DEFENCE

Defence

- The Supreme command of the Armed forces vests in the President of India. The responsibility for national defence, however, rests with the Cabinet. The Defence Minister (Raksha Mantri) is responsible to Parliament. for all matters concerning defence of the country. Administrative and operational control of the armed forces is exercised by the Ministry of Defence and the three Service Headquarters.

Organisation

- Tie principal task of the Ministry is to frame policy directions on Defence and security related matters and communicate them for implementation to the Services Headquarters, Inter- Service Organisations, Production Establishments and Research & Development Organisations.
- The principal functions of the Departments are as follows:

ARMY		
The Army is organized into the following seven command:		
S.No.	Command	Headquarters
1	Western Command	Chandirnandji
2.	Eastern Command	Kolkata
3.	Northern Command	Udhampur
4.	Southern Command	Pune
5.	Central Command	Lucknow
6.	Training Command	Mhow
7.	South-Western Command	Jaipur (newly established in 2005)

- After Independence, Ministry of Defence was created under the charge of a Cabinet Minister and each service was placed under its own Commander-in -chief, (tn 1955, the Commanders- in-chief were renamed as the Chief of the Army Staff, the Chief of the Nval Staff and Chief of the Air Staff, in November, 1962 a Department of Defence Supplies was created for planning and execution of schemes for import substitution of defence requirements! In 2004, the name of the Department of Defence Production and Supplies was changed to Department of Defence Production. In 1980, the Department of Ex-Servicemen Welfare was-created

  (i) The Department of Defence deals with the Integrated Defence Staff (IDS) and three Services and various Inter-Service Organisations. It is also responsible for the Defence Budget, establishment matters, Defence policy, matters relating to Parliament.

  (ii) The Department of Defence Production deals with matters pertaining to defence production, indigenisation of imported stores, equipment and spares, planning and control of departmental production units of the Ordnance Factory Board.

  (iii)The Department of Defence Research and Development is headed by a Secretary, who is - the Scientific Adviser to the Raksha Mantri. Its function is on advise the Government on scientific aspects of military equipment and logistics and the formulation of research, design and development plans for equipment required by the Services.

  (iv) The Department of Ex-Servicemen Welfare, deals with all resettlement, welfare and pensionary matters of Ex-Servicemen.

- Integrated Defence Staff (IDS) was created on October 1,2001. Since then, HQ IDS has been- acting as the single point organisation f6rincülcatingjdmtness and synergy between the Armed Forces, by way of integrating policy, doctrine, war fighting and procurement.

- The three Services Headquarters, viz., the Army Headquarters, the Naval Headquarters and the Air Headquarters function under the Chief of the Army Staff (COAS), the Chief of the Naval Staff (CNS) and the Chief of the Air Staff (CAS) respectively. The Inter-Service Organisations, under the Department of Defence are responsible for carrying out tasks related to common needs of the three Services such as medical care, public relations and personnel management of civilian staff in the Defence Headquarters.

ARMY TRAINING INSTITUTIONS		
S.No.	Name	Located at
1.	NationaL Defence Academy	Khadkvasla
2.	Indian Minitary Academy	Dehradun
3.	Rashtriya Indian Military College	Dehradun
4.	National Defence College	New Delhi
5.	Defence Services Staff College	Willington
6.	Armed Forces Medical College	Pune
7.	Officer's Training School	Chennai
8.	College of Combat	Mhow
9.	Armoured Corps Centre and School	Ahmednagar
10.	Infantry Schools	Mhow & Belgaum
11.	School of Artillery	Deolali
12.	College of Military Engineering	Kirke
13.	College of Defence Management	Secunderabad
14.	Army Cadet College	Dehradun
15.	Army Ordinance Corps School	Jabalpur
16.	High Altitude Warefare School	Gulmarg
17.	Remound and Veterinary Corps Centre School	Meerut
18.	Army Education Corps Training College and Centre	Pachmarhi
19.	Army School of Physical Training	Pune
20.	Military Intelligence Training School and Depot	Pune
21.	Corps of Military Police Centre and School	Bengaluru
22.	Counter Insurgency and Jungle Warfare School	Vairengte
23.	Institute of National Integration	Pune

Army

- It is organized into operational commands, each under a General Officer of the rank of Lieutenant General.
- The field formations in army are Corps, Division, and Brigade commanded by a General Commanding Officer and his rank is as follows:
  1. Corps - Lieutenant General.
  2. Division - Major General
  3. Brigade - Brigadier

  Towards the modernization of the Mechanised Infantry, contracts for procurement of Environmental Control System and Instant Fire Detection and Suppression System tbr BMP-2/2K, Battle Field Surveillance Radar (Medium Range on TATRA8x8 and Thermal Imaging Sight to replace Mia Infra Red have been included during the year. A proposal for procurement of Brahmos Supersonic Cruise Missle System for two regiments of the Indian Army has been approved. The contract has been concluded in March 2010.

Territorial Army

- The Tejtprja1 Army was established in 1948.
- The Territorial Army is a voluntary, part-time citizen's Army.
- In recent times, a maximum of 22 units were embodied in Operational Rakshak, Operation Vijay and Operation Parakram.

Navy

- Around 97 per cent of India's trade amounting to 273 million tonnes and valued at $83 billion annually comes from the seas.

- The entire import of more than 50 million tonnes of oil and gas comes by the sea. The air squadrons INAS311 and IN AS 350 were commissioned on 24th March, 2009. Indian Naval Air Station Parundu was commissioned on26th March, 2009 a Uchipull in Ramnad District Tamil Nadu. INS Airavat, The fifth LST (L) Class Ship was Commissioned on 19th May, 2009 at Visakhapatnam.'INS Chetlat and Car Nicobar were commissioned on 16th February, 2009. ENS Cheriyarn and Cora Divh were Commissioned on 10th September, 2009. INS Shivalik was commissioned on 29th April, 2010

NAVY		
The Navy is organized into the following three command		
S.No.	Command	Headquarters
1.	Western Naval Command	Mumbai
2.	Eastern Naval Command	Vishakhapatnam
3.	Southern Naval Command	Cochin

- INS Shardul, landing ship tank (large), was commissioned at Naval base, Karwar on January 4, 2007. INS Jalashwa acquired from US was commissioned at Norfolk (USA) on June. 22, 20O7. The ship is the first Landing, Platform Dock (LDP) in the Indian Navy.
- The Indian Navy (IN), by virtue of its capability, strategic positioning and robust presence in the Indian Ocean Region (IOR), has been a catalyst for peace, tranquility and stability in the IOR.
- The firing of Beyond Visual Range (BVR) Derby Missile has been conducted successfully. Six UH3H Utility helicopters have been inducted in the service.

Navy Training Institutions		
S.No.	Name	Located at
1.	Naval Academy	Goa
2.	INS Chilka	Orissa
3.	INS Shivaji	Lonavala
4.	INS Asvini (INM) Mumbai	
5.	College of Naval Welfare	Mumbai
6.	INS Garuda	Cochin
7.	INS Hansa	Goa
8.	INS Dronacharya	Cochin
9.	INS Zamorin	Ezhimala (Kerala)

- In continuation with the policy of enhancing co-operation with foreign navies, a series of exercises were conducted. This included Indra 01/09, Konkan O9, Malabar 10, Varuna 10 and SIMBEK 10.
- Intensive Flying Training Unit (IFTU) for UH3H helicopters has been set up. The unit was commissioned as Indian Naval Air Squadron (INAS) 350 on March 23, 2009.
- Indigenously built INS Kesari was commissioned into the Indian Navy in April 2008. Two Water Jet-Fast Attack Crafts Chetlat and Car Nicobar were commissioned into the Indian Navy in February 2009.

Coastguard

- The Coast Guard was established as an independent service on August 19, I978as per the Coast Guard Act, 1978. Since its inception, the Coast Guard has acquired-a wide range of platforms both surface and airborne to undertake the assigned tasks during peace time and to supplement the efforts of Indian Navy during war.
- The command and control of the Coast Guard - rests with the Director General of Indian Coast Guard at New Delhi. The Organisation has four Regional Headquarters i.e. Mumbai, Chennai, Gandhinagar and Port Blair.

The Coast Guard is mandated to keep India's EEZ measuring over 2.02 million Sq Km.

(a) Safety and protection of artificial islands and offshore terminals, installations and devices in Maritime Zones.

(b) Protection and "assistance to fishermen at sea while in distress.

(c) Preservation and protection of marine environment.

(d) Prevention and control of marine pollution.

(e) Other matters, including measures for the safety of life and property at sea and collection of scientific data.

In addition to the mandate laid down under section 14 of Coast Guard Act, 1975, the Indian Coast Guard has also been entrusted the following lead roles:-

(a) Offshore Security Co-ordination Committee.

(b) National Maritime Search and Rescue Co-ordinating Authority.

(c) Lead Intelligence Agency for Coastal and Sea Border.

(d) Coastal Security in territorial waters.

- 11 Coast Guard District Headquarters located along the coastal States of India

Air Force

- It was formed on October 8, 1932.
- The Chief of Air Staff at Air Headquarters in New Delhi is assisted by the Vice-Chief of Air Staff. The Vice Chief of Air Staff is responsible for operations whereas the Deputy Chief of Air Staff is responsible for acquisition and planning. The Inspector General looks after the operational readiness, flight safety and inspection.
- The IAF has inducted state-of-the-art Su-3OMKI aircraft in operational squadrons. Twenty Hawk AJT aircraft have also been inducted' procurement contract of C-130-30 aircraft for special operations from US Government has been signed.

AIR FORCE		
The Air Force is organized into the following five (operation and two (functional) command;		
S.No.	Command	Headquarters
1.	Western Air Command	Delhi
2.	South-Western Air Command	Gandhi Nagar
3.	Central Air Command	Allahabad
4.	Eastern Air Command	Shillong
5.	Southern Air Command	Thiruvanan-thapuram
II. Functional Commands		
1.	Training Command	Bengaluru
2.	Maintenance Command	Nagpur

AIR FORCE TRAINING INSTITUTIONS		
S.No.	Name	Located at
1.	Air Force Administrative College	Coimbatore
2.	Air Force Academy	Hyderabad
3.	Air Force Technical College	Jalahalli
4.	Air Force School	Sambra (Belgaum)
5.	Flying Instructors' School	Tambaram
6.	Ground Training School	Avadi
7.	Navigation and Signals School	Hyderabad
8.	College of Air Welfare	Secunderbad

- A contract has been signed with M/s Rosonboron Export Russia for delivery of Mi-17V5 helicopters.
- Airborne Warning and Control System (AWACS) are being procured to significantly enhance the effectiveness of both Offensive and Defensive operations of the IAF.
- Contract for MiG-29 mid life upgrade and extension of total technical life was signed with RAC MIG, Russia. IAF is also processing upgradation of the Mirage-2000 and Jaguar aircrafts and Mi- 17 helicopters in order to optimise their utilization. To keep the DO-228 aircraft abreast with the latest technology, all the existing aircrafts are being upgraded with the latest avionics.
- The upgrade of DARIN-I Jaguar aircraft to DARIN-III standard has been approved and is planned to be completed by 2017-2018.

Commissioned Ranks

- The following are the commissioned ranks in the three Services; each rank is shown opposite its equivalent in the other Service:

Army	Navy	Air Force
General	Admiral	Air Chief Marshal
Lieutenant General	Vice-Admiral	Air Marshal
Major General	Rear Admiral	Air Vice-Marshal

Army	Navy	Air Force
Brigadier	Commodore	Air Commodore
Colonel	Captain	Group Captain
Lieutenant Colonel	Commander	Wing Commander
Major	Lieutenant Commander	Squadron Leader
Captain	Lieutenant	Flight Lieutenant
Lieutenant	Sub-Lieutenant	Flying Officer

Recruitment

- Recruitment of Commissioned Officers in Armed Forces through UPSC: Commissioned Officers in the Armed Forces are recruited mainly through the UPSC which conducts the following two All India Competitive Examinations: -(a) National Defence Academy (NDA) and Naval Academy (NA) and (b) Combined Defence Service Examination (CDSE).

National Cadet Corps

- The National Cadet Corps (NCC) was established under the (NNC) Act, 1948. It has completed 61 years of existence. The NCC strives to provide the youth of the country opportunities for all round development with a sense of commitment, dedication, self-discipline me and moral values, so that they become useful citizens of tomorrow.
- Director General, NCC located at New Delhi controls and overseas various activities of the NCC through 16 NCC Directorates spread across the country

Training for Defence Services

- Sainik Schools : Sainik Schools were established as a joint venture of the Central and State Governments. These are under the overall governance of Sainik Schools Society.
- Rashtriya Military Schools: The Five Rashtriya Military Schools (earlier known as Military Schools) affiliated to CBSE are functioning at Ajmer, Bangalore, Belgaum, Dholpur and Chail.

Defence Production Units		
S.No.	Name & Established in	Factories at
1.	Hindustan Aeronautics Ltd. (HAL) 1964	Bengaluru (Five factories), oraput, Nasilc, Karwa, Kanpur, Lucknow, arrackpore, Hyderabad.
2.	Bharat Electronics Ltd. (BEL) 1952, Navratna Status in 2007	Bengaluru, haziabad, Pune, Machilipatnarn, Taloja Maharashtra, Panchkula (Haryana), Kotdwara (U.P.), Hyderabad, Chennai
3.	Bharat Earth Movers Ltd. (BEML) 1965	Bengaluru, Mysore, Kolar
4.	Bharat Dynamics Ltd. (BDL) 1970	Hyderabad
5.	Mazagaon Docks Ltd. (MDL) 1960	Mumbai
6.	Garden Reach Shipbuilders and Engineers Ltd. (GRSE) 1934 (Govt. acquired in 1960)	Kolkata
7.	Goa Shipyards Ltd. (GSL) 1967	Goa
8.	Mishra Dhatu Nigam Ltd. (MIDHANI) 1973	Hyderabad
9.	Heavy Vehicles Factory	Avadi

SUBMARINES	
1.	INS Chakra : India's first nuclear powered sub-marine. It was on lease from the former USSR and now it has been returned.
2.	INS Shalki : First indigenously built submarine; commissioned in 1992.
3.	INS Shakkul : Second indigeneously constructed submarine; commission in 1994.
4.	INS Sindushastra : It is India's first missile-firing submarine and was commissioned at St. Petersburg in July 2000. It is 70 metres in length and belongs to the Russian Kilo-class. The Sindushastra is the first submarine to be armed with the anti-ship Klub missile.

- National Defence Academy (NDA): The National Defence Academy (INDIA) is the country 's premier inter-service training institution. The three years course at the NDA is covered in six semesters.
- Rashtriya Indian Military College (RIMC) : The Rashtriya Indian Military College (RIMC) was founded on March 3, 1922, with the objective of providing the necessary preliminary training for boys of Indian birth or domicile, wishing to become officers in the Armed Forces of India.
- Indian Military Academy (IMA) : Founded in 1932, Indian Military Academy, Dehradun aims at the fullest development of intellectual, moral and physical qualities of persons joining the Army as officers.
- Officer Training Academy (OTA): The Academy trains cadets for Short Service Commission. With the entry of women officers in the Army since September 21, 1992.
- College of Military Engineering (CME) : The College of Military Engineering at Pune is a premier technical for personnel of the Corps of Engineers, other Arms and Services, Navy, Air Force, Para Military Forces, Police and Civilians.
- National Defence College : The National Defence College (NDC) has established a name for itself as a centre of excellence on mattes pertaining to national security and strategic studies.
- College of Defence Management : The College of Defence Management (CDM) is a Tri-Service category "A" training establishment in existence for over three decades now. It is entrusted with the responsibility of instilling contemporary management thoughts, concepts and practices in the senior leadership of the Armed Forces.
- Defence Services Staff College (DSSC) : The Defence Services Staff College (DSSC) is one of the oldest military institutions in India.

WARSHIPS	
1.	INS Savitri : First warship fabricated at the Hindustan Shipyard Limited; joined the Navy in 1990.
2.	INS Ghariyal : It is indigeneously built warship. It was commissioned into the Navy in 1997 at the Garden Reach Ship Builders and Engineers Ltd. Kolkata.
3.	INS Mysore : It is the second of the most powerful class of warships built indigenously by Mazagaon Docks Limited. It was commissioned in 1999.
4.	INS Brahmaputra : It has 16 Russian made Uran surface-to-surface missiles and its helicopters carry two long-range Sea Eagle air-to-surface missiles. It was commissioned in 2000.
5.	INS Tillanchang : It ws commissioned in March 2001 at Vishakhapatnam. This is the second indigenous warship in the Trinkat class fast attack craft series.
6.	INS Talwar : It was built by Russia for the Indian Navy. It was commissioned in St. Petersburg in 2003. It boasts of weapons and sensors with a far greater range than what the Indian Navy has at present. Its main attack weapon is the vertical-launch club-N missile system.
7.	INS Satpura : It is the second indigenously built stealth warship; second of the P-17 frigate series. It was launched at the Mazagon Docks (Mumbai) in June 2004. It has advanced surface-to-air missiles and hi-tech radar and communication equipment on board.

MISSILE BOATS	
1.	INS Vibhuti : First indigeneously built missile boat, launched at the Mazagaon Docks, Mumbai in 1991.
2.	INS Nashak : Country's third missile boat. Built at the Mazagaon Docks; it was launched in 1993.
3.	INS Prahar : It is the indigenously built fastest missile boat in the world. It was inducted into Navy in 1997. It packs a powerful punch in the form of Ship-to-Surface KT 138 Missile.
4.	INS Prabhat : It is built by Mazagaon Dock Limited to belongs to Nashak class of boats. Its weapon package includes surface-to-surface missiles with associated surveillance system.

Defence Production

- The Department of Defence Production deals with the indigenization, development and production of

defence equipment both in the public and private sectors.

Ordnance Factories

- The Ordnance Factories Organisation is the largest and oldest departmentally run production organisation in the country. It is primarily engaged in the manufacture of Defence hardware for the Armed forces.
- There are 39 ordnance factories that- manufacture a wide variety of arms, ammunition, battle tanks, armoured vehicles, heavy duty vehicles, military electronic products and other defence equipment for the armed forces two new 1actories, one for artillery communication and other for carbines are under construction. Ordnance factories are managed by the Ordnance Factory Board which has its headquarters in Kolkata
- The first ordinance factory was established in 1801 at Cossipore near Kolkata.

Defence Undertakings

- Hindustan Aeronautics Limited (HAL)'s core business activities comprise of design, development and production of fixed wing aircraft (Fighters, Trainers and Transport) and Helicopters, their avionics and accessories and life cycle customer support through Maintenance, Repair and Overhaul (MRO) of aerospace and products.
- Bharat Electronics Limited (BEL) has been accorded "NAVRATNA' status company in 2007. BEL was established at Begalore by the Government in the year 1954 to meet the needs of the Indian Defence Services. The Company has developed core competencies in areas of (i) Radars, (ii) Sonars (iii) Communication (iv) Electronic Warfare System (v) Electro Optics, and (vi) Tank Electronics. About 85 per cent of the turnover of the company comes from these business segments.

~~Products and Systems Developed by DRDO~~

- LCA-Tejas: LCA Tejas is India's first indigenously designed, developed and produced Light Combat Aircrafts.
- Lakshya: Lakshya is Pilotless Target Aircraft.
- Nishant: Nishant is unmanned aerial vehicle.
- Kaveri: Gas Turbine Engine.
- Pinaka: Multi Barrel Rocket System.
- Arjun: Main Battle Tank
- INDRA I & II: Indian Doppler Radar System.
- Rajendra: Rajendra is multifunction phased array radar.
- Agni: Surface-to-surface strategic missile system Agni 1(700 km), Agni II (2000 km) and Agni III (3000 km).
- Trishull: Trishull is series of surface-to-surface missiles.
- Dhanush: Dhanush is ship launched SS missile.
- Akash: Akash is multi-directional, multi-target SAM area defence weapon system.
- Nag: Nag is 3rd generation anti tank missile.
- HUMSA: HUMSA is ship borne sonar system.
- MIHIR: MIHIR is Air Borne dunking sonar system.

