

COMPILATION FROM SHANKAR IAS ENVIRONMENT

PART-IV- AGRICULTURE & VARIOUS ORGANISATIONS (LAST PART)

CONTENTS

1. AGRICULTURE
2. ACTS AND POLICIES
3. INSTITUTION AND MEASURES
4. ENVIRONMENTAL ORGANISATIONS
5. INTERNATIONAL ENVIRONMENTAL CONVENTIONS
6. ENVIRONMENTAL ISSUES AND HEALTH EFFECTS

AGRICULTURE

- a broad term encompassing all aspects of crop production, livestock farming, fisheries, forestry etc.
- accounts for about 14.7% of the total export earnings and provide raw material to a large number of Industries.

Problems of Indian agriculture

- ✓ Fragmentation of land holding.
- ✓ Existence of small and marginal farmers
- ✓ Regional variation.
- ✓ Dependence of seasonal rainfall.
- ✓ Low productivity of land.
- ✓ Increasing of disguised unemployment
- ✓ Disorder in marketing of Agricultural products.
- ✓ Weak land reformation.

Revolution	Related with
➤ Green	Food grain Production
➤ Golden	Fruit Production
➤ Grey	Fertilizer Production
➤ Blue	Fish Production
➤ Black	Petroleum Production
➤ Pink	Prawn Production
➤ Round	Potato Production
➤ Red	Meat/Tomato Production
➤ Silver	Egg/Poultry Production
➤ White	Milk Production
➤ Yellow	Oil seeds Production

CROP AND ITS CLASSIFICATIONS:

Classification based on climate -

1. **Tropical:** Crops grow well in warm & hot climate. E.g. Rice, sugarcane, Jowar etc
2. **Temperate:** Crops grow well in COO1 climate. E.g. Wheat, Oats, Gram, Potato etc.

Classification Based on-growing-season:

1. Kharif/Rainy/Monsoon crops:

- ✓ crops grown in monsoon months from June to Oct-Nov,
- ✓ require warm, wet, weather at major period of crop growth,
- ✓ also required short day length for flowering.
- ✓ E.g. Cotton, Rice, Jowar, bajara.

2. Rabi/winter/cold seasons crops:

- ✓ The crops grown in winter season from Oct to March month.
- ✓ Crops grow well in cold and dry weather.
- ✓ Require longer day length for flowering.
- ✓ E.g. Wheat, gram, sunflower etc.

3. Summer/Zaid crops:

- ✓ crops grown in summer month from March to June.
- ✓ Require warm dry weather for major growth period and longer day length for flowering.

- ✓ E.g. Groundnuts, Watermelon, Pumpkins, Gourds.

Agronomic Classification of Crops :

1. Cereals

- cultivated grasses grown for their edible starchy grains.
- Larger grains **used as** staple food are cereals Rice, wheat, maize, barley and oats.
- **The important cereal of world RICE.**

2. Millets:

- ✓ **annual grasses of the group cereals. But they are grown in less area or less important area whose productivity and economics are also less important.**
- ✓ staple food of poor people. In India pearl millet is a staple food in Rajasthan
- ✓ It is based on area production and productivity and grain size.
- ✓ **Major millets-** Sorghum /Jowar/Cholam, Pearl Millet /Bajra/cumbu, Finger millet or ragi
- ✓ **Minor millets-** Fox tail millet / Thenai, Little millet / Samai, Common millet /Panivaraugu, Barnyard millet /Kudiraivali, Kodomillet / Varagu

Sugar Crops

- ✓ Juice extracted from stem used for jiggery or sugar
- ✓ Number of by products like Molasses, bagasse, pressmud
- ✓ Molasses used for alcohol and yeast formation
- ✓ Bagasse for paper making and fuel
- ✓ Pressmud used for soil amendment
- ✓ Trash (green leaf + dry foliage) — the waste is used for cattle feed
- ✓ Sugar beet =Tuber for extraction of sugar

Starch Crops or Tuber Crops

1. Potato
2. Tapioca or cassava
3. Sweet potato

Fibre Crops

- ✓ Epidermal hairs of seed coats is the economic portion
- ✓ Lint (cappas — seed) has industrial value (fibre)
- ✓ Stalk is of fuel nature, garment purpose Seed for cattle feed, Oil is edible

Cotton

- ✓ Gossypium arboreum (Karunganni)
- ✓ G. herbaceuth (uppam cotton)
- ✓ G. hirsutirm (American cotton or Cambodium cotton)
- ✓ G. barbadense (Egyptian cotton or Sea island cotton)

Stem Vibres

- ✓ Jute (channal), Mesta (pulicha keerai) , Sun hemp, SiSal hemp

Spices and Condiments

- ✓ Products of crop plants are used to flavour taste and sometime color the fresh preserved food.
- ✓ E.g. ginger,garlic,chili, cumin onion; coriander, cardamom, pepper, turmeric etc.
- ✓ **Medicinal & aromatic crops:** Medicinal plants includes cinchona, isabgali, opium poppy, senna, belladonna, rauwolfra, iycorice and
- ✓ **Aromatic plants** such as lemon grass, citronella grass, palmorsa, Japanese mint, peppermint, rose, jasmine, henna etc.

Classification based on No. of cotyledons:

- 1. Monocots or monocotyledons:** Having one cotyledon in the seed. E.g. all cereals & Millets.
- 2. Dicots or dicotyledonous:** Crops having two cotyledons in the seed. E.g. all legumes & pulses and almost all the trees.

Classification based on length of photoperiod required for floral initiation:

Most plants are influenced by relative length of the day & night, especially for floral initiation, the effect on plant is known as photoperiodism depending on the length of photoperiod required for floral initiation, plants are classified as

- ✓ **Short-day plants:** Flower initiation takes place when days are short less than ten hours. E.g. rice, Jowar, green gram, black gram etc.
 - ✓ **Long day's plants:** require long days are more than ten hours for floral initiation. E.g. Wheat, Barley, etc.
 - ✓ **Day neutral plants:** Photoperiod does not have much influence for phase change for these plants. E.g. Cotton, sunflower, etc.
1. **Zero tillage (No tillage):** In this, new crop is planted in the residues of the previous crop without any prior soil tillage or seed bed preparation and it is possible when all the weeds are controlled by the use of herbicides.

Advantages of Zero –tillage:

1. Zero tilled soils are homogenous in structure with more number of earthworms
2. Organic matter content increases due to less mineralization
3. Surface runoff is reduced due to presence of mulch

Disadvantages

1. Higher amount of nitrogen has to be applied for mineralization of organic matter in zero tillage
2. Perennial weeds may be a problem
3. High number of volunteer plants and build-up of pests

CROPPING:

Cropping intensity:

- ✓ Number of crops cultivated in a piece of land per annum is cropping intensity.
- ✓ In Punjab and Tamilnadu the cropping intensity is more than 100 percent i.e. around 140-145%. In Rajasthan the cropping intensity is less

Cropping pattern.

- ✓ The yearly sequence and spatial arrangement of crops and fallow on a given area is called cropping pattern

Multiple cropping system:

- ✓ Growing more than two crops in a piece of land in a year in orderly succession.
- ✓ **also called as intensive cropping.**
- ✓ used to intensify the production. It is possible only when assured resources are available (land, labour, capital and water).

Monoculture:

- ✓ Repetitive growing of the same sole crop in the same land.

Mono cropping:

- ✓ Continuous production of one and the same crop year after year or season season is called mono cropping.

Sole cropping:

- ✓ One crop variety grown alone in a pure stand at normal density

Relay cropping:

- ✓ Growing the succeeding crop when previous crop attains its maturity stage or sowing of the next crop immediately before the harvest of the standing crops. E.g. Paddy-Lucerne, Rice-Cauliflower-Onion-summer gourds.

Intercropping

- Growing two or more crops simultaneously with distinct row arrangement on the same field at the same time.

Base crop:

- ✓ primary crop which is planted/ sown at its optimum sole crop population in an intercropping situation.

Intercrop:

- ✓ This is a second crop planted in between rows of base crop with a view to obtain extra yields ,with intercrop without compromise in the main crop yields.
Ex: Maize + Cowpea; Sorghum + Red gram; Groundnut + Red gram; Potato + Mustard ;Wheat + Mustard

Synergistic Cropping-

- ✓ Yields of both crops are higher than of their pure crops on unit area basis
Ex: Sugarcane + Potato Multi

Mixed cropping

- ✓ Growing of two Or more crops' simultaneously intermingled without row arrangement is
- ✓ known as mixed-cropping
- ✓ It is a common practice in most of dryland tracts in India
- ✓ Seeds of different crops are mixed in certain proportion and are sown
- ✓ Ex: Sorghum, Bajra and cowpea are mixed and broadcasted in rainfed conditions (with low rainfall situations) to avoid complete crop failures and with ascertaining the minimum yields

Dryland farming:

- ✓ is the practice of crop production entirely depending upon rainfall and the moisture conserved in the soil.
- ✓ This is practiced in areas where annual rainfall is less than 750mm. The crops may face moisture stress frequently due to erratic distribution or failure of monsoon

Rain fed farming

- Crop production in areas where rainfall is more than 750mm (i.e assured rainfall areas). Here moisture stress will be minimum. Soil conservation is given more importance.

