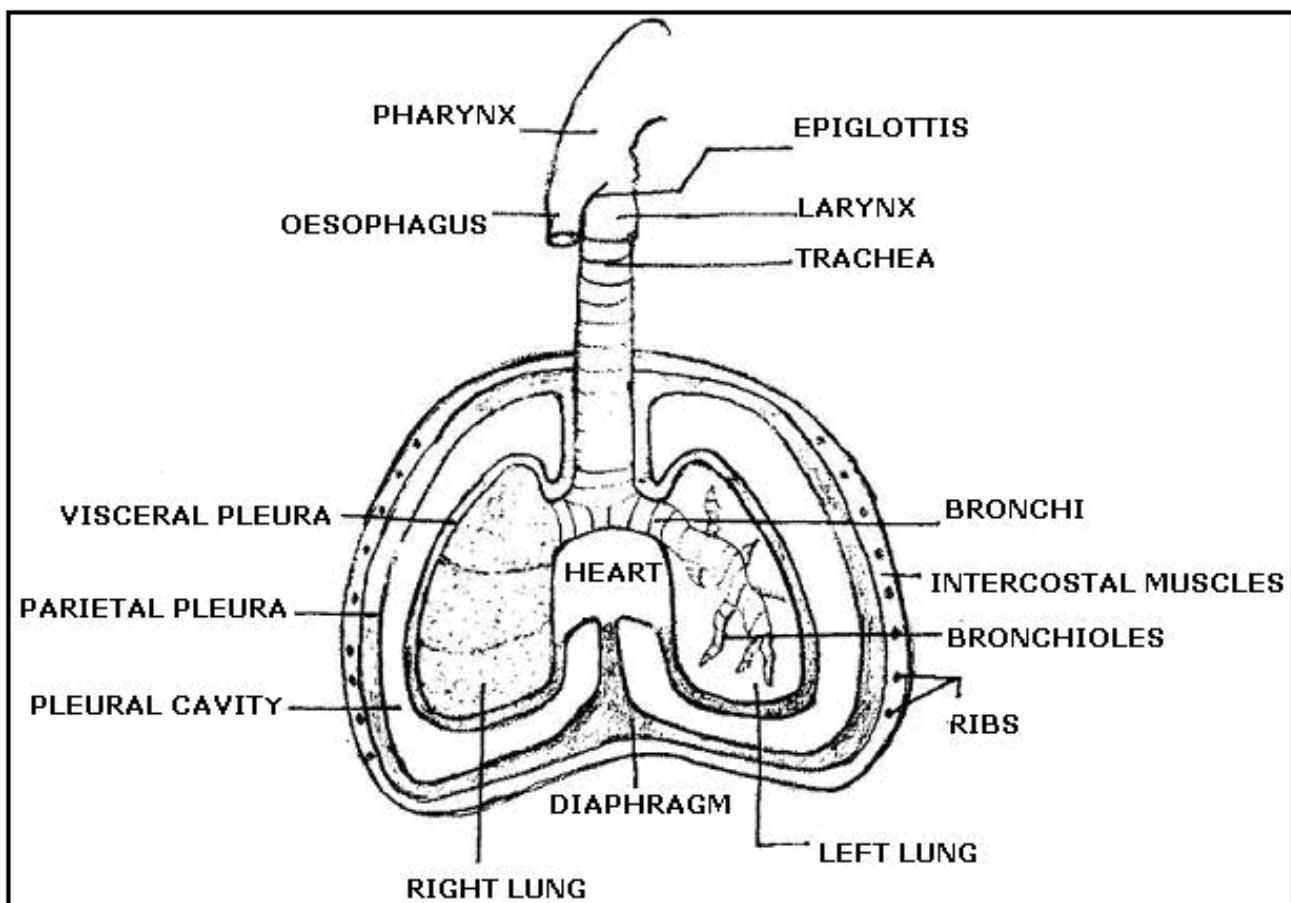
Net gain from Anaerobic Phase = 2 ATP

Thus, oxidation of **1 mole of Glucose** provides = **38 ATP** of Energy

- It simply shows that **95% of energy** for our cells to work comes from **Mitochondria** i.e. **AerobicEnergy**. Organisms that live by Anaerobic Respiration can obtain only about 5% of the energy of food they consume.

## LUNGS

- **Pharynx:** Digestive & respiratory tracts cross each other here.
- **Oesophagus:** or Food Pipe- a Collapsible tube.
- **Visceral Pleura:** Thin, Smooth Epithelium.
- **Parietal Pleura:** Inner Lining of Chest.
- **Pleural Cavity:** Containing pleural fluid to lubricate lungs
- **Epiglottis:** A flap of tissue, which closes when food is swallowed.
- **Larynx:** Also called Sound Box that decides voice, pitch etc. Males have large length & short pitch – called Adonis Apple.
- **Bronchi:** One of the two divisions of Trachea entering into a lung.
- **Bronchioles:** Small tubes, part of Bronchi.
- Right Lung contains three lobes, each lobe divided into millions of air sacs called alveoli. Left Lung contains two lobes.
- **Alveoli** are the structural and functional units of Lungs. Each alveoli has a rich network of Capillaries. During breathing, only a part of air in lungs is renewed.
  - The volume of air passing in and out at normal time is called as **Tidal Volume**, which is about 500 ml each.
  - The amount of air that remains in lungs after maximum expiration is **Residual Volume**, which is about 1200ml.
  - The volume that can be breathed out by a forceful expiration after a forceful inspiration is called **Vital Capacity**, which is about 4800 ml in males and 3100 ml in females. Total Capacity =  $4800+1200 = 6000$  ml.
  - Thin moist membrane forming an inner lining of alveoli is **Respiratory Surface**.



- The exchange of O<sub>2</sub> & CO<sub>2</sub> between Blood and Lungs takes place through **diffusion**. O<sub>2</sub> is at higher concentration in lungs than blood, so diffuses in blood and CO<sub>2</sub> is higher in blood than lungs, so diffuses in lungs.
- Blood carries most of CO<sub>2</sub> from cells to lungs as **Bicarbonate Ions**.

1gm hb has 1.34 ml O<sub>2</sub>; 100 ml blood has 14-15 gm hb

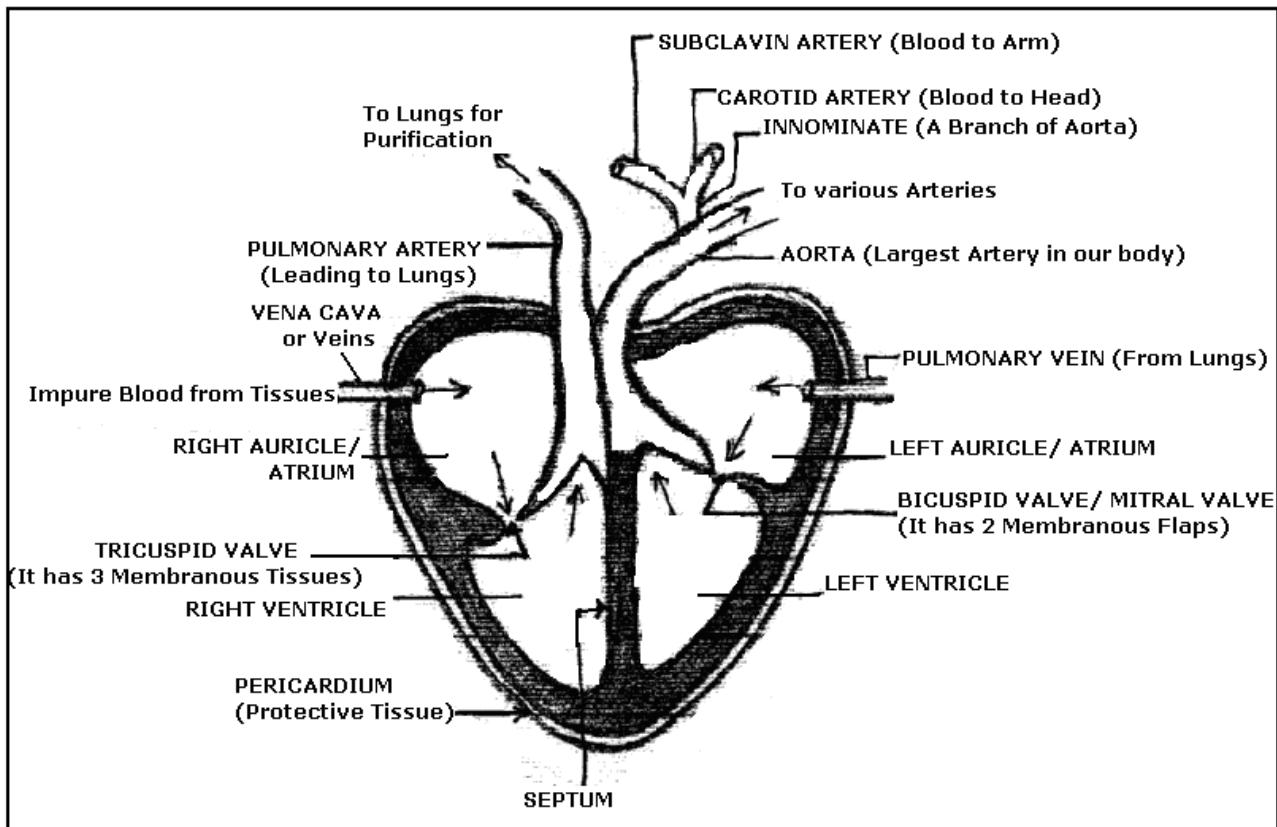
### Affinity of gases with Blood

CO> O<sub>2</sub> >CO<sub>2</sub>

- Hypercapnia:** increase in concentration of CO<sub>2</sub> in blood–Yawning, Asthma, Bronchitis
- Hypoxia:** Low O<sub>2</sub> in blood – Anemia (Blood's Capacity reduces).
- Respiratory Organs in other animals –
  - Earthworms, Frog – Skin.
  - Insects – Trachea.
  - Spiders/ Scorpions– Book Lung.
  - Birds – Air Sacs.
  - Prawns, Fish – Gills.

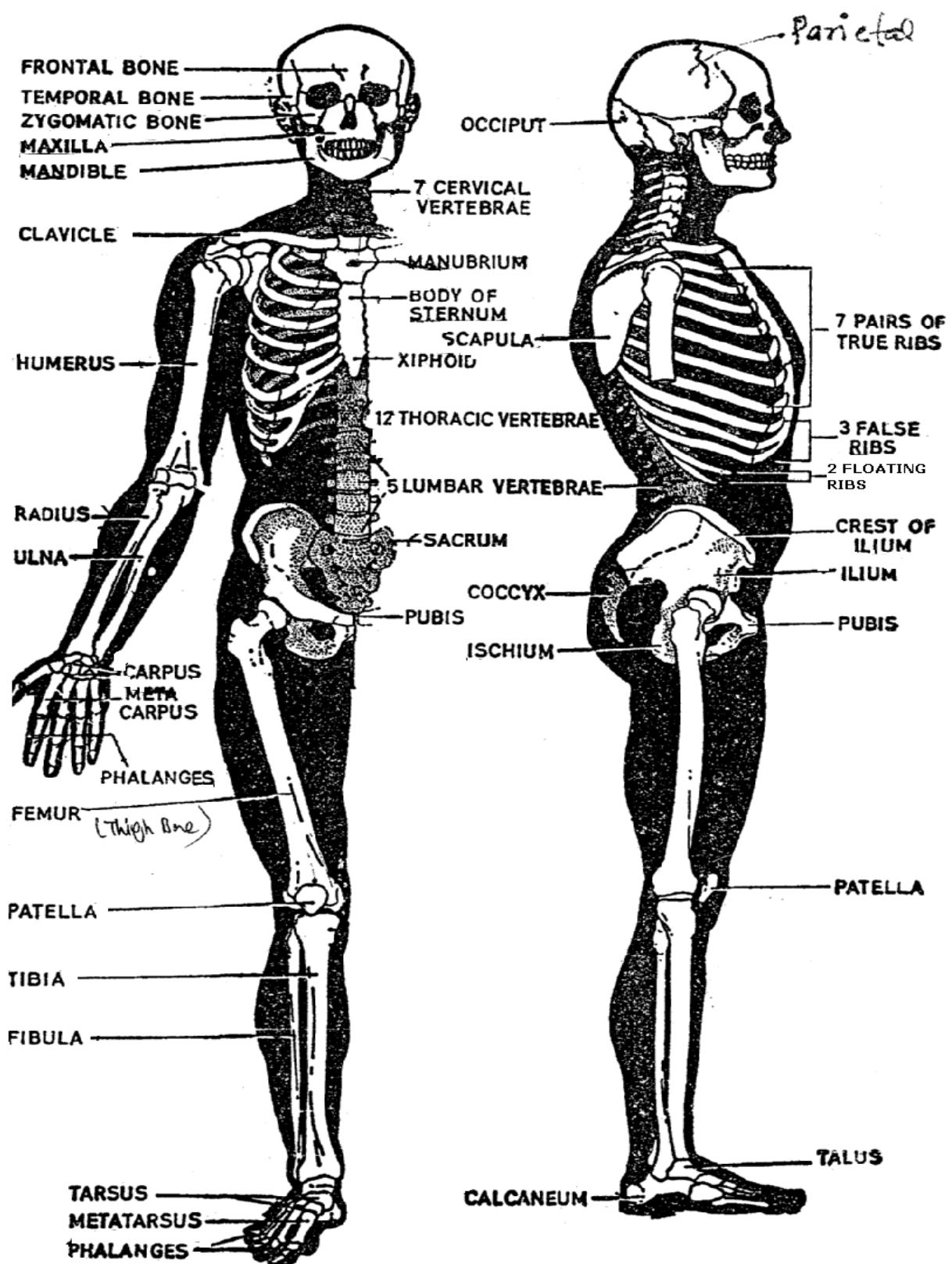
## HEART

- Arterial blood** carries **oxygen** and dissolved food while **venousblood** carries **CO<sub>2</sub>** and waste materials. However, the **Pulmonaryarteryandvein** are **exceptions** to this.
- All chambers of heart and all blood vessels are internally lined by a layer of smooth, thin flattened cells called **endothelium**, which **preventsclotting** of blood **withinCirculatorySystem**.
- Dorsalaorta** is the part of aorta that supplies blood to viscera and legs.
- Artificialvalves** are either **tissue based** (of pigs, cadaver) or **Mechanical** (Plastics, Ceramics).
- No communication between Left and Right compartments.
- Pumping rate of heart is about **70/ minute**. It may go upto 150/ minute during exercise or excitement.
- Pressure of blood **varies** from one part of the body to another.
- The pressure produced in ventricle when it contracts and empties itself into aorta and pulmonary artery is called **SystolicPressure** and equal to **120 mm** of Hg. Opposite situation, when it fills the blood, the pressure is called **DiastolicPressure** and equals **80 mm** of Hg.
- Lymph** is another **mediumofcirculation** in body meant for **proteins**, which cannot re-enter the blood capillaries because of their size. It is **lightyellow** and not red because it **does not contain hemoglobin**. Its composition is quite similar to blood plasma. Flows in one direction i.e. tissues to heart. Contains special white cells, for fighting diseases, called **lymphocytes**.
- CO<sub>2</sub> of respiration in cells is transported both by **hemoglobin** of the blood and by water, which dissolves it. Expulsion of CO<sub>2</sub> occurs in the surface of **lungs**.
- The same circulatory system **transports** both **nutrients** and **water**. So there needs to be a special mechanism of **separating** the **two**, so that only waste is excreted and nutrients are held back. This filtering work is done by **kidneys**. These are in **two** numbers.