- Bharat Earth Movers Ltd.(BEML Ltd.) is engaged in the design, manufacturing, marketing and after sales support of a wide range of Mining & Construction equipment, Defence products and Railway & Metro products. BEML was established in 1965 and commenced operations from January 1965.
- Mazagair Dock Limited (MDL) is a Premier Ship Builder of the Nation. MDL is engaged in construction of warships including Destroyers, Corvettes, Submarines, New Generation Stealth Frigates, Offshore Patrol Vessels; construction of various types of merchant ships and repairs/ modernization of warships, submarines and merchant ships.
- Goa Shipyard Ltd (GSL) is one of the leading shipyards, building medium- sized sophisticated vessels for Indian Navy, Indian Coast Guard and others. It commenced functioning with its own Board of Directors since September 29, 1967. Government of India has conferred the status of Mini Ratna, Category-I in March 2007. Goa Shipyard Limited is an ISO- 9001 certified company.
- Garden Reach Shipbuilders and Engineers Limited (GRSE) has kept pace with the expanding maritime interests of India. The Company has been granted the Category-i Mini Ratna status. The

main business activity of GRSE is shipbuilding and ship repair for the Indian Navy and Coast Guard.

- Bharat Dynamics Limited (BDL) was established in 1970 for manufacture of Guided Missiles. It is one of the few strategic industries in the world that possesses the capability to produce state-of-the-art missiles. BDL is engaged in the production of Konkurs-M and Invar (3UBK-20) Anti Guided Missiles in collaboration with Russian developed CMDS (Counter Measures Dispensing System) has been accepted by the Indian Air Force. BDL is working in close association with DRDO for technology absorption / assimilation and extending support by providing missile subsystems integration of missiles for conducting trials of missiles like Akash, Nag, Article K-15 and Agni Variants (Al, A2 and A3). Advanced Light Weight Tropedo (TAL); Heavy Weight Rorpedo (Varunastra) anI Light Weight Mines in Concurrent Engineering mode in association with NSTL, Visakhapatanam.
- Mishra Dhatu Nigam Limited (MIDHANI) was incorporated as a Public Sector Undertaking under the Administrative Control of Department of Defence Production & Supplies, Ministry of Defence in 1973.

Defence Research and Development Organisation

- DRDO, came into existence in 1958 with the amalgamation of Technical 'Development Establishment (TDES) of Indian Army and Directorate of Technical Development & Production (DTD&P) with Defence Science Organisation (DSO).
- DRDO is headed by the Scientific Advisor to Raksha Mantri, who is also the Secretary,
- Department of Defence R&D and Director General R&D. Dr. DS Kothari, the eminent scientist and educationist was the first to head the organisation. The corporate headquarter of DRDO-is at DRDO Bhawan, an environment friendly building located at Rajaji Marg, New Delhi.
- "Balasya mulam vi am" i.e. "The source of strength is Science" is the tag line of DRDO. It is Science that drives the nation in war and peace. The Organisation has two tier structure, viz, the Corporate Hqrs at New Delhi; and laboratories establishments, regional centres, field stations, etc. across the length and breadth of the country. DRDO Hqrs, under the Department of Defence Research and Development, is organized into two sets of Directorates i.e. the Corporate Directorates and the Technical Directorates. The laboratories, based on their core-competence, are classified into to nine clusters namely, Aeronautics, Armaments, Combat Vehicles and Engineering, Electronics and Computer Sciences, Materials, Missiles and Strategic Systems, Micro Electronics and Devices, Naval Research and Development, and Life Sciences.

Resettlement of Ex-Servicemen

- The Department of Ex-servicemen Welfare (ESW) formulates various policies and programmes for the welfare and resettlement of Ex-servicemen (ESM) in the country.

Entrepreneur Schemes

- The schemes in operation at present are SEMFEX-II and SEMFEX-III comprising ventures in rural areas in agriculture, industry and service sectors. The lending institutions are Nationalised Banks, Cooperative Banks, Regional / Rural Banks etc. Subsidy of 25%-30% is available for these schemes. Application 'for loan is submitted by ex-servicemen directly to the Bank through concerned Zila Sainik Boards.
- SEMFEX-II Scheme : The Scheme was started in 1988 with the assistance of National Bank for Agriculture and (NABARD) for funding the entrepreneurship in agriculture, industry and service sectors in rural areas. Subsidy upto 25% of project cost is provided.
- SE1PEX-III : The scheme was started in 1992 with the assistance of Khadi and Village Industries Commission (KVIC) for setting up of textile, village, cottage, tiny and small scale industries in rural areas. Loan up to Rs. 25 lakhs and subsidy upto 30% is provided under the scheme.

Mass Communication

- The Ministry of Information and Broadcasting, through the mass communication media consisting of radio, television, films, press and print publications, advertising and traditional modes of

Questions

1. Match the following

Army Training Institutions		Location
(i) National Welfare Academy	(a)	Pune
(ii) Indian Militar Academy	(b)	New Delhi
(iii) National Defence College	(c)	Dehradun
(iv) Institute of National Integration	(d)	Khadkvasla

(a) 1 - d, ii - c, iii - b, iv - a

(b) 1 - b, ii - a, iii - d, iv - c

(c) 1 - c, ii - b, iii - d, iv - a

2. Match the following

Navy Training Institutes		Location
(i) Naval Academy	(a)	Goa
(ii) INS Chilka	(b)	Orissa
(iii) INS Shivaji	(c)	Lanavala
(iv) INS Asvini Integration	(d)	Mumbai

(a) 1 - b, ii - d, iii - c iv - a

(b) 1 - a, ii - b, iii - c iv - d

(c) 1 - a, ii - b, iii - d iv - c

3. Consider the following statements?

(i) The Coast guard is mandate to keep Indias EEZ.

(ii) It prevents marine pollution.

(iii) Provides assitance to fishermen in distress.

which of the above are true.

(a) i & ii (b) ii & iii

(c) i, ii & iii (d) ii

4. Consider the following statements?

(i) The Airforce was established in October 8, 1932.

(ii) It contract has been signed with M/s Rosonboron Export Russia for delivery of Mi-17V5 helicopters.

(iii) The upgrade of DARIN-I Jaguar aircraft to DARIN-III standard has been approved & will be completed by 2017-2018.

which of the above are true.

(a) i & ii (b) ii & iii

(c) iii (d) all of the above.

5. Match the following

Defence Production Units		Location
(i) Hindustan Aeronautics Ltd. (HAL)	(a)	Panchkula
(ii) Bharat Electronics Ltd.	(b)	Bengaluru
(iii) Mazgaon Docks Ltd.	(c)	Mumbai
(iv) Heavy vehicles Factory	(d)	Avadi

(a) 1 - b, ii - a, iii - d, iv - c

(b) 1 - d, ii - b, iii - a, iv - c

(c) 1 - b, ii - a, iii - c, iv - d

6. Match the following

Submarines	Status
(i) INS Chakra	(a) 2nd indigenously built submarine in 1994.
(ii) INS Shalki	(b) India's first nuclear power submarine.
(iii) INS Shakkul	(c) India's first missle firing submarine.
(iv) INS Sindushastra	(d) India's first indegenously built submarine in 1992.

(a) 1 - b, ii - d, iii - a, iv - c

(b) 1 - c, ii - a, iii - d, iv - b

(c) 1 - d, ii - b, iii - a, iv - c

7. Match the following

(i) INS Vibhuti	(a) Belongs to Nashak class boats.
(ii) INS Nashak	(b) Indegenously built fastest missile boat.
(iii) INS Prahar	(c) 3rd missle boat
(iv) INS Prabhat	(d) First indegenously built missile boat.

(a) 1 - d, ii - c, iii - b, iv - a

(b) 1 - c, ii - d, iii - a, iv - b

(c) 1 - d, ii - a, iii - b, iv - c

8. Consider the following statements?

(i) LCA Tejas is India's first indegenously designed Light combat aircrafts.

(ii) Lakshya is a pilotless target aircraft.

(iii) Nishant is an unmanned aerial vehicle.

Which of the above are true.

(a) i & ii (b) ii & iii

(c) iii (d) all of the above.

9. Match the following

(i) Pinaka	(a) Multi Barrel Rocket System.
(ii) Arjun	(b) Main Battle Tank
(iii) INDRA I & II	(c) Indian Doppler Radar System.
(iv) Agni	(d) Surface to surface Missile.

(a) 1 - b, ii - c, iii - a, iv - d

(b) 1 - a, ii - b, iii - c, iv - d

(c) 1 - d, ii - c, iii - b, iv - a

10. Match the following.

(i) Dhanush	(a) Multi target SAM area defence weapon.
(ii) Akash	(b) Slip launched SS vechile.
(iii) Nag	(c) Ship borne sonar system.
(iv) HUMSA	(d) 3rd genetation anti tank missile.

(a) 1 - a, ii - b, iii - c, iv - d

(b) 1 - d, ii - c, iii - a, iv - b

(c) 1 - b, ii - a, iii - d, iv - c

Answers

1.	(a)	2.	(b)	3.	(c)	4.	(d)	5.	(c)	6.	(a)	7.	(a)
8.	(d)	9.	(b)	10.	(c)								

BIODIVERSITY

India is an identified megadiverse country, rich in biodiversity and associatd traditional knowledge. The country also has a tradition of conservation and sustanable use of its biodiversity, which has now come under pressure on account of various factors including development imperatives, habitat fragmentation, and introduction of invasive alien species.

Biodiversity comprises all the diversity observed among species, their populations and also the vast ecosystems.

In other words Bioloical diversity, or biodiversity, encompasses the variety of all life on earth. Biodiversity manifests itself at three levels: species diversity which refers to the numbers and kinds of loving organisms; genetic diversity which refers to genetic variation within species; and ecosystem diversity which denotes the variety of habitats. To date, about 1.7 million species have been described while many more await discovery. India, a megadiversity country with only 2.4 per cent of the land area, accounts for 7-8 per cen of the recorded species of the world spread over 45,500 species of plants and 91,000 species of animals that have been documented so far.

In terms of species richness, India ranks seventh in mammals, ninth in birds and fifth in reptiles. In terms of endemism of vertebrate groups, India's position in tenth in birds with 69 species, fifth in reptiles with 156 species and seventh in amphibians with 110 species. India's share of crops in 44 per cent as compared to the world average of 11 per cent. India also has 23.39 per cent of its geographical area under forest and tree cover.

Of the 34 gloablly identified biodiversity hotspots, India harbours four hotspots, i.e., Himalaya, Indo-Burma, Western Ghats and Sri Lanka and Sundarland.

I. Faunal diversity

So far, nearly 91,212 faunal species (7.43 per cent of the world's faunal species) have been recorded in the country. Whereas inventories of mammals, birds, reptiles, amphibians and fishes are fairly complete, a large number of other life forms are yet to be descirbed.

The Indian faunal groups show diverse range of dndemism across groups. Some of the lower groups such as Mesozoa (100 per cent), Acanthocephala (88.6 per cent), Oligochaeta (77.8 per cent), Platyhelminthes (71.9 per cent), Kinorhyncha (70 per cent) show high degree of endemism. among higher groups, Amphibia (61.2 per cent) and Reptilia (47 per cent) deserve special mention.

As per the IUCn Red List (2008). India has 413 globally threatened faunal species, which is approximately 4.9 per cent of the wold's total number of threatened faunal species. The global

Important Facts

- Biodiversity comprises all the diversity obsered among species, their populations and also the vast ecosystems.
- Of the 34 globally identified biodiversity hotspots India harbours four hotspots i.e. Himalaya, Indo-Burma, Western Ghats and Sri Lanka and Sundaland.
- In terms of plant diversity. India ranks tenth in the world and fourth in Asia. With over 45,500 plant species. India represents nearly 11 per cent of the world's knownfloral diversity.
- So far nearly 91.212 faunal species (7.43 per cent of the wrold's faunal species) have been recorded inthe country. Whereas mammals, birds reptiles, amphibians and fishes are fairly complete, a large number of other life forms are yet to be described.

estimates as per IUCN Red List, 2008 suggest that 10 per cent (5,966 species) of vertebrate and 0.20 per cent (2,496 species) of invetebrate described fauna is threatened. In 2004 one species, megaptera novaeangliae, showed an upward trend of population while eleven species showes stable populations. Further, of the total 447 threatened species, for which trends are available, 218 are showing decreasing trend of population as per the 2004 status. The 2008 report, however, indicates upward population trend of one-homed rhinoceros in the country, as a result, the threat category has improved from endangered to vulnerable.

India, through its strong initiatives for survery and monitoring of biodiversity, is contributing towards new discoveries. For example, ZSI has discovered 655 faunal species in 2007 and National Bureau of Fish Genetic Resources (NBFGR) reported 36 new fin fish species from diverse biogeographic zones of India.

II. Floral Divesity

In terms of plant diversity, India ranks tenth in the world and fourth in Asia. With over 45,500 plant species, India represents nearly 11 per cent of the world's known floral diversity. As elsewhere in the world, many organisms fungil algae, lichens and bryophytes are yet to be described and remote geographica areas are to be comprehensively explored.

Angiospersms: India has about 17,527 species of flowering plants (more than 7 per cent of the world's known flowering plants) in 247 families and 2984 genera. The dominant families with more than 500 species are Poaceae-1291; Orchidaceae-1229; Leguminosae-1225; Asteraceae-892; Rubiaceae-616; Cyperaceae-545; Euphoribaceae-527; and Acanthaceae-510.

Gymnosperms nare represented by about 67 species. Pinaceae (6 genera and 15 species) is the largest famialy, followed by Cupressaceae (13 genera and 13 species), Ephedraceae (1 genus, 7 species) and Gnetaceae (1 genus and 5 species). The species of Gnetum and Cycas are mostly confined to North Eastern region, Eastern and Western Ghats, and Andaman & Nicobar Islands.

Pteriodphytes: India has about 1200 species under 204 genera. While species of Marsilea, Azolla and Salvinia grow in aquatic habitats, those of Acrostichum occur in mangrove eco-systems. The north-eastern region (including Eastern Himalaya) is rich in pteridophyic diversity with about 845 species, followed by south India (including Eastern and Western Ghats) with 345 species and north India (including Western Himalaya) with 340 species. About 17 per cent of the species are endemic of India. The families such as Polypodiaceae (137 species), Dryopteridaceae (125 species), Athyriaceae (97 species), Thelypteridaceae (83 species), Salaginella (62 species), Asplenium (45 species) and Polystichum (45 species) are som of the dominant families and genera of the pteriodophytic flora of India region.

Bryophytes represented by 2500 species are the second largest-group of green plants in India distributed largely in Eastern Himalaya, North-eastern India, Western Himalaya and the Western Ghats. Mosses constitute the major component of Indian bryoflora with 1576 species followed by liverworts and hornworts (924 species). Lejeuneaceae (155 species) is the largest family followed by Pottiaceae (129), Dicranacea (119), bryaceae (98) and Sematophyllaceae (92 species). Fissidens (67 species) is the largs genus followed by Plagiochila (65) and Frullania (63). Nineteen genera and 629 species are endemic to India.

Important Facts

- Eighteen families of flowering plants occurring in India such as Ancistrocladaceae. Brebersteiniaceae. Martyniaceae. Tetra centraceae and Trichopodaceae, etc., are monogeneric.
- In the case of fauna, new plant species are continually being discovered in the country. For example 41 plant taxa were discovered by BSI, and other researchers from diverse bio-geographic zones of India during 2007.
- India has 14,500 species of fungi in 2,300 genera and 250 families with maximum diversity inthe Western Ghats followed by the eastern Himalaya and the western Himalaya.
- Lichns representing symbrotic associationof fungi and algae, constitute a dominant component of epiphytic and saxicolous, vegetation and comprise 2,223 species in 283 genera and 72 families.

Major Multilateral environment agreements (MEAs) ratified by India

MEAs	Year	Issues covered
Convention on Wetlands of International Importance	1971	Conservation and wise use of wetlands, Primarilty as habitat for the water-birds
Convention for the Protection of World Cultural and Natural	1972	Protection and conservation of cultural Heritage and natural heritage
Convention on International Trade in Endangered Species	1973	International trade in endangered species of wild fauna and flora
Bonn Convention on Migratory Species of Wild Animals	1979	Conservation, management and wise use of migratory species of wild animals and their habitats
Vienna Convention for that Deplete the Ozone Layer	1985	Protection of atmospheric ozone layer above the planetary boundary layer
Monterla Protocol on Substancesthat Deplete the Ozone Layer	1987	Protection of atmospheric ozone layer above the plantary boundary layer
Basel Convention on Trans-boundary Movements of Hazardous Wasters and their Disposal	1989	Regulation of transboundary ozone layer of hazarous wasts and their disposal
United Nations Framework Convention-on Climate Change (UNFCCC)	1992	Changes in the earth's climate system due to anthropogenic inferference
Kyoto Protocol to the UNFCCC	1997	Quanitified emission limitation and reduction commitments for Annex 1 Parties
Convention on Biological Diversity (CBD)	1992	Biological diversity and biological resources
Cartagena Protocol on Biosafety to the CBD	2000	Regulation of transboundary movement, transit, handling and use of living modified organisms (LMOs)
United Nations Convention to Combat Desertification	1994	Combating desertification and militate the effects of drought, particularly in Africa.
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	1998	Promote shared responsibility and cooperative efforts among the Parties in the international trade of certain hazardous chemicals, in order to protect human health and the environment from potential harm and to contribute to their environmentally sound use
Stockholm Convention on Persistent Organic Pollutants	2001	Protect human health and the environment from persistent organic pollutants.

Lichens representing symbiotic association of fungi and algae, constitute a dominant component of epiphytic and saxicolous vegetation, and comprise 2,223 species in 283 genera and 72 families. Western Ghata are the rivhes region with 800 species (38 per cent) followed by Eastern Himalaya with 759 species (37 per cent) and Western Himalaya with 550 species (27 per cent). Families such as Parmeliaceae, Graphidaceae, Physciaceae, Usneaceae, Cladoniaceae, and genera like Parmelia, Graphina, Usnea, Graphis and Lecannora are among the dominant families and genera of Indian lichens. about 23 per cent species, mainly belonging to genera Graphina, Trypethelium, Graphis and Porina, are endemic to India. Andaman & Nicobar Islands (24 per cent), Western Ghats (20 per cent) and Eastern Himalaya (18 per cent) show high percentage of endemic species.

Fungi: India has 14;500 species of fungi in 2,300 genera and 250 families with maximum diversity in the Western Ghats followed by the eastern Himalaya and the western Himalaya. Deuteromycetes with 900 genera and 6000 species (40 per cent) is the largest group of India mycoflora, followed by Ascomycetes [680 genera / 3500 species (25 per cent)] and Basidiomyceter [520 genera / 3400 species (23 per cent)]. Cercospora with 707 species is the largest genus of Indian fungi followed by Puccinia (328 species) and Phyllosticta (280 species). About species are endemic to the country.

Algae are represented by over 7,175 species in 666 genera. They are found in a variety of habitats ranging from aquatic (both fresh water and marine) to terrestrial. Cholorophyceae with 4,495 species is the largest family followed by Cyanophyceae (1,453 species) and Bacillariophyceae (516 species).

Eighteen families of flowering plants occuring in India such as Ancistrocladaceae, Bieberstein-iaceae, Martyniaceae, Tetra-centraceae and Trichopodaceae, etc., are monogeneric. About 2,863 (16.4 per cent) are trees, which include some of the highly valued timber species of the world. Indi is also a storehouse of primitive flowering plants, confined mainly in North Eastern region of the country. Diversity of such plants led Takhtajan (1969) to designate this region as the “Cradle of Flowering Plants’. The Indian flora also shows a rich diversity in aquatic flowering plants. Some important families of aquatic plants include Hydrocharitaceae (13 species),Pontederiaceae (13 species), Alismateacea (8 species), Aponogeton-aceae (6 species), Potamogetonaceae (6 species), Typhaceae (4 species), Salviniaceae (3 species), etc. The insectivorous plant families, yet another group of unique plants are represented by Lentibulariaceae (36 species), Droseraceae (3 species), and Nepenthaceae (1 species).