ELEMENTS REQUIRED IN PLANT GROWTH:

1. Macro nutrients: Based on the relative abundance in plants, viz.,

- Nitrogen (N); Phosphorous (P), Potassium (K), Sulfur (S), Calcium (Ca) and Magnesium (Mg)

2. Micronutrients:

- ✓ Their concentration is very small. They are also referred to as minor elements.
- ✓ Iron (Fe); Zinc (Zn); Manganese (Mg),Copper (Cu),Boron (B), Chlorine (Cl) and Molybdenum (Mo) .In some plants, other than the above, Sodium (Na), Cobalt (Co), Vanadium (Va), Nickel (Ni) and Silicon (Si) are considered as essential micronutrients

Nitrogen (N)

- ✓ N is an essential constituent of proteins and is present in many other compounds of greatly physiological importance in plant metabolism
- ✓ N is an integral part of chlorophyll, which is primary observer of light energy needed for photosynthesis.
- ✓ N also imparts vigorous vegetative growth and dark green colour to plants.

Phosphorus (P)

- ✓ is an essential part of the enzymes which help the crop to fix light energy.

- ✓ It forms an integral part of nucleic acids, the carriers of genetic information, and is important in stimulating root growth

Potassium (K):

- ✓ is involved in processes which ensure carbon assimilation and the transportation of photosynthates throughout the plant for growth and the storage of sugars and proteins.
- ✓ The potassium ion is also important for water regulation and uptake.
- ✓ Furthermore, the presence of potassium in sufficient amounts ensures resistance to frost, drought and certain diseases

Magnesium

- occurs in chlorophyll and is also an activator of enzymes,

Sulphur-

- forms part of two essential amino acids which are among the many building blocks of protein. It is also found in vitamin B1 and in several important enzymes.

Calcium

- is required for plant growth, cell division and enlargement.
- The growth of root and shoot tips and storage organs is also

Concentrated organic manures

Oil cakes

- There are many varieties of oil cakes which contain not only nitrogen but also some P and K along with large percentage of organic matter. These oil cakes are of two types.
 - i. Edible oil cakes- suitable for feeding cattle.
 - ii. Non-edible oil cakes-not suitable for feeding cattle.
- Oil cakes are quick acting organic manure. Though they are insoluble in water, their nitrogen becomes quickly available to plants in about a week or in 10 days after application.

Integrated Nutrient Management (INM)

- Judicious combination of organic, inorganic and biofertilizers which replenishes the soil nutrients which are removed by the crops is referred to as Integrated Nutrient Management system

Genetically modified crops (GM crops, or biotech crops)

- are plants, the DNA of which has been modified using genetic engineering techniques, which are then used in agriculture.

Watershed Management

- A watershed is an area of land and water bounded by a drainage divide within which the surface runoff collects and flows out of the watershed through a single outlet into a larger river (or) lake.

SOIL:

Soil profile:

- ✓ The vertical section of the soil showing the various layers from the surface to the unaffected parent material is known as a soil profile. The various layers are known as horizons.
- ✓ There are 5 master horizons in the soil profile. Not all soil profiles contain all 5 horizons; and so, soil profiles differ from one location to another.

Loam:



- ✓ A type of soil texture with good water holding capacity and drainage suitable for cultivation of variety of crops.

Soil structure:

- ✓ The arrangement and organization of primary and secondary particles in a soil mass is known as soil structure

Acid soils

- Acid soils are characteristically low in pH (< 6.0). Predominance of H^+ and Al^{3+} cause acidity resulting in deficiency of P, K, Ca, Mg, Mo and B.


Laterization:

- The term laterite is derived from the word later meaning brick or tile and was originally applied to a group of high clay Indian soils found in Malabar hills of Kerala, Tamil Nadu, Karnataka and Maharashtra.
- Laterization is the process that removes silica, instead of sesquioxides from the upper layers and thereby leaving sesquioxides to concentrate in the solum

System of Rice Intensification (SRI) -

- ✓ Emerged in the 1980's as a synthesis of **locally advantageous** rice production- practices encountered in Madagascar by Fr Henri de **Laulanie**
- ✓ A combination of several practices those include changes in nursery management, time of transplanting, water and weed management.
- ✓ It emphasizes altering of certain agronomic practices of the conventional way of rice cultivation. All these new practices are together known as System of Rice Intensification (SRI).
- ✓ Principle - 'More with Less'
- ✓ SRI is not a fixed package of technical specifications, **but a system of production with four main components**, viz., soil fertility management, planting method, weed control and water (irrigation) management.
- ✓ Rice yield increased with less water and with reduction in chemical inputs

Sustainable Sugarcane Initiative (SSI)

- an innovative set of agronomic practices that involves using less seeds, raising seeds in a nursery, and following new planting methods, with wider seed spacing, and better water and nutrient management to increase the cane yields significantly.
- SSI methods can increase sugarcane yields by at least 20% with 30% less water and a 25% reduction in chemical inputs.
- The SSI method of sugarcane cultivation was evolved from the principles of **'More with Less'** followed in SRI (System of Rice Intensification) and introduced in India by the WWF-ICRISAT collaborative project in 2009. 

ACT AND POLICIES

- ✓ On 5th June 1972, environment was first discussed as an item of international agenda in the U.N. Conference of Human. There for 5th June is celebrated all over the world as World Environment Day.
- ✓ The Wildlife (Protection) Act was passed in 1972, followed by the Water (Prevention and Control of Pollution) Act 1974, the Forest (Conservation) Act, 1980, Air (Prevention and Control of Pollution) Act, 1981 and subsequently the Environment (Protection) Act, 1986.

Constitutional Provisions

- ✓ though the 42nd amendment
- ✓ Article-48-A of the constitution provides:
- ✓ "The state shall endeavour to protect and improve the environment and to safeguard forest and wildlife of the country

Article 51-A (g) Provides:

- ✓ It shall be duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures.

The Wildlife (Protection) Act of 1972

- ✓ Provides the basic framework to ensure the protection and management of wildlife.
- ✓ has 7 Chapters, 66 Sections and 6 Schedules. The Act with its various amendments provides the necessary tool to prevent damage to the wildlife.
- ✓ With the amendment of the Act in 1991, powers of the State Governments have been withdrawn almost totally.
- ✓ Now the State Governments are not empowered to declare any wild animal a vermin.
- ✓ Further by addition of provision, immunization of livestock within a radius of 5 km from a National Park or sanctuary has been made compulsory

ENVIRONMENT (PROTECTION) ACT, 1986

- ✓ a more effective and bold measure to fight the problem of pollution.
- ✓ The genesis of the Environmental (Protection) Act, 1986, is in Article 48A (Directive Principles of State Policy) and Article 51A (g) (Fundamental Duties) of the Indian Constitution.
- ✓ The Environment (Protection) Act, 1986 has 26 Sections and it has been divided into four chapters relating to i) Preliminary, ii) General Powers of the Central Government, iii) Prevention, Control, and Abatement of Environmental Pollution, iv) Miscellaneous.
- ✓ The minimum penalty for contravention or violation of any provision of the law is an imprisonment for a term which may extend to five years or fine up to one lakh rupees, or both.
- ✓ The Act prescribes a special procedure for handling hazardous substances.
- ✓ Act, 1986 has relaxed the rule of "Locus Standi" and because of such relaxation even a common citizen can approach the Court provided he has given a notice of sixty days of the alleged offence and his intention to make a complaint

NATIONAL FOREST POLICY-1988

- The principal aim is to ensure environmental stability and maintenance of ecological balance including atmospheric equilibrium which are vital for sustenance of all life forms, human, animal and plant.
- Conserving the natural heritage of the country by preserving the remaining natural forests with the vast variety of flora and fauna, which represent the remarkable biological diversity and genetic resources of the country.
- Checking soil erosion and denudation in the catchments areas of rivers, lakes, reservoirs
- Checking the extension of sand-dunes in the desert areas of Rajasthan and along the coastal tracts.
- Increasing substantially the forest/tree cover in the country and Increasing the productivity of forests to meet essential national needs
- Creating a massive people's movement with, the involvement of women, for achieving these objectives and to minimise pressure on existing forests

BIOLOGICAL DIVERSITY ACT, 2002

- It was born out of India's attempt to realize the objectives enshrined in the United Nations Convention on Biological Diversity (CBD) 1992
- An Act to provide for conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental thereto.
- three-tier structure to regulate access to the biological resources, comprising of National Biodiversity Authority (NBA), State Biodiversity Boards (SBB) and Biodiversity Management Committees (BMC) at the local level

THE SCHEDULED "TRIBES AND OTHER TRADITIONAL FOREST DWELLERS (RECOGNITION OF FOREST RIGHTS) ACT, 2006

- provides for the restitution of deprived forest rights across India, including both **individual rights** to cultivated land in forestland and **community rights** over common property resources.
- The Act is significant as it provides scope and historic opportunity of integrating conservation and livelihood rights of the people.

FRA is a potential tool

- To empower and strengthen the local self governance
- To address the livelihood security of the people
- To address the issues of Conservation and management of the Natural Resources and conservation governance of India.