## JOINTS

- In **hinge joints**, movement occurs in one plane only e.g. knee and elbow joints. In **ball-and-socket joints**, movement occurs in three planes e.g. hip, shoulder.
- Other joints are freely movable called **synovial joints**, example the limb joints
- Muscles are made up of Muscle **Fibre**, which in turn is made up of **Fibril** and further of **Filaments**.
- Filament is composed of two parts – **Actin** (thin, light and active part) and **Myocin** (thick and dark). These two are called contractile tissues.
- Smallest bone of our body – **Stapes** (in ear); **Largest bone – Femur** (thigh)
- Total no of muscles – 639; Total no of bones – 206
- **Physiologically more reactive** organ – Liver.
- **Largest endocrine gland** – Thyroid; **Smallest endocrine gland** – Pituitary
- Organ having **min. regeneration** power – Brain.
- Organ having **max. regeneration** power – Liver



## TEETH

- The **first permanent tooth** appears when a child is about 6 to 7 years old. The last permanent tooth erupts when a person is 17 to 21 years old.
- There are 32 permanent teeth, 16, in each jaw.
- They are larger than the deciduous teeth and consist of four kinds of teeth.
- The **four kinds** are (1) incisors, (2) canines (3) premolars, (4) molars.
- Each jaw has 4 incisors, 2 canines, 4 premolars, and 6 molars.
- **Incisors** are the chief biting teeth. They have a sharp straight cutting edge. In most cases, incisors have one root. The central incisors of the lower jaw are the smallest permanent teeth.
- **Canines** are used with the incisors to bite into food. They are also used to tear off pieces of food. The canine teeth resemble a dog's fangs. They have a sharp, pointed edge and one root. Canines are also called cupids or dogteeth. The upper canines are sometimes known as eyeteeth.
- **Premolars** are sometimes called *bicuspid*s because, in most cases, they have two cusps. The premolars erupt in the place of the deciduous molars.
- **Molars**, like premolars, are used to grind food. They are shaped much like premolars but are larger. The various molars normally have 3-5 cusps and 2-3 roots.
- The permanent molars do not form beneath any of the deciduous teeth. They develop as the jaws grow, which makes space for them. Some adults lack one or more of the third molars, which are commonly called **wisdom teeth**.
- In many cases, jaws do not grow large enough to provide space for wisdom teeth.
- A tooth consists of **four kinds of tissues**- (1) pulp (2) dentine (3) enamel and (4) cementum.
- **Connective tissue** surrounds the root of the tooth. This tissue, called the **periodontal ligament**, holds the root in the socket in the jaw.

# HEAT AND TEMPERATURE

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**Heat:** Heat is a form of energy arising from mechanical motion of the molecules composing a body. This is known as the **dynamically kinetic theory of heat**.

**Temperature:** Temperature is an indication of an object's internal energy level. A thermometer is used to measure temperature. Thermometers have a numbered scale so that temperature can be expressed in degrees. The two most common scales are the **Celsius or centigrade and the Fahrenheit scales**. The temperature of an object determine weather that object will take more on internal energy or lose some when its come into contact with another object.

- All things are made up of atoms or molecules, which are always moving. The motion gives every object internal energy that depends on how rapidly its atoms or molecules move.
- Temperature and heat is not the same thing. Temperature is simply an indication of the level of internal energy that an object has. Heat on the other hand, is the energy passed from one object to another.
- Temperature is measured by a thermometer. There are several types of the thermometers but the **most common is the mercury in glass type**, which measures temperature by means of the expansion and contraction of mercury.
- To fix a scale for a thermometer, a number 0 (zero) is assigned to the temperature of pure melting ice and the number 100 to the temperature of water boiling under standard atmospheric pressure of 760 mm of mercury. The space between these two is divided into 100 equal parts, **called degrees**. This is called the Celsius ( $0^{\circ}\text{C}$ ).
- On the Fahrenheit Scale of temperature, the **number 32 corresponds to  $0^{\circ}\text{C}$**  and the **number 212 to  $100^{\circ}\text{C}$** . To covert temperature from the Fahrenheit to the Celsius scale, the following relation is

$$\text{Temp in } ^\circ\text{C} = \frac{5}{9} (\text{F}-32)$$

Using the formula, one can easily see that at  $-40^{\circ}$ , both Celsius and Fahrenheit scales will show identical readings.

- **Absolute Zero and Kelvin scale:** In principle, there is no upper limit to temperature but there is a definite lower limit- **the 'absolute Zero'**. This limiting temperature is **273.16° below zero on the Celsius scale** of temperature. **On the Kelvin scale absolute zero is 0 K** (it is not written as  $0^{\circ}\text{K}$ ). On Kelvin scale  $0^{\circ}\text{C}$  corresponds to 273.16 K and  $100^{\circ}\text{C}$  to 373.16 K. Degrees on the Kelvin scale are calibrated with the same sized division as on the Celsius scale. Thus, a  $10^{\circ}\text{C}$  rise of temperature is equal to 283.16 K rise of temperature.

## CLINICAL THERMOMETER

- Mercury-in-glass type thermometer is used to measure the temperature of human body. Its thermometer scale is marked from 95F to 110F or  $35^{\circ}\text{C}$  to  $43^{\circ}\text{C}$ . The **normal temperature of a healthy person is 98.4F or  $36.9^{\circ}\text{C}$** .

## USE OF MERCURY IN THERMOMETER

- It is opaque and shining; therefore temperature reading is convenient.

- It's a good conductor of heat; thus recording of temperature is easy.
- It neither sticks to glass, nor vaporizes.

**Water is not used in thermometer** because it freezes at 0°C and expands irregularly. In the countries **where the temperature falls below -40°C, alcohol thermometer** is used since alcohol freezes at -115°C but mercury freezes at -39°C.

## SPECIFIC HEAT CAPACITY

- The specific heat capacity of a substance is the amount of heat required to produce a 1 K (1 °C) rise in the temperature in a mass of 1 kg.
- Heat like other forms of energy is measured in joules (J) and the unit of specific heat capacity is the joules per kilogram Kelvin (J/(kg K)) or J (kg °C). In physics the word 'specific' indicates that units mass is being considered.
- The specific heat equation: heat taken in or given out = mass x specific heat capacity x Temperature change.
- Specific Heat capacity of various substances (Decreasing Order)
  - Water
  - Ice
  - Iron
  - Kerosene Oil
  - Mercury
  - Lead

## HEAT CAPACITY

- The heat capacity (symbol °C) of an object is the heat required for raising its temperatures by 1 K and is measured in J/K. Therefore if an object requires 1000J to raise its temperature by 2K, its heat capacity is  $1000J / 2K = 500 \text{ J/K}$ .
- A calorie is the quantity of heat required to raise temperature of 1 gm water by 1°C.

## UNUSUAL BEHAVIOR OF WATER

- When water is cooled to 4°C it contracts, but as it cools from 4°C to 0°C it expands. Water therefore has a **maximum density at 4°C**. At 0°C, where water freezes, a considerable expansion occurs and every 100 cm<sup>3</sup> of water becomes 109 cm<sup>3</sup> of ice. This accounts for **bursting of water pipes** in very cold weather. Further cooling of ice causes it to contract.
- The expansion of water below 4°C is due to the fact that above 4°C water molecules form into groups, which break up when the temperature drops below 4°C. The new arrangements occupy a larger volume and this cancels out the contraction due to fall in temperature.

## FREEZING OF PONDS

- The behavior of water between 4°C to 0°C explains why fish survive in frozen ponds.
- Water at the top of the ponds cools first, contracts and being denser sink to the bottom. Warmer, less dense water rises to the surface to be cooled. When the whole water is at 4°C, this circulation stops. If the temperature of the surface of the water falls below 4°C, it becomes less dense and remains at the top (because it is less dense than the water at 4°C), eventually forming a layer of ice at 0°C.

## **TRANSMISSION OF HEAT**

Modes of Transmission of Heat (i) Conduction (ii) Convection (iii) Radiation

**Conduction:** Conduction is the flow of heat through matter; from places of higher to places of lower temperature **without movement of the matter** as a whole.

**Convection:** Convection is the flow of heat through a fluid from places of higher to places of lower temperature **by movement of fluid itself**.

**Radiation:** Radiation is the flow of heat from one place to another **by means of electromagnetic waves**. In conduction and convection, the motion of a particle transmits heat. But in radiation, heat can travel even through vacuum. In any object, the moving atoms or molecules creates waves of radiant energy. When the radiant energy strikes an object, it speeds up the atoms and molecules in that object.

## **NEWTON'S LAWS OF COOLING**

It states that rate at which a hot body loses heat is directly proportional to the difference between its temperature and the surrounding temperature. Thus a hot liquid will take less time in cooling from 90°C to 80°C than in cooling from 30°C to 20°C.

## **CHANGE OF STATE**

- Normally the temperature of an object rises when heat flows in it, but under certain circumstances even if the heat is supplied there is no increase in temperature of that object.
- For example if heat is added to block of Ice (say at -5°C) it is absorbed by ice without changing its temp. till it fully converts from solid to liquid state 0°C. Similarly when water boils at 100°C, its temp remains constant at 100°C until all of it is converted into steam.

## **SPECIFIC LATENT HEAT OF FUSION**

It is defined as amount of heat required to change 1kg of substance **from solid to liquid without change of temperature**. The heat required to convert 1kg of ice at 0°C into water at the same temp. It amounts to 336000 J of heat. This is known as specific latent heat of fusion of Ice.

## **SPECIFIC LATENT HEAT OF VAPOURISATION**

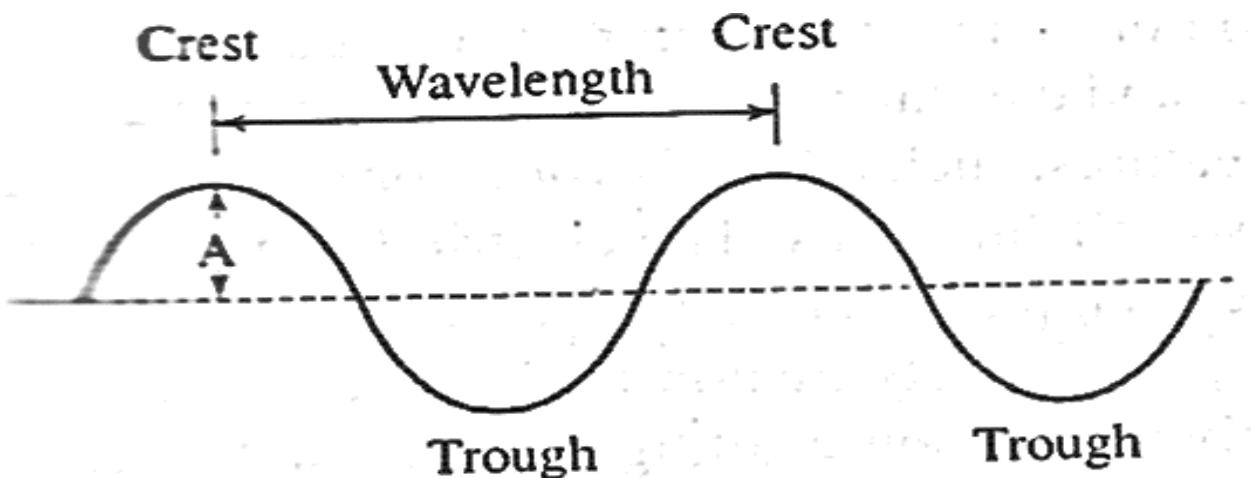
It is defined as the heat required for changing a unit mass of substance **from liquid to vapor state without change in temperature**. The specific latent heat of steam is 2260 J per gram.

# WAVES

- Light and sound are both propagated in the form of waves.
- Waves may be magnetic or electromagnetic. Mechanical waves are produced by a disturbance (such as a vibrating body) in the material medium, which transmits them; for example water waves, waves on springs and sound waves.
- Electromagnetic waves consist of disturbances in form of varying electric and magnetic forces. They travel more easily in vacuum than in matter; for example, radio signals and X-rays.

## FORMS OF WAVES

1. Transverse
2. longitudinal



**Transverse:** In these waves, the motion of particles is perpendicular to the motion of waves. For example **light waves**. Highest and lowest parts of these waves are called **crest and trough** respectively. And the height or depth (from the normal) of crest or trough is called **amplitude**. The distance between adjacent crests or troughs is called **wavelength**.

**Longitudinal:** In, which the motion of vibrating particles is along the direction or parallel to the motion of the wave. For example **sound waves and the waves in a coiled spring**. In a coiled spring, **compressions** are the regions where the loops of the spring are pressed together and **rarefactions** are where the loops are stretched apart. Therefore the region during one cycle in, which density of vibrating particles is maximum, is called compression and where the density of vibrating particles is minimum is called as rarefaction. The distance between the adjacent compressions (or in rarefactions) is called **wavelength**.

## FREQUENCY ( $\nu$ )

Frequency is the number of waves that pass through a point per second. It is measured in Hertz (Hz).

## SPEED OF WAVES

For all kind of waves, it is represented as  $V=v\lambda$ , where  $v$  = frequency,  $\lambda$  = wavelength.

## ELECTROMAGNETIC WAVES

These include an enormous range of frequencies from radio waves (frequencies  $< 10^5$  Hz) to gamma rays (frequencies  $> 10^{20}$  Hz)

### INCREASING ORDER OF FREQUENCIES

**Radio waves < Microwaves < Infrared < Visible Light < Ultraviolet Rays < X-Rays < Gamma Rays**

**$>10^{10} >10^{12} >10^{14} >10^{15} >10^{16} >3 \times 10^{16}$  to  $3 \times 10^{19} >10^{19}$**

- The waves with less frequency have more wavelengths whereas waves having higher frequencies have lesser wavelengths. This is because all the waves have same speed i.e.  $3 \times 10^8$  m/sec in vacuum.
- The **RADAR** (radio detection and ranging) region falls in microwave region and the frequencies at, which the Radar systems operate grade into Television and Radio frequencies.
- Radio and Television waves are radiated from antennae and can bend (diffract) around obstacles therefore can be received even if a hill or tower falls in their way. They are also **reflected by Ionosphere** thus making long distance reception possible.

# LIGHT

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- The Bodies, which themselves are a source of light, i.e. they emit light, are called **luminous**. For example the sun, a burning candle.
- Any substance through, which light passes is called a medium. A medium is said to be **homogenous** when it posses the same optical properties at all point and in all directions, i.e. has uniform structure and composition throughout, example water, glass, gold etc.
- A medium is said to be **heterogeneous** where the optical properties vary from point to point e.g. calcite, quartz, etc.
- A body through light passes freely and objects can be distinctly seen are called **transparent**, e.g. glass, water, etc. and where objects are not distinctly seen are translucent e.g. butter-paper, paraffin-wax, etc.
- Bodies, which do not allow to pass any light through them and through, which vision is not possible are **opaque**, e.g. stone, wood, etc.

## RAY AND BEAM OF LIGHT

The direction of the path taken by the light is called a ray. A number of rays constitute a beam of light. A beam of light may be converging, diverging or parallel.

## SPEED OF LIGHT

The speed is known to within a couple of miles per second. At present best value is given by **c = 186,310 miles/sec = 299,776 km/sec  $\approx 3 \times 10^8$  m/sec**, c being the standard symbol for the speed of light in **vacuum**. The speed in a **transparent medium** is found to be less than c. In **air** the speed is only 0.03 per cent smaller, but in **water** it is about 25 per cent less and in **glass** about 35 per cent less than c.