About 11,058 species are endemic to India region, 6,200 of which belong to flowring plants alone. Eastern Himalaya and north-eastern region (about 2,500 species), peninsular India including western adn Eastern Ghats (about 2,600 species), north-western Himalaya (about 800 species) and Andaman & Nicobar Islands (about 250 species) are the areas rich in endemic plants.

As in the case of fauna, new plant species are continually being discovered in the country. For example, 41 plant taxa were discovered by BSI and

Important Facts

Area Initiative / Even Contribution

1. Indian Network for Climate Chnge Assessemtn (INCCA): Network of 120 research institution and 250 scientists launched; major conferences planned in May and November 2010.
2. Himalayan Glaciers Monitoring Programme: Comprehsive programme to scientifically monitor the Himalayan galciers Phase I completed; Phase Ii launched; Discussion Paper on State of Himalayan Glaciers released.
3. Launch of Indian Satellite to Monitor Greenhouse Gases ISRO to launche a micro-satelliete in 2010 to study aerosols (soot particles), followed by a comprehensive satellite in 2011 to monitor GHG gases; India to join elite club of countries to do so.
4. India’s Forest and Tree Cover as a Carbon Sink. Research estimates the value of India’s forests as a carbon sink- assessment shows that they neutralise 11% of India’s annual GHG emissions Science & Research
5. India’s GHG Emissions, Profile: India’s GHG Emission Pathways until 2030 under different assumptions made public; shows India will remain a minor per capita emitter even in 2010.

othe researchers from diverse bio-geographic zones of Idnia during 2007. Similarly in cryptogams (Lichens and Bryophytes), the National Botanical Research Institute (NBRI), Lucknow described 11 new species during 2007-08. Under the AICOPTAX, 493 taxa new to science have been discovered.

III. Crop genetic diversity

India stands seventh in the world in terms of contribution of species to agriculture and animal husbandry. In qualitative terms too, the contribution has been significant. The National Bureau of Soil Survey and Land Use Planning distinguished 20 broad agro ecological zones, based on natural features and crop growing periods. India has over 800 crop species and 320 wild relatives: millets (51); legumes (31); fruits (109); spices and condiments (27); vegetables (54); fiber crops (24); oil seeds, tea, coffee, tobacco and sugarcane (12); and medicinal plants (3,000). The National Gene Bank at NBPGR is primarily responsible for conservation of unique accessions on long-term basis, as base collections for posterity, predominantly in the form of seeds.

IV. Livestock genetic diversity

India, endowed with varied forms of animal genetic resources, is traditionally considered as an important rearing centre for domesticated aniamals. India has vast resources of livestock (485 million) and poultry (489 million), which play a vital role in rural livelihood security. In terms of population, India ranks first in buffaloes, second in cattel and goats, third in sheep, fourth in ducks, fifth in chicken and sixth in camels in the world. The genetic resources of farm animals inIndia are represented by broad spectrum of native breeds of cattle buffaloes, goats, sheep, swine, equines, camel and poultry. There are around 140 listed breeds of livestock and poultry in India, with 30 breeds of cattle, 10 of buffalo, 42 of sheep, 20 of goat, 3 of pig, 6 of horse an dpony, 8 of camle and 18 of poultry. Besides, there are breeds of yak, mithun, ducks, quails and several nondescript populations.

Over the years, animal husbandry has intensified in India with widespread introduction of exotic breeds. There is a perceptible increase in the population of limited specialized breeds. This has led to the reduction in total genetic variability and reduction size of many local breeds. The majority (85 per cent) of the domestic livestock in India is reared under low input production systems. Of the indigenous breeds, 14 of cattle, 3 of bufalo, 9 of sheep, 4 of goat and almost all breeds of horse and poultry are showing declining trends in the country. Estimates indicate that 50 per cent of indigenous goat, 30 per cent of sheep, 20 per cent of cattle and almost all poultry breeds are threatened.

In this context, the National Bureau of Animal Genetic Resources (NBAGR) undertakes suitable programmes for identification, evaluation, characterization, conversation and sustainable utilization of animal genetic resources).

V. Fish genetic diversity

India is endowed with vast inland and marine bio-resources. It is the third largest producer of fish in the world and second lalrgfst producer of inaldn fish. As such, fisheries and aquaculture play and

Important Facts

6. Expert Group on Low Carbon Economy Planning Commission led Group set up to develop strategy for India as a low carbon economy; to feed into twelfth plan process.
7. State Action Plans on Climate Change Delhi becomes first State to release Climate Change Action Plan, other States finalising their Plans, Policy Development.
8. National Policy on Biofuels National Policy on Bio-fuels approved by Cabinet to promote cultivation, production and use of Bio-fuels for transport and in other applications.
9. National Missions under National Action Plan on Climate Change. National Mission on Solar Energy, Energy Efficiency and Strategic Knowledge approved; other Missions in final stages of preparation.
10. First National Conference on Green Building Materials and Technologies: Conference to stimulate green building sector, to set an example the Govt. proposals that all its new building will be GRIHA 4* compliant subject to site conditions.
11. 30 “Solar Cities”: In-principle approval given to 30 ‘Solar Cities’ with aim of 10% deduction in

important role in social development, economic upliftment of farmers and fisherfolks, apart from contributing to the nutritional security of the country. The NBFGR has taken up various research programmes and major achievements which are as under:—

- Development of a database on 2,182 fishes found in India wates; total listing of 287 fresh-water fishes of aquatic hotspot - the Western Ghats which include 192 endemic species.
- Identification of 47 potentially cultivable teleosts and 106 ornamental species endemic to Western Ghats.
- Assessment of 327 freshwater fish species for IUCN threat categories and listing of 79 threatened species.
- Preparation of a macro level fish occurrence map of entire India (1:1000000).
- Genetic characterzation of 33 species using different markers and development of DNA barcodes for 100 Indian marine fish species.
- Ex-situ conservation of prioritized endangered species undertaken through successful captive breeding techniques for Horabagrus brachysoma, Labeo dussumieri, L. dyocheilus, Chitala chitala, COmpok, pabda, Puntius sarana, Anabas testudineus, Nandus nandus, Clarias btrachus and Heteropneutes fossils; sperm cryopreservation protocols for 16 threatened and commercial fish species; and, tissue culture bank for housing 11,600 accessories of 273 species.
- Publication of a bibliography on 'Fish Pathogens and Diseases in India' which contans 2,610 reference of 1451 Indian research in different fields of fish pathology, quarantine and related topics across 104 years (1898-2001). Also, developed an information system 'Fish Diseases and Quarantine Information System'.
- Development of a new database on Indian fish diversity comprising information on 2,243 indigenous and 291 exotic fin fished (globally recognized number of fin fishes in 29,300).

VI. Genetic diversity of agriculturally important microorganisms (AIMs)

India has initiated isolation and identification of AIMs mainly through the efforts of NBAIM. Important initiatives inter alia include the following:

- NBAIM has a repository of 2,517 cultures which includes filamentous fungi (2,077), bacteria (394), Actinomycetes (36) and yeasts (10).
- The sources of fungi collections include plants (1,212) soil insects (641), air flora (39) and others (185).
- The special collections of microoganisms having importance in agriculture and industry include: bio-control agents (Trichoderma viride, T. harzianum, T. aurioviride, Glocalidium virens, Bacillius subtilis, Pseudomonas (flurescens); bio-pesticides (beauvaria bassiana, Bacillus thrungenensis); biofertilizers (Rhizobium spp., Azotobacter chrococcum, Azospirillum brasilense, Bacillus subtilis, fluorescent Pseudomonas); bio-redemdation (Pseudomonas putida, P.

Important Facts

projected demand of conventional energy through a combination of energy efficienty and renewables.

12. Energy Efficiency Standards of Applicances: Energy efficiency ratings made mandatory for 4 key appliances—refrigerators, air conditioners, tubelights and transformers from January 7, 2010 more to follow through 2010.
13. Fuel Efficiency Norms Plan for fuel economy norms for vecicles announced; to be made operational in two years Policy Implementation.
14. CDM Program India assessed as Best CDM Country; Indian projects to neutralise 10% of emissions by 2012.
15. India to host Rio+20 India to host 11th COP of Convention on Biodiversity CBD) in 2012, mark 20th anniversary of Rio.
16. UN Climate Technology Conference India successfullyhosts global Conference on technology, Delhi Statement adopted.
17. SAARC Environment Ministers Conference: India successfully hosts SAARC Ministers

flourescens, Alcligens); industrial imporance (Aspergillus niger, Bacillus subtilis).

- The Vision 2025 envisages that the NBAIM act as a nodal agency, responsible for taking appopriate measures for system-wide management of AIMs by various means, such as, (i) constituting microbial genetic resource advisory committee (ii) preparing national exploration maps, developing and widely disseminating guidelines for handling and storage of microbial isolates, registration and notification of microbial deposits, (iv) developing / implementing coordination, linkages and cooperation mechanisms, (v) technical backstopping by development of national policy and its implementation, and (vi) handling matters / concerns related to biosafety, biopiracy and IPR issues, etc.

VII. Mountain diversity

The Himalayan flora represents 71 endemic genera and 32 per cent endemic species. Also, five families are endemic to the region (i.e. Tetracentraceae, Hamamelidaceae, Circaeaseteraceae, Butomaceae, and Stachyuraceae), while over 90 per cent of the species in Berberidaceae and Saxifragaceae are endemic to the Himalaya. A large number of orcids, many representing neo endemic taxa, have been reported from Sikkim and Arunachal Pradesh. Out of the five natural World Heritage Sites (WHS) recognized by United National Educational, Scientific and Cultural Organization (UNESCO) in India, three are located in the Himalayan region viz, Nanda Devi NP, Kaziranga NP and Manas NP. Further, the Valley of Flowers NP has been included in the list of WHS as an extension to Nanda Devi NP. In addition, Kangchendzonga NP and Namdapha NP are included in the tentative list of WHS. Considering the importance of natural sites, an externally aided project titled 'World Beritage Biodiversity Programme for India : Building Partnerships to Support UNESCO's WHS programme' is being undertaken.

Magnitude of Biodiversity : The known and described number of species of all organism on the earth is between 1.7 to 1.8 million, which is fewer than 15 per cent of the actual number. The predicted number of total species varies from 5 to 50 million and averages at 14 million. About 61 per cent of the known species are insects. Only 4650 species are known to science. Biological diversity includes three hierarchical levels:

(i) Genetic diversity,

(ii) Specific diversity, and

(iii)Community and ecosystem diveristy.

These levels are interrelated, yet distinct enough to be studied separately to understand the interconnections that support life on the earth.

Genetic Diversity : Each species, varying from bacteria to higher to higher plants and animals, stores an immense amount of genetic information. Genetic diversity refers to the variation of genes within species; the differences could be in alleles (different variants of same genes), in entire genes (the traits determining particularly characteristics) or in chromosomal structures. The genetic diversity enables a population to adapt to its environment and to respond to the natural

Important Facts

conference and agrees joint action on Climate Change 2010 SAARC Summit to be on the theme of Climage Change International Cooperation.

18. India's Submissions to UNFCCC Report documenting India's 12 proactive submissions to UNFCCC released.
19. State of Forests Report 2009 Latest State of Forest Report released, shows continued rise in India's forest cover.
20. Launch of CAMPA Ambitious Rs. 11,700 crore (USD2.5Bn) Programme for forest conservation launched.
21. Green India Mission New mission under NAPCC to fast-track reforstation being finalised.
22. Capacity Building in Forestry Scheme New Rs. 369 crore (USD 80 Mn) scheme for HRD for forest personel.
23. Intensification of Forest Management New Rs. 600 crore (USD 125Mn) scheme to improve forest in manatement, infrastructure, fires, etc.

selection. If specie has more genetic diversity, it can adapt bettern to the changed environmental conditions.

The amount of genetic variation is the basis of speciation (evolution of new species). It has a key role in the maintenance of diversity at species and community levels.

Species Diversity : Species are distinct units of diversity, each playing a specific role in an eco-system.

Community and Ecosystem Diversity : Diversity at the level of communiyt and ecosystem has three perspectives:

Alpha diversity (within-community diversity) refers to the rate of replacement of species along a gradient of habitats or communities.

Gamma diversity (overall) refers to the diversity of the habitats over the total landscape or geographical area.

Gradient of Biodiversity: Biodiversity varies with the change in latitude or altitude. As we move from high to low latitudes, broadly speaking, the biological diversity increases. Similarly, we generally notice a decrease in species diversity from lower to higher altitudes on a mountain.

Problems of Biodiversity

A global scientific analysis of current trends and plausible future scenarios project that biodiversity loss is likely to continue in the foreseeable time largely because the direct drivers of biodiversity loss are projected to either remain constant or to increasein the near future. This global concern about loss of biodiversity is sough to be addressed in the international Convention on Biological Diversity (CBD), to which India is a Party.

The growing population, industrialization and urbanization and excessive use of chemical fertilizers and pesticides has completely perturbed the existing ecological balance of the country. As a result of this about 1,336 plant species are considered vulnerable and endagered; about 20 species of higher plants are categorised as possibly extinct because these have not been sighted during the last 6-10 decades.

More than 33 species of mammals, 72 species of birds, 17 species of reptiles, three species of amphibious, two species of fish and a large number of butterflies, mothand beetles are considered vulnerable and endangered.

Habitat destruction is identified as the main threat to biodiversity. The major impact of developmental activities involves diversion of forest land. Since the enactment of Forest (Conservation) Act in 1980, 11.40 lakh heactares of fores area, for about 14,997 development projects, has been approved for diversion. Against this diversion, compensatory afforestation has been stiuplated for over 12.10 lakh hectares of land.

The lossof diversity is not only an ethical tragedy but also a great social, economic and cultural one. In fact, official conservation policies and progammes, planned and controlled by a centralized bureaucracy in collaboration with urban environment, is responsible to greater extent for this state of nature. It is only an alliance between local communities, government agencies and concerned NGOs and individuals that can save natural habitats and wildlife from the cluthes of

Important Facts

Forestry

24. Inclusion of Forestry within NREGA Forestry related activities included as part of India's flagship employment guarantee scheme to fast track reforestation; Pilots being implemented.

- The loss of diversity is not only an ethical tragedy but also a great social economic and cultural one. In fact official conservation policies and programme, planned and controlled by a centralized bureau cracy in collaboration with urband environment is responsible to a greater extend for this state of nature.
- Even though forestry is the second largest land use in India after agriculture, covering approximately 23.57 percent (recorded forest area) of the total geographical area, the contribution to the Gross Domestic Product from foresry is minimal (it was barely 1.1 percent in 2001).
- Nearly 50 per cent of the aquatic plant of the world are recorded from the India sub-continent but only a few have been studied in detail in order to address some of these concerns a National Institute on Mangroves and Coastal Bioresources is being set up by the MoEF an underbans.

destructive forces.

Declining natural resource base and over-exploitation or resources:

Construction of roads and canals, quarrying, shifting cultivation and encroachments are other threats. Degradation of forests results from illicit felling, excess removal of forest products, fodder, fuel wood, forest floor litter, overgrazing and forest fires. As a result, some of the floristic and faunal components, including many keystone and endemic forest species are now left with narrow eroding populations which need to be urgently conserved.

Even though forestry is the second largest land use in India after agriculture, covering approximately 23.57 percent (recorded forest area) of the total geographical area, the contribution to the Gross Domestic Product from forestry is minimal (it ws barely 1.1 percent in 2001). An estimated 41 percent of the country's forest cover has been degraded to some degree. As much as 78 percent of forest area is subject to heavy grazing and about 50 percent of the forest area is prone to forest fires. Domestic demand for timber and fuelwood is well above the sustainable level.

The rich diversity of medicinal plants (over 6,500 species) in the country needs conservation and sustainable utilization, as their habitats are either degraded or the species are being over-exploited. In fact, nearly 90 per cent of the medicinal plants in trade are harvested from the wild. The medicinal plants constitute critical resource for health care of rural communities and for the growth of India herbal industry. Currently, India's share in the complementary medicine related global market is only 0.3 per cent and there exits immense scope for expanding its share in the 62 billion US$ world market from the present level of Rs. 5,000 crores (approximately 1.2 billion US$).

But, it is asad reflection that while it has the knowledge, skills and resources, India has not yet seized opportunities in the global market. Even its 0.3 per cent share is largely (70 per cent) through export of raw materials and only in a limited way (30 per cent) through value addition and sasle of finished products. Indian exports are thus guided by what may be termed as a trader's vision rather than by a knowledge-products vision.

Why to conserve Bio-diveristy?

Each genetic resource has a certain specific character of its own. The genetic material can be exploited by the man in the form of food, medicines and specimens. The example, plant bio-diversity can be used to develop transgenic plants that can yield more production and are resistant to disease, drought, and pess. Grains with higher percentage of protein and biofertilizer can also be produced by these genetic resources.

Problems related to the underground biodiversity:

The undergound biodiversity, particularly soil microbes, are poorly understood. The degration of land has led to the loss of underground biodiversity. Similarly, the microbial diveristy of fresh water and marine ecosystems is less know and may yield novel compounds of therapeutic and industrial vlaue. For sustainable agriculture, microorganisms play a decisive role. The information on biodiversity of freshwater, coastal and maine areas of the country is highly fragmentary, although it has vaste economic potential.

Nearly 50 per cent of the aquatic plants of the world are recorded from the Indian sub-continent but only a few have been studied in detail. In order to address some of the these concerns, a National

Important Facts

- Government initiated a schme on bio-diversity conservation to ensure coordination among various agencies dealing with the issues related to conservation of biodiversity and to review monitor and evolve adequate polity instruments for the same.
- A draft National Action Plan (NAP) has been prepared based on 71 mega Biodiversity Strategy and Action Plan (BSAPs) at local (sub-state) state, eco-regional and thematic levels.
- The international Agricultural Research Centre, operating under CGIAR, decided in 2000 against the use of this technology and India was the first country to block its only. The Government of India has further strengthened this action through Protection of Plant Vaneties and Farmers' Rights Act, 2001.

Institute on Mangroves and Coastal Bioresources is being set up by the MoEF in Suderbans.

GMOs and Biodiversity:

The appliation of Genetic Use Restriction Technologies (GURTs) or terminator technologies is prohibited and import of GURTs based products is also banned in the country. Hence, there is a need to further develop state-of-the-art containment facilities and diagonstic tools for GURTs in the country. GURT, also called terminator technology, is a biotech-based strategy that prevents seeds from germinating in the next growing season unless treated chemically by the seed company prior to planting. When seeds of crop varieties (containing this kind of genetic manipulation) are purchased from the company and planted, they germinate and grow normally but produce seeds that do not germinate when saved by the farmers for sowing during the following season. Thus, healthy and high yielding plants are genetically commanded to produce 'sterile' preventing the farmers to use them for the next season's planting.

The technology was first developed by the Delta & Pine Land, a multinational seed company, and the US Deparment of Agriculture. If commercialized, 'terminator' would compel farmers to purchase fresh seeds from the company every year. It is bad for agricultural biodiversity and worse for the small and marginal farmers.

Farmers have to purchase seeds of high yeilding hybrid varieties because seeds produced by the hybrid plants are not uniform and their production capacity decreases in successvie seasons. Hybrid varieties are not yet popular in self-fertilised crop plants like wheat and rice whose seeds are normally replaced after five years or so and that too on exchange among the farmers.

Multinational seed companies intend to prevent this traditional practice through GURTs. It is noteworthy that India opted to enact its sui generis system (PPVFR Act 2001) for protection of crop varieties as required under the WTO-TRIPS provisions. The India system is largely compliant to an accepted international system for variety protection, called UPOV 1978, that permits farmers to use saved-seeds and also exempts researchers in using seeds of protected varieties. These tow exemptions distinguish this system from its more recent version called UPOV 1991 which does not permit them and operates more like the patenting system. GURTs can be employed to achieve this objective without the need to seek protection or patenting of new seed varieties.

