GLOBAL ENVIRONMENTAL ISSUES AND POLICIES

- Climate Change
- Global Warming
- Acid Rain
- Ozone Layer Depletion

Unit 6

Global Environmental Issues and Policies (7 lectures)

- Causes of Climate change, Global warming, Ozone layer depletion, and Acid rain; Impacts on human communities, biodiversity, global economy, and agriculture

- International agreements and programmes: Earth Summit, UNFCCC, Montreal and Kyoto protocols, Convention on Biological Diversity(CBD), Ramsar convention, The Chemical Weapons Convention (CWC), UNEP, CITES, etc
- Sustainable Development Goals: India's National Action Plan on Climate Change and its major missions

- Environment legislation in India: Wildlife Protection Act, 1972; Water (Prevention and Control of Pollution) Act, 1974; Forest (Conservation) Act 1980; Air (Prevention & Control of Pollution) Act, 1981; Environment Protection Act, 1986; Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006


CLIMATE CHANGE

Climate is the average weather of an area. It is the general weather conditions, seasonal variations and extremes of weather in a region. Such conditions which average over a long period- at least 30 years is called climate.

- The Inter governmental Panel on Climate Change (IPCC) in 1990 and 1992published best available evidence about
- Past climate change,
- The green house effect
- And recent changes in global temperature.
- It is observed that earth’s temperature has changed considerably during the geological times. It has experienced several glacial and interglacial periods.

Causes

- **Human Activities**: Changes observed in Earth's climate since the early 20th century are primarily driven by human activities, particularly fossil fuel burning, which increases heat-trapping greenhouse gas levels in Earth's atmosphere, raising Earth's average surface temperature. These human-produced temperature increases are commonly referred to as global warming.
- **Natural processes** can also contribute to climate change, including internal variability (e.g., cyclical ocean patterns) and external forcings (e.g., volcanic activity, changes in the Sun's energy output, variations in Earth's orbit).

- However, during the past10000 years of the current interglacial period, the mean average temperature has fluctuated by 0.51˚ c over 100 to 200 year period.
- We have relatively stable climate for thousands of years due to which we have practiced agriculture and increased population.

Effects of Climate Change

- Even small changes in climatic conditions may disturb agriculture that would lead to migration of animals including humans.
- Anthropogenic activities are upsetting the delicate balance that has been established between various components of the environment.
- Green house gases are increasing in atmosphere resulting in increase in the average global temperature.
- This may upset the hydrological cycle; result in floods and droughts in different regions of the world, cause sea level rise, changes in agricultural productivity, famines and death of humans as well as livestock