- **Nodal Agency for the implementation is MoTA**
- **The maximum limit of the recognizing rights on forest land is 4 ha.**
- **National Parks and Sanctuaries have been included along with Reserve Forest, Protected Forests for the recognition of Rights.**
- The Act recognizes the right of ownership access to collect, use, and dispose of minor forest produce which has been traditionally collected within or outside village boundaries.
- term **"minor forest produce" to include all non-timber forest produce of plant origin**, including bamboo, brush wood, stumps, cane, tussar, cocoons, honey, wax, lac, tendu or kendu leaves, medicinal plants and herbs, roots, tubers and the like.
- diversion of forest land for the purpose of schools, hospitals, anganwadis, drinking water supply and water pipelines, roads, electric and telecommunication lines, etc.
- **The rights conferred under the Act shall be heritable but not alienable or transferable**
- **Gram Sabha has been designated as the competent authority**

COASTAL REGULATION ZONE (CRZ)

- The coastal stretches of seas, bays, estuaries, creeks, rivers and back waters which are influenced by tidal action up to 500 meters from the High Tide Line (HTL) and the land between the Low Tide Line (LTL) and the HTL are declared "Coastal Regulation Zone" (CRZ), on 19.2.1991.
- National Coastal Zone Management Authority (NCZMA) and State Coastal Zone Management Authority (SCZIVIA) for enforcement and monitoring of the CRZ Notification.
- Classification Criteria and Regulatory Norms:
- The coastal regulation zone has been classified for the purpose of regulation of the permitted activities.

CRZ-I:

- Ecological sensitive area and the area between High Tide Line (HTL) and Low Tide Line (LTL).
- No new construction is permitted except for a few specified most essential activities like support activities for Atomic Energy Plants and Defense requirements, facilities required for disposal of treated effluents and other port related water front activities

CRZ-2:

- The area that have been developed up to or close to the shore line which includes the designated urban areas that are substantially built up.
- Buildings permitted only on the landward side of the existing road (or roads approved in the coastal zone Management Plan of the area) or on the landward side of the existing authorized structures as defined in the notification

CRZ-III:

- The areas that are relatively undisturbed and those which do not belong to either CRZ-I or CRZ-II which includes mainly the rural area and those not substantially built up within designated urban areas.
- The area up to 200 meters from HTL is earmarked as "No Development Zone".

- No construction is permitted within this zone except for repairs to the existing authorized, structures without exceeding existing FSI, plinth area and density.
- Development of vacant plots between 200 and 500 meters of HTL is permitted in CRZ III for the purpose of construction of dwelling units and hotels/beach resorts subject to certain conditions

CRZ-IV:

- No untreated sewage effluents, ballast water, ship washes, fly-ash or solid waste from all activities including from aquaculture operations shall be let off or dumped.
- A comprehensive plan for treatment of sewage generating from the coastal towns and cities shall be formulated within a period of one year in consultation with stakeholders including traditional coastal communities, traditional fisher folk and implemented;
- Pollution from oil and gas exploration and drilling, mining, boat house and shipping;
- There shall be no restriction on the traditional fishing and allied activities undertaken by local communities.

WETLANDS (CONSERVATION AND MANAGEMENT) RULES 2010

- The Ministry of Environment and Forests has notified the Wetlands (Conservation and Management) Rules 2010 in Order to ensure that there is no further degradation of wetlands.
- The rules specify activities which are harmful to wetlands.
- Central Wetland Regulatory Authority has been set up to ensure proper implementation of the Rules and perform all functions for management of wetlands in India.

NATIONAL GREEN TRIBUNAL (NGT)

- The National Green Tribunal Act, 2010 is a Act of the Parliament of India which enables creation of a special tribunal to handle the expeditious disposal of the cases pertaining to environmental issues. It was enacted under India's constitutional provision of Article 21, which assures the citizens of India the right to a healthy environment.
- India is third country in the world to full-fledged green tribunal followed by New-Zealand and Australia.
- NGT is mandated to dispose the cases within six months of their respective appeals.
- 10 expert members and 10 judicial members although the act allows for up to 20 of each.
- The Chairman of the tribunal is required to be a serving or retired Chief Justice of a High Court or a judge of the Supreme Court of India
- Members are chosen by a selection committee (headed by a sitting judge of the Supreme Court of India) that reviews their applications and conducts interviews. The Judicial members are chosen from applicants who are serving or retired judges of High Courts.

THE OZONE DEPLETING SUBSTANCES RULES

- The Ozone Depleting Substances (Regulation and Control) Rules, 2000 under the Environment (Protection) Act, in July 2000
- These Rules set the deadlines for phasing out of various ODSs, besides regulating production, trade import and export of ODSs and the product containing ODS.
- These Rules prohibit the use of CFCs in manufacturing various products beyond 1st January 2003 except in metered dose inhaler and for other medical purposes.
- use of halons is prohibited after 1st January 2001 except for essential use.
- Other ODSs such as carbon tetrachloride and methylchloroform and CFC for metered dose inhalers can be used upto 1st January 2010.
- Further, the use of methyl bromide has been allowed upto 1st January 2015.
- Since HCFCs are used as interim substitute to replace CFC, these are allowed upto 1st January 2040.

INSTITUTIONS AND MEASURES

NATIONAL WILDLIFE ACTION PLAN

- The first National Wildlife Action Plan (NWAP) was adopted in 1983

- The plan had outlined the strategies and action points for wildlife conservation
- The first National Wildlife Action Plan (NWAP) of 1983 has been revised and the new Wildlife Action Plan (2002-2016) has been adopted.
- **Strengthening and Enhancing the Protected Area Network**
- Effective Management of Protected Areas'
- Conservation of Wild and Endangered Species and Their Habitats
- Restoration of Degraded Habitats outside Protected Areas
- Control of Poaching, Taxidermy and Illegal Trade in Wild Animal and Plant Species
- Monitoring and Research
- Ensuring Peoples' Participation in Wildlife Conservation
- Conservation Awareness and Education X Wildlife Tourism
- Domestic Legislation and International Conventions
- Enhancing Financial Allocation for Ensuring Sustained Fund Flow to the Wildlife Sector
- Integration of National Wildlife Action Plan with Other Sectoral Programmes

NATIONAL AFFORESTATION AND ECO-DEVELOPMENT BOARD


- The Ministry of Environment and Forests
- August 1992
- evolved specific schemes for promoting afforestation and management strategies,

National Afforestation Programme

- Launched in 2002, which involves plantation in degraded forests of the country
- **NAFP is a flagship programme of National Afforestation and Eco-development Board (NAEB)**
- **provides physical and capacity building support to the Forest Development Agencies (FDAs), which are the implementing agencies.**

COMPENSATORY AFFORESTATION FUND MANAGEMENT AND PLANNING

AUTHORITY (CAMPA)

- **In April 2004,** the central government, under the orders of the Supreme Court, constituted (CAMPA) for the management of money towards compensatory afforestation, and other money recoverable, in compliance of the conditions stipulated by the central government and in accordance with the Forest (Conservation) Act
- These remittances relate to Compensatory Afforestation (CA), Additional Compensatory Afforestation (ACA), Penal Compensatory Afforestation (PCA), Catchment Area Treatment (CAT) Plan, Protected Area Management and Net Present Value (NPV) etc.
- the Supreme Court order, a sum of Rs.1000 crores per year, for the 5 years, shall be released to the State
-  CAMPAs in proportion of **10%** of the principal amount deposited by the States/Union Territories in Ad-hoc CAMPA.

JOINT FOREST MANAGEMENT (JFM)

- an initiative to institutionalize participatory governance of country's forest resources by involving the local communities living close to the forest.
- a co-management institution to develop partnerships between forest fringe communities and the Forest Department (FD) on the basis of mutual trust and jointly defined roles and responsibilities with regard to forest protection and regeneration.
- started in consonance with the **National Forest Policy 1988**
- Most of the states in India have adopted JFM
- Under JFM, both forest departments and local communities come to an agreement to form the committee to manage and protect forests by sharing the costs and benefits.
- One of the key objectives is the rehabilitation of degraded forestlands with people's participation involving Forest Protection Committees
- win-win situation for both forest departments as well as the local communities in terms of greater access to minor forest produces from these regenerated forests.

SOCIAL FORESTRY





The National Commission on Agriculture, Government of India, first used the term 'social forestry' in 1976.