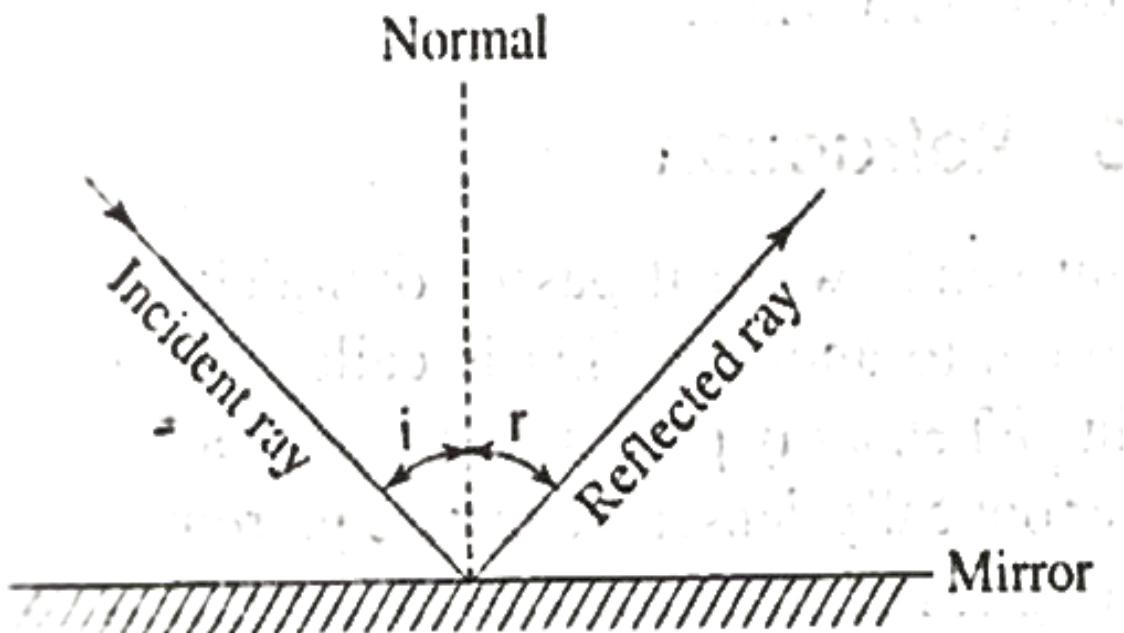
## WAVE AND PARTICLE NATURE OF LIGHT

- **Newton** proposed that **light consists of small particles** that travel in same lines through space. He called these particles **corpuscles** and his theory is called **corpuscular theory**.
- **Huygens** (Dutch physicist) proposed wave theory to explain the behavior of light. According to him light **consists of waves**.
- **Thomas Young's** (English physicist) experiment regarding interference of light proved the **wave theory of light**, he showed that due to the wave nature of light, two light beams cancel each other just like (water waves) under certain conditions.
- **James clerk Maxwell** (British physicist) propounded the **mathematical theory of electromagnetism**, according to, which light gets affected by change in electric field and magnetic field. This theory also supported wave theory of light.
- Experiments conducted by **Edward Morley and Albert Michelson**, both American physicists suggested that light travels through medium called **ether**.
- **Max Planck** (German physicist) experimented in the field of emission of light by a hot surface and predicted that the tiny emitters of light have certain values of energy, and when this value is restricted it is called **Quantized**. Quantization of light was suggested by Einstein in 1905. According to, which light comes in tiny packets of energy, called as **Quanta**. This supported the particle nature of light and particles of light came to known as **photons**.

- **Neil's Bohr** (Danish physicist) proposed about the **quantization energy of atoms**. According to him when energy is supplied to an atom, the atom accepts only certain value of energy and gets excited. In order to de-excite it gives away the extra amount of energy by emitting photons. Different types of atoms except different sets of energy therefore photons emitted from one type of atom differ in energy from photons from other type of atoms.
- Field of quantum mechanics explains how atoms and light are quantized.

## REFLECTION

When an incident ray (emanating from a point source) falls on a mirror with angle  $i$  to normal (perpendicular to the plane of mirror) gets reflected back at an angle  $r$  to the normal, then law of reflection states that **Angle i = Angle r**.



When a bundle of rays after reflection enter the eye, it appears to emanate from a point behind the mirror. The eye sees the image of source at this point. Since the light rays do not actually come from this point the image is called the **virtual image**. A **Real image** on the other hand is formed by actual intersection of rays and can be taken on a screen, which is not so in case of virtual image. An image formed in a plane mirror has the following characteristics:-

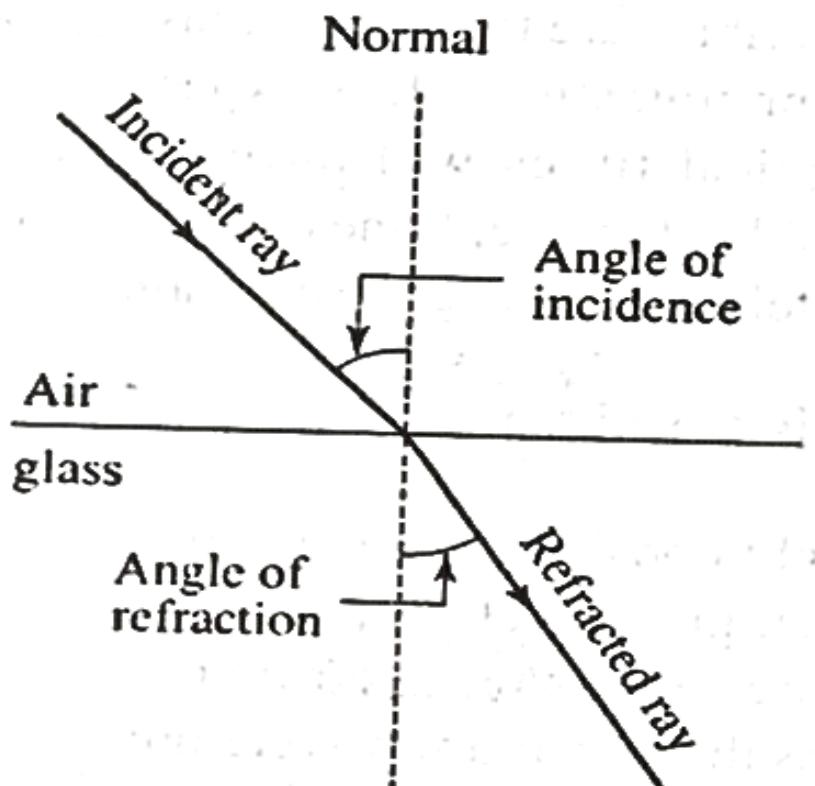
1. The image is of same size as that of object.
2. It is formed far behind the mirror.
3. It is virtual and laterally inverted (a person holding any object in his left hand, appears to holding it in his right hand in the image).
- When light is incident on a rough surface, the reflected rays are scattered in all directions by the many surface irregularities. This is called **diffuse reflection**.
- **Inclined mirror:** when an object is placed between two inclined mirrors, several images of the object are formed. The number of images depends on the angle between the mirror and can be determined by using the formula

<b>No. of images = <math>\frac{360}{\text{Angle between the mirrors}} - 1</math></b>
--

Thus if an object is placed between two mirrors inclined at  $90^\circ$ , there will be a total of three images. In the case of parallel mirrors (angle =  $0^\circ$ ), there will be an infinity number of images.

## REFRACTION

When a light ray passes from one optical medium to other, it is deviated from its original path. This is called refraction of light. When a ray passes from optically rarer medium to optically denser medium, its bends towards the normal, on the other hand if a ray passes from denser to rarer medium it deviates away from the normal.



This happens because of change in speed of light in medium having different densities. E.g. speed of light in air is slightly less than that in vacuum and **speed of light in water is nearly 0.75 c and in glass it is approx. 0.66 c.**

## REFRACTIVE INDEX OF A MEDIUM ( $\mu$ )

$$\mu = \frac{\text{speed of light in vacuum}}{\text{Speed of light in a medium}}$$

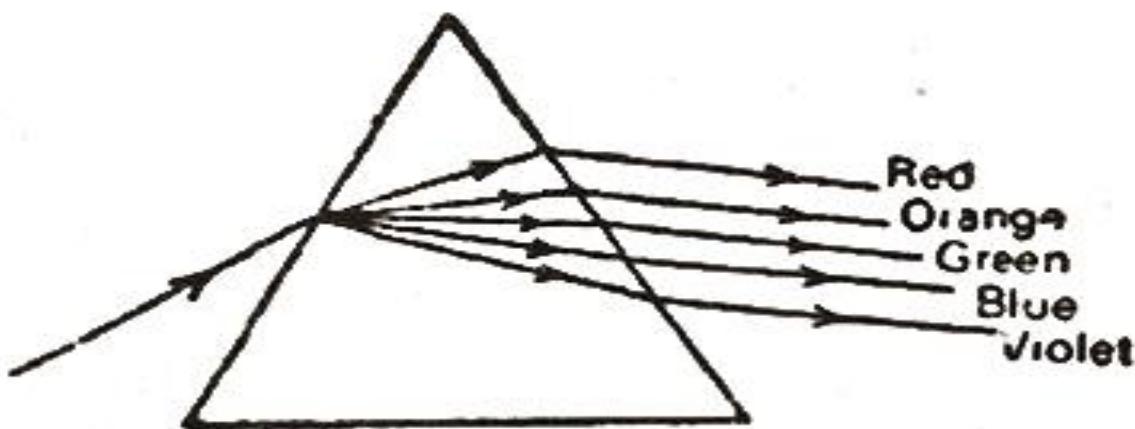
- Refraction explains the phenomenon as to why a **stone lying at bottom of a pond** appears to be at higher point than it actually is. Also the **bending of a stick, dipped in water** can be explained on the basis of the phenomenon of refraction.
- It is due to the refraction caused by the atmosphere that **sun or moon appears to be elliptical near the horizon**. This is observed because rays from the lower edge of the sun are bent more than those from the upper edge.
- **Twinkling of the stars** can be explained on the basis of the phenomenon of the refraction.
- **Mirage** (phenomenon of hot deserts) is caused by refraction as the air in the dessert is hot near the ground buts cools rapidly with the height. The hotter air is optically less dense.

## TOTAL INTERNAL REFLECTION

- When the angle of **incidence of light in the denser medium is greater than the critical angle of the medium**, the light do not get refracted into rarer medium but it is totally reflected to the medium of the incidence. This is known as Total Internal Reflection.
- This phenomenon finds application in **optical fibers**, which are used not only for communication purposes but also for medical examination of patient's internal body parts (**endoscopy**).

## DISPERSION

- Splitting of light into **spectrum of seven colors in accordance with their frequencies** when a light ray passes through a prism is called dispersion of light. Due to different speeds, the colors of light are refracted through different angles when narrow beam of white light passes through a glass prism.
- When sun rays passes through the droplets in the atmosphere they get split into spectrum of colors called as **rainbow**. **Violet color has min. wavelength** (max. frequency) and red color has max. Wavelength (min. frequency). The order of the colors can be explained on the basis of **VIBGYOR**.



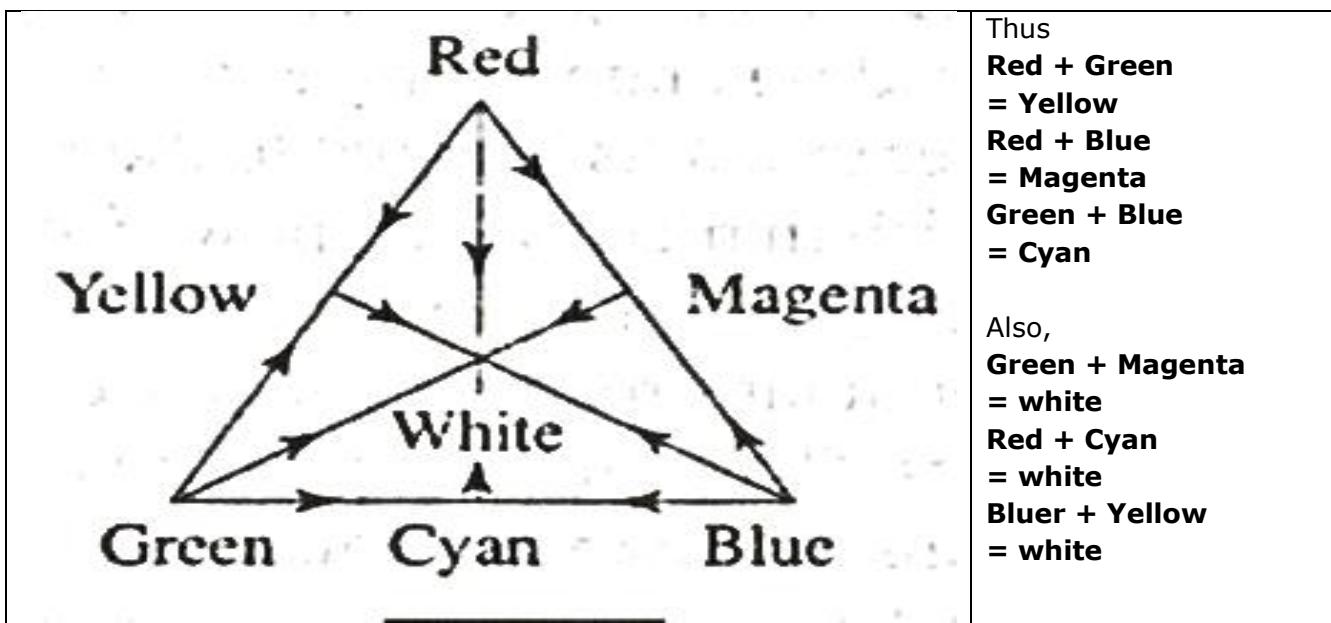
WAVELENGTH ►►

VIOLET – INDIGO – BLUE – GREEN – YELLOW – ORANGE – RED

◀◀ FREQUENCY

## COLOR OF OBJECTS

**White light is a mixture of the basic colors, red, green and blue.** All colors can be produced by mixing these three colors suitably. These three colors are also called **primary colors**. The color of an object is the color reflected by that object, out of seven colors of spectrum. E.g. a leaf appears green because chlorophyll inside it absorbs other colors except green. Colors produced by the mixing lights of primary colors can be obtained from the color triangle



Two colors when combined together results into white light are called **complimentary colors**.  
E.g. blue and yellow are complimentary colors.