The International Agricultural Research Centre, operating under CGIAR, decided in 2000 against the use of this technology and India was the first country to block its entry. The Government of India hasd further strengthened this action through Protection of Plant Varieties and Farmers Rights Act, 2001. Its section 29(3) states that "Notwithstanding anything contained in sub-section (2) and sub-sections (1) and (3) of section 15, no variety of any genus or species which involves 'any technology' injurious to the life of health of human beings, animals or plants shall be registered under this Act. For the purpose of this subsection, the expression "any technology" includes genetic use re-constriction technology and terminator technology."

Government Efforts for Conversation

Envirment protection is enshrined in the Constitution of India [Article 48A and Article 51A (g)]. Wide-raging policies, programmes and projects are in place, which directly or indirectly serve to protect, conserve and sustainably use the country's biological resources. These include the Forest

Important Facts

- Several species specific projects are being implemented for flagship animal species such as Tiger (National Animal), Elephant (National Heritage Animal) Rhinoceros, Gharial, Hangul and snow leopard, birds such as Vulture, Great Indian Bustard and plants such as Orchids, Rhododendron and citrus.
- India has a National Wildlife Action Plan, which envisages 10 per cent of the geographical area of the country under PA coverage. This is significant, keeping in view that India holds 18 per cent of the world's livestock population in an area which is only 2.4 per cent of the world's geographical area.
- India has a National River Conservation Plan under implementation in 160 cities covering 34 rivers.

(conversation) Act, Wildlife (Protection) Act, Biological Diversity Act, National Green Tribunal Act, National Biodiversity Action Plan, National Forest-Policy, National Wildlife Action Plan, National Forestry Action Programme, National Environment Policy and National Action Plan on Climate Change.

Government initiated a scheme on bio-diversity conservation to ensure coordination among varius agencies dealing with the issues related to conservation of biodiversity and to review, monitor and evolve adquate polity instruments for the same. Imporant steps taken are:

(i) A comprehensive project National Biodiversity Strategy and Action Plan (NBSAP) has been launched for preparation of planning documents relating ecological security and livelihood of people depending on natural resources. The ultimate aim is to develop a National Plan for conservation of biodiversity and to sustainable use.

A draft National Action Plan (NAP) has been prepared based on 71 mega Biodiversity Strategy and Action Plan (BSAPs) at local (sub-state) state, eco-regional and thematic levels. Thereby are draft and thematic review, large number of secondary sources and so on.

The National Biodiversity Authority (NBA) set up at Chennai on October 1, 2003 as per the provisions of the Biological Diversity Act, 2002 is mandated to faciliate implementation of the Act. Progress / Achievements made during the year.

- The Authority has held two meetings during the year and taken a number of important decisions including prescribing format for "agreements" to be signed between NBA and other parties seeking access to Genetic Resources and Associated Knowledge and Notification of guidelines on collaborative research.
- The Authority organized a number of seminars, symposia involving various stake holders to educate and create awareness in regard to provisions of the Act. The NBA has also considered 38 applications related matters and another 62 applications are under consideration and examination by the Authority.

NCDMA : India has established National Clean Development Mechanism Authority (NCDMA) for according host country approval to CDM projects as mandated under the Kyoto Protocol to the UN Framework Convention on Climate Change (UNFCCC). One of the criteria used for approval of CDM projects is impact on biodiversity. Host country approvals have so far been accorded to 404 CDM projects facilitating investment of mor than Rs. 22,000 crores.

Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, enacted in 2006, is a tool to provide occupational and habitational rights to the people, thus, incentivising conservation and sustainable use of biological resources by providing access to livelihood enhancing resources to people.

National Biotechnology Development Strategy, 2007 calls for promotion of mass use of technologies for sustainable utilization of bioresources.

National Biodiversity Action Plan of 2008 developed in consultation with various stakeholders and by taking cognizance of legislative and policy framework is a dynamic matrix for mainstreaming biodiversity concerns in the country.

India has a National Wildlife Action Plan, which envisages 10 per cernt of the geographical area of the country under PA coverage. This is significant, keeping in view that India holds 18 per cent of

Important Facts

- The CBD is the first comprehensive global agreement addresing all aspedts relating to biodiversity. The institutional framework for CBD's implementation is provided by the Conference of the Parties (COP).
- COP 10 was held from 18 to 29 October 2010 at the Nagoya Conference Centre, in Nagoya, Aichi Prefecture, Japan.The high level segment of the Nagoya Summit was held with the participation of 122 ministers and five Heads of State and Government.
- India has been a signatory to the Convention since 18th February 1994 and is one of the firs countries to have enacted an appropriate comprehensive legislation to achieve the objective of the convention.

world's human population and also 18 per cent of the world's livestock population in an area, which is only 2.4 per cent of the world's geographical area.

Under the Man and Biosphere (MAB) Programme out of 16 biospheres in India (70,000 sq. km.), seven are already in UNESCO World Network of Biosphere Reserves (World total 503). India has a National Wetland Conservation Programme covering 125 wetlands including 25 Ramsar sites under the Samsar Convention. India accounts for about 5 per cent of the world's mangroves (including Sunderbans delta the largest mangrove forest in the world) and partners with IUCN's Mangroves for Future programme and has established a National Institute of the Mangrove Research at Kolkata.

Coral reefs in India occupy an extent of 2375 sq. km. (including the Andaman Islands, which have rich coral diversity and a National Coral Reef Research Centre at Port Blair).

India has National Lake Conversation Plan covnering 42 lakes, which aims at rejuventation in terms of improvement on water quality and biodiversity.

India has a National River Conversation Plan under implementation in 160 cities covering 34 rivers. National Ganga River Basin Authority (NGRBA) is responsible for conserving and sustainable use of the bio-diversity of the river Ganges. Conservation and sustainable use of biodiversity have been an integral part of Indian ethos. Sacred groves are thick patches of natural Forests conserved by the local communities as part of sociocultural practices. The Sacred Grove Information System hlds information on 3000 such groves in the country out of an estimated 100,000 to 150,000.

Several species specific projects are being implemented for flagship animal species such as Tiger (National Animal), Elephant (National Heritage Animal), Rhinoceros, Gharial, Hangul and snow leopord, birds such as Vulture, Great Indian Bustard, and plants such as Orchids, Rhododendron and citrus.

India has put in place a number of initiatives for promoting conservation of biodiversity, such as, provision of national gene fund, national biodiversity fund, awards etc. Pressure from habitat loss and degradation has been reduced by the sysem of environment clearances based on Enrivonmental Impact Assessment (EIA), Coastal Regulation Zone (CRZ), National Afforestation and Eco-development Board (NAEB), National Action Programme to Combat Desertification and Green India Mission.

- The Guidelines for International Collaboration Reserach Project involving transfer or exchange of biological resources or information realting thereto between institutions including government sponsored institutions and such institutions in other countries were issued through Gazette. These guidelines are applicable in all the Departments / Ministries of Government of India. The methodology for preparation of Peoples Biodiversity Register was also finalized during the year.

Seventeen countries-Bolivia, Brazil, China, Colombia, Costa Rica, Democratic Republic of Congo, Ecuador, India, Indonesia, Kenya, Madagascar, Malaysia Mexico, Peru, Philippines, South Africa and Venezuela rich in biological diversity and associated traditional knowledge have formed the Group of Like Minded Megadiverse Countries (LMMC). The LMMC Group holds nearly 70 per cent of the global biodiversity and is duly recognized negotiating forum India has taken over Presidency of the LMMC on February 2004. Indian in its capacity as the Chair of the LMMC had

Important Facts

- the Multi-Year Plan of Action on South Cooperation on Biodiversity for Development adopted by the 131 member of the Group of 77 and China was welcomed as an important instrument at the service of the new vision.
- The Economikcs of Ecosystems and Biodiversity (TEEB) Local and Regional Policy Makers report launched at national workshop in New Delhi.
- The Aichi Target will be the overarching framework on biodiversity not only for the biodiversity related convention but for the entire United Nations system Partiesa agreed to translate this overarching international framework into national biodiversity strategy and action plans within two years.

organised an Expert and Ministerial level Meeting of the LMMCs in New Delhi at January 2004 and this meeting has adopted the New Delhi Ministerial Declaration of Like Minded Megadiverse Countries on Access and Benefit Sharing.

The Cartagena Protocol on Biosafety, the first international regulatory framework for safe transfer, handling and use of Living Modified Organism (LMOs) was nogotiated under the aegis of the convention on Biological Diversity. The Cartagena Protocol on Biosafety, a supplementary treaty to the Convention, seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology. To date, 159 countries and the European Union have ratified the Protocol. The Secretariat of the Convention and its Cartagena Protocol is located in Montreal.

Biological Diversity Act-2002

India has been a signatory to the Convention since 18th February 1994, and is one of the first countries to have enacted an appropriate comprehensive legislation ot achieve the objectives of the convention. As of now, 193 countries are party to the CBD. The Union Ministry of Environment and Forests (MoEF), the nodal agency for implementing provisions of CBD in India, developed a strategy for biodiversity conservation at macro-level in 1999 and enacted the Biological Diversity Act in 2002 followed by the Rules thereunder in 2004. In pursuance to Article 6 of the CBD, India within five years of ratifying the Convention, had developed a National Policy and Macrolevel Action Strategy on Biodiversity in 1999. Thereafter, an externally-aided project on national Biodiversity Stretegy and Action Plan (NBSAP) was also implemented in the country during 2000-2004, adopting a highly participatory process involving various stakeholders. Meanwhile, India also enacted the Biological Diversity Act in 2002, Section 36 of which empowers the Central Government to develop national biodiversity action plan. The Central Government has brought Biological Diversity Act 2002, with the following salient features:

(i) to regulate access to biological resources of the country with the purpose of securing equitable share in benefits arising out of the use of biological resources; and associated knowledge relating to biological resources.

(ii) to conserve and sustainable use biological diversity;

(iii) to respect and protect knowledge of local communities related to biodiversity;

(iv) to secure sharing of benefits with local people as conservers of biological resources and holders of knowledge and information relating to the use of biological resources;

(v) conservation and development of areas of important from the stand point of biological diversity by declaring them as biological divesity heritage sites;

(vi) protection and rehabilitation for threatened species; and

(vii) involvement of institutions of state government in the broad scheme of the implementation of the Biological Diversity Act through constitution of committees.

National Biodiversity Authority (NBA) The NBA established in October 2003 pursuant to Section 8 of the BDA. It focuses and advises GOI on

Important Facts

- The GBD recognises the sovereign rights of States over their natural resources in areas within their jurisdiction. Parties to Convention therefore have the authority to determine access to genetic resources in areas within their jurisdiction.
- The Protection of Plant Varieties and Farmer's Rights Act, 2001 and Rules 2003 deal primarily with the protection of plant breeders rights over the new varieties developed.
- The Geographical Indications of Goods Act, 1999 has been enacted to provide for protection of geographical indications of goods referring to a place of origin of that product and the exclusion of unauthorized persons from misusing geographical indications.
- The Biological Diversity Act provides for documentation of coded and oral traditional knowledge associated with bioresources in the form of People's Biodiversity Register, to ensure effective management, promotion and sustainable uses.

conservation of biodiversity, sustainable use of its components and securing equitable sharing of benefits arising out of the utilization of biological resources. It regulates access to biological resources and associated traditional knowledge for research and / or commercial purposes, bio-survey and bio-utilization as well as transfer of research results, seeking IPR and third party transfer of bio-resources.

It advises the State Governments int he selection of areas of importance as biodiversity heritage sites and measures for the management of such sites. It has constituted expert committes to perform functions such as laying down the procedure and guidelines to govern the activities such as Access and Benefit Sharing (ABS), Prior Informed Consent (PIC), Mutually Agreed Terms (MAT), Intellectual Property Rights (IPR), list of normally traded commodities, establishment of heritage sites and their management, national designated repositories and safeguarding of traditional knowledge respecting the Article 8 (j) of the CBD.

CBD and CoP

The CBD is the first comprehensive global agreement addressing all aspects relating to biodiversity. The institutional framework for CBD's implementation is provided by the Conference of the Parties (COP). The COP is the governing body of CBD which keeps under review implementation of the Convention, and steers its development COP is the supreme decision making body which has the authorikty to adopt protocols under the Convention. It also has the authority to amend the Convention itself. To date, ten ordinary meetings of the COP have been held, the first three annually (Nassau, Bahamas in 1994; Jakarta, Indonesia in 1995; and Buenos Aires, Argentina in 1906), and thereafter biennially (Bratislava, Slovak Republic in 1998; nairobi, Kenya in 2000; Hague, the Netherlands in 2002; Kaula Lumpur, malaysia in 2004, Curitiba, Brazil in 2006, Bonn, Germany in May, 2008).

Nagoya Biodiversity Summit

COP 10 was held from 18 to 29 October 2010 at the Nagoya Conference Centre, in Nagoya, Aichi Prefecture, Japan. The high-level segment of the Nagoya Summit ws held with the participation of 122 ministers and five Heads of State and Government, including the President of Gabon, the President of Guinea-Bissau, the Prime Minister of Yemen representing the Group of 77 and China, as well as Prince Albert of Monaco. The President of the tenth meeting of the Conference of the Parties to the Convention on Biological Diversity (COP-10) was Ryu Massumoto, the Minister of the Environment of Japan. The Nagoya Protocol is expected to enter into force by 2012, with support from the Global Environment Facility of one million United States dollars to support early entry into force.

The summit achieved its three inter-linked goals: (a) adoption of a new ten year Strategic Plan to guide international and national efforts to sve biodiversity through enhanced action to meet the objectives of the Convention on Biological Diversity; (b) a resource mobilization strategy that provides the way forward to a substantial increase to current lelels of official development assitance in support of biodiversity; and (c) a new international protocol on access to and sharing of the benefits from the use of the genetic resources of the planet.

the Strategic Plan of the Convention on Biological Diversity or the "Aichi Target", adopted by the meeting includes 20 headline targets, organized under five strategic goals that address the underlying causes of biodiversity loss, reduce the

Important Facts

- National Innovation Foundation (NIF, an autonomous society established in 2000 for recognising, respecting and rewarding innovations and outstanding traditional knowledge at grassroots, has developed a model for facilitating prior informed consent for local innovators and traditional knowledge holders which provides for NIF mediation.
- Traditional Knowledge Digital Library (TKDL) is an effective deterrent to bio-piracy. TKDL is a maiden. Indian effort and is a proprietary and original detabase TKDL is available in Englihs, Japanese, French, Germand and Spanish.
- The Department of Biotechnology (DBT) has been implementing focused programmes on biodiversity conservation through biotechnological internventions since 1991, inter alia by developing techniques, tools and technologies for ex situ conservation.

pressures on biodiversity, safeguard biodiversity at all level,s enhance the benefits provided by biodiversity, and povide for capacity-building. Among the targets, it is important to not that Parties:

- Agreed to at least halve and where feasible bring close to zero the rate of loss of natural habitats including forests;
- Estaablished a target of 17 per cent of terrestrial and inland water areas and 10 per cent of marine and coastal areas;
- Through conservation and resotration, Governments will restore at least 15 per cent of degraded areas; and
- Will make special efforts to reduce the pressures faced by coral reefs.

Parties also agreed to a substantial increasein the level of financial resources in support of implementation of the Convention.

The "Aichi Target" will be the overarching framework on biodiversity not only ofr the biodiversity-related conventions, but for the entire United Nations system. Parties agreed to translate this overarching international framework into national biodiversity strategy and action plans within two years.

Actions in support will also take place at subnational and local levels. Parties endorsed a plan of action on cities and biodiversity adopted by the Nagoya Biodiversity City summit attended by more 200 mahors. 122 legislators from around the world attending the GLOBE meeting on parliamentarians and biodiversity agreed to support the implementatin of the new Strategic Plan.

The importance of acting to conserve biodiversity also received support by the donor community. Representatives of 34 bilateral and multilateral donor agencies agreed to tranlate the plan into their respective development cooperation priorities.

The Multi-Year Plan of Action on South-south Copoperation on Biodiversity for Development adopted by the 131 members of the Group of 77 and China was welcomed as an important instrument at the service of the new vision.

Finance in support of implementation of the Convention was announced. The Prime Minister of Japan, Mr Naoto Kan, announced 2 billion United States dollars in financing, the Minister of Environment of Japan Biodiversity Fund. Additional financial resources were announced by France, the European Union and Norway. Some 110 million United States dollars were mobilized in support of projects under the CBD life Web Initiative aimed at enhancing the protected area agenda.

Financial support for the Strategic Plan will be provided under the framework of the resource mobilization strategy. Parties will work to define in time for the eleventh meeting of the Conference of the Parties in 2010, the targets and mechanisms through which financial resources can be identified, unleashed and channelled.

Parties adopted the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization. The historic agreement creates a framework that balances access to genetic resources on the basis of prior informed consent and mutually agreed terms with the fair and equitable sharing of benefits while taking into account the important role of traditional knowledge. The Protocol also proposes the creation of a global multilateral mechanism that will operate in tranboundary areas or situations where prior informed consent cannot

Important Facts

- India has all along shown deep commitment for biodiversity conservation and sustainable development and has responded effectively to relevant international treaties and conventions.
- Indian forests are rich in several types of Non-Timber Forest Products (NTFPs) such as honey, bamboo, cane, gums and resing, leaves used for country smoke and plate making, several types of flowers, dye plants, fruits, nuts, seeds and roots.
- Remedial actions for restoration of degraded areas have been undertaken through eco restoration programmes by involving local people Special attention has been given to coastal zones through Coastal Zone Regulation. Rules 1994 under the Environment (Protection) Act.
- Invasive alien species (obnoxious weeds, fish, pathogens and pests, etc.) pose a serious, threat to native species their habitats and functioning of different ecosystesm.

be obtained. India is going to host the 11th Conference of Parties of CBD in 2012.

TEEB 2010

The Economics of Ecosystems and Biodiversity (TEEB) Local and Regional Policy Makers report launched at national workshop in New Delhi. Factoring the planet's multi-trillion dollar ecosystem services into policy-making can help save cities and regional authorities money while boosting the local economy, enhancing quality of life, securing livelihoods and generating employment.

This is the finding from a major international study, launched in a report by TEEB for Local and REgional Policy Makers, being released in India, Brazil, Belgium, Japan and South Africa on September 9. Various representatives from national governments, state bodies, muncipalities, corporations, NGOs, biodiversity boards, environmental organisations, forest departments, academics etc. from across India participated in the New Delhi launch. The event provided the platform for the launch of this significant report, and a workshop for local authorities from across trhe region to explore findings of the report within an Indian context. The event was organized by the TEEB Study, Ministry of Environment and Forests, indian Institute of Technology Bombay, Green India States Trust (GIST) and ICLEI South Asia.

Negotiation on Access and Benefit Sharing (ABS): The CBD recognises the sovereign rights of States over their natural resources in areas within their jurisdiction. Parties to the Convention therefore have the authority to determine access to genetic resources in areas wihtin their jurisdiction. Parties also have the boligation to take appropriate measures with the aim of sharing the benefits derived on of farmer's varieties and creation of national gene fund for promoting conservation of local varieties.

The second and third amendments to the Patent Act, 1970 provide for mandatory disclosure in the patent application, of the source and geographical origin of the biological material used in the invention.

The Geographical Indications of Goods Act, 1999 has been enacted to provide for protection of geographical indications of goods referring to a place of origin of that product and the exclusion of unauthorized persons from misusing geographical indications.