- It was then that India embarked upon a social forestry project with the aim of taking the pressure off the forests and making use of all unused and fallow land.
- Government forest areas that are close to human settlement and have been degraded over the years due to human activities needed to be afforested.
- Trees were to be planted in and around agricultural fields. Plantation of trees along railway lines and roadsides, and river and canal banks were carried out. They were planted in village common land, Government wasteland and Panchayat land.
- aims at raising plantations by the common man so as to meet the growing demand for food, fuel wood, fodder, fiber and fertilizer (5 F's) etc, thereby reducing the pressure on the traditional forest area.
- the government formally recognised the local communities' rights to forest resources, and encouraged rural participation in the management of natural resources.
- Farm forestry, Community forestry, Extension forestry (Planting of trees on the sides of roads, canals and railways, along with planting on wastelands), Recreational forestry

NATIONAL BAMBOO MISSION

- a Centrally Sponsored Scheme with 100% contribution from Central Government. It is being implemented by the Horticulture Division under Department of Agriculture and Co-operation in the Ministry of Agriculture, New Delhi
- Bamboo Mission envisages integration of different Ministries/Departments and involvement of local people/initiatives for the holistic development of bamboo sector in terms of growth of bamboo through increase in -area coverage, enhanced yields and scientific management, marketing of bamboo and bamboo based handicrafts, generation of employment opportunities etc.
- Set up National, State and sub-State level structures, to ensure adequate returns for the produce of the farmers and eliminate middlemen, to the extent possible

COMPREHENSIVE ENVIRONMENTAL POLLUTION INDEX (CEPI)

- is a rational number to characterize the environmental quality at a given location following the algorithm of source, pathway, receptor and various parameters like pollutant concentration, impact on human health and level of exposure have been taken into consideration for the calculation of pollution indices for air, water and land
- The present. CEPI is intended to act as an early warning tool.
- It can-help in categorizing the industrial clusters in terms of priority of planning needs for interventions
- The Central and state Pollution Control Board, in collaboration with IIT, Delhi has applied the CEPI
- 43 such industrial clusters having CEPI greater than 70, on a scale of 0 to 100, have been identified as critically polluted

LIGHTING A BILLION LIVES (LABL)

- a campaign by TERI that promotes the use of solar lanterns specially designed and manufactured on a decentralized basis.
- has been able to engage with government interventions under Sarva Shiksha Abhiyan, Madhya Pradesh Rural Livelihood Project, Rasthriya Gramin Vikas Nidhi, and has facilitated the spread of mobile telephony with support from Department of Telecommunications, Government of India.
- successfully engaged the private sector and leveraged Corporate Social Responsibility
- initiative has the potential to contribute towards the realization of the Millennium Development Goals (MDGs) by improving energy access for the rural poor
- Formation of more than 100 women-led Self Help Groups (SHGs), and strengthening of
- around 150 SHGs are among the impacts of this initiative
- The campaign has demonstrated how Public- Private-People partnerships can support rural development schemes, particularly in the areas of health, education, environment and women's empowerment

ECO MARK

- labeling of environment friendly products to provide accreditation and labelling ' for household and other consumer products which meet certain environmental criteria along with quality requirements of the Bureau of Indian Standards for that product.
- Objective - to recognize good environmental performance as well as improvements in performance of the unit
- Any product, which is made, used or disposed of in a way that significantly reduces the harm to environment, could be considered as 'Environment Friendly Product'

URBAN SERVICES ENVIRONMENTAL RATING SYSTEM (USERS)

- Project funded by UNDP executed by Ministry of Environment and Forests and implemented by TEM.
- Aim - to develop an analytical tool to measure the performance, with respect to delivery of basic services in local bodies of Delhi and Kanpur. (identified as pilot cities).
- Performance measurement (PM) tool was developed through a set of performance measurement indicators that are benchmarked against set targets using the inputs-outputs efficiency outcomes framework.

BIODIVERSITY CONSERVATION & RURAL LIVELIHOOD IMPROVEMENT PROJECT (BCRLIP)

- Aim - conserving Biodiversity in **selected landscapes**, including wildlife protected areas/ critical conservation areas while improving rural livelihoods through participatory approaches.
- Development of Joint Forest Management (JFM) and eco-development
- **The Project would be implemented as a Centrally Sponsored Scheme with five financiers (IDA loan, GEF grant, contributions from Government of India, State Governments and beneficiaries), amounting to around Rs. 137.35 crores, and spread over six years.**

NATIONAL CLEAN ENERGY FUND

- **'National Clean Energy Fund' (NCEF) was constituted in the public account of India in the Finance Bill 2010-11.**
- **Objective - to invest in entrepreneurial ventures and research & innovative projects in the field of clean energy technology.**
- The Central Board of Excise and Customs consequently notified the Clean Energy Cess Rules 2010 under which producers of specified goods namely raw coal, raw lignite and raw peat were made liable to pay **Clean Energy Cess.**
- Any project with innovative methods to adopt to clean energy technology and research & development shall be eligible for funding under the NCEF.
- **Government assistance under the NCEF shall in no case exceed 40% of the total project cost.**
- The Indo-French Centre for the Promotion of Advanced Research (CEFIPRA) launched a multi-disciplinary Indo-French research project titled 'Adaptation of Irrigated Agriculture to Climate Change (AICHA).'
- The study aims at developing an integrated model for analysing the impact of climate change on ground water-irrigated agriculture in south India.
- Berambadi village and surrounding areas in Hangla hobli of Gundlupet taluk in Chamaraja nagar district have been selected for a field study under the project.
- The project would explore adaptation strategies based on innovative cropping systems and water resource management policies,
- The methodology will combine remote sensing, field surveys and advanced numerical analysis with hydrological, agronomical and economic modeling, and will pay particular attention to sustainability and acceptability issues.

NATIONAL MISSION FOR ELECTRIC MOBILITY

- to promote electric mobility and manufacturing of electric vehicles in India,
- The setting up of NCEM has been influenced by the following three factors:
- 1.Fast dwindling petroleum resources

- 2.Impact of vehicles on the environment and climate change
- 3.Worldwide shift of the automobile industry towards more efficient drive technologies and alternative fuels including electric vehicles
- The NCEM will be the apex body in the Government of India for making recommendations in these matters

SCIENCE EXPRESS - BIODIVERSITY SPECIAL (SEBS)

- an innovative mobile exhibition mounted on a specially designed 16 coach AC train, traveling across India from 5 June to 22 December 2012 (180 days) to create widespread awareness on the unique biodiversity of the country.
- SEBS is the fifth phase of the iconic and path-breaking Science Express.
- The SEBS is a unique collaborative initiative of Department of Science & Technology (DST) and Ministry of Environment & Forests (MoEF), Government of India.

ENVIRONMENT EDUCATION, AWARENESS & TRAINING (EEAT) SCHEME

- A Central Scheme launched during the 6th Five Year Plan in 1983-84

Objectives:

1. To promote environmental awareness among all sections of the society
2. To spread environment education, especially in the non-formal system.
3. To facilitate development of education/training materials and aids in the formal education sector.
4. To promote environment education through existing educational/scientific institutions.
5. To ensure training and manpower development for EEAT.
6. To encourage NGOs, mass media and other concerned organizations for promoting awareness about environmental issues.
7. To use different media (audio & visual) for spreading messages concerning environment and awareness and
8. To mobilize people's participation for preservation and conservation of environment.

NATIONAL ENVIRONMENT AWARENESS CAMPAIGN (NEAC)

- ✓ launched in 1986 with the objective of creating environmental awareness at the national level.
- ✓ It is a multi-media campaign which utilises conventional and non-conventional methods of communication for disseminating environmental messages.
- ✓ Under this campaign, nominal financial assistance is provided to registered NGOs, schools, colleges, universities, research institutions, women and youth organisations, army units, State Government Departments etc. from all over the country for organising/ conducting awareness raising activities.

ECO-CLUBS (NATIONAL GREEN CORPS)

- ✓ The main objectives of this programme are to educate children about their immediate environment and impart knowledge about the eco-systems, to mobilise youngsters by instilling in them the spirit of scientific inquiry into environmental problems and involving them in the efforts of environmental preservation.
- ✓ **Global Learning and Observations to Benefit the Environment (GLOBE)**
- ✓ The GLOBE is an International Science, and Education Programme, which stress on hands on participatory approach.
- ✓ **India joined this programme during the August, 2000.**
- ✓ **aimed at school children.**

MANGROVES FOR THE FUTURE



- ✓ a partnership-based initiative promoting investment in coastal ecosystems for sustainable development.
- ✓ to promote healthy coastal ecosystems through a partnership-based, people-focused, policy-relevant and investment-orientated approach, which builds and applies knowledge, empowers communities and other

stakeholders, enhances ' governance, secures livelihoods, and increases resilience to natural hazards and climate change.

- ✓ Member countries: India, Indonesia, Maldives, Pakistan, Seychelles, Sri Lanka, Thailand, VietNam.
- ✓ Outreach countries: Bangladesh, Cambodia, Myanmar, Timor-Leste.
- ✓ Dialogue countries: Kenya, Malaysia, Tanzania.

ORGANIZATIONS

THE ANIMAL WELFARE BOARD OF INDIA

- ✓ statutory advisory body on Animal Welfare Laws and promotes animal welfare in the country
- ✓ The Animal Welfare Board of India, the first of its kind to be established by any Government in the world, was set up in 1962, in accordance with Section 4 of the Prevention of Cruelty to Animals Acts 1960
- ✓ Shrimati Rukmini Devi Arundale pioneered the setting up of the Board, with its Headquarters at Chennai.