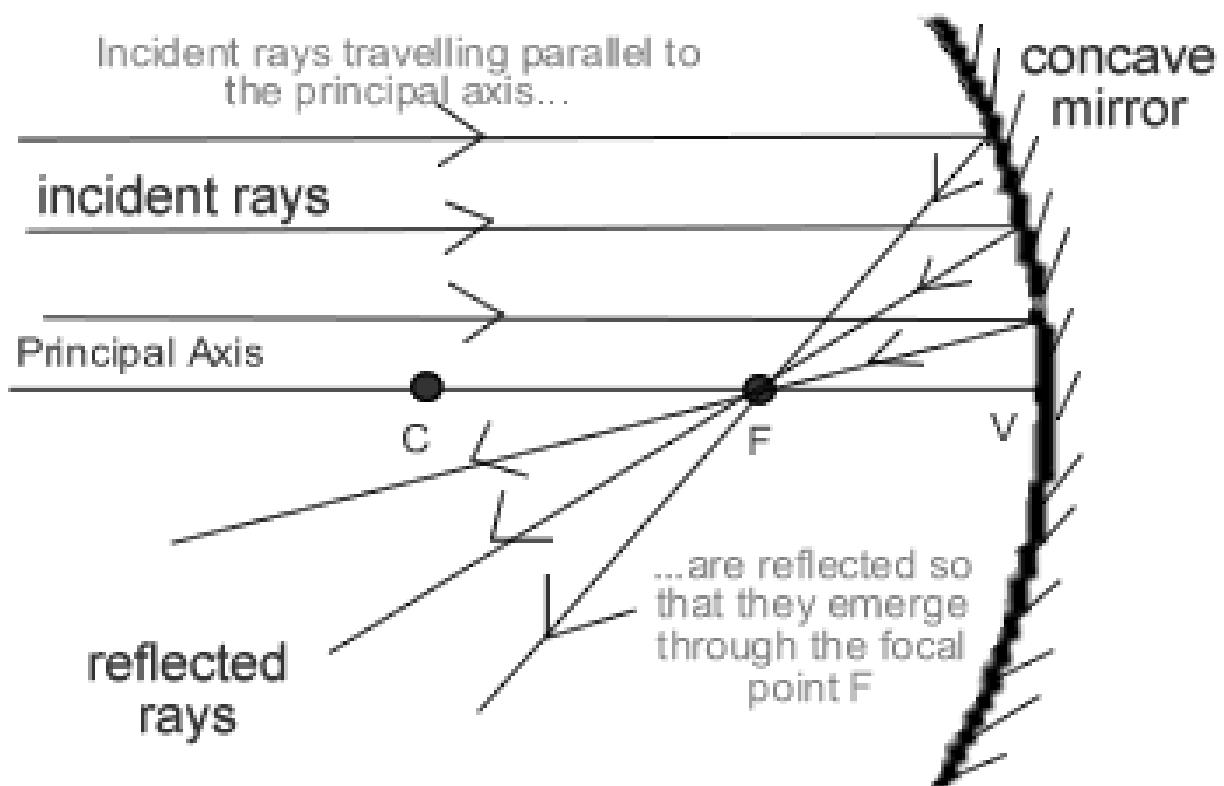
## MIRRORS AND LENSES

There are mainly two types of lenses and mirrors

1. **concave**
2. **convex**

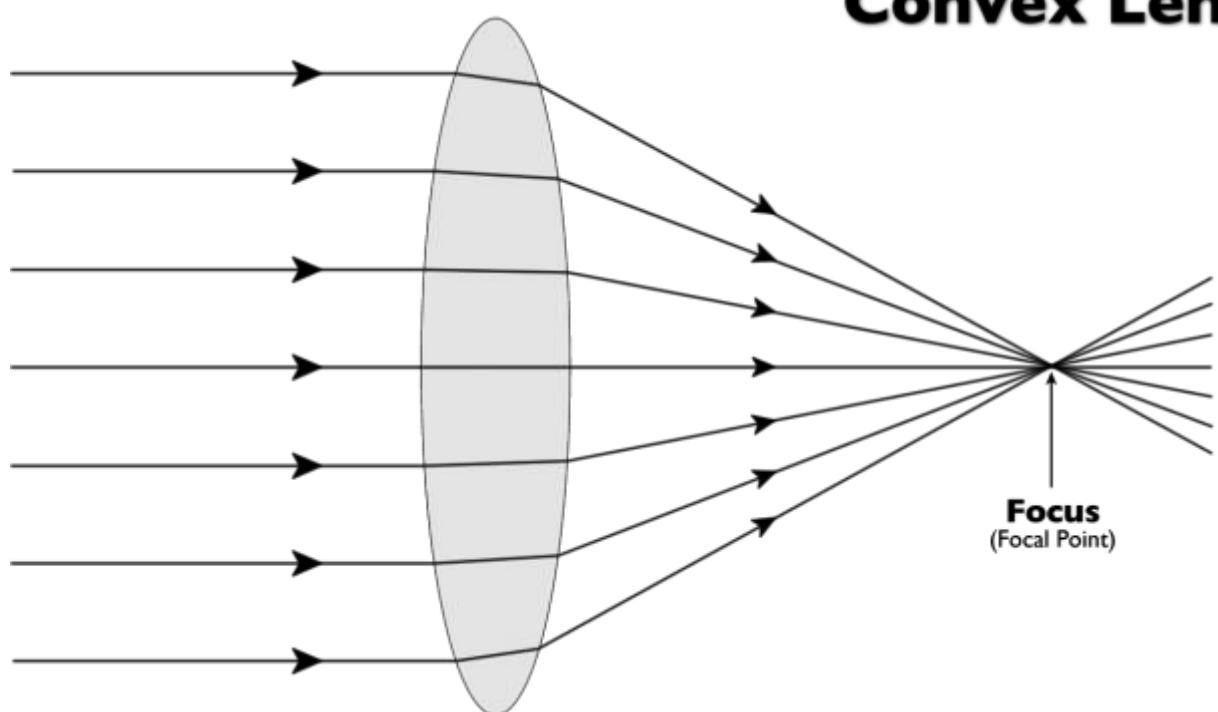
## CONCAVE AND CONVEX MIRRORS

- Mirrors find uses of phenomenon of **reflection**.
- When mirrors are made by depositing vaporized aluminum on a glass surface exposed outside, this makes a concave (converging) mirror, whereas deposition on the **inside portion of glass makes it a convex** (divergent) mirror.
- When rays fall on a concave mirror, they are converged to a point called **focus of mirror**. Because of this property they are used in **solar cookers, shaving mirrors, car headlights, torches, table lamp, and clinical usages**. They form virtual and real image depending on the position of the object.
- When an object is placed closed to the concave mirror i.e. at the distance less than the focal length of the mirror, the image is **virtual, erect and larger than the object**.
- A convex mirror always produces the virtual images, which are erect and smaller than the objects. These mirrors find **use in vehicles as rear view mirrors** because they cover wide field of view and curing **hyper-metropia of eyes**.

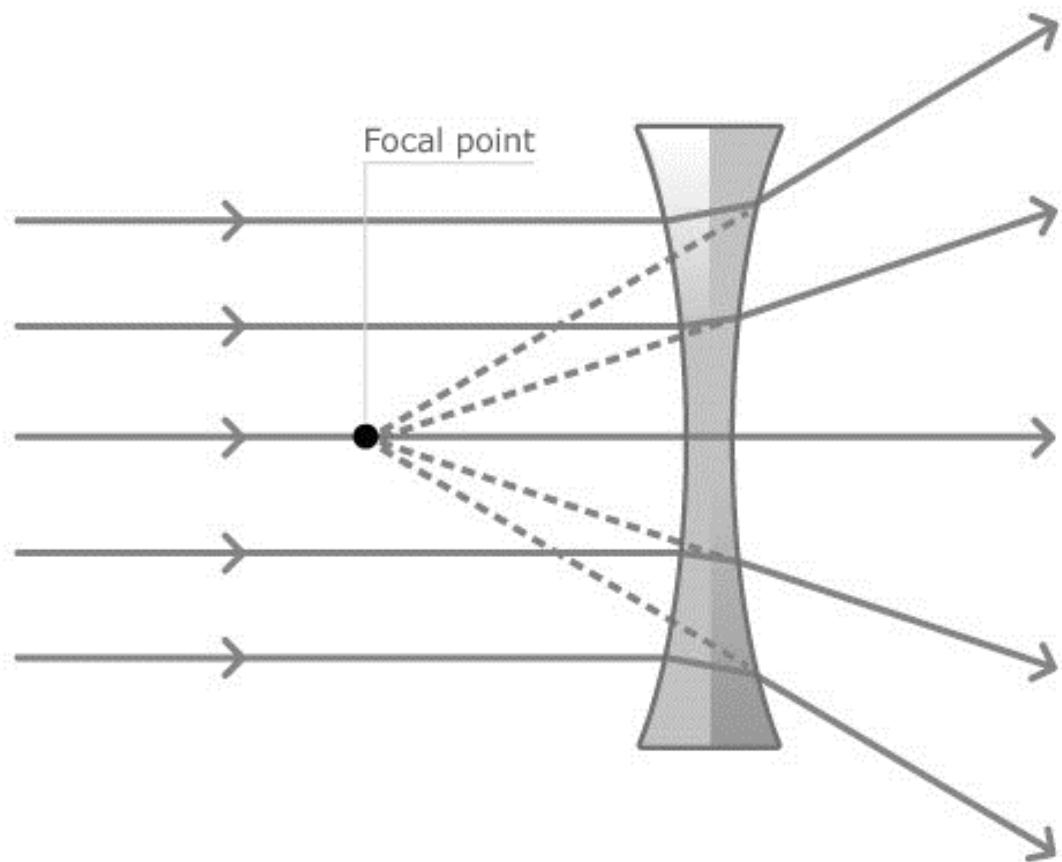


#### CONCAVE AND CONVEX LENSES

### Convex Lens



## Refraction of light through a diverging lens



- Lenses use of the phenomenon of the **refraction**.
- When a beam of light parallel to the principal axis of a convex lens passes through the lens, it is refracted so as to converge to a point on the axis called the **principal focus F**.
- A concave lens has a **virtual principal focus behind the lens**, from which the refracted beam seems to diverge. Since light can fall on the both faces of a lens it has two principal foci, one on each side, equidistance from c. The distance CF is the focal length (f) of the lens and is an important property of it.

### IMAGES FORMED BY CONVEX (CONVERGING) LENS

1. When object is **placed beyond 2F**: image is formed between F and 2F, its nature is real, inverted and smaller.
2. When object is **placed at 2F**: image is formed at 2F, which is real, inverted and is of same size.
3. When object is **placed between 2F and F**: image formed is beyond 2F, which is real, inverted and larger.
4. When object is **placed between F and C**: image is formed behind the object, which is virtual, erect and larger.

## IMAGES FORMED BY CONCAVE LENS

This lens forms virtual, erect and smaller image for all object positions thus behave like a convex mirror.

Ray Diagram	Characteristics of Image
<p>The object is between the lens and the focal point.</p>	<ul style="list-style-type: none"> <li>• larger than object</li> <li>• farther from lens than object</li> <li>• upright</li> <li>• virtual</li> </ul>
<p>The object is between the focal point and twice the focal length.</p>	<ul style="list-style-type: none"> <li>• larger than object</li> <li>• farther from lens than object</li> <li>• inverted</li> <li>• real</li> </ul>
<p>The object is more than twice as far from the lens as the focal point.</p>	<ul style="list-style-type: none"> <li>• smaller than object</li> <li>• closer to lens than object</li> <li>• inverted</li> <li>• real</li> </ul>

## SCATTERING OF LIGHT

- It takes place when light falls on atoms and molecules. Sunlight is scattered by atmospheric molecules in, which the predominantly scattered colors are **violet and blue**. As our eyes are not sensitive to violet light therefore sky appears blue to our eyes.
- **Red light** is scattered the least and therefore travel more in atmosphere than any other color. In the evening and the morning sun is lower in the sky because of, which sky appears Red and Orange in color.

## INTERFERENCE OF LIGHT

- The **superposition of two or more light waves of the same kind** that pass the same point in space at same time is called interference. If waves are in same phase, **constructive interference** takes places, which results into production of a strong wave; on the other hand, waves, which are out of phase, **destructive interference** takes place and waves die out.
- The phenomenon of **beautiful colors in soap bubbles and oil films on water** can be explained on the basis of interference of white light reflected by these surfaces.

## **OPTICAL ILLUSION**

An optical illusion (also called a **visual illusion**) is characterized by visually perceived images that differ from objective reality. The information gathered by the eye is processed in the brain to give a perception that does **not tally with a physical measurement** of the stimulus source. There are **three main types**: literal optical illusions that create images that are different from the objects that make them, physiological ones that are the effects on the eyes and brain of excessive stimulation of a specific type (brightness, colour, size, position, tilt, movement), and cognitive illusions, the result of unconscious inferences.

As **sunrise and sunset** are calculated from the leading and trailing edges of the Sun, and not the center, the duration of a day time is slightly longer than night time (by about 10 minutes, as seen from temperate latitudes). Further, because the **light from the Sun is refracted** as it passes through the Earth's atmosphere, the Sun is still visible after it is geometrically below the horizon. Refraction also affects the apparent shape of the Sun when it is very close to the horizon. It makes things appear higher in the sky than they really are.

Light from the **bottom edge of the Sun's disk is refracted** more than light from the top, since refraction increases as the angle of elevation decreases. This raises the apparent position of the bottom edge more than the top, **reducing the apparent height of the solar disk**. Its width is unaltered, so the disk appears wider than it is high. (In reality, the Sun is almost exactly spherical.) The Sun also appears **larger on the horizon, an optical illusion**, similar to the moon illusion.

## **SUNRISE**

- Sunrise is the instant at, which the **upper edge of the Sun appears above the horizon in the east**. Sunrise should not be confused with dawn, which is the (variously defined) point at, which the sky begins to lighten, some time before the sun itself appears, ending twilight.
- Because atmospheric refraction causes the sun to be seen while it is still below the horizon, both sunrise and sunset are, from one point of view, optical illusions. The sun also exhibits **an optical illusion at sunrise similar to the moon illusion**.
- The apparent westward revolution of Sun around the earth after rising out of the horizon is due to the Earth's eastward rotation, a counter-clockwise revolution when viewed from above the North Pole.
- This illusion is so convincing that **most cultures had mythologies and religions** built around the geocentric model. This same effect can be seen with near-polar satellites as well.

## **SUNSET**

- **Sunset or sundown is the daily disappearance** of the Sun below the horizon in the west as a result of Earth's rotation.
- The time of sunset is defined in astronomy as the moment the trailing edge of the Sun's disk disappears below the horizon in the west. The ray path of light from the setting Sun is highly **distorted near the horizon because** of atmospheric refraction, making sunset appear to occur when the Sun's disk is already about one diameter below the horizon.
- **Sunset is distinct from dusk**, which is the moment at, which darkness falls, which occurs when the Sun is approximately eighteen degrees below the horizon. The period between sunset and dusk is called twilight.

- Locations north of the **Arctic Circle** and south of the **Antarctic Circle** experience no sunset or sunrise at least one day of the year, when the polar day or the polar night persist continuously for 24 hours.
- Sunset creates unique atmospheric conditions such as the often intense orange and red colors of the Sun and the surrounding sky.

## **TWINKLING OF STARS**

- The fact is "**stars do not twinkle**". But it is just an **optical illusion**. Stars continuously emit light. These light travels through various layers of earth atmosphere before they reach our eyes.
- Now **refractive index decreases** as we move from down through atmosphere. **So light keeps on getting bent towards normal** at each point of incidence.
- Further **atmospheric conditions** keeps on changing. Hence **light flux reaching our eyes keeps** varying and so star appears bright at some time and it appears fade at other. So starts apparently twinkles but practically they don't.

## **MOON ILLUSION**

- The moon illusion is one of the most famous of all illusions. Stated simply, **the full moon**, when just above the horizon, **appears much larger than** when it is overhead. Yet the moon, a quarter of a million miles away from the earth, always subtends the same angle wherever it is in the sky, roughly 0.5 degrees.
- The **first problem is for photographers**. A wonderful picture presents itself, with the full moon just rising above a spectacular horizon. Click, the picture is taken. Yet the result is disappointing.
- The **moon seems much smaller** in the photograph than it did when viewed with the naked eye. Even professional photographers fall for this one.
- Yet on a normal lens, 50mm on a 35mm camera, the field of view is around 50 degrees, and the width of the moon, subtending an angle of 0.5 degrees, will be 100th of the width of the photo.
- Many photographs that you see in magazines, containing both a moon and a landscape, will be composites. The **landscape will be taken with a normal lens, the moon taken with a telephoto lens**, to get a bigger image.

Samples from

# INDIAN ECONOMY

### **Before we start**

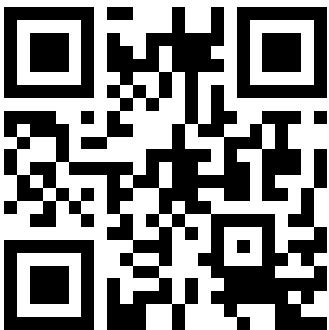
When the first man was born on earth, he didn't have money in his pocket; in fact, he didn't have a pocket itself! The pocket came when money came and money came when we started trading and transacting. At the start, man was self-sufficient living in caves, eating in jungles and wearing leafs (fulfilled his needs of **roti, kapda aur makaan**). Then we came out of jungles and started living in closed settlements. Even then, the lives were simple, lifestyles were simpler; there was a barter system. Farmers used to exchange grains for cloths; traders used to exchange for ornaments and so on.

Then came the complex trading structures; barters started failing as values of products started becoming complicated and rejections of one's products by the other started. For example, trader rejected to give cloths to the farmer as he didn't find the quality appropriate for the asking price of farmer. Thus came the need for a common unit of exchange which has same value for all and which cannot be rejected by anyone (legal tender). This is how "money of today" has evolved. But sadly, the money today has over casted everyone's head, so much so, that we have forgotten the real purpose of life. We are running so blindly after collecting these 'papers' that we forgot that they are not the end, but just a means towards a happy life. People have relegated their ethics to the lowest standard to accumulate these papers.

Henceforth, in this book, our whole story of economics will weave around the concept of money in your pocket. We will try to understand together various concepts of economics thru this.

Are you ready? Then check how much money you have in your pocket? Consider whatever amount you have right now in your pocket as the fixed one and write it on a paper. Forget that your parents will give you more money beyond this. Even if you don't have anything, it's perfectly fine. But be with me and realize now that this is the only and only money that you have!

# POVERTY



## Overview

Ask your friend how much money he has in his pocket. If he has more money in his pocket than you, he is rich and you are poor (relative poverty). If you have so less money in your pocket that you even can't afford food, then it is absolute poverty. Now the question is which 'food' we are talking about – affording a *kulcha channa* on a nearby *rehriwala* or eating in a 4-star hotel? Or if your friend has 10 lakhs in his pocket and you have 9 lakhs, are you poor?