Effects of Climate Change

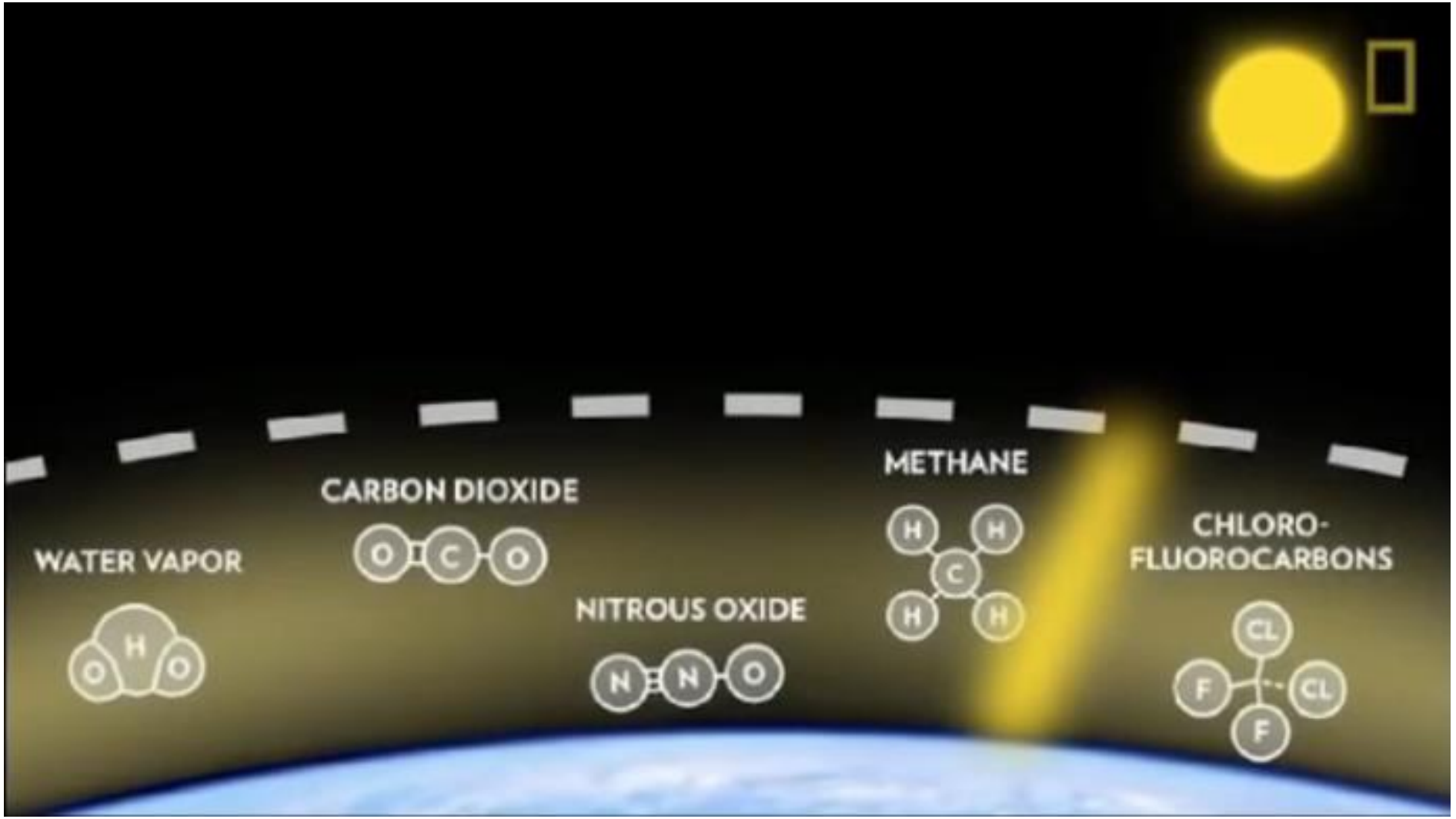
- Rising sea levels will lead to coastal flooding on the Eastern Seaboard, especially in Florida, and in other areas such as the Gulf of Mexico.
- Forests, farms, and cities will face troublesome new pests, heat waves, heavy downpours, and increased flooding.
- All these factors will damage or destroy agriculture and fisheries.
- Disruption of habitats such as coral reefs and Alpine meadows could drive many plant and animal species to extinction.

GLOBAL WARMING

- Before the Industrial Revolution, human activities released very few gases into the atmosphere and all climate changes happened naturally.
- After the Industrial Revolution, through fossil fuel combustion, changing agricultural practices and deforestation, the natural composition of gases in the atmosphere is getting affected and climate and environment began to alter significantly.
- Over the last 100 years, it was found out that the earth is getting warmer and warmer, unlike previous 8000 years when temperatures have been relatively constant. The present temperature is 0.3 - 0.6 ^{o} C warmer than it was 100 years ago.