Functions

- ✓ To keep the law in force in India for the Prevention of Cruelty to Animals under constant study and to advise the government on the amendments to be undertaken in any such law from time to time.
- ✓ To advise the Central Government on the making of rules under the Act with a view to preventing unnecessary pain or suffering to animals generally, and more particularly when they are being transported from one place to another or when they are used as performing animals or when they are kept in captivity or confinement.
- ✓ To take all such steps as the Board may think fit for amelioration of animals by encouraging, or providing for the construction of sheds, water troughs and the like and by providing for veterinary assistance to animals.
- ✓ To advise the Government or any local authority or other person in the design of slaughter houses
- ✓ To take all such steps as the Board may think fit to ensure that unwanted animals are destroyed by local authorities
- ✓ To encourage by the grant of financial assistance or otherwise, the formation or establishment of pinjarapoles, rescue homes, animals sanctuaries and the like, where animals and birds may find a shelter when they have become old and useless or when they need protection.
- ✓ To advise the Government on matters relating to the medical care and attention which maybe provided in animal hospitals, and to give financial and other assistance to animal hospitals whenever the Board think it is necessary to do so.
- ✓ The Board consists of 28 Members. The term of office of Members is for a period of 3 years

CENTRAL ZOO AUTHORITY

- ✓ The amendment made to the Wild Life (Protection) Act in 1991 added a new chapter dealing with zoos to the Act and allowed for the Central Government to constitute an authority known as the Central Zoo Authority

Imp Functions

- ✓ To specify the minimum standards for housing, upkeep and veterinary care of animals kept in a zoo
- ✓ To identify endangered species of wild animals for purposes of captive breeding and assigning responsibility in this regard to a zoo
- ✓ To co-ordinate the acquisition, exchange and loaning of animals for breeding purposes
- ✓ To ensure maintenance of stud-books, of endangered species of wild animals bred in captivity
- ✓ To co-ordinate training of zoo personnel in India and abroad

THE NATIONAL BIODIVERSITY AUTHORITY OF INDIA — CHENNAI

- ✓ established in 2003 to implement India's Biological Diversity Act (2002).
- ✓ The NBA is a Statutory, Autonomous Body and

- ✓ it performs facilitative, regulatory and advisory function for the Government of India on issues of , conservation, sustainable use of biological resources- and fair and equitable sharing of benefits arising out of the use of biological resources.

Objectives of the NBA

- ✓ Anybody seeking any kind of intellectual, property rights on a research based upon biological resource or knowledge obtained from India has to obtain prior approval of the NBA.
- ✓ The NBA will impose benefit-sharing conditions.

Main functions:

- (1) The National biodiversity Authority may-
 - (a) advise the Central Government on matters relation into-the conservation of biodiversity, sustainable use of its components
 - (b) advise the State Governments in the selection of areas of biodiversity importance to be notified as heritage sites and measures for the management of such heritage sites;
- 2) The National Biodiversity Authority may, on behalf of the Central Government, take any measures necessary to oppose the grant of intellectual property rights in any country outside India on any biological resource obtained from India or knowledge associated with such biological resource which is derived from India.

WILDLIFE CRIME CONTROL BUREAU (WCCB)

- ✓ The Government of India constituted a statutory body, the Wildlife Crime Control Bureau on 6th June 2007, by amending the Wildlife (Protection) Act, 1972.
- ✓ The bureau would complement the efforts of the state governments, primary enforcers of the Wildlife (Protection) Act, 1972 and other enforcement agencies of the country.

Functions

- ✓ Collection, collation of intelligence and its dissemination and establishment of a centralized Wildlife Crime data bank;
- ✓ Co-ordination of actions by various enforcement authorities towards the implementation of the provisions of this Act.
- ✓ Implementation of obligations under the various international Conventions and protocols
- ✓ Assistance to concerned authorities in foreign countries and concerned international organizations to facilitate co-ordination and universal action for wildlife crime control;
- ✓ Development of infrastructure and capacity building for scientific and professional investigation;
- ✓ Advice the Government of India on issues relating to wildlife crimes having national and international ramifications, and suggest changes required in relevant policy and laws from time to time.

NATIONAL LAKE CONSERVATION PLAN (NLCP)

- ✓ Ministry of Environment and Forests
- ✓ for conservation and management of polluted and degraded lakes in urban and semi-urban areas through an integrated ecosystem approach.

Activities Covered Under NLCP

- ✓ Prevention of pollution from point sources by intercepting, diverting and treating the pollution loads entering the lake.
- ✓ In situ measures of lake cleaning such as de-silting, de-weeding, bioremediation, aeration, bio-manipulation, nutrient reduction, withdrawal of anoxic hypolimn ion, constructed wetland approach or any other successfully tested eco-technologies etc depending upon the site conditions.
- ✓ Lake front eco-development including public interface.
- ✓ Solid waste management & provision of dhobi ghats is generally not covered under NLCP.
- ✓ Prevention of pollution from non-point sources by providing low cost sanitation.

- ✓ Public awareness and public participation. Capacity building, training and research in the area of Lake Conservation.

NATIONAL GANGA RIVER BASIN AUTHORITY (NGRBA)

- ✓ NGRBA was constituted on February 2009 under the Environment (Protection) Act, 1986.
- ✓ The NGRBA is a planning, financing, monitoring and coordinating body of the centre and the states.
- ✓ The objective of the NGRBA is to ensure effective Abatement of pollution and conservation of the river Ganga by adopting a river basin approach for comprehensive planning and management.
- ✓ **The Authority has both regulatory and developmental functions.**
- ✓ Development of a river basin management plan;

WILDLIFE TRUST OF INDIA

- ✓ ➤ NGO founded: 1998
- ✓ ➤ Aim: To conserve nature, especially endangered species and threatened habitats, in partnership with communities and governments.

INTERNATIONAL CONVENTIONS

MAJOR ENVIRONMENT INTERNATIONAL CONVENTIONS:

Nature conservation

- ✓ 1. United Nations Conference On Environment And Development (UNCED)
- ✓ 2. Convention on Biological Diversity (CBD)
- ✓ 3. Ramsar Convention on Wetlands
- ✓ 4. Convention on International Trade in Endangered Species of Fauna and Flora (CITES)
- ✓ 5. The Wildlife Trade Monitoring Network (TRAFFIC)
- ✓ 6. Convention on the Conservation of Migratory Species (CMS)
- ✓ 7. Coalition Against Wildlife Trafficking (CAWT)
- ✓ 8. International Tropical Timber Organization (ITTC)
- ✓ 9. United Nations Forum on Forests (LTNFF)
- ✓ 10. International Union for Conservation of Nature and Natural Resources (IUCN)
- ✓ 11. Global Tiger Forum (GTF)

Hazardous material

- ✓ 12. Stockholm Convention
- ✓ 13. Basel Convention
- 14. Rotterdam Convention

Land

- ✓ 15. United Nations Convention to Combat Desertification (UNCCD)

Marine environment

- ✓ 16. International Whaling Commission (MC) Atmosphere
- ✓ 17. Vienna convention and Montreal Protocol
- ✓ 18. United Nations Framework Convention on Climate Change (UNFCCC)
- ✓ 19. Kyoto Protocol

United Nations Conference On Environment And Development (UNCED)

- ✓ Also known as the Rio Summit, Rio Conference, Earth Summit held in Rio de Janeiro in June 1992. The issues addressed included:
- ✓ Systematic scrutiny of patterns of production — particularly-the production of toxic components, such as lead in gasoline, or poisonous waste including radioactive chemicals
- ✓ Alternative sources of energy to replace the use of fossil fuels which are linked to global climate change
- ✓ New reliance on public transportation systems in order to reduce vehicle emissions, congestion in cities and the health problems caused by polluted air and smog

- ✓ The growing-scarcity of water

Rio Declaration on Environment and Development

- ✓ Agenda 21
- ✓ Forest Principles

Two important legally binding agreements

- ✓ 1. Convention on Biological Diversity
- ✓ 2. Framework Convention on Climate Change (UNFCCC).
- The Rio Declaration on Environment and The Rio Declaration consisted of 27 principles intended to guide future sustainable development around the world.

Agenda 21

- ✓ Agenda 21 is an action plan of the United Nations (UN) related to sustainable development
- ✓ It is a comprehensive blueprint of action to be taken globally, nationally and locally by organizations of the UN, governments, and major groups in every area in which humans directly affect the environment.
- ✓ The number 21 refers to an agenda for the 21st century.

Agenda 21 for culture

- ✓ During the first World Public Meeting on Culture, held in Porto Alegre, Brazil in 2002.
- ✓ The first document with worldwide mission that advocates establishing the groundwork of an undertaking by cities and local governments for cultural development.

Rio +20

- ✓ "Rio+20" is the short name for the United Nations Conference on Sustainable Development which took place in Rio de Janeiro, Brazil in June 2012 - twenty years after the landmark 1992 Earth Summit in Rio
- ✓ The official discussions focussed on two main themes:
 1. how to build a green economy to achieve sustainable development and lift people out of poverty; and
 2. how to improve international coordination for sustainable development.

Convention on Biological Diversity (CBD)

- CBD is a Legally binding Convention recognized for the first time, that the conservation of biological diversity is "a common concern of humankind" and is an integral part of the development process. The agreement covers all ecosystems, species, and genetic resources.

Objectives

- The conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

Cartagena Protocol on Biosafety to the Convention on Biological Diversity

- Biosafety refers to the need to protect human health and the environment from the possible adverse effects of the products of modern biotechnology.
- The Convention clearly recognizes these twin aspects of modern biotechnology.
 - 1. Access to and transfer of technologies
 - 2. Appropriate procedures to enhance the safety of biotechnology technologies
- The Protocol establishes procedures for regulating the import and export of LMOs from one country to another.

Nagoya—Kuala Lumpur Supplementary Protocol

- The Cartagena Protocol is reinforced by the Nagoya—Kuala Lumpur Supplementary Protocol on Liability and Redress.

- The Supplementary Protocol specifies response measures to be taken in the event of damage to biodiversity resulting from LMOs.

Biodiversity Target

- It was adopted in May 2002 during the sixth Conference of the Parties to the Convention on Biological Diversity.
- The Target aimed to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth'.