Defining these parameters is the pain point for economists and governments throughout the world. A cup of tea in India is for 5 Rs while in USA, it costs 3 US\$ (200 Rs). No single standard or definition of poverty therefore could be universally accepted because of this kind of subjectivities and dynamism. Therefore, various economists, committees, organisations have come up with different definitions of poverty. Let's try to believe them. But whatever definition you agree with, close your eyes and think – if you can't afford a food today, why? Who's responsible for that?

Different people think about poverty in different ways. Some people think that poverty is about being able to buy and sell but other people think about getting a fair share of education and health care or about being given respect, and having some influence over what happens in their life. Because of these differences it is useful to think about two main types of poverty - income poverty and non-income poverty.

**Income poverty** happens when a household takes in less than one US dollar per day. This means that people will not have enough food or medicine and they will have poor clothes and houses. Income poverty is due to people not having access to money or other assets. The best way to reduce income poverty is to encourage and support the development of effective businesses (small, medium and large) which make good use of our natural resources and talents to create wealth & jobs.

**Non income poverty** happens when people may have a little bit of money but otherwise the quality of their life is not good. They do not have access to affordable social and physical services (schooling, health care, medicines, safe water, good sanitation, and good transport). The best way to reduce non-income poverty is to make sure that people have access to affordable and good quality social services and infrastructure, that they feel secure in their homes, that they trust the authorities and, if they are vulnerable, that there are safety net programmes to protect them. Poverty is the **deprivation of common necessities** such as food, clothing, shelter and safe drinking water, all of which determine our quality of life. It may also include the **lack of access to opportunities** such as education and employment which aid the escape from poverty and/or allow one to enjoy the respect of fellow citizens. This is the **World Bank's** definition of poverty:

Poverty is an **income level below some minimum level necessary to meet basic needs**. This minimum level is usually called the "**poverty line**". Definition agreed by the **World Summit on Social Development** in Copenhagen in 1995:

- Poverty is a condition characterized by **severe deprivation of basic human needs**, including food, safe drinking water, sanitation facilities, health, shelter, education and information. It depends not only on income but also on **access to services**.
- It includes a **lack of income and productive resources to ensure sustainable livelihoods**; hunger and malnutrition; ill health; limited or lack of access to education and other basic services; increased morbidity and mortality from illness; homelessness and inadequate housing; unsafe environments and social discrimination and exclusion.
- It is also characterized by **lack of participation in decision making** and in civil, social and cultural life.
- **It occurs in all countries**: as mass poverty in many developing countries, pockets of poverty amid wealth in developed countries, loss of livelihoods as a result of economic recession, sudden poverty as a result of disaster or conflict, the poverty of low-wage workers, and the utter destitution of people who fall outside family support systems, social institutions and safety nets.

### **Poverty has many dimensions**

- A **material** dimension (food, clothing etc.)
- A **psychological** dimension (respect, self-esteem, trust, fear)
- A **political** dimension (power, representation) and
- A **social** dimension (education, health, work).

The **latter 2 dimensions** point to the fact that poverty, while often suffered alone and in solitude, requires **social cooperation** if it is to be eliminated. The **material, political and social dimensions can, to some extent, be measured**, which is necessary if we want to have an idea of the importance of the problem, its evolution over time, and the effectiveness and success of policy measures aimed to combat poverty. One can measure nutrition, housing, income, access to certain services, standard of living, quality of life etc.

The **psychological dimension** is much more difficult to measure, but no less important. This dimension also shows us that poverty is not just a matter of the current state one is in, and the resources one has or doesn't have. It is also about vulnerability, about the **future**, about trust and fear. Poverty means comparing yourself to others, feeling like a failure, humiliated, shameful etc. The **insufficiency of resources to meet basic needs**, such as nutrition, shelter, health and education can result in following **material symptoms of poverty**:

- Low **income or consumption** levels.
- Low average **calorie** intake levels.
- High infant **mortality** rates.
- Low **life expectancy** rates.
- High **illiteracy** rates.
- High **unemployment**.
- Widespread **diseases**, especially curable ones.

- Famine or high risk of **famine**.
- High rates of economic **migration**.

Apart from these absolute monetary and non-monetary kinds of poverty, there is also **relative poverty**: people compare themselves to others, mostly others who are relatively close by and better off. This inequality of income or consumption can result in the following **psychological symptoms of poverty**:

- Feelings of loss of dignity
- Low self-esteem
- Feelings of relative powerlessness
- Feelings of lack of participation in culture and politics
- Feelings of discrimination and resentment

A third kind of poverty is **vulnerability**, actual or perceived risk of future poverty. This vulnerability can result in following **psychological symptoms** of poverty:

- Fear, stress
- Feelings of insecurity
- Irrational precaution measures
- Family planning decisions
- Migration

#### **ANOTHER DIMENSION: ABSOLUTE POVERTY & RELATIVE POVERTY**

Poverty is usually measured as either **absolute** or **relative poverty** (the latter being actually an index of **income inequality**). Absolute poverty refers to a **set standard** which is consistent over time and between countries. The **World Bank** defines **extreme poverty** as living on **less than US \$1.25 (PPP) per day**, and **moderate poverty** as **less than \$2 a day** (but note that a person or family with access to subsistence resources, e.g. subsistence farmers, may have a low cash income without a correspondingly low standard of living- they are not living "on" their cash income but using it as a top up). It estimates that "**in 2010**, 1.2 billion people had consumption levels below \$1 a day and 2.7 billion lived on less than \$2 a day". Although the decline was slowed by the global financial crisis, the number of people living in extreme poverty is expected to fall to around 900 million by 2015, even as the population living in developing countries rises to 5.8 billion. Still, an additional 1.1 billion people will live on less than \$2 a day.

Global poverty has **declined significantly over the last few decades**. The number of people living on less than \$1.25 a day (referred to as extreme poverty) has halved since 1990, reaching around 1 billion people in 2011, representing 14.5 percent of the entire global population. Poverty has been **more prevalent in Sub-Saharan Africa and South Asia** than in other developing regions, accounting for about 80 percent of the global poor. According to the 2011 estimates, almost three-fifths of the world's extreme poor are concentrated in just **five countries**: Bangladesh, China, the Democratic Republic of Congo, India, and Nigeria. Adding another five countries (Ethiopia, Indonesia, Pakistan, Madagascar, and Tanzania) would encompass just over 70 percent of the extreme poor.

In **1990**, nearly half of the population in the developing world lived on **less than \$1.25 a day**; that proportion dropped to 14 per cent in 2015. Globally, the number of people living in extreme poverty has declined by more than half, falling from 1.9 billion in 1990 to 836 million in **2015**. Most progress has occurred since 2000. The number of people in the **working middle class**—living on more than \$4 a day—has almost tripled between **1991 and 2015**. This group now makes up half the workforce in the developing regions, up from just 18 per cent in 1991.

**6 million children die of hunger every year** - 17,000 every day. The proportion of **undernourished people in the developing regions** has fallen by almost half since 1990, from 23.3 per cent in 1990–1992 to 12.9 per cent in 2014–2015. The global under-five mortality rate has declined by more than half, dropping from 90 to 43 deaths per 1,000 live births between 1990 and 2015. Despite population growth in the developing regions, the **number of deaths of children under five** has declined from 12.7 million in 1990 to almost 6 million in 2015 globally. Since the early 1990s, the rate of reduction of under-five mortality has more than tripled globally.

**Selective Primary Health Care** has been shown to be one of the most efficient ways in which absolute poverty can be eradicated in comparison to Primary Health Care, which has a target of treating diseases. **Disease prevention** is the focus of Selective Primary Health Care, which puts this system on higher grounds in terms of preventing malnutrition and illness, thus putting an end to Absolute Poverty.

The **proportion of the developing world's population living in extreme economic poverty** fell from 28% in 1990 to 22% in 2012. Most of this improvement has occurred in **East and South Asia**. In East Asia the World Bank reported that "The poverty headcount rate at the \$2-a-day level is estimated to have fallen to about 25% (in 2012), down from 69% in 1990." Globally, **extreme poverty has declined significantly**. In 2011, one billion people—14.5 percent of the world's population—could be classified as extremely poor, down from 1.25 billion—or 18.6 percent of the world's population—in 2008.

In the early 1990s some of the **transition economies of Eastern Europe and Central Asia** experienced a sharp drop in income. As a result poverty rates also increased although in subsequent years as per capita incomes recovered the poverty rate dropped from 31.4% of the population to 19.6%. World Bank data shows that the percentage of the population living in households with **consumption or income per person below the poverty line** has decreased in each region of the world since 1990:

Region	1990	2002	2010
East Asia and Pacific	15.40%	12.33%	12.5%
Europe and Central Asia	3.60%	1.28%	0.7%
Latin America and the Caribbean	9.62%	9.08%	5.5%
Middle East and North Africa	2.08%	1.69%	2.4%
South Asia	35.04%	33.44%	31.0%
Sub-Saharan Africa	46.07%	42.63%	48.5%

However, there are **various criticisms** of these measurements. Although "a clear trend decline in the percentage of people who are absolutely poor is evident ... with uneven progress across regions...the **developing world outside China and India has seen little or no sustained progress** in reducing the number of poor". **The World Bank report "Global Economic Prospects"** predicts that in **2030** the number living on less than the equivalent of **\$1 a day will fall by half**, to about 550 million.

Much of **Africa** will have difficulty keeping pace with the rest of the developing world and even if conditions there improve in absolute terms, the report warns, Africa in 2030 will be home to a larger proportion of the world's poorest people than it is today. The reason for the faster economic growth in **East Asia and South Asia** is a result of their relative backwardness, in a phenomenon called the **convergence hypothesis** or the **conditional convergence hypothesis**. Because these economies began modernizing later than richer nations, they could benefit from simply adapting **technological advances**, which enable higher levels of productivity that had been invented over centuries in richer nations.

### **Relative Poverty**

Relative poverty views poverty as **socially defined and dependent on social context**, hence relative poverty is a **measure of income inequality**. Usually, relative poverty is measured as the percentage of population with income **less than some fixed proportion of median income**. There are several other different income inequality metrics, for example the **Gini coefficient** or the **Theil Index**.

Relative poverty measures are used as official poverty rates in several **developed countries**. As such these poverty statistics **measure inequality rather than material deprivation** or hardship. The measurements are usually based on a person's yearly income and frequently take no account of total wealth. The main poverty line used in the OECD and the European Union is based on "**economic distance**", a level of income set at 60% of the median household income.

**Ultra-poverty**, a term apparently coined by **Michael Lipton**, connotes being **amongst poorest of the poor in low-income countries**. Lipton defined ultra-poverty as receiving less than 80% of minimum caloric intake whilst spending more than 80% of income on food. Alternatively, a 2007 report issued by **International Food Policy Research Institute** defined ultra-poverty as living on less than 54 cents per day. The depth of poverty should be measured. This **depth is the distance to the poverty line**. Just below the poverty line or way below makes a lot of difference.

### **MEASURES OF POVERTY**

**Not all of the kinds of poverty can be easily measured.** Some perhaps cannot be measured at all. Even the apparently easy ones, such as infant mortality rates or income levels, can and do pose problems, such as the **availability of data** (poor countries often do not have the institutional resources to generate high quality statistics), international comparability of data, definitions of data etc. However, it is important to measure the levels of poverty and their evolution as good as we can. Only if we have data

can we **judge the effectiveness of specific programs** to alleviate specific symptoms of poverty.

Poverty is **not just a philosophical problem** because depending on the definition of poverty we use, our measurements will be radically different (even with an identical definition, measurements will be different because of different measurement methods). Roughly, **6 different parameters for measuring poverty** are used:

- insufficient **income**
- insufficient **consumption** spending
- insufficient **caloric** intake
- **food consumption spending** above a certain share of total spending
- certain **health indicators** such as stunting, malnutrition, infant mortality rates or life expectancy
- certain **education** indicators such as illiteracy

**None of these parameters is ideal**, although the first and second on the list are the most widely used. A few words about the advantages and disadvantages of each are as follows:

**1 Income:** e.g. "**\$1 a day**" level, which is the **World Bank definition** of extreme poverty level; moderate poverty is less than \$2 a day; these levels are, of course, expressed in purchasing power parity. In **developed countries**, income is a common definition because it's easy to measure. Most people in developed countries earn a salary or get their income from sources that are **easy to estimate** (interest payments, the value of houses, stock market returns etc.). They don't depend for their income on the climate, crop yields etc. Moreover, developed countries have **good tax data** which can be used to calculate incomes.

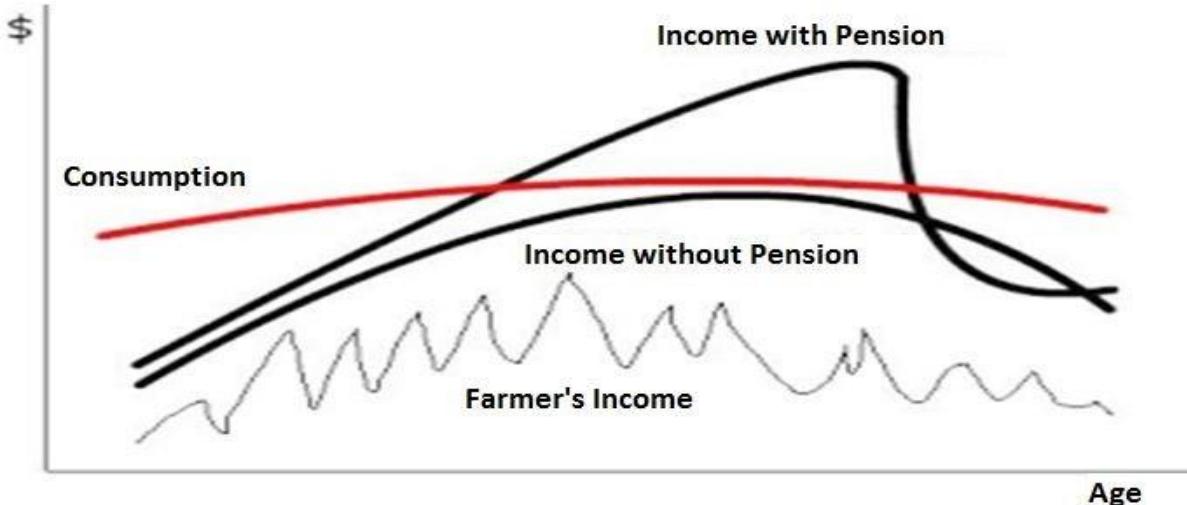
In **developing countries**, however, income data tend to be underestimated because it's **difficult to value the income of farmers and shepherds**. Farmers' incomes fluctuate heavily with climate conditions, crop yields etc. Another disadvantage is that people are generally **reluctant to disclose their full income**. Some income may have been hidden from the **tax administration** or may have been earned from illegal activity such as **corruption**, smuggling, drug trade, prostitution, theft etc. For this reason, using income to estimate poverty means overestimating it.

**2 Gross Domestic Product** (GDP, or total annual country income) per capita or per citizen is another measure of poverty. However, the problem with this measure is that it tells us about average and not how it is distributed over the spectrum. For example, in India, the people below poverty line are much below the average GDP per capita.

**3 Consumption:** The main advantage of using consumption rather than income to measure poverty is that consumption is **much more stable over the year and over a lifetime**. This is even truer in the case of farmers who depend on the weather for their income and hence have a more volatile income. As farmers are often relatively poor, this issue is all the more salient for poverty measurement. This is called the **lifecycle hypothesis**. Another advantage of using consumption is that people aren't as reticent to talk about it as they are about certain parts of their income.

:: **However**, consumption of goods like **durable goods and housing** is difficult to measure because it's difficult to value them. For example, if a household owns a house, it is difficult to estimate what it would cost to rent that particular house and add this to the total consumption of that household. Then the same has to be done for cars etc.

### Lifecycle Hypothesis



:: **Another** difficulty in measuring consumption is that in developing countries households **consume a lot of what they themselves produce** on the family farm. This as well is often difficult to value correctly. And finally, **different people have different consumption needs**, depending of their age, health, work etc. It's not clear how these different needs are taken into account when consumption is measured and used as an indicator of poverty.