Biodiversity in 2010

India has taken wide range of measures to achieve 2010 target. Some examples include (i) holistic community based sustainable forestry programmes such as JFM is now operational on more than 17 million of land spread all over the country; (ii) National Bureau of Plant Genetic Resources (NBPGR) theat has been engaged in documenting a large number of varieties of crop plants in the country, and National Bureau of Agriculturally. Imporant Microoranisms (NBAIM) which is acting as a noal centre of the acquisition and management of indigeneous and exotic microbial genetic resources for improved utilization in food and agriculture (iii) the Tiger Project that now incorporates 37 tiger reserves in seventeen states (iv) 38 mangrove areas identified for intensive conservation and management; (v) Project Elephant which helps in ensuring long term survival of idenfitied viable elephant populations in their natural habitats and presently India has

Important Facts

- Environmental Impact Assessemnt (EIA) is one of the management tolls for incorporating environmental concerns in development process and also in improved decision making.
- Seventeen categories of heavily polluting industrie-s have been identified. They are cement, thermal power plant, distilleries, sugar, fertilizer, integrated iron and steel, oil refineries, pulp and paper, petrochemicals, pesticides lanneries, basic drugs and pharmaceuticals, dye and dye intermediates, caustic soda, zinc smelter, copper smelter and aluminium smelter.
- The National River Conservation Directorate (NRCD) functioning under the Ministry is engaged in implementing the River Action Plans under the National River Conservation Plan (NRCP). It has 31 rivers under this programme in action.
- The Centrla Pollution Control Boad (CPCB), an autonomous body of the Ministry, was set up in September 1974, under the provisions of the Wter (Prevention and Control of Pollution) Act, 1974.

26 such reserves; (v) development of TKDL, an easily nagivable computerized database of documented information available in published texts of India systems of medicine, with the objective of preventing the grant of patents on non-original invention; and (vii) the National Policy on Farmers (2007) which contributes to proect and improve land, wate, biodiveristy and genetic resources essential for sustained increase in productivity, profitability and stability of majnor farming systesm by creating an economic stake in conservation. Like wise, initiative in PAs include an innovative strategy as envisaged in NEP, 2006, to increase forest cover from 23 per cent to 33 per cent of the national territory by 2012 and the goal to establish 163 NPs and 707 WIs ensuring appropriate representation across all ecosystems. The monitoring committee of the NWAP periodically monitors the status of establishment and management of PAs.

There is a provision for benefit sharing of acces to biologica and or associated knowledge (ABS) in the Biological Diversity Act. Under this Act, 87 benefit sharing agreements have been entered by NBA with applicants in consultation with the stakeholders.

There are seven main statutory Acts that regulate environmental impacts from mining activity as give below:

(i) Mines and Mineral (Development and Regulations) Act, 1957

(b) The Water (Prevention and Control of Pollution) Act, 1974

(c) The Air (Prevention and Control of Pollution) Act, 1981

(d) The Environment (Protection) Act, 1986

(e) The Wildlife (Protection) Act, 1972, and

(f) The Forest (Conservation) Act, 1980

(g) The Scheduled Tribes and Other Traditional Forest Dwellers

(Recognition of Forest Rights Act), 2006

National Innovation Foundation (NIF), an autonomous society established in 2000 for recognising, respecting and rewarding innovationsand outstanding traditional knowledge at grassroots, has developed a model for facilitating prior informed consent for local innovators and traditional knowledge holders which provides for NIF mediation

Protection of Tradtional Knowledge: India has strived hard to protect its traditional knowlede and resources. India fough successfully for the revocation of turmeric and basmati patents granted by United States Patent and Trad-mark Office (USPTO) and neemd patent granted by European Patent Office (EPO). As a sequel to this, in 1999, the Department of Ayurveda, Yoga and Naturopathy, Unani, Siddah and Homeeopathy (AYUSH) and Council of Scientific and Industrial Research CSIR) constituted an inter-disciplinary Task Force, for creatin an approach paper on establishing a Traditional Knowledge Digital Library (TKDL).

Traditional Knowledge Digital Library (TKDL) is an effective deterrent to bio-piracy: TKDL is a maiden India-effort and is a proprietary and original database. TKDL is available in English, Japanese, French, German and Spanish. Todya, India through TKDL is capable of protecting about 0.224 million medical formulations. On an average, it takes five to seven years for opposing a granted patent at international level which may cost 0.2-.06 million US$. India has signed TKDL Access Agreements with European, US, Canadian, German, and UK Patent Offices. These agreements are unique in nature and have inbuilt safeguards on non-disclosure to protec India's interest. Significant

Important Facts

- Bio-sphere Reserves are a special category of protected areas of land and / or coastal environments, wherein people are an integral component of the system. These are representative examples of natural boimes and contain unique biological communities.
- A Biosphere Reserve consists of core, butter and transition zones. The natural or core zone comprises an undistributed and legally protected ecosystem. The buffer zone surrounds the core are and is managed to accomodate a greater variety of resources use strategies, and research and educational activities.
- Kachchh (12,454) notified on 29th January, 2008 and it includes parts of Kachchh, Rajkot, Sundernagar and Patan Civil Districts of Gujarat state.

impact has already been realised at EPO during the last one year. The access to 2.24 Lakh (0.22 million) medicinal formulations is available to Patent Offices under TKDL. Access Agreements. AS of September 2010, 3 patents have been set aside and 23 patents have been withdrawn based on TKDL database by the EPO.

A recent study has revealed a sharp decline (44 per cent) of filing of patent applications concerning Indian systems of medicine at EPO. TKDL is proving to be an effective deterrent against bio-piracy. India has also set up a global bio-piracy watch system under TKDL in respec of patent applications related to Indian System of Medicines. Misappropriation and biopiracy are the issues of great concern for the developing countries and this agnda is being pursued at multilateral fora such as CBD, TRIPs Council and WIPO, and we hope, a global Traditional Knowledge protection system is established soon.

The Biological Diversity Act provides for documentation of coded and oral traditional knowlede associated with bioresources in the form of People's Biodiverseity Register, to ensure effective management, promotion and sustainable uses. So far, 419 such registers have been documented in 6 states. Thee documents will be of great value in protecting the biodiversity.

Agriculture and Bio-diversity

India has made significant strides in agriculture to integrate and mainstream biodiversity considerations through a strong back-up of policies (e.g. National Policy for Farmers, 2007), institutions including four National Bureaus and agricultural universities, missions (e.g. National Bamboo Mission), and projects, especially the ones that follow ecosystem approach (such as National Agriculture Innovation Project and Conservation and Management of Pollinators for Sustainable Development). Major achievements include:

(i) creation of a National Gene Fund conservation and development of plant genetic resources;

(ii) establishment of Protection of Plant Varieties and Farmer's Rights Authority (PPV&FR Authority) and granting incentives to farmers in the form of "Plant Genome Savior Community Recognition";

(iii) establishment of multilateral system to facilitate access to plant genetic resources for food and agriculture (PGRFA); through International Treaty on Platn Genetic Resources for Food and Agriculture (ITPGRFA);

(iv) integration of pest management programmes, and

(v) promotion of organic farming; and

(vi) identification of agro-biodiversity heritage sites.

Research and Development

The Indian Coucil of Agricultural Reserach has set up a number of gene banks for ex situ conservation under the National Bureau of Plant Genetic Resources (NBPGR), New Delhi, National Bureau of Animal Genetic Resources (NBAGR), Karnal, National Bureau of Fish Genetic Resources (NBFGR), Lucknow, and National Bureau of Agriculturally Important Microorganism (NBAIM), Mau. A large number of microorganisms of agricultural importance also form a vital part of the diversified India agricultural ecosystem.

Important Facts

- Coastal Area Ecosystem (CAE) particularly as sensitive eco zone is an "interface zone" where land meets the sea. It is therefore dynamic and non-static in its geo-physical and chemical parameters.
- As per the recommendation of the National Committee on Mangroves and Coral Reefs, the four major coral reefs areas identified for intensive conservation and management are : (i) Gulf of Mannar, (ii) Lakshadweep and (iv) Andaman and Nicobar Islands.
- Coastal features are varied and display a sharp contrast between the western and the eastern segments.
- The Ministry has a National Committee and a Research Sub-Committee on Mangroves and Coral Reefs. In order to further focus attention on all aspects / issues related to corals in India's Working Groups of expert scientist on Strategy for Conservation and Management of Coral Reefs has also been constituted.

The department of Biotechnology (DBT) has been implementing focused programmes on biodiversity conservation through biotechnoloigcal internventions since 1991, inter alia by developing techniques, tools and technologies for ex situ conservation. many tissue culture protocols have been developed for regeneration of endangered and threatened species.The DBT has established a national facility "Laboratory for conservation of speciesx" - La Cones, at Hyderabad jointly with the help of Central Zoo Authority (MoEF), CSIR and Andhra Pradesh Government for the conservation of endangered animals species like tiger, lion, black buck, vulture, etc.

India has all along shown deep commitment for biodiversity conservation and sustainable development and has responded effectively to relevant internationa treaties and conventions. Partnerships and cooperation in different sectors have further strengthened and consolidated India's efforts in cross-sectoral integration of biodiversity considerations. Among others, the sector sna dprogrammes include:

(i) plant, animal, human and microbial genomics (joint centres in biotechnology with France, Germany, Indo-ASEAN Institute of Biotechnology, Indo-ASEAN Biotechnology Network);

(ii) International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi (an autonomous UN organization);

(iii) cooperation with Consultative Group on International Agricultural Research (CGIAR) centres for development of high quality seed material of some crops;

(iv) partnership building through FDAs and JFMCs, partnerships with industries;

(v) CSIR Strategic Alliances;

(vi) new initiatiges in agriculture sector to promote agriculture research and educaiton through collaboration with a large number of countries;

(vii) promoting nvestment in coastal ecosystem conservation with IUCN;

(viii) wildlife protection and care with USA; and

(ix) collaboration with GEF through wide ranging twelve on-going projects.

NTFPs

Indian forests are rich in several types of Non-Timber Forest Products (NTFPs) such as honey, bamboo, cane, gums and resins, leaves used for country smoke and plate-making, several types of flowers, dye plants, fruits, nuts, seeds and roots. Sustanable management of NTFPs is one of the main objectives of forest management. NTFPs contribute to over 75 per cent of total forest export revenue, and add significantly to the income of about 30 per cent of rural people.

NTFPs play in important role in the social and traditional life forest dependent popuations. According to a study, about 67 per cent of all gatherers are women and 13 percent are childeren.

Trade in some items as tendu leaves,sal seeds, myrobolans, gums and resins in nationalized in some States. In Madhya Pradesh and Chhattisgarh, the major share of net revenue goes back to NTFP gatherers.

Sustainability of the management of NTFPs is one fo the major concerns which is being ensured through developent and application of non-destructive methods NTFP collection.

Despite very high potential of NTFPs, their sustainable management is a major issue

Important Facts

- An Environment Information System (ENVIS) was set up by the Ministry of Environment and Forests in 1982 as a decentralised information network for collection, collation, storage, retrieval and dissemination of environmental information.
- The MoEF had constituted an export committee under the chairmanship of Prof. M.S. Swaminathan in July, 2004, to review and make recommendations with regard to implementation and amendments if necesary, of Coastal Regulation Zone Notification, 1991.
- The collected water can be stored for direct use or can be used to recharge the ground water. Artificial recharge of groundwater is a process by which the ground water reservoir is augmented at a rate exceeding that under natural conditions of replenishments.

requiring urgent action. NTFP gatherers are highly unorganized with little market access. Because of lack of inventory data or value addition, and resultant non-remunerative prices, the gatherers often resort of unsustainable and destructive harvesting to maximize their collection.

Further, in the forestry sector, the local organizations such as cooperatives are either still rare or in infancy. There is a need to strengthen the useufl link between NTFP management and JFM so that the benefits accuring from NTFPs can be profitably channelised for the well-beingof the forest dependent communities, ensuring sustainable forest management.

The high potential of NTFP is to be rationally and optimally utilized through scientific approaches, reserach, acquition of appropirate technology and greater people's participation. The constraints in forestry sector, among others, include :

(i) lack of adequate awareness about the multiple roels and benefits of forests and theri relevance to poverty alleviation and sustainable developmetj;

(ii) low priority for forestry in national planning process;

(iii) slow pace of policy reforms and inadequate implementation of regulatory mechanisms;

(iv) overemphasis on government control and involvement, and difficult administrative procedures;

(v) weak forestry information system rendering decision-making difficult;

(vi) inadequate investment in forestry, not-commensurate with its role in sustainable development;

(vii) inadequate space for private participation;

(viii) lack of full realization of people's participation;

(ix) inadequate targeted research and extension studies;

(x) inadeaquate frontline staff and that too of older age group;

(xi) less emphasis on forestry research;

(xii) lack of on-job training and capacity building for forest officers especially for the frontline staff;

(xii) general neglect of full potential of NTFPs; and

(xiv) lack of supportive land use policy.

Remedial actions for restoration of degraded areas have been undertaken through eco-restoration programmes by involving local people. Special attention has been given to coastal zones through Coastal Zone Regulation Rules, 1991 under the Environment (Protection) Act. This notification is under reformulation based on scietific principles as recommended by Swaminathan Committee (2005), and a draft notification on Coastal Management Zone 2008 has been issued.

Invasive alien species

Invasive alien species (obnoxious weeds, fish, pathogens and pests, etc.) pose a serious threat to native species, their habitats and functioning of different ecosystems. In India, a multi-agency and multi-programme approach, involving several Ministries and agencies, is being followed for regulating introductions andmanaging invasive alien species. Major activities include regulation of introduction of exotic living materials, their

Important Facts

- Bioil-FC has proven effective in changing toxic compounds in hydrocarbons into biodegradable substances, up to complete conversion into carbon dioxide and water. Bioremediation is usually employed as a secondary treatment after mechanical collection of oil waste using different types of equipment.
- "Bioremediation" is a technique for environmental detoxification through microorganisms that break down dangerous organic waste and turn it into less harmful compounds.
- To provide the necessasry infrastructure to harvest and develop forest resources based, to promote forest resources based industries to arrange marketing of timber and other forest resources on the mainland and aborad.
- A Mexican architect, Hector Ceballos Lascurian, first conceptualised the concept of eco-tourism in 1983.

No.	Name of PTR	State	Year	Total Area (sq. km.)
1	Achanakmar	Chhattisgarh	2009	553,286
2	Annamalai-Parambikulam	Tamil Nadu and Kerala	2007	1410
3	Bandhavgrah	Madhy Pradesh	1993-94	1161.471
4	Bandipur	Karnataka	1973-74	880
	Nagarhole Extension	Karnataka	199-00	643.39
5	Bhadra	Karnataka	1998-99	451.69
6	Bori-Satpura	Madhya Pradesh	1982-83	1486
7	Buxa	West Bengal	1982-83	760.92
8	Corbett	Uttarakhand	1973-74	1318.54
9	Dampa	Mizoram	1994-95	500
10	Dendeli-Anshi	Karntalaka	2007	875
11	Dudhwa	Uttar Pradesh	1987-88	883.739
	Katerniaghat Extension	Uttar Pradesh	1999-00	551
12	Indravati	Chhattishgarh	1982-83	2799.086
13	Kalakad-Mundathurai	Tamil Nadu	1988-89	895
14	Kanha	Madhya Pradesh	1973-74	2837
15	kaziranga	Assam	2006	859
16	Manas	Assam	1973-74	2837
17	Melghat	Maharashtra	1973-74	1676.49
18	Mudumalai	Tamil Nadu	2007	321
19	Nagarjunsagar-Srisailam	Andhra Pradesh	1982-83	3568.09
20	Namdapha	Arunachal Pradesh	1982-83	1985.245
21	Pakhui-Nameri	Arunachal Pradesh and Assam	1999-00	1206
22	Palamau	Jharkhand	1973-74	1026
23	Panna	Madhya Pradesh	1994-95	542.67
24	Pilibhit	Uttar Pradesh	2008	1079
25	Pench (Maharashtra)	Maharashtra	1992-93	664.3
26	Pench (M.P.)	Madhya Pradesh	1992-93	757.86
27	Periyar	Kerala	1978-79	777
28	Ranthambhore	Rajasthan	1973-74	1334.64
29	Ratapani*	Madhya Pradesh	2008-09	741.22
30	Shahyadri*	Maharashtra	2008-09	674
31	Sanjay-Sanjay Dubri	Madhya Pradesh	2008-09	741.22
32	Sariska	Rajasthan	2008	831
33	Satkosia	Orissa	2007	964
34	Simlipal	Orissa	1973-74	2750
35	Sitanadi-Udanti	Chhattishgarh	2008	1580
36	Sunabeda*	Orissa	2008	956.17
37	Sunderbans	West Bengal	1973-74	2585
38	Tadoba-Andhari	Maharashtra	1993-94	575.78
39	Valmiki	Bihar	1989-90	840.26
			Total -	49,112

quarantine clearnace and release for research and direct use.

FDAs-JFMC and NAEB

The concept of Forest Development Agencies (FDAs) was initially developed as an institutional mechanism to develop forest range villages where communities are substantially dependent on local forest resources. The FDAs in collaboration with village-level forest committees (JFMCs) are working as a two-tier mechanism in which forest communities a village level are supported and guided by forest division level FDAs.

- The NAP Scheme is being implemented through two-tier decentralized methanism of Forest Development Agency (FDA) at Forest Division Level and Joint Forest Management Committees (JFMCs) at the village level.

National Afforestation and Eco Development Board (NAEB), Ministry of Environment and Forests, Government of India, is currently implementing a National Afforestation Programme (NAP) with the help of FDA-JFMC mechanism in over 700 FDAs involving over twenty thousand JFMCs. The scheme, since the inception has invested over Rs. 1500 crore to bring afforestation in about one million hectare are forest land and led to infrastructure development in over twenty thousand villages. The National Afforestation and Eco-development Board (NAFB) was set up in August 1992 for promoting afforestation, tree planting ecological restoration and eco-development activities in the country. Special attention is being given to the regeneration of degraded forest areas and lands ajoining forest areas, national parks, sanctuaries and other protected areas as well as the ecologically fragile areas like the Western ecologically fratile areas like the Western Himalayas, Aravillis, Western Ghats etc.

Retulatory Mechanisms

- Environmental Impact Assessment (EIA) is one of the management tolls for incorporating environmental concerns in development process and also in improved decision making.
- To give legislative status to the procedure of impact assessment, EIA was made mandatory since January 1994 for thirty categories of development activities.
- In 1999, in order to ensure safeguards, the Ministry has established six regional offices at Shillong, Bhubaneshwar, Chanidarh, Bangalore, Lucknow and Bhopal.
- The interim operational guidelines providing inter-link between EIA Notification 1994 and 2006 have been issued by the Ministry and are available on the website of the Ministry.
- The Ministry has recently fostered a scheme for accreditation / registration of EIa Consultants with an objective of improving the quality of EIA studies and making it more authentic. The scheme will be operated by Quality Council of India (QCI).
- Amended EIA Notification 2009 : With a view to further simplify by procedure for obtaining the environmental clearance without compromisiung or diluting the regulatory framework, the EIA notification has been amended in December, 2009. The amended DIA Notification of December, 2009 provides for exemption of biomass based power plants up to fifteen MW, power plants based on non hazardous municipal solid wastes and power plants based on waste heat recovery boilers without using ausiliary fuel.
- For the purpose of protecting and conservating the coastal environment the Ministry has

Important Facts

- Indian Council of Forestry Reserach and Education (ICFRE), Dehradun is the premier foresty research organisation.
- The following forestry research institutes and centres under the Council are responsible for undertaking research in theri respective eco-climate zones: (i) Forest Research Institute, Dehradun, (ii) Arid Forest Reserach Institute, Jodhpur, (iii) Rain Forest Research Institute, Jorhat; (iv) Institute of Wood Science and Technology, Bangalore, (v) Tropical Forestry Research Institute, Jabalpur, (vi) Institute of Forest Genetics and Tree Breeding, Coimbatore; (vii) Himalayan Forest Research Institute, Shimal (vii) Institute for Forest productivity, Ranchi (ix) Centre of Social Forestry and Eco-rehabilitation, Allahabad and (x) Institute of Forestry Research and Human Resources Development Chhindwara.

issued the Cosatal Regulation Zone (CRZ) Notification in 1991, declaring coastal stretches of seas, bays, estuaries, creeks, rivers and back wates which are influenced by tidal action, up to 500 metres from the high tide line and the inter-tidal zone as the Coastal Regulation Zone.