Strategic Plan For Biodiversity 2011-2020

- In the tenth meeting of the Conference of the Parties, held in 2010, in Nagoya, Aichi Prefecture, Japan, adopted a revised and updated Strategic Plan for Biodiversity, including the Aichi Biodiversity Targets, for the 2011-2020 period.
- The tenth meeting of the Conference of the Parties agreed to translate this overarching international framework into national biodiversity strategies and action plans within two years.
- Additionally, the meeting decided that the fifth national reports, due by 1 March 2014, should focus on the implementation of the 2011-2020 Strategic Plan and progress achieved towards the Aichi Biodiversity Targets.
 1. **Strategic Goal A:**
 - Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
 2. **Strategic Goal B:**
 - Reduce the direct pressures on biodiversity and promote sustainable use
 3. **Strategic Goal C:**
 - To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.
 4. **Strategic Goal D:**
 - Enhance the benefits to all from biodiversity and ecosystem services
 - By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization
 5. **Strategic Goal E:**
 - Enhance implementation through participatory planning, knowledge management and capacity building

COP 11 HYDERABAD:

- One of the most important outcomes of the CoP is the commitment of the Parties to double the international financial flows for Bio Diversity by 2015. This will translate into additional financial flows to the developing countries to the tune of about US \$ 30 billion in the next 8 years.
- India has committed US \$50 million towards strengthening the institutional mechanism for biodiversity conservation in the country during its presidency of the Convention on Biodiversity (CBD) called the Hyderabad Pledge
- The funds will be used to enhance technical and human capabilities at the national and state-level mechanisms to attain the CBD objectives
- India formally took charge of the presidency of CBD from Japan for the next two years on October 8 at the inaugural of the eleventh meeting of the Conference of Parties (CoP 11) to CBD.
- India has instituted together with UNDP Biodiversity Governance Awards.
- The first such awards were, given during the CoP 11.
- It is now proposed to institute Rajiv Gandhi International Award for Harnessing Biodiversity for Livelihood.

RAMSAR CONVENTION ON WETLANDS:

- The Convention on Wetlands [waterfowl convention] is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.
- It was adopted in the Iranian city of Ramsar in 1971 and came into force in 1975, and it is the only global environmental treaty that deals with a particular ecosystem.
- Ramsar is not affiliated with the United Nations system of Multilateral Environmental Agreements, but it works very closely with the other MEAs and is a full partner among the "biodiversity-related cluster" of treaties and agreements.
- World Wetlands Day, 2 February every year.
- Number of Contracting Parties: 163 (Please refer my Ramsar Compilation which is already posted in Teamwork 2015 Group)

Mission

- "The conservation and wise use of all wetlands through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world".
- "Three pillars" of the Convention

The Parties have committed themselves to

- Work towards the wise use of all their wetlands through national land-use planning, appropriate policies and legislation, management actions, and public education;
- Designate suitable wetlands for the List of Wetlands of International Importance ("Ramsar List") and ensure their effective management;
- Cooperate internationally concerning trans boundary wetlands, shared wetland systems, shared species, and development projects that may affect wetlands.

The Montreux Record

- Adopted by the Conference of the Contracting Parties in Brisbane, 1996, accompanying the Guidelines for Operation of the Montreux Record
- The Montreux Record is a register of wetland sites on the List of Wetlands of International Importance where changes in ecological character have occurred, are occurring, or are likely to occur as a result of technological developments, pollution or other human interference.
- It is the principal tool of the Convention and is maintained as part of the Ramsar List.

Indian wetland and the Montreux Record

- Keoladeo National Park, Rajasthan and Loktak Lake, Manipur have been included in Montreux Record in 1990 and in 1993 respectively
- Chilika Lake, Orissa included in Montreux Record in 1993 but have been removed in November 2002.
- Chilika Lake gets Wetland Conservation Award for 2002.

"IOPs"

- Five global non-governmental organizations (NGOs) have been associated with the treaty since its beginnings and were confirmed in the formal status of International Organization Partners (IOPs) of the Convention.
- 1. Bird Life International (formerly ICBP)
- 2. IUCN - The International Union for the Conservation of Nature
- 3. IWMI - The International Water Management Institute
- 4. Wetlands International (formerly IWRB, the Asian Wetlands Bureau, and. Wetlands for the Americas)
- 5. WWF (World Wide Fund for Nature) International

The Changwon Declaration on human well-being and wetlands

- The Changwon Declaration highlights positive action for ensuring human well-being and security in the future under the themes - water, climate change, people's livelihood and health, land use change, and biodiversity,

India and wetland convention

- India became a contracting party to the Ramsar Convention in 1981 and has been implementing conservation programmes for wetlands, mangroves and coral reefs.
- India presently has 26 sites designated as Wetlands of International Importance.
- There is close coordination between implementing units of Ramsar with that of CBD at the national level. India took a lead role in the formulation of Ramsar guidelines on integration of wetlands into river basin management.

4. CITES

- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement between governments entered into force in 1975, and became the only treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
- Currently 176 countries are Parties to CITES
- **CITES is administered through the United Nations Environment Programme (UNEP).**

Protecting Species from Unsustainable Trade

- Species for which trade is controlled are listed in one of three Appendices to CITES, each conferring a different level of regulation and requiring CITES permits or certificates.

Appendix I:

- Includes species threatened with extinction and provides the greatest level of protection, including restrictions on commercial trade.
Examples include gorillas, sea turtles, most lady slipper orchids, and giant pandas.

Appendix II:

- Includes species that although currently not threatened with extinction, may become so without trade controls. It also includes species that resemble other listed species and need to be regulated in order to effectively control the trade in those other listed species.

Appendix III:

- Includes species for which a range country has asked other Parties to help in controlling international trade. Examples include map turtles, walrus and Cape stag beetles
 - CoP13, these meetings were held every two years; since then, CoPs are held every three years.
 - CoP16 is scheduled to occur from March 3-14, 2013 in Bangkok, Thailand.

TRAFFIC: The Wildlife Trade Monitoring Network

- TRAFFIC is a joint conservation programme of WWF and IUCN.
- **It was established in 1976 by the Species Survival Commission of IUCN,**
- **TRAFFIC has grown to become the world's largest wildlife trade monitoring programme,** and a global expert on wildlife trade issues.
- This non-governmental organization
- **To ensure that trade in wild plants and animals is not a threat to the conservation of nature**

Convention on the Conservation of Migratory Species (CMS)

- **The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or Bonn Convention)**
- aims to conserve terrestrial, aquatic and avian migratory species throughout their range.
- It is an intergovernmental treaty, concluded under the aegis of the United Nations Environment
- The Agreements may range from legally binding treaties (called Agreements) to less formal instruments, such as Memoranda of Understanding, and can be adapted to the requirements of particular regions

Coalition Against Wildlife Trafficking (CAWT)

- aims to focus public and political attention and resources on ending the illegal trade in wildlife and wildlife products.
- Initiated in 2005, **CAWT is a unique voluntary public-private coalition**
- CAWT is leveraging the combined strengths of government and nongovernmental partners to:
- Improve Wildlife Law Enforcement by expanding enforcement training and information sharing and strengthening regional cooperative networks
- **Reduce consumer demand** for illegally traded wildlife by raising awareness of the impacts of illegal wildlife trade on biodiversity
- Catalyse high-level political will to fight wildlife trafficking

The International Tropical Timber Organization (ITTO)

- ITTO is an intergovernmental organization, under UN (1986) promoting the conservation and sustainable management, use and trade of tropical forest resources.

United Nations Forum on Forests (UNFF)

- The Economic and Social Council of the United Nations (ECOSOC), established the UNFF In October 2000, a subsidiary body
- with the main objective to promote "the management, conservation and sustainable development of all types of forests and to strengthen long-term political commitment to this end" based on the Rio Declaration, the Forest Principles, Chapter 11 of Agenda 21 and the outcome of the Intergovernmental Panel on Forests (IPF) I intergovernmental Forum on Forests (IFF) Processes and other key milestones of international forest policy.
- The Forum has universal membership, and is composed of all Member States of the United Nations and specialized agencies
- Enhance the contribution of forests to the achievement of the internationally agreed development goals, including the Millennium Development Goals,

The four Global Objectives seek to:

- 1. Reverse the loss of forest cover worldwide through sustainable forest management (SFM), including protection, restoration, afforestation and reforestation, and increase efforts to prevent forest degradation;
- 2. Enhance forest-based economic, social and environmental benefits; including by improving the livelihoods of forest-dependent people;
- 3. Increase significantly the area of sustainably managed forests, including protected forests, and increase the proportion of forest products derived from sustainably managed forests; and
- 4. Reverse the decline in official development assistance for sustainable forest management and mobilize significantly-increased new and additional financial resources from all sources for the implementation of SFM

IUCN

- IUCN was founded in October 1948 as the International Union for the Protection of Nature (or IUPN) following an international conference in Fontainebleau, France.
- **ALL READY COVERD IN PREVIOUS CHAPTERS**
 - ✓ Priority Areas of IUCN
 - ✓ Biodiversity
 - ✓ Climate change
 - ✓ Sustainable energy
 - ✓ Human well-being
 - ✓ Green economy

THE GLOBAL TIGER FORUM (GTF)

- ✓ is an inter-governmental and international body established with members from willing countries to embark on a worldwide campaign, common approach, promotion of appropriate programmes and controls to save the remaining five sub-species of tigers in the wild

distributed over 14 tiger range countries of the world.