- 4 **Calorie intake:** the problem with this is that **different people need different amounts** of calories (depending on their type of work, their age, health etc.), and that it isn't very easy to measure how many calories people actually consume. An average adult male has to eat food representing **approximately 2000-2500 calories** per day in order to sustain the human body.
- 5 **Food spending as a fraction of total spending:** here the problem is that if we say people who spend more than x% of their total spending on food are considered poor, we still have to factor in **relative food prices**.
- 6 **Stunting as an indicator of malnutrition and hence of poverty:** stunting (height for age) is a notoriously difficult thing to measure.
- 7 Another measure of poverty is work out the **parameters related to education** such number of years in education, Literacy levels, drop-out rates etc.

Another issue with poverty measurement is that people may have comparable incomes or even consumption patterns, but they may face very **different social or environmental conditions**: an annual income of \$500 may be adequate for people living in a rural environment with a temperate climate where housing is cheap, heating isn't necessary and subsistence farming is relatively easy. However, the same income can mean deep poverty for a family living in a crowded city on the edge of a desert. The presence or absence of public goods such as quality schools, roads, running water and electricity also makes a lot of difference, but poverty measurement usually does not take these goods into account.

For other types of **poverty such as income differences**, traditionally used measure is the **Gini coefficient** although most symptoms of this kind of poverty, as well as social, psychological poverty, are **intangible**. The difficulties of aggregating the different available measures, together with the difficulties of measuring other indicators, result in the **impossibility to establish a single, binary poverty indicator**, "are you poor or not", yes or no type of indicator. As a result, many scientists and politicians use a simplified rule to establish poverty, for example the "1 \$ a day" rule, of some other kind of poverty level expressed quantitatively. It is also important to measure the time frame of poverty, i.e. **incidental or chronic poverty**. This difference should be taken into account when devising policies.

## **POVERTY ESTIMATES IN INDIA**

Poverty in India is still rampant, with the nation estimated to have a third of the world's poor, despite an impressive economic growth. **In 2011, World Bank stated, 23.7%** of the total Indian people fall below the international poverty line of US\$ 1.25 per day (PPP) while 68.7% live on less than US\$ 2 per day. According to 2010 data from the **United Nations Development Programme**, an estimated **37.2% of Indians** live below the country's national poverty line. Rapid **economic growth since 1991**, has led to sharp reductions in extreme poverty in India. According to United Nation's Millennium Development Goal (**MDG**) programme 270 million or 21.9% people out of 1.2 billion of Indians lived below poverty line of \$1.25 in 2011-2012.

According to the definition by **Planning Commission**, poverty line is drawn with an intake of **2155 calories in rural areas and 2090 calories in urban areas**. If a person is unable to get that much minimum level of calories, then he/ she is considered as being below poverty line. The Planning Commission in **March 2014** released the latest poverty estimates for the country showing a **decline in the incidence of poverty** from 38.2% to 29.5% and stating that anyone with a daily consumption expenditure of Rs. 47 and Rs. 32 in urban and rural areas respectively is above the poverty line. According to **Global Wealth Report 2016** compiled by Credit Suisse Research Institute, India is the **second most unequal country** in the world with the top one per cent of the population owning nearly 60% of the total wealth.

### **Poverty Estimation in India – C Rangarajan and Tendulkar Committee**

- To Measure Exact numbers of Poor People And Per capita expenditure various methods had been adopted by Government of India.
- The official measure of Indian government, **before 2005**, was based on **food security** and it was defined from per capita expenditure for a person to consume enough calories and be able to pay for associated essentials to survive.
- **Since 2005**, Indian government adopted the **Tendulkar methodology** which moved away from calorie anchor to a basket of goods and used rural, urban and regional minimum expenditure per capita necessary to survive.
- The **Planning Commission** has been estimating the number of people below the poverty line (BPL) at both the state and national level based on consumer expenditure information collected as part of the National Sample Survey Organization (NSSO) since

the Sixth Five Year Plan. The latest available data from such surveys is from NSSO conducted in 2004-05.

- Government Of India Formed **various Committees** for Poverty Estimation In India
  - Alagh Committee (1977),
  - Lakdawala Committee (1989)
  - Tendulkar Committee (2005)
  - Saxena committee
  - Hashim Committee
  - C. Rangarajan Committee (2012)

**Poverty Line Estimation in India. Comparison Given below read and understand both Methods of Poverty Estimation in India**

<b>Committees</b>	<b>Tendulkar</b>	<b>C Rangarajana</b>
Set Up By	Planning Commission	Planning Commission
Set Up In	2005	2012
Submitted Report	2009	2014
Poverty Estimation Method	Per capita Expenditure Monthly	Monthly Expenditure of family of five.
Urban Poverty Line Per Day per Person	33	47
Urban Poverty Line Per Month per Person	1000	1407
Urban Poverty Line Per Month, Family of Five Members	5000	7035
Rural poverty line Per Day Per Person	27	32
Rural poverty line (Rs) per Month Per Person	816	972
Rural poverty line (Rs) Per month Family Of 5 Members	4080	4860
BPL (Below Poverty Line) In crore	27 crore	37 crore
Calorie Expenditure	Only calorific value in Expenditure	Calorie + Protein + fat
Calories In Rural Areas	2400	2155
Calories In Urban areas	2100	2090
Main Focus Areas	Only counts Expenditure on food, health, education, and clothing.	<ol style="list-style-type: none"> <li>1. Food</li> <li>2. nonfood items such as education,</li> <li>3. healthcare,</li> <li>4. clothing,</li> <li>5. transport</li> <li>6. rent</li> <li>7. Non-food items that meet nutritional requirements.</li> </ol>

- C Rangarajan Committee was set up by Planning Commission in 2012 and Submitted Report In 2014. The Rangarajan committee estimation is based on an **independent large survey of households** by Centre for Monitoring Indian Economy (CMIE).
- It has also used different methodology wherein a household is considered poor if it is **unable to save**. The methods also include on certain normative levels of adequate nourishment, clothing, house rent, conveyance, education and also behavioural determination of non-food expenses.
- It also considered average requirements of calories, protein and fats based on ICMR norms differentiated by age and gender.
- Based on this methodology, Rangarajan committee estimated the number of poor were **19 per cent higher in rural areas and 41 per cent more in urban areas** than what was estimated using Tendulkar committee formula.
- Tendulkar, an economist, had devised the formula to assess poverty line in 2005, which the Planning Commission had used to estimate poverty in 2009-10 and 2011-12.

### **Global Hunger Index (GHI)**

- The report is released by the **International Food Policy Research Institute** (IFPRI). The hunger index ranks countries based on undernourishment, child mortality, child wasting (low weight for height) and child stunting (low height for age).
- The GHI ranks countries on a 100-point scale. Zero is the best score (no hunger), and 100 is the worst, although neither of these extremes is reached in practice.
- Global Hunger Index (GHI) is an index that places a third of weight on **proportion of the population that is estimated to be undernourished**, a third on the estimated prevalence of low body weight to height ratio in children younger than five, and remaining third weight on the proportion of children dying before the age of five for any reason.
- According to **2011 GHI report**, India has improved its performance by 22% in 20 years, from 30.4 to 23.7 over 1990 to 2011 period. However, its performance from 2001 to 2011 has shown little progress, with just 3% improvement. A sharp reduction in the percentage of underweight children has helped India improve its hunger record on the Global Hunger Index (GHI) 2014.
- According to the latest Global Hunger Index data, hunger levels in **developing countries** may have fallen 29% since 2000, but India is still rated as a **country with 'serious' hunger levels** in the 2016. It ranked India 97 among 118 countries, faring worse than all its neighbours China (29), Nepal (72), Myanmar (75), Sri Lanka (84) and Bangladesh (90), except for Pakistan (107) in measures of hunger.
- The report found that **one in three children in India has stunted growth**, whereas 15% of the country's population are undernourished. India's score is 28.5.
- At the current rate of decline, more than 45 countries – including India, Pakistan, Haiti, Yemen, and Afghanistan – will have “moderate” to “alarming” hunger scores in the year 2030.
- Sub-Saharan Africa has the highest hunger levels, followed closely by South Asia

### **Other Poverty Estimates For India**

Income inequality in India is increasing, with a Gini coefficient of 32.5 in 1999-2000. Although the Indian economy has grown steadily over the last two decades, its **growth has been uneven** when comparing different social groups, economic groups,

geographic regions, and rural and urban areas. Poverty rates in **rural Orissa** (43%) and **rural Bihar** (41%) are among the world's most extreme.

A study by the Oxford Poverty and Human Development Initiative using a Multi-dimensional Poverty Index (**MPI**) found that there were 645 million poor living under the MPI in India, 421 million of whom are concentrated in eight North India and East India states of Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan, Uttar Pradesh and West Bengal. This number is higher than the 410 million poor living in the 26 poorest African nations. Multi-dimensional Poverty Index placed 33% weight on number of years spent in school and education and 6.25% weight on financial condition of a person, in order to determine if that person is poor.

A report by the state-run **National Commission for Enterprises in the Unorganized Sector** (NCEUS) found that 77% of Indians, or 836 million people, lived on less than 20 rupees (approximately US\$ 0.50 nominal; US\$ 2 PPP) per day. It is relevant to view poverty in India on a PPP basis as food etc. are purchased in Rupees. According to a recently released **World Bank report**, India is on **track to meet its poverty reduction goals**. However by **2015**, an estimated **53 million people** will still live in extreme poverty and 23.6% of the population will still live under US\$ 1.25 per day. This number is expected to reduce to 20.3% or 268 million people by 2020.

## **PROBLEMS WITH EXISTING OFFICIAL POVERTY LINES**

The existing all-India rural and urban official poverty lines were originally defined in terms of **Per Capita Total Consumer Expenditure** (PCTE) at 1973-74 market prices and **adjusted over time and across states** for changes in prices keeping unchanged the original 1973-74 rural and urban underlying all-India reference **Poverty Line Baskets** (PLB) of goods and services. These all-India rural and urban PLBs were derived for rural and urban areas separately, anchored in the per capita calorie norms of 2400 (rural) and 2100 (urban) per day.

However, they covered the consumption of all the goods and services incorporated in the rural and urban **reference poverty line baskets**. Three major criticisms of these poverty lines have been commonly aired. One, the **consumption patterns** underlying the rural and urban PLBs remained tied down to those observed more than three decades ago in 1973-74 and hence had become outdated. Two, **crude price adjustment** for prices was leading to implausible results such as proportion of total urban population below poverty line being higher than its rural counterpart in certain major states. Three, the earlier poverty lines assumed that **basic social services of health and education** would be supplied by the state and hence, although private expenditure on education and health was covered in the base year 1973-74, no account was taken of either the increase in the proportion of these in total expenditure over time or of their proper representation in available price indices.

## **CAUSES OF POVERTY IN INDIA**

- **Caste system:** Dalits constitute the bulk of poor and unemployed. Casteism is still widespread in rural areas, and continues to segregate Dalits despite the steady rise and empowerment of the Dalits through social reforms and the implementation of

reservations in employment and benefits. Caste explanations of poverty, however, fail to account for the urban/rural divide. However, using the **UN definition** of poverty, 65% of **rural forward castes** are below the poverty line.

- **British era:** Jawaharlal Nehru claimed "A significant fact which stands out is that those parts of India which have been longest under British rule are the poorest today." The Indian economy was purposely and severely de-industrialized, especially in the areas of textiles and metalworking, through colonial privatizations, regulations, tariffs on manufactured or refined Indian goods, taxes, and direct seizures.
- **India's economic policies:** In 1947, the **average annual income** in India was US\$ 439, compared with US\$ 619 for China. By 1999, the numbers were US\$ 1,818 and US\$ 3,259 respectively and by 2014 the numbers were US\$ 1581 and US\$ 7,590 respectively. Thus **India was left far behind due to its economic policies** especially the **License Raj** and the accompanying **red tape** that were required to set up and run business in India. The License Raj was a result of India's decision to have a planned economy, where all aspects of the economy are controlled by the state and licenses were given to a select few. **Corruption** flourished under this system. Up to 80 agencies had to be satisfied before a firm could be granted a license to produce and the state would decide what was produced, how much, at what price and what sources of capital were used.
- **Over-reliance on agriculture:** There is a surplus of labour in agriculture. While services and industry have grown at double-digit figures, agriculture growth rate has dropped from 4.8% to 2%. About 60% of the population depends on agriculture whereas the contribution of agriculture to the GDP is about 18% as compared to Industry (24.2%) and Services (57.9%).
- **High population growth rate**, although demographers generally agree that this is a symptom rather than cause of poverty. Its population growth rate is 1.2%, ranking 94th in the world.
- High **Illiteracy** (about 25% of adult population) as per 2011 census.
- **Regional inequalities**

### **Causes of Rural Poverty in India**

- Rapid Population Growth & Excessive Population Pressure on Agriculture
- Lack of Capital
- Lack of Alternate Employment Opportunities Other than Agriculture
- Illiteracy & Child Marriage Tradition
- Regional Disparities
- Joint Family System
- Lack of proper implementation of PDS

### **Causes of Urban Poverty in India**

- Migration of Rural Youth towards Cities □ Lack of Vocational Education / Training
- Limited Job Opportunities of Employment in the Cities
- Rapid increase in Population
- Lack of Housing Facilities
- No proper Implementation of Public Distribution System

## **LIBERALIZATION POLICIES AND THEIR EFFECTS**

**75% of poor are in rural India.** There is a viewpoint that holds that the **economic reforms** initiated in the early 1990s are **responsible for the collapse of rural economies and the agrarian crisis** currently underway. P Sainath describes that the **level of inequality** has risen to extraordinary levels, when at the same time; hunger in India has reached its highest level in decades. He also points out that rural economies across India have collapsed, or on the verge of collapse due to the neo-liberal policies of the government of India since the 1990s.

The **human cost of the "liberalization"** has been very high. The huge wave of **farm suicides** in Indian rural population from 1997 to 2015, which exceeded 200,000, according to official statistics. Commentators have faulted the policies pursued by the government, which, according to Sainath, resulted in a very high portion of rural households getting into the **debt cycle**, resulting in a very high number of farm suicides. Government policies encouraging farmers to **switch to cash crops**, in place of traditional food crops, has resulted in an extraordinary increase in farm input costs, while market forces determined the price of the cash crop. Sainath points out that a disproportionately large number of affected farm suicides have occurred with cash crops, because with food crops such as rice, even if the price falls, there is food left to survive on.

He also points out that **inequality** has reached one of the highest rates India has ever seen. During the time when **Public investment in agriculture** shrank to 2% of the GDP, the nation suffered the worst agrarian crisis in decades, the same time, as India became the nation of **second highest number of dollar billionaires**. Sainath argues that Farm incomes have collapsed. Hunger has grown very fast. Non-farm employment has stagnated. Only the National Rural Employment Guarantee Act has brought some limited relief in recent times. Millions move towards towns and cities where, too, there are few jobs to be found.

## **SUCCESS OF EFFORTS TO ALLEVIATE POVERTY**

Since the early 1950s, government has initiated, sustained, and refined various planning schemes to help the poor attain self-sufficiency in food production. Probably the most important initiative has been the **supply of basic commodities**, particularly food at controlled prices, available throughout the country as poor spend about 80 percent of their income on food.

Eradication of poverty in India is generally only considered to be a **long-term goal**. Poverty alleviation is expected to make better progress in the next 50 years than in the past, as a **trickle-down effect of the growing middle class**. Increasing stress on education, reservation of seats in government jobs and the increasing empowerment of women and the economically weaker sections of society, are also expected to contribute to the alleviation of poverty. It is incorrect to say that all poverty reduction programmes have failed. The **growth of the middle class** (which was virtually non-existent when India became a free nation in August 1947) **indicates that economic prosperity** has indeed been very impressive in India, but the distribution of wealth is not at all even.

## **CONTROVERSY OVER EXTENT OF POVERTY REDUCTION**

:: **While total overall poverty in India has declined**, the extent of poverty reduction is often debated. With the rapid economic growth that India is experiencing, it is likely that a significant fraction of the rural population will continue to migrate toward cities, making the issue of urban poverty more significant in the long run.