- The Ministry constituted a four member Committee under the chairmanship of Prof. M.S. Swaminathan on 15th June, 2009. The Committee submitted its report on 15th July, 2009 after holding detailed discussions with the concerned stakeholders. The major recommendations of the Committee included

  (i) to let the draft Coastal Management Zone Notification, 2008 lapse,

  (ii) stringent implementatin of the Coastal Regulation Zone Notification, 1991 and use of space technology — enabled enforcement of the provisions of the notification,

  (iii) enhance protection of fishermen communities,

  (iv) introduce regulations to manage the proliferation of ports along the coasts,

  (v) tighter standars for disposal of effluents in to coastal waters,

  (vi) new management regimes for Andaman, Nocbar and lakshdweep Islands,

  (vii) include the seaward side to insure protection from current and future threats,

  (viii) measures to strengthen research and regulatory capacity,

  (ix) introduce policies keeping in view the future dangers from sea level rise and increased vulnerability of the coasts:

- An Ecomark lable has been introduced to label consumer products that are environment-friendly.

- A Network of 295 Ambient Air Quality Monitoring Stations covering towns / cities all over the country has been set up by Central Pollution Control Board in coordination with State Pollution Control Boards.

- Under National Air Quality Monitoring Programme (NAMP), four air pollutants viz, Sulphur Dioxide, Oxides of Nitrogen, Suspended Particulate Matter and Respirable Suspanded Particulate Matter have been identified for regular monitoring at all the locations. Besides this, additional parameters such a Respirable Lead and other toxic trace metals and Polycyclic Aromatic Hydrocarbons are also being monitored in seven metro-cities of the country.

- The Central Pollution Control Board (CPCB), an autonomous body of the Ministry, was set up in September, 1974, under the provisions of the Water (Prevention and Control of Pollution) Act, 1974.

- The CPCB coordinates the activities of the State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs) and also advises the Central Government on all matters concerning the prevention and control of engironmental pollution.

- Seventeen categories of heavily polluting industries have been identified. They are : cement, thermal power plant, distilleries, sugar, fertilizer, intergrated iron adn steel, oil refineries, pulp and paper, petrochemicals, pesticides, tanneries, basic drugs and pharmaceuticals, dye and dye intermediates, caustic soda, zinc smelter, copper smelterm and aluminium smelter.

- The National River Conservation Directorate (NRCD) functioning under the Ministry, is enagaged in implementing the River Action Plans under the National River Conservation Plan (NRCP). It has 31 rivers under this programme in action.

- The National Afforesation and Eco-Development Board (NAEB) was set up in August 1992 for promoting afforestation, tree planting, ecological restoration an eco-development activities in the country.

The institution of Forest Development Agency (FDA), which is a forest division-level federation of village forest division-level federation of village forest committes, has been formalised and supported under the National Afforestation Programme of NAEB in the Tenth Plan.

Integrated Coastal Management Zone (ICMZ) project of World Bank: An integrated Coastal Zone Management (ICZM) project of World Bank has been initiated with financial assistance from the World Bank which has following three major components:

(i) Vulnerability and Ecologically Sensitive Area Mapping;

(ii) National Institute Building and Capacity Strengthening;

(iii) Development and Implementation of State Level approached to Integrated Coastal Zone Management on pilot scale in the States of Gujarat, West Bengal and Orissa.

Ecologically Sensitive Areas: Environmentally Sensitive Zones may be defined as areas with identified environmental resources having "Incomparable Values" which require special attention for their conservation. The Ministery has already notified ecologically-sensitive areas in respect of Matheran, Mahableshwar-Numaligarh, Aravalli and Dhanu Taluka under the Environment (Protection) Act; 1986. Zonal Master Plan / Area Development Plan for all notified / to be notified environmentally senstive areas would be prepared by the concerned State Governments as per the provisions of the said respective draft notifications involving local communities / experts and got approved by the Ministry, for regulating development activities and protection and conservation of Entities of Incomparable Values. Monitoring Committees with representatives of Government, Experts and local representatives as per the notifications would be constitued to ensure compliance of approved Zonal Master Plans / Area Development Plan.

Bio-sphere Reserves

They are a special category of protected areas of land and / or coastal environments, wherein people are an integral component of the system. These are representative examples of natural biomes and contain unique biological communities. Biosphere reserve is basically a multipurpose. Biosphere reserve is basically a multipurpose protected area with the basic objective to preserve the genetic diversity in representive eco-systems.

- The idea was launched in 1975 as a part of the UNESCO's Man nd Biosphere Programme. Till May 2022, there were 408 biosphere reserves located in 94 countries.
- The Ministry has provided financial assitance to the respective State Governments for conservation and management of fourteen Biosphere Reserves designated so far. In addition, a number of potential sites are under consideration out of which Rann of Kutchch in Gujarat and Cold Desert Biosphere Reserve in Jammu & Kashmir and Himachal Pradesh are at an advanced stage. Reserach and development projects are also supported in these designated Reserves and poetential sites.
- Out of the sixteen Biosphere Reserves designated nationally, seven Biosphere Reserves namely Sunderbans (West Bengal), Gulf of Mannar (Tamil Nadu), Nilgiri (Tamil Nadu, Kerala and Karnataka), Nanda Devi, (Uttarakhand), Pachmrhi (Madhya Pradesh), Simlipal (Orissas) and Nokrek (Meghalaya) have been included in the World Network of Biosphee Reserves so far.The proposals in respect of Khangchandzonga (Sikkim), Manas (Assam) and Great Nicobar (Andaman & Nicobar Islands) are under active consideration of the UNESCO for inclusion in the world Network. Efforts are on for getting remaining Biosphere Reserves included in the World Network of Biosphere Reserves.
- While the Core areas of the Biosphere Reserves will continue to be protected under the Wild Life (Protection) Act, 1972 and Indian Forest Act, 1927 and Forest Conservation Act, 1980, a separate Regulation within the framework of existring Environment (Prorection) Act, 1986 is being firmed up to regulate activies within Buffer Zone of the Biosphere Reservese.

1. Nilgiri* (5520) 1.8.86 Part of Wynad, Nagarhole, Bandipur and Madumalia, Nilambur, Silent Valley and Siruvani hills (Tamil Nadu, Kerala and Karnataka).

2. Nanda Devi* (6497.03) 18.1.88 Part of Chamoli, Pithoragarh & Almora Disrtricts and Valley of Flowers (Uttarakhand).

3. Nokrek (820) 1.9.88 Part of Garo Hills (Meghalaya).

4. Manas (28327) 14.3.89 Part of Kakrajhar, Bongaigaon, Barpeta, Nalbari, Kamprup and Darang Districts (Assam).

5. Sunderbans* (9630) 29.3.89 Part of delta of Ganges & Brahmaputra river system (West Bengal).

6. Gulf of Mannar* (10500) 18.2.89 India part of Gulf of Mannar between India and Sri Lanka (Tamil Nadu).

7. Great Nicobar (885) 6.1.89 Southern most islands of Andaman and Nicobar (A&N Island).

8. Similipal (4374) 21.6.94 Part of Mayurbhanj district (Orissa).

9. Dibru-Saikhowa (765) 28.7.97 Part of Dibrugarh and Tinsukia districts (Assam).

10. Dehang Debang (5111.5) 02.09.98 Part of Siang and Debang valley in Arunachal Pradesh.

11. Kanchanjunga (2619.92) 07.02.2000 Part of North and West Sikkim.

12. Pachmari (4926.28) 03.03.99 Parts of Betur, Hoshangabad and Chhindwara District of Madhya Pradesh.

13. Agasthyamalai (3500.36) 12.11.2001 Parts of Thirunelveli and Kanya Kumari (area Districts in Tamil Nadu and expanded on Thiruvanthapuram, Kollam and Pathanmthitta 30.3.2005) of Kerala.

14. Achanakmar-Amarkantak 30.3.2005 Parts of Anuppur and Dindori (3835.51) districts of Madhya Pradesh and Parts of Bilaspur districts of Chhattisgarh State.

15. Kachchh (12,454) notified on 29th January, 2008 and it includes parts of Kachchh, Rajkot, Sundernagar and Patan Civil District of Gujarat state.

16. Cold Desert (7770) notified on 28.08.09 and includes parts of Pin Valley National Park and surroundings; Chandratal and Sarchu & Kibber Wildlife Sancturary in Himachal Pradesh.

- In India, Biosphere Reserves are also notified as National Parks.

A Biosphere Reserve consists of core, buffer and transition zones. The natural or core zone comprises an undistributed and legally protected ecosystem. The buffer zone surrounds the core area and is managed to accommodate a grater variety of resource use strategies, and research and educational activities. The transition zone, the outermost part of the Biosphere Reserve, is an area of active cooperation between reserve management and local people, wherein activities like settlements, cropping and other economic uses continue in harmony with conservation goals.

Hot spots of Biodiversity

- Twenty-five terrestrial hot spots for conservation of biodeversity have been identified world-wide. Among the 25 hot spots, two are in India, they are (i) Western Ghats; and (ii) Eastern Ghats.

Wasteland

- The National Wasteland Development Board (NWDB) was set up in 1985.
- In 1989 out of 120 million hectares: (a) 40 million hectares has been identified as forest-lands and (b) Nearly 80 million hectares has been identified as in non-forest wastelands.
- Government has taken a number of steps to promote wastewater management.
- Submerged Aerated Fixed Film Reacotr (SAFF) has been introduced by the wastewater management division of Thermax in place of what is termed as the activated sludge process. SAFF has various advantages: (a) lower powre requirement; (b) less maintenance; (c) low operating cost; and (d) recution in the overall volume of the plant.
- Reserve Osmosis is a highly advanced recycling system. Common Effluent Treatment Plants (CEPTs) have a number of problems:
  (a) There is significant variation in the composition of the effluent discharged by the industrial units;
  (b) The problem is compunded because many of the users do not give the primary treatment that is required before changing wastes into the common dischargfe line;
  (c) This pre-treatment is technically necessary;
  (d) Improper planning at the design stage;
  (e) No adequate training and it is a long drawn process; and
  (f) For SSIs, it is very costly

Types of Wastelands:

(a) Cultivable Wastelands: Surface water logged, laterite and saline lands; (b) Uncultivable Wasteland : Land Rocky lands, snow capped mountains.

- There are over 87 million hectares of agricultural land prone of degradation by severe erosion.

Coastal Area Ecosystem

Coastal Area Ecosystem (CAE), particularly a sensitive eco-zone is an “interface zone” where land meets the sea. It is there fore, dynamci and non-static in its geo-physical and chemical parameters. It has the highest primary productivity on the planet. Being the tail-end ecosystem, it receives all the negative externalities of the terrestrial pollution.

The importance of the coast can be guaged more precisely if we look at its place in the overall

classification of the physical divisions and relief features of the Earth. The prinicpal division of the earth are air, water and land. Technically, we can recall them as atmosphere, hydrosphere, and lithosphere. The major relief features of the earth comprise continental masses and the ocean basins.

Coastal features are varied and display a sharp contrast between the western and the eastern segments. Wide variations in coastal features are conditioned by geological factors such as the rock type, and their compostion, structure / tectonics and the dominant process of degration or aggradatons, besides wave and wind action, and vegetation.

Initiatives for sustainability

- On the land ward side, there is need for set back area of at least 500 meters from the high tide line that should be deemed as "non-development greent zone" which should be engisaged as a playground for the sea.
- The no development green zone can be suitably transformed into a bio-shield using vegetation or tree ocver that is appropriate for the specific site mangrove, beach grass, casuarines.
- The sea gives and takes in the natural course of her being.It is in human interest that we learn to respect her vicissitudinous nature. In this light the rationale of Coastal Regulation Zone (CRZ), should be seen and should not be considered as a restriction on development activity.
- There should be a Littoral Regulation Zone (LRZ), an area of the sea about five kilometers from the shoreline, for exclusive access rights of fisher folk who use conventional firshing boats and within this a two kilometer belt from the shoreline should be exclusively reserved for those using non-mechanized fishing means.
- In this LRZ the sedentary marine resources such as sea grass, sea weeds, corals and marine fauna should be nurtured preferably with community participation.
- The possibility of setting up Marine Protected Areas (jMPAs) and Marine Extractive Reserves (MERs), where controlled harvesting of the resources is undertaken under community supervision may be envisaged.

Coral reefs

As per the recommendation of the National Committee on Mangroves and Coral Reefs, the four major coral reefs areas identified for intensive conservation and management are: (i) Gulf of Mannar, (ii) Gulf of Kutchch, (iii) Lakshadweep and (iv) Andaman and Nicobar Islands. The Ministry provides financial assistance to the State Forest Departments of all the four identified coral reefs areas in the country for activities like monitoring, surveillance, education and awareness. Besides, the Ministry also supports R&D activities with emphasis on targeted reserach on coral biodiveristy, its management including various aspects of pollution in these area.

- The India reef area is estimated to be 2,375 sq. km. for engouraging targetted research on both hard and soft corals in the country, the Ministry has established a National Coral Reef Research Centre at Port Blair. The Ministry has a National Committee and a Reserach Sub-Committee on Mangroves and Coral Reefs. In order to further focus attention on all aspects / issues related to corals in India, a Working Group of expert scientists on Strategy for Conservation and Management of Coral Reefs has also been constituted.
- Detailed Guidelines for the preparation of comprehensive Management Action Plans for identified coral reefs have also been formulated by way of augmentation of existing guidelines.
- Thirty two reserach projects have been sanctioned and implemented to supplement the management action plans on mangroves & coral reefs.
- During the year, over 100 researchers and officers of the Coastal States have been trained in the taxonomy of marine flora & fauna, snorkeling, scuba diving and coral biomonitoring methodologies.

Management of Coastal Zones

The MoEF had constituted an expert committee under the chairmanship of Prof. M.S. Swaminathan in July, 2004, to review and make recommendations with regard to implementation and amendments if necessary, of Coastal Regulation Zone Notification, 1991. The Expert Committee submitted its report alongwith recommendations, which were accepted by the MoEF in April, 2005. The major recommendations include:

1. Implementation of Integrated Coastal Zone Management Plan rather than uniform regulatory approach.
2. Development along the coastal stretches based on the vulnerability of the coast, taking into account the natural and manmade hazards.
3. Inclusion of the ocean zone for regulation.
4. Setting up of an Institute of Coastal Zone Management to address the policy and legal issues.
5. Abatement of the pollution of coastal areas and marine waters in a time-bound manner.
6. Identification and mapping of the coastal eco-sensitive areas such as mangroves, corals, and turtle breeding areas.
7. Development of coastal bio-shield.

The MoEF has initiated staps for implementing the above recommendations which include:

1. Preparation of a national action plan for control of pollution of coastal waters from land based activities.
2. Pilot scale studies for demarcation of vulnerability line along identified coastal stretches through scientific organizations namely, Survey of India, Dehradun, Space Application Centre, Ahemdabad and Centre for Earth Science Studies, Thiruvananthapuram.
3. Seeking technical and financial assistance from multilateral agencies for implementing the recommendations pertaining to mapping of ecologically sensitives areas along the coastline, control of pollution in the coastal wates from land based activities and capacity building and institutional development.

ENVIS Network

An Environment Information System (ENVIS) was set up by the Ministry of Environment and Forests in 1982 as a decentralised information network for collection, collation, storage, retrieval and dissemination of environmental information. The ENVIS has been designated as National Focal Point (NFP) and Regional Service Centre (RSC) for South Asia Sub-regional countries by INFO-TERRA of UNDP. The World Bank under the Environmental Managerment Capacity Building Technical Assistance Project (EMC-BTP), which is basically geared to improve the functioning of ENVIS.

ENVIS has maintained a close liaison with various national information systems like Bio-Tecnological Information systems like Bio-Technological Infomation System (BTIS), Delhi Library Network (DELNET), etc., for exchange of environmental information and to void duplication of efforts in the field of environment and related areas. ENVIS network at present consists of a chain 76 network partners out of which 46 are on subject-specific and 30 are on State related issues.

- All the ENIVS network partners both in the matic areas as well as State subject-areas continued their activities in information collection, collation, storage, retrieval and dissemination to all concerned. All the ENVIS network partners continued to publish information packages in the print form like newsletters, mongoraphs state-of-art, etc., in their specific subject-areas for dissemination of information to the users concerned. These publications have also been uploadedin theri respective websites to access electronically by the concerned users. Each network partner also published the newsletter in their concerned subejct-area in a regional language in order to create awareness among the people of the region regarding availability of environmental information in the concerned subjec-area among the users, develop forest resources based, to promote forest resources based Industries, to arrange marketing of timber and other forest resources on the mainland and abroad.
- The ENVIS Focal Point, in association with NIC, developed a database, namely, India State Level Basic Environmental Information Data-base (ISBEID) with 23 modules and GIS interface, to assist the State Government ENVIS Centres to collect, collate and disseminate environmental information concerning theri States. The database with six modules was implemented on pilot basis for the States of Madhya Pradesh and Orissas and with seven more modules in the North-Eastern States and the State of Maharashtra for the implementation of ISBEID. The remaining States have been planned to be taken in a phased manner.

Waste Water Management

- Government has made a number of steps to for waste water management.

- Submerged Aerated Fixed Film Reactor (SAFF) has been introduced by the waste water management division of Thermax in place of what is termed as the activated sludge process. SAFF reactor has various advantages: (a) lower power requireent; (b) less maintenance; (c) low operating cost; (d) reduction in the overall volume of the plant.
- Reverse Osmosis - is a highly advanced recycling system.
- Common Effluent Treatment Plants (CETPs) this has a number of problems:

  (a) There is significant variation in the comprosition of the effluents discharged by the industrial units;

  (b) The problem is compounded because many of the users do not give the primary treatment that is required before it is discharged into the common discharge line;

  (c) This pre-treatment is technically necessary;

  (d) Improper planning at the design stage;

  (e) No adequate training and it is a long drawn process; and

  (f) For SSIs, it is very costly.
- Some of the industries that constitute the sources of the most toxic effluents, such as sugar industries, distillery units, etc., bypass waste water management norms using their political lobbies.

Biological clean-up methods

Bioil-FC has proven effective in changing toxic compounds in hydrocarbons into biodegradable substances, up to complete conversion into carbon dioxide and water. Bioremediation is usually employed as a secondary treatment after mechanical collection of oil waste using different types of equipment. That first phase can mean the recovery of up to 60 percent of the spilt hydrocarbon.

Advantages:

1. The applications in Cuba and Caribbean Islands have shown effective results. It is more cost-effective than other chemical and physical process.
2. "Bioemediation" is a technique for environmental detoxification through microogranisms that break down dangerous organic waste and turn it into less harmful compounds.
3. It is least polluting and doesn't affect the eco-system.
4. It can be effectively used in cold areas like Antarctica.
5. It has ability to be used in cleaning up the acid drainage produced from abandoned coal mines.
6. Unlike chemical and physical pollution, the biological, or "passive" control. This technology involves the construction of a treatment system that is permanent and requires little or no maintenace. Passive control measures involve the use of anoxic drains, limestone rock channels, alkaline recharge of ground water, and diversion of drainage through man-made wetlands or other settling structures.

Disadvantages:

(a) Bioil-FC is that is acts only at temperatures above five degrees (Celsius). Maximum effectiveness is achieved between 25 and 35 degrees.

(b) Biological pollution removal, which on the face of it is relatively simple, nevertheless requires case by case investigations".

Rain-Water Harvesting

The collected water can be stored for direct use or canbe used to recharge the groundwater. Artificial recharge of groundwater is a process by which the ground water reservoir is augumented at a rate exceeding that under natural conditions of replenishments.

Water harvesting is aimed at understanding the value of rain and improvising optimum use of rainwater at a place where it falls. Most of the rain that occurs in India is short in duration and heavy in intensity.

Techniques Used

There are two main techniques of rain water harvesing. They are:

First, the *storage* of rain water on surface for future use. It is a traditional technique and structures used are underground tanks, ponds, check dams, weirs, etc.

Second the *recharge* to ground water is a new concept of rain water harvesting. The structures they employ are: pits, trenches, dug wells, hand pumps, recharge wells, etc.

Recharge wells are generally constructed for recharging the deeper aquifers and water is passed through filter media to avoid choking of recharge wells.