- ✓ Formed in 1994 with its secretariat at New Delhi, GTF is the only inter-governmental & international body campaigning to save the TIGER worldwide.
- ✓ The General Assembly of GTF shall meet once in three years.
- ✓ To promote a worldwide campaign to save the tiger, its prey and its habitat;
- ✓ To promote a legal framework in the countries involved for bio-diversity conservation;
- ✓ To increase the protected area network of habitats of the tiger and facilitate their inter passages in the range countries;
- ✓ To promote eco-development programmes with the participation of the communities living in and around protected areas;
- ✓ elimination of illegal trade;
- ✓ scientific research
- ✓ the development and exchange among themselves, of appropriate technologies and training programmes for scientific wildlife management
- ✓ To set up a participative fund of an appropriate size to engender awareness in all places

Global Tiger Initiative

- ✓ An alliance of governments, international, agencies, civil society, and the private sector united to save wild tigers from extinction

Goals of GTI

- ✓ To support capacity-building in governments for responding effectively to the transnational challenge of illegal trade in wildlife and for scientifically managing tiger landscapes in the face of mounting and varied threats;
- ✓ To curtail international demand for tiger parts and other wildlife
- ✓ To develop mechanisms for safeguarding habitats from development through planning 'smart, green' infrastructure and sensitive industrial development;
- ✓ To create innovative and sustainable financing mechanisms for tiger landscapes including protected areas;
- ✓ To build strong local constituencies for tiger conservation through development of economic incentives and alternative livelihoods for local people;"
- ✓ To spread the recognition among governments, international aid agencies and the public that tiger habitats are high-value diverse ecosystems with the potential to provide immense benefits- both tangible and intangible

THE STOCKHOLM CONVENTION ON POP

- ✓ The Stockholm Convention on Persistent Organic Pollutants was adopted at a Conference of Plenipotentiaries on 22 May 2001 in Stockholm, Sweden and entered into force on 17 May 2004,

POP

- ✓ Persistent Organic Pollutants (POPs) are organic chemical substances, that is, they are carbon-based:
- ✓ They possess a 'particular combination of physical and chemical properties such that, once released into the environment, they:
- ✓ remain intact for exceptionally long periods of time (many years);
- ✓ become widely distributed throughout the environment as a result of natural processes involving soil, Water and, most notably, air;
- ✓ accumulate in the fatty tissue of living organisms including humans;
- ✓ and are found at higher concentrations at higher levels in the food chain;
- are toxic to both humans and wildlife
- ✓ not soluble in water

The 12 initial POPs

- ✓ Initially, twelve POPs have been recognized as causing adverse effects on humans and the ecosystem and these can be placed in 3 categories:
- ✓ 1. Pesticides: aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene;
- ✓ 2. Industrial chemicals: hexachlorobenzene, polychlorinated biphenyls (PCBs); and
- ✓ 3. By-products: hexachlorobenzene; polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDD/PCDF), and PCBs.

The new POPs under the Stockholm Convention Nine new POPs

1. **Pesticides:** chlordecone, alpha hexachloro- cyclohexane, beta hexachlorocyclohexane, lindane, pentachlorobenzene;
2. **Industrial chemicals:** hexabromobiphenyl, hexabromodiphenyl ether and heptabromodiphenyl ether, pentachlorobenzene, perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride, tetrabromodiphenyl ether and pentabromodiphenyl ether; and
3. **By-products:**, alpha hexachlorocyclohexane, beta hexachlorocyclohexane and pentachlorobenzene

Endosulfan

At its fifth meeting held in 2011, the CoP adopted an amendment to Annex A to the Stockholm Convention to **list technical endosulfan and related isomers with a specific exemption**

BASEL CONVENTION

- ✓ The **Basel Convention on the Control of Transboundary Movements of Hazardous Wastes_ and their Disposal** was adopted on 22 March 1989 by the Conference of Plenipotentiaries in **Basel, Switzerland,**

Objective

- ✓ To protect human health and the environment against the adverse effects of hazardous wastes.
- ✓ Its scope of application covers a wide range of wastes defined as "hazardous wastes" based on their origin , and/or composition and their characteristics, as well as two types of wastes defined as "other wastes" **-household waste and incinerator ash.**

Principal aims:

- ✓ The reduction of hazardous waste generation and the promotion of environmentally sound management of hazardous wastes, wherever the place of disposal;
- ✓ the restriction of transboundary movements of hazardous wastes
- ✓ a regulatory system applying to cases where transboundary movements are permissible
- ✓ Examples of wastes regulated by the Basel Convention
- ✓ Biomedical and healthcare wastes
- ✓ Used oils
- ✓ Used lead acid batteries
- ✓ Persistent Organic Pollutant wastes (POPs wastes),
- ✓ Polychlorinated Biphenyls (PCBs),
- ✓ Thousands of chemical wastes generated by industries and other consumers

ROTTERDAM CONVENTION

- ✓ It was adopted in 1998 by a Conference of Plenipotentiaries in Rotterdam, the Netherlands and entered into force on 24 February 2004.
- ✓ The Convention creates **legally binding obligations** for the implementation of the Prior Informed Consent (PIC) procedure. It built on the voluntary PIC procedure, initiated by **UNEP and FAO in 1989 and ceased on 24 February 2006.**

- ✓ The Convention covers **pesticides and industrial chemicals** that have been banned ,or severely restricted for health or environmental reasons by Parties and which have been notified by Parties for inclusion in the PIC procedure.

Objectives:

- ✓ to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm;

UNCCD

- ✓ Established in 1994, UNCCD is the sole **legally binding international agreement** linking environment and development to sustainable land management.
- ✓ The UNCCD is particularly committed to a **bottom-up approach, encouraging the participation of local people in combating desertification and land degradation.**
- ✓ The United Nations Convention to Combat Desertification (UNCCD) is one of the Rio Conventions that focuses on desertification, land degradation and drought (DLDD).
- ✓ **'Desertification' as-defined in the UNCCD refers to land degradation in the drylands (arid, semi arid and dry sub humid regions)** resulting from various factors and does not connote spread or expansion of deserts.
- ✓ UNCCD with 194 Parties
- ✓ The **convention aims at adaption** and can, on implementation, significantly contribute to achieving the Millennium Development Goals (MDGs), as well as sustainable development and poverty reduction by means of arresting and reversing land degradation.
- ✓ The convention promotes sustainable land management (SLM) as solution to global challenges

International Whaling Commission

- ✓ is the global intergovernmental body charged with the conservation of whales and the management of whaling with headquarters in Cambridge, United Kingdom.
- ✓ It was set up under the **International Convention for the Regulation of Whaling** which was signed in Washington DC on 2nd December 1946

Preamble

- ✓ To provide for the proper conservation of whale stocks and thus make possible the orderly development of the whaling industry.
- ✓ In 1986 the Commission introduced **zero catch limits** for **commercial whaling**. This provision is still in place today, although the Commission continues to set catch limits for **aboriginal subsistence whaling.**

VIENNA CONVENTION

- ✓ Vienna convention adopted in the year 1985 and entered into force in 1988.
- ✓ **It acts as a framework for the international efforts to protect the ozone layer however it does not include legally binding reduction goals for the use of CFCs.**
- ✓ With 197 parties, they are the most widely ratified treaties in United Nations history.

Montreal Protocol

- ✓ The Montreal Protocol on Substances that Deplete the Ozone Layer was designed to Reduce the production and consumption of ozone depleting substances in order to reduce their abundance in the atmosphere, and thereby protect the earth's fragile ozone Layer.
- ✓ The treaty was opened for signature on September 16, 1987, and entered into force on January 1, 1989, followed by a first meeting in Helsinki, May 1989.
- ✓ Since then, it has undergone seven revisions, in 1990 (London), 1991 (Nairobi), 1992 (Copenhagen), 1993 (Bangkok), 1995 (Vienna), 1997 (Montreal), and 1999 (Beijing).

India and Protection of Ozone Layer

- ✓ India became a Party to the Vienna Convention for the Protection of Ozone Layer on 19 June 1991 and the Montreal Protocol on substances that deplete the ozone layer on 17 September 1992
- ✓ Consequently, it ratified the Copenhagen, Montreal and Beijing Amendments in 2003.
- ✓ India produces CFC-11, CFC-12, CFC-113, Halon-1211, HCFC-22, Halon-1301, Carbontetrachloride (CTC), methyl chloroform and methyl bromide.
- ✓ These ozone Depleting Substances (ODS) are used in refrigeration and air conditioning, fire fighting, electronics, foams, aerosol fumigation applications.
- ✓ A detailed India Country Programme for phase out of ODS was prepared in 1993
- ✓ The Ministry of Environment and Forests established an Ozone Cell and a steering committee on the Montreal Protocol to facilitate implementation of the India Country Programme for phasing out ODS (ozone depleting substances) production by 2010.
- ✓ In order to meet the objectives of the Protocol, the Indian government has granted full exemption from payment of Customs and Central Excise Duties on import of goods designed exclusively for non-ODS technology

GLOBALLY IMPORTANT AGRICULTURAL HERITAGE SYSTEMS

- ✓ The FAO recognizes the agricultural heritage regions of the world under a programme titled Globally Important Agricultural Heritage Systems (GIAHS).
- ✓ purpose of GIAHS is to recognize "Remarkable land use systems and landscapes which are rich in globally significant biological diversity evolving from the co-adaptation of a community with its environment and its needs and aspirations for sustainable development".
- ✓ In our country so far the following sites have received recognition under this programme:
 1. Traditional Agricultural System, Koraput, Odisha
 2. Below Sea Level Farming System, Kuttanad, Kerala
- ✓ In the Koraput system, women have played a key role in the conservation of biodiversity.
- ✓ The Kuttanad system was developed by farmers over 150 years ago to ensure their food security by learning to cultivate rice and other crops below sea level.
- ✓ The Kuttanad System is now attracting worldwide attention since one of the effects of global warming is sea level rise.
- ✓ It has therefore been an act of vision on the part of Kerala government to have decided to, set up an International Research and Training Centre for Below Sea Level Farming in Kuttanad.