:: **While absolute poverty** may not have increased India remains at an **abysmal rank in the UN Human Development Index**. India in recent years remained at lowest position in the index compared to last 10 years. It can even be argued that the situation has become worse on **critical indicators of overall well-being** such as the number of people who are **undernourished** (India has the highest number of malnourished people, at 230 million), and the number of malnourished children (43% of India's children under 5 are underweight ( $BMI < 18.5$ ), the highest in the world) as of 2008.

### **Persistence of malnutrition among children**

:: The World Bank, citing estimates made by the World Health Organization, states that "About 49% of the world's underweight children, 34% of the world's stunted children and 46% of the world's wasted children, live in India." The World Bank also noted that "while poverty is often the underlying cause of malnutrition in children, the superior economic growth experienced by South Asian countries compared to those in Sub-Saharan Africa, has not translated into superior nutritional status for the South Asian child". A special commission to the **Supreme Court** has noted that the **child malnutrition rate in India is twice as great as sub-Saharan Africa**.

## **TENDULKAR COMMITTEE REPORT**

:: There has been a growing concern on the official estimates of poverty. In view of this, **Planning Commission** set up an expert group under the chairmanship of **Suresh Tendulkar** to examine the issue and suggest a new poverty line and estimates. Following are the salient features of the proposed poverty lines:

- 1 The expert group has also taken a conscious decision to move away from anchoring the poverty lines to a **calorie intake norm** in view of the fact that calorie consumption calculated by converting the consumed quantities in the last 30 days as collected by NSS has not been found to be well correlated with the **nutritional outcomes** observed from other specialized surveys either over time or across space (i.e. between states or rural and urban areas).
- 2 NSSO has decided to shift to **Mixed Reference Period (MRP)** for all its consumption surveys in future, namely, **365-days for low frequency items** (clothing, footwear, durables, education and institutional health expenditure) and 30-days for all the remaining items. This change captures the household consumption expenditure of the poor households on low-frequency items of purchase more satisfactorily than the earlier 30-day recall period. The Expert Group decided to adopt the **MRP-based estimates** of consumption expenditure as the basis for future poverty lines as against previous practice of using **Uniform Reference Period** estimates of consumption expenditure.

- 3 The new poverty lines have been arrived at after assessing the adequacy of **private household expenditure** on **education and health**, while the earlier calorie-anchored poverty lines did not explicitly account for these.
- 4 It may be noted that although those near the poverty line in urban areas continue to afford the original **calorie norm** of 2100 per capita per day, their actual observed calorie intake from 61st Round of NSS is 1776 calories per capita. This actual intake is very close to the revised calorie intake norm of 1770 per capita per day currently recommended for India by the **Food and Agriculture Organization** (FAO). Actual observed calorie intake of those near the new poverty line in rural areas (1999 calories per capita) is higher than the FAO norm.
- 5 Separate allowance for private expenditure on **transport and conveyance** has been made in the recommended poverty lines. For **rent and conveyance**, actual expenditure share for these items were used to adjust the poverty line for each state.

## **ENTRENCHED FACTORS ASSOCIATED WITH POVERTY**

- **Scarcity of basic needs:** Rise in the costs of living makes poor people less able to afford items. Poor people spend a **greater portion of their budgets on food** than richer people. As a result, poor households and those near the poverty threshold can be particularly vulnerable to increases in food prices.
- **Third World debt:** Third World debt plays a large part in **international inequality and poverty**. The World Bank and the IMF, as primary holders of Third World debt, attach **structural adjustment conditionalities** to loans. These conditionalities generally push for economic liberalization, including reducing barriers to trade, elimination of state subsidies, Union busting, privatization of state assets and services etc. As a result of such policies, developing countries need to spend a large proportion of their budgets to repay foreign debt.
- **Barriers to opportunities:** lack of **economic freedom** inhibits entrepreneurship among the poor. New enterprises and foreign investment can be driven away by the results of **inefficient institutions**, notably corruption, weak rule of law and excessive bureaucratic burdens. Lack of financial services, as a result of restrictive regulations, such as the requirements for banking licenses, makes it hard for even smaller micro-savings programs to reach the poor. In India, businesses had to bribe government officials even for routine activities, which were, in effect, a tax on business. **Lack of opportunities** can further be caused by the failure of governments to provide essential infrastructure.
- **Colonial Histories:** One of the most important barriers to development in poor countries is lack of uniform, basic infrastructure, such as roads and means of communication. Some development scholars have identified colonial history as an important contributor to the current situation. In most countries with a history of colonization, the colonizers developed local economies to facilitate the expropriation of resources for their own economic growth and development.
- **Centralization of Power:** In many developing countries, political power is disproportionately centralized. Instead of having a network of political representatives distributed equally throughout society, in centralized systems of governance one major party, politician, or region is responsible for decision-making throughout the country. This often causes development problems. For example, in these situations politicians make decisions about places that they are unfamiliar with, lacking sufficient

knowledge about the context to design effective and appropriate policies and programs.

- **Corruption:** Corruption often accompanies centralization of power, when leaders are not accountable to those they serve. Most directly, corruption inhibits development when leaders help themselves to money that would otherwise be used for development projects. In other cases, leaders reward political support by providing services to their followers.
- **Warfare:** Warfare contributes to more entrenched poverty by diverting scarce resources from fighting poverty to maintaining a military. Take, for example, the cases of Ethiopia and Eritrea. The most recent conflict over borders between the two countries erupted into war when both countries faced severe food shortages due to drought.
- **Environmental degradation:** Awareness and concern about environmental degradation have grown around the world over the last few decades, and are currently shared by people of different nations, cultures, religions, and social classes. However, the negative impacts of environmental degradation are disproportionately felt by the poor. Throughout the developing world, the poor often rely on natural resources to meet their basic needs through agricultural production and gathering resources essential for household maintenance, such as water, firewood, and wild plants for consumption and medicine. Thus, the depletion and contamination of water sources directly threaten the livelihoods of those who depend on them.
- **Social Inequality:** One of the more entrenched sources of poverty throughout the world is social inequality that stems from cultural ideas about the relative worth of different genders, races, ethnic groups, and social classes. Ascribed inequality works by placing individuals in different social categories at birth, often based on religious, ethnic, or 'racial' characteristics. In South African history, apartheid laws defined a binary caste system that assigned different rights (or lack thereof) and social spaces to Whites and Blacks, using skin colour to automatically determine the opportunities available to individuals in each group.

## EFFECTS OF POVERTY

:: The effects of poverty may also be causes, thus creating a "**poverty cycle**" operating across multiple levels, individual, local, national and global.

### Health

- **Hunger, disease, and less education** describe a person in poverty. One third of deaths - some 18 million people a year or 50,000 per day - are due to **poverty-related causes**: in total 270 million people, most of them women and children, have died as a result of poverty since 1990. Those living in poverty suffer disproportionately from hunger or even starvation and disease. Those living in poverty suffer lower life expectancy.
- According to the **World Health Organization**, **hunger and malnutrition** are the single gravest threats to the world's public health and malnutrition is by far the biggest contributor to child mortality, present in half of all cases.
- **Women who have born children into poverty** may not be able to nourish the children efficiently and provide adequate care in infancy. The children may also suffer

from disease that has been passed down to the child through birth. Asthma and rickets are common problems children acquire when born into poverty.

## Education

- There is a high risk of **educational underachievement** for children who are from low-income housing circumstances.
- This often is a process that begins in primary school for some less fortunate children. For children with low resources, the risk factors are similar to excuses such as **juvenile delinquency rates**, higher levels of teenage pregnancy, and the economic dependency upon their low income parent or parents.
- Poverty often **drastically affects children's success in school**. A child's "home activities, preferences, mannerisms" must align with the world and in the cases that they do not these students are at a disadvantage in the school and most importantly the classroom. Children who live at or below the poverty level will have far **less success educationally** than children who live above the poverty line.
- Poor children have a great deal less healthcare and this ultimately results in many absences from the academic year. Additionally, poor children are much more likely to suffer from **hunger, fatigue, irritability, headaches**, ear infections, flu, and colds. These illnesses could potentially restrict a child or student's focus and concentration.

## Housing

- **Slum-dwellers**, who make up a third of the world's urban population, live in poverty no better, if not worse, than rural people, who are the traditional focus of the poverty in the developing world, according to a report by the United Nations.
- Most of the children living in institutions around the world have a surviving parent or close relative, and they most commonly entered orphanages because of poverty.

## Violence

- According to a UN report on modern slavery, the most common form of **human trafficking** is for prostitution, which is largely fuelled by poverty.
- In Zimbabwe, a number of girls are turning to **prostitution** for food to survive because of the increasing poverty.
- Also there are also many effects of poverty closer to home. For example after dropping out of school children may turn to violence as a source of income i.e mugging people, betting during street fights etc.

## ADDRESSING THE UNDERLYING CAUSES OF POVERTY

:: Building a more widespread commitment to overcoming poverty is an essential first step in overcoming poverty, and actions to address this are discussed below.

- **Share the benefits of economic growth** through an emphasis on more widespread employment: The phenomenon of **jobless economic growth** that increases income inequalities and generates too few jobs for low income groups poses a serious threat to the well-being of many nations, both North and South. **Government policies**

should consider not only aggregate economic impact but also the distribution of employment. **Socially responsible venture capital and microcredit initiatives** can foster employment-generating businesses that complement the local culture and environment.

- **Root out corruption**, which harms society as a whole: Corruption, both in government and business, places heavy cost on society. Businesses should enact, publicize and follow codes of conduct banning corruption on the part of their staff and directors. Citizens must **demand greater transparency** on the part of both government and the corporate sector and create reform movements where needed.
- **Broaden access to education and technology** among marginalized groups, and especially among girls and women: The educational attainment of **women** has strong bearing on the wellbeing of their families, and efforts to improve education for women and girls must be strengthened. At the same time, steps should be taken to ensure that the **current revolution in information technology** benefits marginalized groups. This must begin in school.
- Improve **government capacity to provide universal access** to essential goods and services, including potable water, affordable food, primary health care, education, housing and **other social services**: Governments around the world have made commitments to this through the 20/20 Initiative, which calls for 20% of national budgets and 20% of foreign aid to be spent on human services. But raising adequate resources through effective taxation and other mechanisms is often politically difficult. New mechanisms for **public policy dialogue** that enable citizens of all classes to recognize the benefit of universal access to key services must be put in place. Non-profit groups and even corporations can provide essential support here, helping articulate a **vision of a healthy society**. These nongovernmental actors can also help in the actual provision of services.
- **Investments in human capital** in the form of health, is needed for economic growth. Nations do not necessarily need wealth to gain health. Cheap water filters and promoting hand washing are some of the most **cost effective health interventions** and can cut deaths from diarrhoea and pneumonia. Knowledge on the cost effectiveness of healthcare interventions can be elusive but educational measures to disseminate what works are available, such as the disease control priorities project.
- **Human capital**, in the form of education, is an even more important determinant of economic growth than physical capital. **De-worming children** costs about 50 cents per child per year and reduces non-attendance from anaemia, illness and malnutrition and is only a twenty-fifth as expensive to increase school attendance as by constructing schools.
- **Good Infrastructure**, such as roads and information networks, helps market reforms to work. It was the technology of the steam engine that originally began the dramatic decreases in poverty levels. **Cell phone technology** brings the market to poor or rural sections. With necessary information, remote farmers can produce specific crops to sell to the buyers that bring the best price. Such technology also makes **financial services accessible** to the poor. Those in poverty place overwhelming importance on having a safe place to save money, much more so than receiving loans. Also, a large part of microfinance loans are spent on products that would usually be paid by a checking or savings account.

- **Aid in its simplest form is a basic income grant**, a form of social security periodically providing citizens with money. Some aid, such as **Conditional Cash Transfers**, can be rewarded based on desirable actions such as enrolling children in school or receiving vaccinations. Another form of aid is microloans, made famous by the **Grameen Bank**, where small amounts of money are loaned to farmers or villages, mostly women, who can then obtain physical capital to increase their economic rewards. Aid from **non-governmental organizations** may be more effective than governmental aid; this may be because it is better at reaching the poor and better controlled at the grassroots level.
- **Good Institutions:** Efficient institutions that are not corrupt and obey the rule of law make and enforce good laws that provide security to property and businesses. Efficient and fair governments would work to invest in the long-term interests of the nation rather than plunder resources through corruption. Examples of good governance leading to economic development and poverty reduction include Thailand, Taiwan, Malaysia, South Korea, and Vietnam, which tends to have a **strong government**, called a hard state or development state.

# INCLUSION

	<p><b>Overview</b></p> <p>With the little money that you have in your pocket today, you cannot afford the basic education; forget about the <i>vazirams</i> and <i>cracks</i> of the world. When the stomach is empty, everything else goes for a toss. When you can't afford education or even basic health, you actually understand the meaning of 'money can buy everything!' Without basic health and education, you are excluded from the mainstream way of life. Getting daily food becomes the utmost priority every morning. And if you are married &amp; have kids, what will be your life? Big questions! No answers! You will then realize the shallowness of various slogans of political parties, of policies &amp; programmes, of administrative implementation, and of the corrupt system that we have evolved.</p>
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Inclusion is when all **people have the freedom to do** what anyone else can do, access to anyplace that anyone else can go, where full participation is available to everyone and all people embrace differences, and feel accepted, valued and respected for who they are. When considering the concept of inclusion one needs to be aware of the source of exclusion.

Inclusion is recognizing our **universal "oneness"** and **interdependence**. Inclusion is recognizing that we are "one" even though we are not the "same". We were all born "in". The act of inclusion means fighting against exclusion and all of the social diseases exclusion gives birth to - i.e. racism, poverty, hunger, etc. The **difference between inclusion and exclusion** lies not with the individual, but within the society where the person lives. With this knowledge, the causes and strategies used to achieve inclusion the onus must fall upon societies. The causes and challenges of **exclusion result from social barriers** that exist within society as such; society is where the problems must be addressed.

## WHY BE CONCERNED WITH INCLUSION?

- First, there are serious negative effects for people who experience exclusion. Exclusion **creates division within a community** and separation of people causes vulnerability among the excluded groups, whether it is because of disability, race or class. This vulnerability puts people at risk of negative experiences in their lives.
- Lack of inclusion also leads to and exacerbates **social disparity**, which, furthers the devaluation of these groups and reduces their quality of life. A lack of inclusion within a community creates an **atmosphere of inequality**, which prevents people from having equal access to all things that should be available to them in their society.
- This prevents those who are excluded from getting what they need to live effectively. The areas often affected include access to employment and as a result, **reduced financial status** which creates the risk of people not being capable of acquiring their basic needs.

- Those who are excluded are at increased risk of participation in many types of **unhealthy behaviours** and **reduced overall health**. Beyond the implications of exclusion on the individual and groups in society, there are also effects, which touch society as a whole in a negative way.
- A reduced level of inclusion leads to the **marginalization and segregation of groups**, which emphasize differences, and creates separation within a community. A community divided in this way, is a weaker society in its humanity.
- Separation also leads to **power differentials**, which create divisions, segregation and **inequality** within a community. These concerns develop into power imbalances and oppression of groups in communities.