Spreading technique is also very effective. When permeable strata starts from top then this technique is used. Water is spread in streams / nalas by making check dams, cement plusgs, Nala Bunds, gabion structures or a percolation pond, Recharge Shaft, Dugwell Recharge, Ground water dams or sub-surface Dykes may be constructed in rural area. In the urban areas, the technology of rooftop rainwater harvesting through Recharge Pit / Recharge Trench / existing Tubewells can be adopted. It has many advantages: (a) it enhances the underground water table; (b) it can be effectively employed to combat drought situations; (c) it reduces flooding of roads and improves the quality of water; (d) it saves energy in lifting of water; and (e) the application of rain wter harvesting reduces the runoff which chokes the storm water drains.

Wide water-harvesting scheme, NABARD will lend the money on easy terms and no margin money will be charged from the borrower.

Andaman & Nicobar Islands Forest and Plantation Dev. Corp. Ltd.

To provide the necessasry infrastructure to harvest and develop forest resources based, to promote forest resources based Industries, to arrange marketing of timber and other forest resources on the mainland and abroad.

To plant, grow, cultivate, produce, and raise plantations of various forest species of proven utility and other agricultural, plantation, horticultural crops, medicinal and aromatic plants and to buy, sell, export, import, process, distribute, or otherwise deal with all kind of forest crops, natural products agricultura, plantaion and horticultural crops, medicinal and aromatic plants.

To carry on the business of planters, cultivators, producers, sellers and dealers in timber, processed or not and such other products of every description and to manufacture, dispose of sell and deal in products of natural forest and forest plantations, agricultural, plantation and horticultural crops and medicinal aromatic plants.

To establish, administer, own and run industries for manufacturing forest products, agricultural, plantaion and horticultural products, medicinal and aromatic plants.

To conduct and contract for training and research connected with the integrated development of forest resources of the islands and cultivation as well as processing of agricultural, plantation and horticultural crops, medicinal and aromatic plants.

To maintain and improve Wild Life and other natural Resources.

Eco-tourism

A Mexican architect, Hector Ceballos-Lascurian, first conceptualised the concept of eco-tourism in 1983.

Agricultural and Processed Food Products Export Development Authority (APEDA):

- It came into existence in 1986;
- It acts as local point for agricultural exports; concentrates on marketing of processed foods in value added form;
- Also introduces effective quality control measures.

Marine Product Export Development Authority, Cochin:

- It is a statutory body set up in August 1972;
- It is responsible for the development of marine products industry with special reference to exports.
- National Action Programme to Combat Desertification and MoEF is the National Coordinating Agency for the implementation of the United Nations Convention to Combat Desertification (UNCCD) in the country.
- Under UNCCD, a Regional Action Programme for Asian countries has been formulated to strengthen the existing capacity of the member country parties and to network with each other for effective measures to combat desertification. Six Thematic Programme Network (TPN) has been identified for this purpose.
- India is member-country of TPN-2 “Agro-Forest and Soil Conservation in Arid, Semi-Arid and Dry Sub-humid Areas”. The Central Arid Zone Research Institute (CAZRI), Jodhpur has been identified as National Task Manager.
- G B Pant Institute of Himalayan Environment and Development was established in August 1988, at Kosi-Katarmal, Almora (uttaranchal) as an autonomous Institute of the MoEF.

- Indian Council of Forestry Reserach and Education (ICFRE), Dehradun is the premier foresty reserach organisation.
- The following forestry research institutes and centres under the Council are responsible for undertaking research in their respective eco-climatic zones: (i) Forest Research Institute, Dehradun (ii) Arid Forest Research Institute, Jodhpur, (iii) Rain Forest Research Institute, Jorhat; (iv) Institute of Wood Science and Technology, Bangalore, (v) Tropical Forestry Research Institute, Jabalpur, (vi) Institute of Forest Genetics and Tree Breeding, Coimbatore; (vii) Himalayan Forest Research Institute, Shimla; (viii) Institute for Forest Productivity, Ranchil (ix) Centre of Social Forestry and Eco-rehabilitation, Allahabad, and (x) Institute of Forestry Research and Human Resources Development, Chhindwara.

Questions

1. Which of the following are correct

   1) India, a megadiversity country with only 2.4 percent of the land area, accounts for 7-8 per cent of the recorded species of the world

   2) In terms of species richness, India ranks seventh in mammals, ninth in birds and fifth in reptiles.

   a) 1 b) 2

   c) Both d) None

2. Which of the following are correct

   1) India also has 23.39 per cent of its geographical area under forest and tree cover

   2) Of the 34 globally identified biodiversity hotspots, India harbors four hotspots, i.e., Himalaya, Indo-Burma, Western Ghats and Sri Lanka and Sundaland.

   a) 1 b) Both

   c) 2 d) None

3. Which of the following are incorrect

   1) In terms of plant diversity India ranks tenth in the world and fourth in Asia

   2) India represents nearly 15 per cent of the world's known floral diversity.

   a) 1 b) 2

   c) Both d) None

4. Which of the following are correct

   1) Cartagena Protocol is a regulation on transboundary movement on the biosafety of handling and use of living modified organisms (LMOs)

   2) Stockholm Convention is to Protect human health and the Persistent Organic environment from persistent organic substances

   a) 1 b) 2

   c) None d) Both

5. Which of the following are correct

   1) India stands seventh in the world in terms of contribution of species to agriculture and animalhusbandry.

   2) The National Gene Bank at NBPGR is primarily responsible for conservation of unique accessions on long-term basis form of seeds.

   a) 1 b) Both

   c) None d) 2

6. Which of the following are correct

   1) India ranks third in buffaloes, second in cattle and goats.

   2) The National Bureau of Animal Genetic Resources (NBAGR) undertakes suitable programmes for identification, evaluation of animal genetic resources

   a) 1 b) 2

   c) Both d) None

7. Which of the following are correct

   1) India is endowed with vast inland and marine bio resources.

   2) It is the third largest producer of fish in the world and second largest producer of inland fish.

   a) 1

   b) 2

   c) Both

   d) None

8. Which of the following is incorrect

   1) Delhi is the first state to follow the State action plan on Climate change

   2) State of Forests Report 2009 Latest State of Forest Report released, shows continued rise in India's forest cover.

   a) None b) Both

   c) 1 d) 2

9. Which of the following are correct

1) Alpha diversity (within-community diversity) refers to the rate of replacement of species along a gradient of habitats or communities.

2) Gamma diversity (overall) refers to the diversity of the habitats over the total landscape or geographical area.

a) 1 b) 2

c) Both d) None

10. Which of the following are incorrect

1) Forestry is the second largest land use in India after agriculture, covering approximately 23.57 percent (recorded forest area) of the total geographical area

2) It contribution to the Gross Domestic Product is maximum

a) 1 b) 2

c) Both d) None

11. The National Biodiversity Authority (NBA) set up at

a) Delhi b) Chennai

c) Kolkata d) Banglore

12. Which of the following are correct

1) The CBD is the first comprehensive global agreement addressing to all aspects related to biodiversity.

2) COP 10 was held from18 to 29 October 2010 at the Nagoya Conference Centre, in Nagoya, Aichi Prefecture, Japan.

a) 1 b) 2

c) Both d) None

13. Which of the following are incorrect

1) India accounts for about 5 percent of the world's mangroves

2) Sunderbans delta the largest mangrove forest in the world

a) 1 b) 2

c) None d) Both

14. Which of the following are correct

1) Coral reefs in India occupy an extent of 2375 sq.

2) National Coral Reef Research Centre is at Port Blair.

a) 1 b) 2

c) Both d) None

15. Which of the following are correct

1) India has National Lake Conversation Plan covering 42 lakes

2) India has a National River Conversation Plan under implementation in 162 cities covering 35 rivers.

a) 1 b) 2

c) Both d) None

16. Which of the following are correct

1) India signed the Biological Diversity Act in 1994

2) 194 countries are party to the convention

a) 1 b) 2

c) Both d) None

17. National Bureau of Animal Genetic Resources (NBAGR) is located at

a) Karnal b) Mau

c) Lucknow d) Delhi

18. Which of the following are correct

1) The department of Biotechnology (DBT) has been implementing focused programmes on biodiversity for ex situ conservation.

2) The DBT has established a national facility "Laboratory for conservation of species" - La Cones, at Hyderabad

a) Both b) None

c) 1 d) 2

19. Organization responsible for maintaining Red Data Book/Red List is

a) IUCN b) CITES

c) WWF d) IBWL

20. Which of the following are correct

1) Convention on Wetlands is related to Conservation and wise use of wetlands, International Importance Primarily as habitat for the water-birds

2) Convention on International 1973 is related to International trade in

endangered Trade in Endangered Species species of wild fauna and flora

a) Both b) None

c) 1 d) 2

21. Which of the following are incorrect

1) The Geographical Indications of Goods Act, 1999 has been enacted to provide for protection of geographical indications of goods referring to a place of origin of that product and the exclusion of unauthorized persons from misusing geographical indications.

2) The Biological Diversity Act provides for documentation of coded and oral traditional knowledge associated with bio resources in the form of People's Biodiversity Register, to ensure effective management, promotion and sustainable uses.

a) 1 b) 2

c) None d) Both

22. Which of the following are correct

1) A Biosphere Reserve consists of core, butter and transition zones

2) Kachchh (12,454) notified on 29th January, 2008 and it includes parts of Kachchh, Rajkot, Sundernagar and Patan Civil Districts of Gujarat state

a) 1 b) 2

c) None d) Both

23. Which of the following are incorrect

1) An Environment Information System (ENVIS) was set up by the Ministry of Environment and Forests in 1982

2) The MoEF had constituted an export committee under the chairmanship of Prof. M.S. Swaminathan in July, 2004, to review and make recommendations with regard to implementation and amendments if necessary, of Coastal Regulation Zone Notification, 1991.

a) 1 b) Both

c) 2 d) None

24. Which of the following are correct

1) "Bioremediation" is a technique for environmental detoxification through microorganisms that break down dangerous organic waste and turn it into less harmful compounds

2) A Mexican architect, Hector Ceballos Lascurian, first conceptualized the concept of eco-tourism in 1983.

a) 1 b) 2

c) Both d) None

25. Which of the following are correct

1) Agricultural and Processed Food Products Export Development Authority (APEDA) came into existence in 1986;

2) It acts as local point for agricultural exports and concentrates on marketing of processed foods in value added form

a) Both b) None

c) 1 d) 2

26. Which of the following are correct

1) Marine Product Export Development Authority Cochin: It is a statutory body set up in August 1972

2) It is responsible for the development of marine products industry with special reference to exports.

a) 1 b) 2

c) Both d) None

27. Which of the following are incorrect

1) Sunderbans is a delta located in Ganges& Brahmaputra river system(West Bengal).

2) Gulf of Mannar is a part of Gulf between India and Sri Lanka (TamilNadu).

3) Similipal is a Part of Mayurbhanj district (Orissa).

a) 1, 2 b) 2, 3

c) All d) None

28. Which of the following animals is protected in Kaziranga Sanctuary of Assam

a) Indian bison

b) Indian lion

c) Indian rhinoceros

d) Indian elephant

29. Which of the following is not done in a wildlife sanctuary ?

a) fauna is conserved

b) flora is conserved

c) soil and flora is utilized

d) hunting is prohibited

30. First national park developed in India is

a) Gir

b) Kaziranga

c) Jim Corbett

d) None of these

31. Which one of the following pairs of geographical areas show maximum biodiversity in our country

a) Sunderbans and Rann of Kutch

b) Eastern ghats and West Bengal

c) Eastern himalaya and Western ghat

d) Kerala and Punjab

32. Genetic diversity in agricultural crops is threatened by

a) introduction of high yielding varieties

b) intensive use of fertilizers

c) extensive intercropping

d) intensive use of biopesticides

33. Which of the following is considered a hot-spot of biodiversity in India

a) Aravali hills

b) Western Ghats

c) Indo-gangetic Plain

d) Eastern Ghats

34. Biosphere reserves differ from national parks and wildlife sanctuaries because in the former

a) human beings are not allowed to enter

b) people are an integral part of the system

c) plants are paid greater attention than the animals

d) living organisms are brought from all over the world and preserved for posterity

35. The world biodiversity day is celebrated annually on

a) 5th June

b) 29th December

c) 22nd April

d) 16th September

36. Identify the odd combination of the habitat and the particular animal concerned. :

(a) Sunderbans.....Bengal Tiger

(b) Periyar.....Elephant

(c) Rann of Kutch.;.....Wild Ass

(d) Dachigam National Park.....Snow

37. Manas sanctuary is located at

a) Rajasthan b) Assam

c) Bihar d) Gujarat

38. Which one of the following is not included under in-situ conservation ?

a) national park

b) sanctuary

c) botanical garden

d) Biosphere reserve

39. Which of the following is correctly matched pair of an endangered animal and a national park ?

a) great Indian bustard : Keoladeo National Park

b) lion : Corbett National Park

c) rhinoceros: Kaziranga National Park

d) Wildass : Dudhwa National Park

40. If the Bengal tiger becomes extinct

a) Hyaenas and Wolves will become scarce

b) The wild areas will be safe for man and domestic animals

c) Its gene pool will be lost for ever

d) The population of beautiful animals like deers will get stabilized.

Answers

1.	(c)	2.	(b)	3.	(2)	4.	(d)	5.	(b)	6.	(b)	7.	(c)
8.	(a)	9.	(c)	10.	(b)	11.	(b)	12.	(c)	13.	(c)	14.	(c)
15.	(a)	16.	(a)	17.	(a)	18.	(a)	19.	(a)	20.	(a)	21.	(c)
22.	(d)	23.	(d)	24.	(c)	25.	(a)	26.	(c)	27.	(d)	28.	(c)
29.	(b)	30.	(c)	31.	(c)	32.	(c)	33.	(b)	34.	(b)	35.	(b)
36.	(d)	37.	(b)	38.	(c)	39.	(c)	40.	(c)				

AFRICA

Introduction

Area: 3,03,35,000 sq. km (20.4% of total area Madagascar and other islands of Africa)

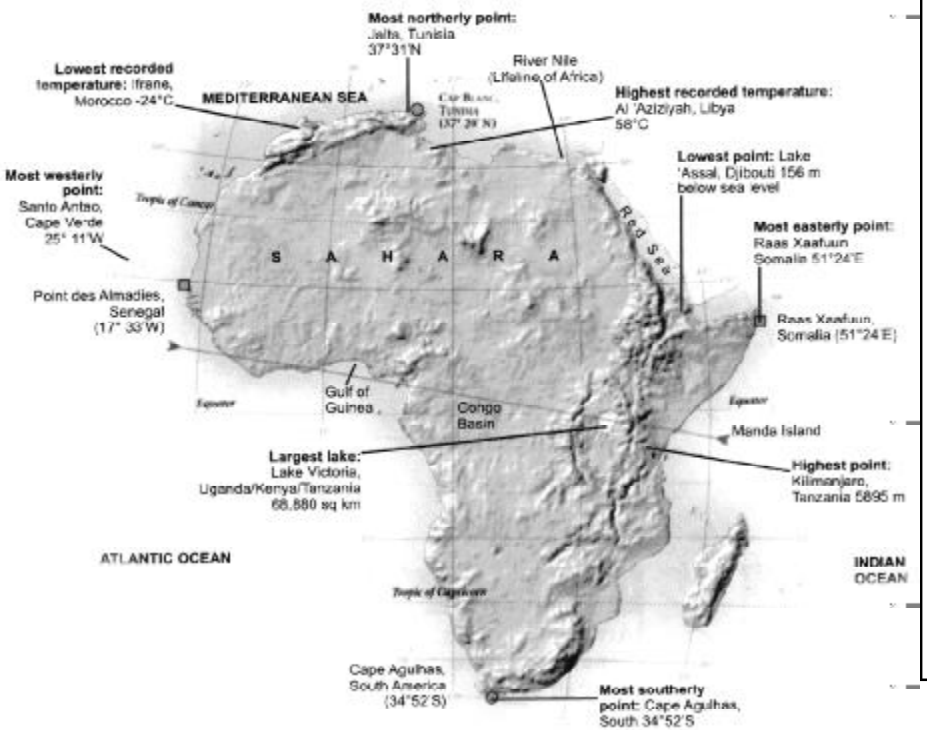
Population : 778.5 million

Latitude : $37^0$31'N to $34^0$52'S Longitude : $25^0$11'W to $51^0$24'E

Size : Second largest continent after Asia and nine times the size of India.

Africa is called as the *"Dark Continent'* because the greater part of its vast interior remained little known to the outside world until the last century.

Situation : Situated to the south of Europe and south west of Asia. It is bound by the Meditarranean Sea in the north, the Atlantic Ocean in the west and southwest, the Indian Ocean in the east and the Red Sea in the northest. Africa belongs to all the four hemispheres and bulk of the continent lies in tropics. It is joined to Asia by the narrow isthmus of Suez and separated from Eurasia at three diffirent points (*Strait of Gibraltar, Suez Canal and Strait of Bab-el-Mandeb*). The only continent which is crossed by Tropic of Cancer, Equator and Tropic of Capricorn.



PRINCIPAL COUNTRIES

Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameron, Cape Verde, Central African Republic, Chad, Comoros, Congo, Cote D'lvoire, Djibouti, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Nimibia, Niger, Nigeria, Rwanda, Sao Tome & Principle, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Congo, Zambia, Zimbabwe.

- Greatest extent, North-South : 7623 km
- Greatest extent, East-West : 7260 km

Important Seas / Ocean Channels around Africa

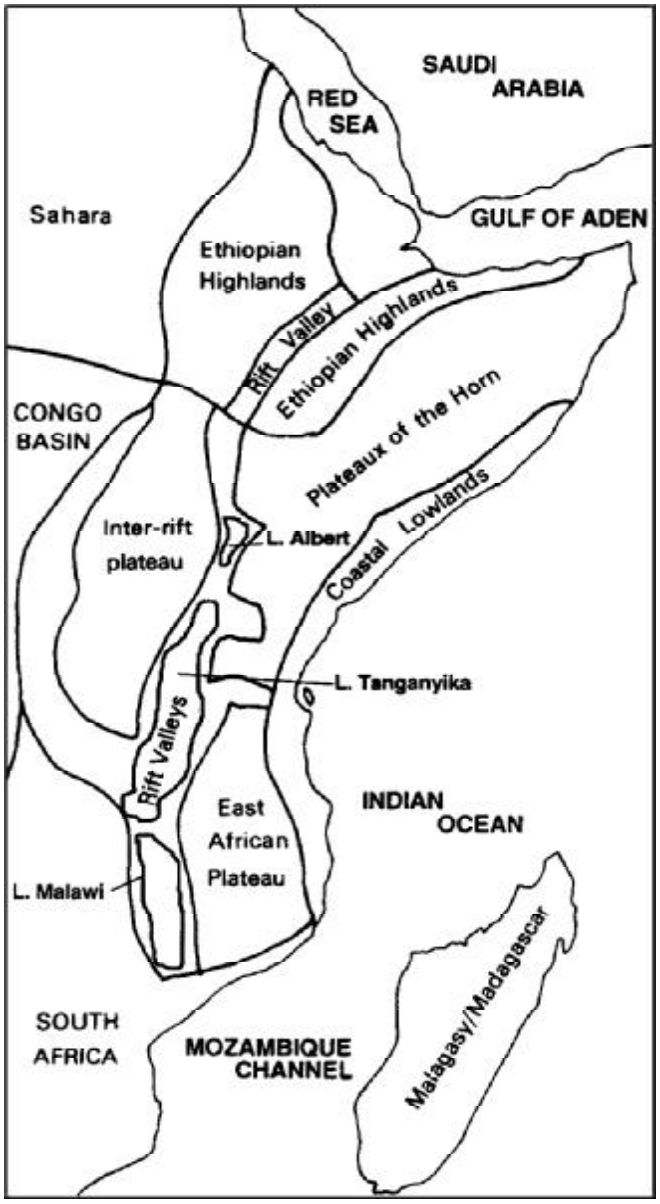
Name	Location	African Countries Along the Sea
Mediterranean Sea • It separates Africa from Europe. • Region around are known for its distinct climate.	North of Africa	Morocco, Algeria, Tunisia, Libya, Egypt.
Red Sea • It separates Africa from Asia.	North East of Africa	Egypt, Sudan, Eritrea and Djibouti.
Indian Ocean	East of Africa	Somalia, Kenya, Tanzania, Mozambiquei and South Africa
Atlantic ocean	West of Africa	Morocco, Western Sahara, Mauritania, Senegal, Gambia, Guinea Bissau, Guinea, Sierra Leone, and Liberia, Ivory Coast, Ghana, Togo, Benin, Nigeria, Camernoon, Equatorial Guniea, Gabon, Congo, Zaire, Angola, Namibia, South Africa.
Mozambique Channel	East of Mozambique	Mozambique (West) and Madagascar (East).