ENVIRONMENT ISSUES AND HEALTH EFFECTS

TOXICOLOGY EFFECTS

- Eco-toxicology is "a study of the effects of released pollutants on the environment and on the biota that inhabit it.

Rem



- It gives an indication of biological damage. It is an estimate of the amount of radiation of any type, which produces the same biological injury in man as that resulting from the absorption of a given amount of X-ray radiation or gamma radiation.

Iodine - 131

- Iodine -131 produced by nuclear tests is passed to vegetation and then appears in the milk of the cattle that consume the contaminated vegetation and is passed to humans.
- Iodine-131 causes serious damage to thyroid gland, especially among children.
- About 99% of long-term radioactivity from either strontium or radium taken into the human body is found in the bones.

Lead

- Lead is highly toxic to plants and animals including man. Lead generally affects children more severely than adults.

- **Lead poisoning** causes a variety of symptoms. These include liver and kidney damage, reduction in hemoglobin formulation, mental retardation and abnormality in fertility and pregnancy. Symptoms of chronic lead-poisoning are of three general types.
 - a. Gastrointestinal troubles - most common in industrial workers includes intestinal stress.
 - b. Neuromuscular effects - collectively called lead palsy, and impairment of muscle metabolism resulting into residual paralysis and muscular atrophy.
 - c. Central nervous system effects - CNS syndrome- a panoply of nervous system disorders, they may lead to delirium, convulsions coma and death.

Mercury

- This is the most common and most toxic in water bodies. It occurs , in water as monomethyl mercury.
- Methyl mercury vapours cause fatal poisoning.
- The recent popularity of energy efficient compact to fluorescent lamps or CFLs has added another dimension to the controversy.
- Toxicity of mercury is much greater than any other substance, about 1000 times more potent than colchicines.

Fluorine

- It occurs in nature as fluoride, in air, soil and water.
- **Fluorosis** is a common problem in several states of the country due to intake of high fluoride content water.
- Fluorides cause dental fluorosis, stiffness of joints (particularly spinal cord) causing humped back. Pain in bones and joint and **outward bending of legs from the knees is called Knock-Knee syndrome.**
- In cattle, fluoride intake causes staining, mottling and abrasion of teeth, lameness and **decrease in milk production.**

DDT

- Toxic pesticides as BHC, PCB, DDT etc., are not easily degraded and are long-lasting in the environment.
- Their concentration therefore goes on increasing in water and soil with successive applications.
- **DDT was sprayed for many years on marshes to control mosquitoes.**
- **The DDT has bio-magnified from water to fish eating birds and humans. DDT is known to depress the activity of estrogen, the female sex hormone and testosterone, male sex hormone.**

LEAD IN PAINTS

- present in paints.
- Though several countries have banned the use of this substance India is yet to: do so, which is why paint makers use them.
- 'Inhaling lead dust like opening or closing windows is the most common source of lead poisoning.
- The human body is not designed to process lead. Young children are particularly vulnerable to lead as it can damage the central nervous system and the brain.
- **If lead is so poisonous why do paint makers continue to use it?**
- **Using lead, substitutes increases the cost and also reduces paint performance.**

TRANSFAT

- **Transfats are formed during the process of addition of hydrogen atoms to oils, a process which industry prefers as it keeps the oil from turning rancid and ensures a longer Shelf life. (E.g trans-fatty acid in vanaspati).**

- Transfats are associated with a host of serious health problems ranging from diabetes to heartdisease to cancer.
- The health ministry in 2008 came out with a notification for labelling food including transfats.
- Junk food high in transfats,

HIGH CAFFEINE IN ENERGY DRINKS

- **Energy drinks are in controversy because of its high caffeine content.** Most of these brands
- have upto 320 ppm of caffeine in them. These drinks are marketed as an instant source of energy.
- The manufacturers claim that it is the combination of caffeine, taurine, glucoronolactone, vitamins, herbal supplements, and sugar or sweeteners that gives the energy.
- **According to study reports, it is the sugar that gives the energy rush, the caffeine only gives a 'feeling' of energy.**
- Energy drinks fall under the category of 'Proprietary foods' in the Prevention of Food Adulteration (PFA) Act of 1954.
- An amendment in the PFA act 2009 ensured that caffeine in energy drinks should be capped at 145 ppm, the limit that was set for carbonated beverages.
- However, Red Bull managed to get a stay order on the amendment of the PFA act in 2010 and since then the energy drink market is expanding unregulated.
- The Food Safety and Standards Authority of India (FSSAI) is currently making regulations on energy drinks.

PESTICIDE IN HUMAN BLOOD

- Pesticides are commonly used in India but this comes at great cost to human health. It found that 15 different pesticides in the 20 blood samples tested from four villages in Punjab.

TESTING OF PESTICIDE TOXICITY

- All pesticides are tested to establish toxicity — a dose necessary to produce a measurable harmful effect; it is usually established through tests on mice, rats, rabbits and dogs.
- Results are then extrapolated on humans, and safe exposure levels predicted.
- The value commonly used to measure acute toxicity is LD 50 (a lethal dose in the short term; the subscript 50 indicates the dose is toxic enough to "kill 50 per cent of lab animals exposed to the chemical).
- LD 50 values are measured zero onwards; the lower the LD 50 the more highly toxic the pesticide.
- comparison of DDT most Used in India up to the early 1990s, with monocrotophos, currently most used.
- DDT's LD 50 is 113 mg/kg; monocrotophos, 14 mg/kg. But never forget that lower LD 50 means higher acute toxicity

DISEASES CAUSED BY ENVIRONMENTAL DEGRADATION

a) Minamata disease

- first discovered in Minamata city in Kumamoto prefecture, Japan in 1956.
- caused by the release of methyl mercury in the industrial wastewater from the Chisso Corporation's chemical factory, which continued from 1932 to 1968.
- referred to as Chisso-Minamata disease, is a neurological syndrome caused by severe mercury poisoning.

b) Yokkaichi asthma

- occurred in the city of Yokkaichi in Mie Prefecture, Japan between 1960 and 1972.
- The burning of petroleum and crude oil released large quantities of sulfur oxide that caused severe smog.

c) Itai-itai disease

- was the documented case of mass cadmium poisoning in Toyama Prefecture, Japan, starting around 1912.
- The cadmium poisoning caused softening of the bones and kidney failure.
- The cadmium was released into rivers by mining companies in the mountains.

d) Blue baby syndrome

- caused by high nitrate contamination in ground water resulting in decreased oxygen carrying capacity of hemoglobin in babies leading to death.

e) Pneumoconiosis

- The coal miners are frequently caught by the black lung disease, which is also called as Pneumoconiosis
- caused due to the deposit of coal dust in the lungs of coal miners, leads to a serious lung disease called as Black Lung disease

f) Asbestosis

- Workers working in the asbestos industry are caught by the serious lung disease called as asbestosis.

G) Silicosis

- caused due to the deposit of silica in the lungs of workers working in silica industries or at the sand blasting sites

h) Emphysema

- The breaking down of sensitive tissue of lungs due to air pollution and smoke of cigarette is called as Emphysema.
- Once this disease happens, the lungs cannot expand and contract properly

I) Sick Building Syndrome (SBS)

- Sick building syndrome (SBS) is a combination of ailments (a syndrome) associated with an individual's place of work or residence.
- Most of the sick building syndrome is related to poor indoor air quality.

The National Wastelands Development Board (NWDB)

- ✓ The National Wastelands Development Board (NWDB) was set up under the Ministry of Environment & Forests in 1985 with the objective of
 - i. to increase tree and other green cover on wastelands,
 - ii. to prevent good land from becoming wasteland, and
 - iii. to formulate within the overall nodal policy, perspective plans and programmes for the management and development of the wastelands in the country.
- ✓ In 1992, the Board was transferred to the Ministry of Rural Development, putting under a New Department of Wastelands Development under the charge of a Minister of State

Bioassay

- ✓ a test in which organisms are used to detect the presence or the effects of any other physical factor, chemical factor, or any other type of ecological disturbance.
- ✓ are very common in pollution studies.
- ✓ can be conducted by using any type of organisms.
- ✓ The fish and insect bioassays are very common.
- ✓ The aim is to find out either lethal concentration or effective concentration causing mortality or other effects. Ultimately they are to be used for determination of safe concentration of a chemical or maximum acceptable toxicant concentration (MATC).