### **WHAT ARE THE CONTRIBUTING FACTORS TO EXCLUSION?**

- There are a number of issues which contribute to exclusion. The biggest contributing factor is **attitudinal barriers** held about a group of people because of difference such as disability, race, or gender.
- This type of barrier has been identified as leading to lack of acceptance perpetuation of negative stereotypes and adherence to **certain norms, habits and societal rules**. These rules are designed by and for the dominant group in society and the belief that if people do not fit they should not be included. Finally, attitudinal barriers are the root cause of a number of other factors which contribute to exclusion such as access barriers, power imbalance, superficial service inclusion and policy barriers.
- One of the barriers that are caused by the presence of attitudinal barriers is **lack of accommodation of differences**.
- This includes physical barriers that prevent access. **Lack of accommodation** and accessibility contribute directly to the exclusion of people. Not only are these physical barriers an issue as they exist, but they also affect efforts to remove them and stifle willingness to prevent future barriers from being created.
- Voluntary measures are limitedly successful. Project and policy directives need to be put in place to assist with the elimination of barriers, so an environment of inclusion can occur.
- **Power imbalances** also result from attitudinal barriers and contribute to exclusion. People within the dominant group make decisions, as they possess the power to do so, for those outside the dominant group there is often a lack of support needed and feelings of inequality develop.
- When power is held by one dominant group those outside are more likely to be excluded and their needs are left unheard and unmet. Attitudinal barriers about the excluded contribute to superficially inclusive services and systems.
- These types of systems may have the best intentions but a **lack of belief in and respect for people** leads to the excluded being silent recipients of services. This superficial type effort often leads to generic approaches which are ineffective for everyone.
- This also applies to segregated programs which do not provide an opportunity to promote inclusion and perpetuates the separation of people and the belief that they are different and should not be part of the mainstream of society.
- Service language of benevolence and gifting sends very strong messages to the people served and to the community. This perspective can lead to perpetuation of attitudinal barriers, **negative self-images**, and negatively impacts on the service and community environment.

- The final area where attitudinal barriers affect **exclusion of people is around policy barriers**. Commonly held negative attitudes influence the political agendas that support negative policy development for excluded groups. Outcome of this type of policy development is patchwork ineffective programs that do not address the needs of the people they were created to support.
- It is these barriers which prevent adequate funds and resources from being directed to the efforts of inclusion in service and accessibility supports. Negative attitudes and beliefs have a major effect on the production of **legislative disincentives** in their programs, which put up another barrier for the excluded to overcome.

## **INCLUSION IN "INDIAN CONTEXT"**

In Indian context it implies, an **equitable allocation of resources** with benefits accruing to every section of society- A growth process which yields **broad-based benefits** and ensures **equality of opportunity** for all. It is concerned with the **Pro-poor growth**, growth with equity. It is aimed at **poverty reduction, human development, health** and provide **opportunity to work** and be creative. In order to achieve inclusion, the allocation of resources must be focused on the indented short and long terms benefits and economic linkages at large and not just equitable mathematically on some regional and population criteria.

## **THE INCLUSION INVOLVES FOUR ATTRIBUTES**

- **The Opportunity** attribute focuses on generating more and more opportunities to the people and focuses on increasing their income.
- **The Capability** attribute concentrates on providing the means for people to create or enhance their capabilities in order to exploit available opportunities.
- **The Access** attributes focuses on providing the means to bring opportunities and capabilities together.
- **The Security** attribute provides the means for people to protect themselves against a temporary or permanent loss of livelihood.

All together it is a process in which economic growth measured by a sustained expansion in GDP contributes to an enlargement of the scale and scope of all four dimensions.

## **NEED FOR INCLUSION IN INDIA**

- India is the 7th largest country by area and 2nd by population. The **Economy of India** is the seventh-largest in the world by nominal GDP and the third-largest by purchasing power parity (PPP). Yet, India is **far away from the development** of the neighbourhood nation, i.e., China.
- The exclusion in terms of **low agriculture growth**, low quality employment growth, low human development, rural-urban divides, gender and social inequalities, and regional disparities etc. are the problems for the nation.
- Studies estimated that the cost of **corruption in India** amounts to over 10% GDP. Corruption is one of the ills that prevent inclusive growth.
- Although **Child labour** has been banned by the law in India and there are stringent provisions to deter this inhuman practice. Still, many children in India are unaware of education as they lives are spoiled to labour work.

- **Literacy levels** have to rise to provide the skilled workforce required for higher growth.
- **Economic reforms** in the country are overwhelmed by **out dated philosophies** and allegations by the politicians and opposition parties in India.
- Even at **international level** also, there is a **concern about inequalities** and exclusion and now they are also taking about inclusive approach for development.

## **ELEMENTS OF INCLUSION-ORIENTED GROWTH**

The key components of the inclusion oriented growth strategy included a sharp **increase in investment in rural areas**, rural infrastructure and agriculture spurt in credit for farmers, increase in rural employment through a unique social safety net and a sharp increase in public spending on education and health care. The five interrelated elements of inclusion oriented growth are:

1. **Poverty Reduction** and increase in quantity and quality of employment.
2. **Agriculture Development**
3. **Social Sector Development**
4. **Reduction in regional disparities**
5. **Protecting the environment.**

## **PROBLEMS BEFORE INCLUSION ORIENTED GROWTH STRATEGIES IN INDIA**

For a developing country like India, the need of inclusion-oriented growth is vital to achieve the overall progress of the country. Though it is positive for macro-economic stability, 200809 resulted a relative growth slowdown, mostly from the spill over effects of the weakening of the global economic momentum and volatile financial markets. The following problems are the **major concerns for developing countries** like India to achieve the inclusive growth. They are:

- Poverty
- Employment
- Agriculture
- Problems in Social Development
- Regional Disparities
- Poverty
- Percent of population living under the poverty line, which is 356.35 rupees or around \$7 a month in rural areas.

A proportionally large share of poor is lower castes. Many see the **caste system** as a system of exploitation of poor low-ranking groups by more prosperous high-ranking groups. In many parts of India, land is largely held by high-ranking property owners of the dominant castes that economically **exploit low-ranking landless labourers** and poor artisans, all the while degrading them with ritual emphases on their so-called God-given inferior status.

## **EMPLOYMENT**

- Employment considered as one of the **big problems** for inclusion-oriented growth in India. Raising population at a great speed after independence showed its impact on employment. The **unemployment became the big worry** to the development of the country.

- Since poverty is much higher than unemployment, employment is the **only source to eradicate poverty**. The quality and quantity of employment in India is very low due to illiteracy and due to over dependency on agricultural employment. The quality of employment is also a problem.
- **Unorganized employed** people in India are **around 85%**. Workers in this sector do not have social security. The generation of productive employment for labour force in the economy, as employment is a key to inclusion-oriented growth is the toughest task for the country.
- The country is also facing in employment generation in all sectors, regions and for all socio economic groups particularly for poorer sections of population, backward regions, lagging sectors and SC/ST/OBC/women etc.

## **AGRICULTURE**

- Traditionally, India is considered as the agricultural based country. As the majority of Indians are engaged in agriculture for employment, the recent developments in the other sectors decreased this major sector's growth. Some of the **problems in Indian agriculture are:**
  - ✓ Long term factors like steeper decline in per capita land availability, shrinking of farm size.
  - ✓ Slow reduction in share of employment.
  - ✓ Low labour productivity in agriculture and the gap between agriculture and non-agriculture sector is widening.
  - ✓ Decline in yield growth due to land and water problems, vulnerability to world commodity prices, farmer's suicides.
  - ✓ Disparities in growth across regions & crops, i.e., growth rate declined more in rainfed areas.
- Thus these **problems became the hurdles** in the key area for the economic development of the nation, i.e., agriculture.

## **PROBLEMS IN SOCIAL DEVELOPMENT**

Social development is also one of the key concerns in inclusion oriented growth. The social development became the hot criteria in the recent past in India. Social development is also **facing some problems** making the path critical to inclusion-oriented growth in the country. Some of the problems in social sector are:

- ✓ Significant regional, social and gender disparities.
- ✓ Low level and slow growth in public expenditures particularly on health.
- ✓ Poor quality delivery systems.
- ✓ Achievement of 127th rank among 170 countries on Human Development index.
- ✓ Social indicators are much lower for scheduled castes and scheduled tribes.
- ✓ Malnutrition among children is one major problem.
- ✓ Since BPO brought the multi culture environment in India, this sector is facing under saviour pressure due to global recession.

## **REGIONAL DISPARITIES**

Regional disparities are also a major concern for India due to **different culture and Traditions**. Traditional cultures, caste system and the rich & poor feelings favoured some specific groups as a result, the regional disparities raised in India before and after independence. And also, due to the development in agriculture and industrial

sector some regions in India developed fast and some other places still are facing the scarcity. The **National Income** (measured as Net National Income at market prices) and **Per Capita National Income** (measured as Per Capita Net National Income at market prices) of the country has been increasing during the last three years. The State/UT-wise estimates of Per Capita Income (measured as Per Capita Net State Domestic Product) at current prices are given as below:-

State/UT	Per Capita Income						
	2012-13	2013-14	2014-15		2012-13	2013-14	2014-15
Andhra Pradesh	72301	81397	90517	Mizoram	63413	76120	NA
Arunachal Pradesh	76370	85468	96199	Nagaland	70274	77529	85544
Assam	38945	44263	49480	Odisha	49227	52559	59229
Bihar	26948	31199	36143	Punjab	84526	92638	NA
Chhattisgarh	53815	58547	64442	Rajasthan	60844	65974	NA
Goa	200514	224138	NA	Sikkim	151395	176491	NA
Gujarat	93046	106831	NA	Tamil Nadu	98628	112664	128366
Haryana	119833	133427	NA	Telangana	85169	95361	NA
Himachal Pradesh	83899	92300	NA	Tripura	57402	69705	NA
J&K	52250	58593	NA	UP	33482	36250	40373
Jharkhand	40238	46131	NA	Uttarakhand	92566	103716	115632
Karnataka	76578	84709	NA	West Bengal	60318	70059	78903
Kerala	91567	103820	NA	Andaman & Nicobar	97687	107418	NA
Madhya Pradesh	43426	51798	59770	Chandigarh	141926	156951	NA
Maharashtra	103991	114392	NA	Delhi	192587	219979	NA
Manipur	37656	41573	NA	Puducherry	114256	143677	175006
Meghalaya	54156	61548	69516				

## CHALLENGES BEFORE INCLUSION-ORIENTED GROWTH STRATEGIES IN INDIA

The key components of the inclusion-oriented growth strategy included a **sharp increase in investment in rural areas**, rural infrastructure and agriculture spurt in credit for farmers; increase in rural employment through a unique **social safety net** and sharp **increase in public spending on education and health** care. The government also should go for a variety of legislative interventions to empower the disadvantaged. Some of the challenges and opportunities before inclusion-oriented growth strategies in India are:

1. **Poverty alleviation** is one of the big challenges for India. Eradication of poverty in India is generally only considered to be a long-term goal. Poverty alleviation is expected to make better progress in the next 50 years than in the past, as a trickle-down effect of the growing middle class. **Increasing stress on education, reservation of seats** in government jobs and the increasing empowerment of women and the economically weaker sections of society, are also expected to contribute to the alleviation of poverty.
2. **For agricultural growth**, the private players can participate in to bridge the gap including providing micro finance. **Contract farming**, setting up **storage facilities** for agro-produce, and producing them from farmers. The private sector could also develop heritage sites and tourist spots and encourage the **promotion of traditional arts** and crafts in **joint ventures with rural enterprises**. The government of India

should also increase its present moratorium on interest payments, lowering of farm credit rates for increase in agricultural growth.

3. **Government schemes** should target eradication of both poverty and unemployment (which in recent decades has sent millions of poor and unskilled people into urban areas in search of livelihoods) attempt to solve the problem, by providing **financial assistance** for setting up businesses, skill honing, setting up public sector enterprises, reservations in governments, etc. The decreased role of the public sector after liberalization has further underlined the need for focusing on **better education** and has also put political pressure on further reforms.
4. **Child labour** is a complex problem that is basically rooted in poverty. The Indian government is implementing the **world's largest child labour elimination program**, with primary education targeted for around 250 million. Numerous non-governmental and voluntary organizations are also involved.
5. Special investigation cells have been set up in states to enforce existing laws **banning employment of children** (under 14) in hazardous industries. Failure to implement the law and poor rehabilitation policies need urgent attention which is a big challenge for India to achieve inclusive growth. Social development is possible through achieving **Women Empowerment** and eradicating the regional disparities.
6. Though the Government is giving the women empowerment by giving special reservations, the women's advancement in India is still not matched the expectations for inclusive growth. Presently, the **women** are dealing with the **top posts** in India like President, Lok Sabha Speaker and Railway Minister.
7. To bring in inclusive growth, it is necessary to enhance the capabilities of women by providing education, so that they get the opportunity of getting employed and be self-sustainable. Government of India has stepped up for inclusion-oriented growth by launching **many initiatives** with features that are innovative, flexible and reform oriented such as:
  - ✓ Rural Infrastructure(Bharat Nirman)
  - ✓ Employment(National Rural Employment Guarantee Scheme)
  - ✓ Regional Development (backward District Development Program)
  - ✓ Education (Sarva Shiksha Abhiyan)
  - ✓ Rural Health (National Rural Health Mission)
  - ✓ Urban Infrastructure (National Urban Renewal Mission)

#### **CREDIT GUARANTEE FUND FOR MUDRA LOANS – A BOOST TO REFINANCE OPERATIONS**

- Government has created the **Credit Guarantee Fund for Micro Units Development Refinance Agency (MUDRA)** loans and to convert MUDRA Ltd. into MUDRA Small Industries Development Bank of India (**SIDBI**) Bank as a wholly owned subsidiary of SIDBI.
- The objective is to **reduce the credit risk** to Banks / NBFCs / MFIs / other financial intermediaries, who are Member Lending Institutions (MLIs).
- The National Credit Guarantee **Trustee Company** Ltd. (NCGTC Ltd.), a wholly-owned company of Government of India, constituted under the Companies Act, 1956 (2013) to manage and operate various credit guarantee funds, shall be the Trustee of the Fund.

- The Fund is expected to guarantee more than Rs 1,00,000 crore worth of loans to micro and small units in the first instance.
- The guarantee would be provided on portfolio basis to a maximum extent of **50% of Amount in Default** in the portfolio.
- The MUDRA (SIDBI) Bank will undertake **refinance operations** and provide support services with focus on portal management; data analysis etc. apart from any other activity entrusted/ advised by Government of India.

## **WIDENING THE NET BEYOND THE INCOME NORM**

In an effort to reduce unnecessary subsidy burden on the exchequer, the Union Government has undertaken a series of LPG Subsidy reforms over the last one year.

### **PAHAL:**

- The centre launched the **modified Direct Benefit Transfer for LPG** (DBTL) scheme (also known as PAHAL) in 2015, which allowed domestic LPG cylinders to be sold at market price. The scheme aims to reduce diversion and eliminate duplicate or **bogus LPG connections**.
- The scheme was launched with the objective to prevent diversion of subsidized LPG, by transferring the **subsidy amount directly in the bank accounts** of the consumers.
- It is also important to note here that, with more than 14.74 crore LPG consumers enrolled under the scheme, this scheme has been **recognized by Guinness Book of World Records as the largest cash transfer programme in the world**.
- The scheme has significantly reduced subsidy leakage towards non-domestic uses.

### **'Give It Up' scheme:**

- Following the launch of DBTL, the government launched the 'Give It Up' scheme in March 2015. The scheme was aimed at **urging well-to-do households**, who can easily afford LPG at market price, to give up LPG subsidy, in order to extend the subsidy benefits to poorer households, without increasing the fiscal burden.
- As a result of an intensive awareness campaign, nearly **57 lakh beneficiaries** have voluntarily given up their LPG subsidy. This translates to an annual subsidy saving of Rs. **940 crore** for the government, at prevailing prices and consumption trends.
- Even though this is a significant achievement, it represents a mere 3.6% of the active consumer base.

### **Exclusion of high-income households:**

- The Ministry of Petroleum and Natural Gas announced the exclusion of high-income households from the LPG subsidy cover. As per this decision, henceforth, subsidy would not be available for domestic LPG consumers, if the **consumer or his/ her spouse had taxable income of more than Rs. 10 lakh for the previous financial year**.
- According to a study conducted by the Council on Energy, Environment and Water (**CEEW**) in 2014, the richest 15% of Indian households can easily be weaned off the subsidy, as the full market price (then Rs. 950 per cylinder) is well within their affordability limits. At present, these households account for **25% of the active consumer base**.
- The study also highlights that the richest 10% households in India corner 22% of LPG subsidy, while the bottom 50% households together receive only 30% of LPG subsidy.

Thus, the government's move to target beneficiaries by excluding well-to-do households from the subsidy net is well-founded and timely.

- It is equally important to note here that **less than 3% of India's population** pays income tax and a significant proportion **under-reports taxable income**. Thus, exclusion based on reported income alone would not be as expansive a criterion as is needed indirectly benefiting the tax evaders.