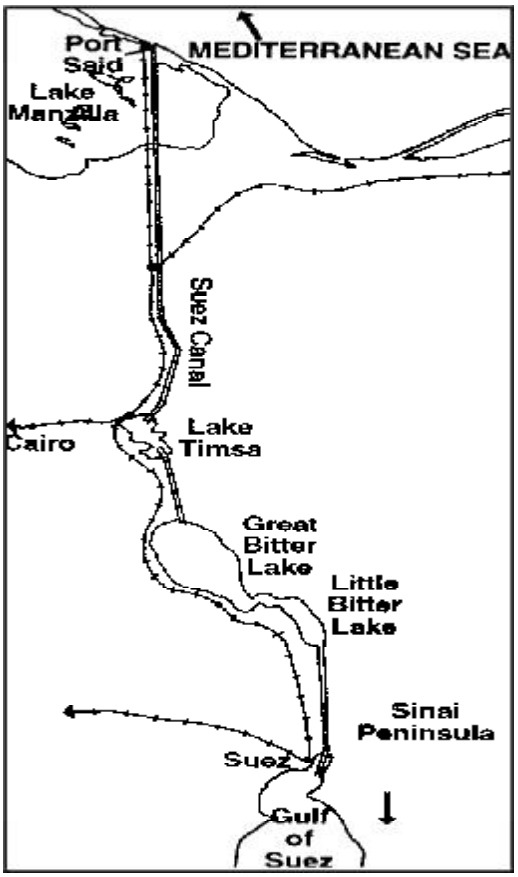
Important Gulfs and Bays

Name	Location
Gulf of Guinea	South of Ivory coast, Ghana, Togo, Benin, Nigeria, Cameroon and Equatorial Guinea in the Atlantic Ocean.
Walvis Bay	West of Namibia, Atlantic Ocean.
Maputo Bay	South East of Mozambique, Indian Ocean.

Important Straits

Name	Separates	Connects
Strait of Gibraltar	Europe from Africa	Mediterranean Sea with Atlantic Ocean.
Strait of Bab-el-Mandeb	Djibouti (Africa) from Yemen (Asia)	Red Sea with Gulf of Aden.
Coasts of Africa	Countries	
Grain Coast	Sierra Leone and Liberia	
Ivory Coast	Ivory Coast	
Gold Coast	Ghana	
Slave Coast	Togo, Benin and Nigeria.	





RIFT VALLEY OF AFRICA

- It stretches northwards through Zambia, Malawi (L. Nayasa), Tanzania (L. Tanganyika), Kenya and Ethiopia and extends along the Red sea to Israel and Jordan for about 5,000 km. Most of the lakes fill parts of rift valleys and therefore are long, narrow and deep.

SUEZ CANAL

- Connects the Mediterranean Sea with the Gulf of Suez and Red Sea across the low Isthmus of Suez.
- Total length of canal is 172 Km (107 miles.)
- Sea ports of Port Said on the Mediterranean and Suez on the Gulf of Suez are situated at the opposites ends of the canal.

Important Lakes

Name	Information
Lakes from South to North	
LakeKariba	• Southernmost lake which is located on the Zambezi River in Zambia. One of the biggest man-made lake where commercial fishing is done. • Largest producer of hydroelectricity in Africa.
Lake Nayasa (Lake Malawi)	• Rift valley lake, which lies along the Malawi, Mozambique, and Tanzania. • Third largest lake in Africa.
Lake Mweru	• A small lake which lies along the border of Democratic Republic of Congo (Zaire) and Zambia.
Lake Tanganyika	• Rift valley lake which lies along the Tanzania, Zaire and Zambia. • World's second deepest lake (1435 m) after Ozero, Baikal and also the second largest lake of Africa. • It lies 2500 m above sea level.
Lake Edward	• Located between Uganda and Democratic Republic of Congo.
Lake Victoria Area : 68,880 sq. km. Max. depth : 80 m.	• Largest lake of Africa which is located between Uganda, Keyna and Tanzania. • Source of White Nile River. • It does not lie in the rift valley. • A large lake through which equator pass. • World's third largest lake after Caspian Sea and Lake Superior. • It contains numerous islands coral reefs.
Lake Turkana (Lak Rudolf)	• Rift valley lake of Kenya.
Lake Tana	• Lake situated in the Ethiopian highlands. • Source of Blue Nile River.
Lake Nasser	• Lake lies on the River Nile. • Man-made lake, which is located between Egypt and sudan.
Lake Chad	• Largest lake (shallow fresh water lake) of Sahara in chad. • Actually an example of deflation hollow which is formed due to wind erosion. • A lake of inland drainage where the *Chari* River drains.
Lake Volta	• One of the largest man-made lakes on the *River* Volta in Ghana.
Lake Assal	• Located in Djibouti. • The lowest point in Africa.

Important Rivers

Nile

Source : Blue Nile : Lake Tana (Ethiopian Highlands)

White Nile : Lake Victoria

Outflow : Arcuate

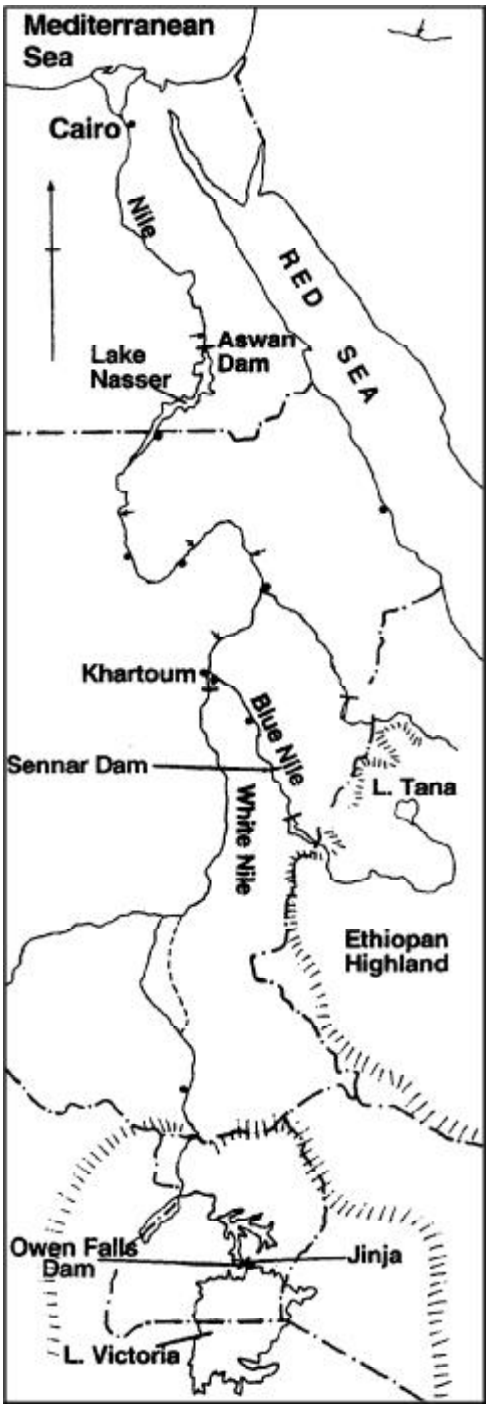
- The White and Blue Nile meet at Khartoum (Sudan) to form the Nile.
- Longest river in the world, life blood of Egypt.

Dams

(1) *Owen Dam* near the Owen falls, on the White Nile, where it leaves Lake Victoria.

(2) *Sennar Dam* on the Blue Nile in Sudan.

(3) *Aswan Dam* on the Nile in Egypt—Controls the flow of the greate river.



Zaire Or Congo

- Confluence of Lualoba and Luapula River.
- Joins the Atlantic Ocean near the port of Matadi.
- Carriers the largest amount of water among all the rivers of Africa.
- Navigable only in part because it has numerous waterfalls and rapids (small waterfalls).
- It cuts equator twice.
- The Kasai and the Oubangi are the main tributaries of Zaire.
- Half the world's supply of industrial diamonds comes from the alluvial deposits of the Kasai river.
- Stanley Fall and Living Stone Fall are on the Zaire River.
- Inga Dam is located on the Zaire River.
- Cities located : Brazzaville, Kinshasa, Matadi and Boma.
- Country's only outlet to the ocean.

NIGER RIVER

Source : Guinea

Outflow : Gulf of Guinea

- It starts in Sierra Leone flow north-east through guine and Mali turns south-eastwards, across West Nigeria to Lokoja where it is joined by its main tributary, the Benue.
- The third longest river in Africa.
- Port Harcourt of Nigeria is located on the Niger Delta.

ZAMBEZI RIVER

Source : Katanga Plateau

Outflow : Mozambique Channel (Indian Ocean

- Its original name in the local language means the smoke that thunders'.
- The Zambezi's course includes the spectactular Victoria falls, one of the largest in the world and Lake Kariba, Kariba Dam is built on it.
- Coborra Bassa Dam in Mozambique is also located on the Zambezi River.
- It is also a natural political boundary between Zambia and Zimbabwe.

ORANGE RIVER

Source : Drakensberg Mts. (Lesotho)

Outflow: Atlantic Ocean.

Tributary : Vaal

- Aughrabies Falls in located on the river.
- It forms a natural boundary between South Africa and Namibia.

LIMPOPO RIVER

Outflow: Indian Ocean.

- The Limpopo river cuts tropic of Capricorn.
- It separates South Africa from Botswana and Zimbabwe.

Important Mountains and Plateaus

Name	Information
Atlas Mountains Divided into five separate running to each other- (i) High (Haut) Atlas Mts. (ii) Anti-Atlas (iii) Middle Atlas (iv) Sahara Atlas (v) Maritime Atlas	• Highest peak- Jbel Toubkal (4165m) located in High Atlas Mountains. • Dominates in the rugged country of Morocco. • These mountains sweep across the centre from north east to south-west and rising 2,750 m in the Middle Atlas to over 4,000 m in the High Atlas and to the south the Anti-Atlas (the uplifted edge of the Saharan platform) reaches 2,000 m. • An example of fold mountain.
Ethiopian Highlands Highest peak : Ras Dashan (4,620 m) is the Africa's third highest peak.	• High plateau of volcanic origin. • The high plateau is split by the Great Rift vallyey along a a north east-southwest line. • Source of the Blue Nite River.
Mt. Kenya (5,200 m)	• Africa's second highest peak, volcanic in origin.
Mt. Elgon (4,210 m)	• Mighly peak of Kenya, lies on the Uganda border.
Mt. Kilimanjaro (5,895 m)	• Also known as Mount Kibo. • It stands alone, not apart of mountain range. • Africa's highest peak locatedin Tanzania. • An example of extinct volcanoes. • Coffee is grown on the slopes of Kilimanjaro. • Just 322 km from the equator, mountain peaks covered with perpetual snow throughout the year.
Drakensberg Scarpland	• High escarpment in Southeast Africa caused by lava flow. • An example of continental plateau, formed due to epierogenic (continental building) movement. • From the escarpment rim, the land slopes inwards down to the Kalahari desert in the north.
Mount Rouwenzori (5,109 m)	• Situated near the Lake Mobutu or Lake Albert in Zaire. • Known as the 'The Mountains of the Moon'.
Mount Cameroon (4,070 m)	• Only active volcanic mountain of Africa, dominates the coastline of Cameroon. • Known for iron ore deposits. • Wettest place in Africa along slopes of Mt. Cameroon.
Tibesti Massif (3,400 m)	• Desert Mountains which is situated in the south east of Sahara in Norhtern Chad.

Name	Information
Ahaggar Massif	• Desert mountains of Algeria.
Bomi and Nibas hills	• The main hills of Liberia, known for Iron ore deposits.
Katanga Plateau	• One of the largest copper and diamond producing region of Zaire.
Jos Plateau	• The northern half of Nigeria consists of undulating Jos Plateau which rises to over 1,500 m in the centre. • Tin is the main mineral of this region.
Mount Sinai	• Desert mountain of Egypt.
Sahara desert	• Lies between 15^0 top 30^0 N latitudes. • The largest stretch of desert, which is 5150 km from east to west and at least 1610 km in area. • *Erg:* Sandy desert of Sahara (9.1 sq. km) is undulating plain of sand, produced by wind deposition. • *Hamada:* Rocky desert of Sahara is bare rock surface formed by deflation. • Cities located in the desert fringe are *Zinder* (Niger), *Timbuktu* (Mali), *Kano* (Nigeria), and *Kumasi* (Ghana).
Libyan desert	• Vast arid land of north-east of Africa in Libya. • *Serir:* Stony desert of Libya is covered with boulders, angular pebbles and gravels which have been produced by high diurnal temperature range.
Arabian desert	• Arid region of North-East Egypt.
Nubian desert	• It is an extension of Sahara which occupies a third of the Sudan's territory in the north.
Namib desert	• A narrow, dune-covered desert belt, runs 1,600 km along the entire Atlantic Sea board of Namibia.
Kalahari desert	• Semi desert region of Botswana lies to the east of Namib desert. • Home of one of the Africa's oldest races, the Kalahari Bushmen.

Questions

1. Consider the following statements

i) Africa is the second largest continent after Asia and is ten times the size of India

ii) Also called as The Dark Continent

iii) It is the only continent that crosses the Tropic of Cancer, Equator and Tropic of Capricon.

Which of the above are correct?

a) i and ii b) ii and iii

c) i only d) i and iii

2. Consider the following statements

i) Africa is separated from Eurasia at three different points, Strait of Gibraltar, Suez Canal and strait of Bab-el- Mandel.

ii) It joins Asia by the narrow isthmus of Suez

Which of the above are incorrect?

a) Both i and ii b) I only

c) ii only d) none

3. Consider the following

i) Mediterranean Sea separates Africa from Asia

ii) Red Sea separates Africa from Europe.

iii) Mozambique Channel lies to the East of Mozambique.

Which of the above are incorrect?

a) i and ii b) ii and iii

c) I only d) ii only

4. Match the following

i)	Gulf of Guniea	a) West of Namibia
ii)	Walvis Bay	b) South East of Mozambique
iii)	Maputo	c) South of ivory coast

a) i- c, ii-a, iii-b

b) i-a, ii-b, iii-c

c) i-c, ii-b, iii-a

5. Consider the following

i) Strait of Gibraltar separates Europe from Africa

ii) Strait of Babel Mandel connects Red sea with Gulf of Aden

Which of the following are true?

a) i and ii b) I only

c) ii only d) none

6. Match the following

	Coast	Countries
i)	Grain Coast	a) Ivory coast
ii)	Ivory Coast	b) Togo, Benin, Nigeria
iii)	Gold Coast	c) Sierra Leone and Liberia
iv)	Slave coast	d) Ghana

a) i- b, ii- d, iii-a, iv-c

b) i-a, ii-b, iii-c, iv-d

c) i-c, ii-a, iii-d, iv-b

7. Consider the following

i) Lake Kariba is located on the Zambezi River

ii) It is the largest manmade lake where commercial fishing is done

iii) It is the largest producer of hydroelectricity in Africa

Which of the above are incorrect?

a) i and ii b) ii only

c) ii and iii d) none

8. Consider the following

i) Lake Nayasa is a Rift valley lake

ii) It is the second largest lake in Africa

Which of the above are true?

a) i only b) ii only

c) both d) none

9. Consider the following

i) Lake Tanganyika is the world's second deepest lake

ii) It is Africa's second largest lake

iii) It lies 2500 m above sea level

Which of the above are incorrect?

a) i and ii b) ii and iii

c) none of the above d) ii only

10. Consider the following

i) Lake Victoria is the largest lake of Africa

ii) It is the source of White Nile River

iii) It lies in the rift valley

Which of the above are correct?

a) i and ii b) ii and iii

c) iii only d) i only

11. A lake through which the equator passes

a) Lake Kariba b) Lake Tana

c) Lake Volta d) Lake Victoria

12. Which of the following is the source of Blue Nile River

a) Lake Tana b) Lake Nasser

c) Lake Chad d) Lake Victoria

13. Consider the following

i) Lake Chad is the largest shallow fresh water lake of Sahara

ii) An example of deflation hollow formed due to wind erosion

iii) Chad is a lake of inland drainage where the Chari river drains

Which of the above are correct?

a) ii and iii b) ii only

c) all of the above d) i only

14. Which of the following lake lies on the river Nile

a) Lake Edward b) Lake Tana

c) Lake Victoria d) Lake Nasser

15. Consider the following

i) The White and the Blue Nile meet at the Khartoum to form the Nile

ii) Nile is the Longest river in the world and also the life of Egypt.

Which of the above are true?

a) i and ii b) ii

c) i d) None

16. Match the following

River	Source
i) Niger	a) Guinea
ii) Zambezi	b) Katanga Plateau
iii) Orange	c) Drakensberg Mountains

a) i- a, ii- c, iii-b

b) i-b, ii-c, iii-a

c) i-a, ii-b, iii-c

17. Consider the following

i) The Aughrabies falls is located on the Orange River

ii) Vaal is the tributary of the orange river

iii) It froms a natural boundary between South Africa and Namibia

Which of the above are correct?

a) All of the above b) i and ii

c) ii and iii d) i and iii

18. The Limpopo river cuts the

a) Tropic of cancer

b) Tropic of Capricon

c) Equator

19. The Smoke that thunders is the name for

a) Limpopo river

b) Orange River

c) Niger River

d) Zambezi River

20. Consider the following

a) The Highest peak Jbel Toubkal is located in the Sahara Atlas

b) Atlas Mountains are an example of fold mountains

Which of the above are true?

a) a and b b) b only

c) a only d) None

21. Consider the following

a) Mount Kenya is also known as Mount Kibo

b) Mount Kilimanjaro is the highest peak located in Tanzania

c) Coffee is grown on the slopes of Kilimanjaro

Which of the above are incorrect?

a) i only b) i and ii

c) i and iii d) iii only

22. Consider the following

i) Drakensberg Scarpland is an example of continental plateau

ii) Mount Rouwenzori is known as the Mountains of the Moon

iii) Mount Cameroon is the only active volcanic mountain of Africa

Which of the above are correct?

a) All of the above (b) None of the above

c) i and ii (d) ii and iii

23. Consider the following

i) Erg is the Sandy desert of Sahara

ii) Hamada is the rocky desert of Sahara

iii) Mount Sinai is the desert mountain of Egypt.

Which of the above are true?

a) ii and iii b) i and iii

c) all of the above d) i and ii

24. Consider the following

i) Suez canal connects the Mediterranean sea with the Gulf of suez and Red Sea.

ii) Total length of the canal is 172 kms

Which of the above are incorrect?

a) Both i and ii b) None

c) i d) ii

25. Consider the following

i) Zaire is the confluence of Lualoba and Luapula river

ii) It cuts the equator twice

iii) Stanely fall, Living stone fall and Igna dam are located on the Zaire.

Which of the above are incorrect?

a) All of the above b) i and ii

c) ii and iii d) None

Answers

1.	(b)	2.	(d)	3.	(a)	4.	(a)	5.	(a)	6.	(c)	7.	(d)
8.	(a)	9.	(c)	10.	(a)	11.	(d)	12.	(a)	13.	(c)	14.	(d)
15.	(a)	16.	(c)	17.	(a)	18.	(b)	19.	(d)	20.	(a)	21.	(a)
22.	(a)	23.	(c)	24.	(b)	25.	(d)						