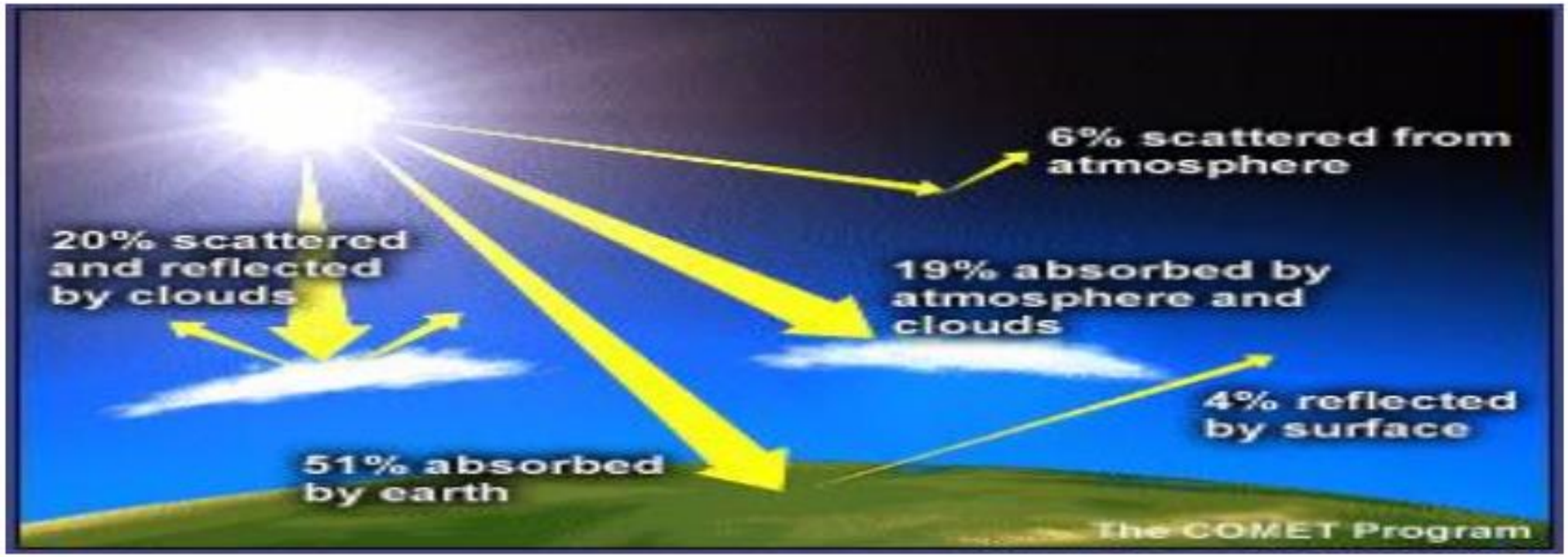
The greenhouse effect

- The greenhouse effect is a naturally occurring process that aids in heating the Earth's surface and atmosphere.
- It results from the fact that certain atmospheric gases, such as carbon dioxide, water vapor, and methane, are able to change the energy balance of the planet by absorbing long wave radiation emitted from the Earth's surface.
- Without the greenhouse effect life on this planet would probably not exist as the average temperature of the Earth would be a chilly -18° Celsius, rather than the present 15° Celsius.


WATER VAPOR
H
O
O
CARBON DIOXIDE
O
C
O
NITROUS OXIDE
N
N
O
METHANE
H
H
C
H
H
CHLORO-
FLUOROCARBONS
CL
F
CL
F

- Some greenhouse gases occur either naturally in the atmosphere, while others result from human activities.
- Naturally occurring greenhouse gases include:
- water vapor,
- carbon dioxide,
- methane,
- nitrous oxide,
- and ozone
- Certain human activities, however, add to the levels of most of these naturally occurring gases.

- Certain human activities, however, add to the levels of most of these naturally occurring gases.
- Carbon dioxide: When solid waste, fossil fuels (oil, natural gas, and coal), and wood and wood products are burned.
- Methane: During the production and transport of coal, natural gas, and oil. Methane emissions also result from the decomposition of organic wastes in municipal solid waste landfills, and the raising of livestock.
- Nitrous oxide : During agricultural and industrial activities, as well as during combustion of solid waste and fossil fuels.
- Very powerful greenhouse gases that are not naturally occurring include :
- hydro fluorocarbons (HFCs),
- per fluorocarbons (PFCs),
- and sulfur hexafluoride (SF6), which are generated in a variety of industrial processes.


6% scattered from atmosphere
20% scattered and reflected by clouds
19% absorbed by atmosphere and clouds
4% reflected by surface
51% absorbed by earth
The COMET Program

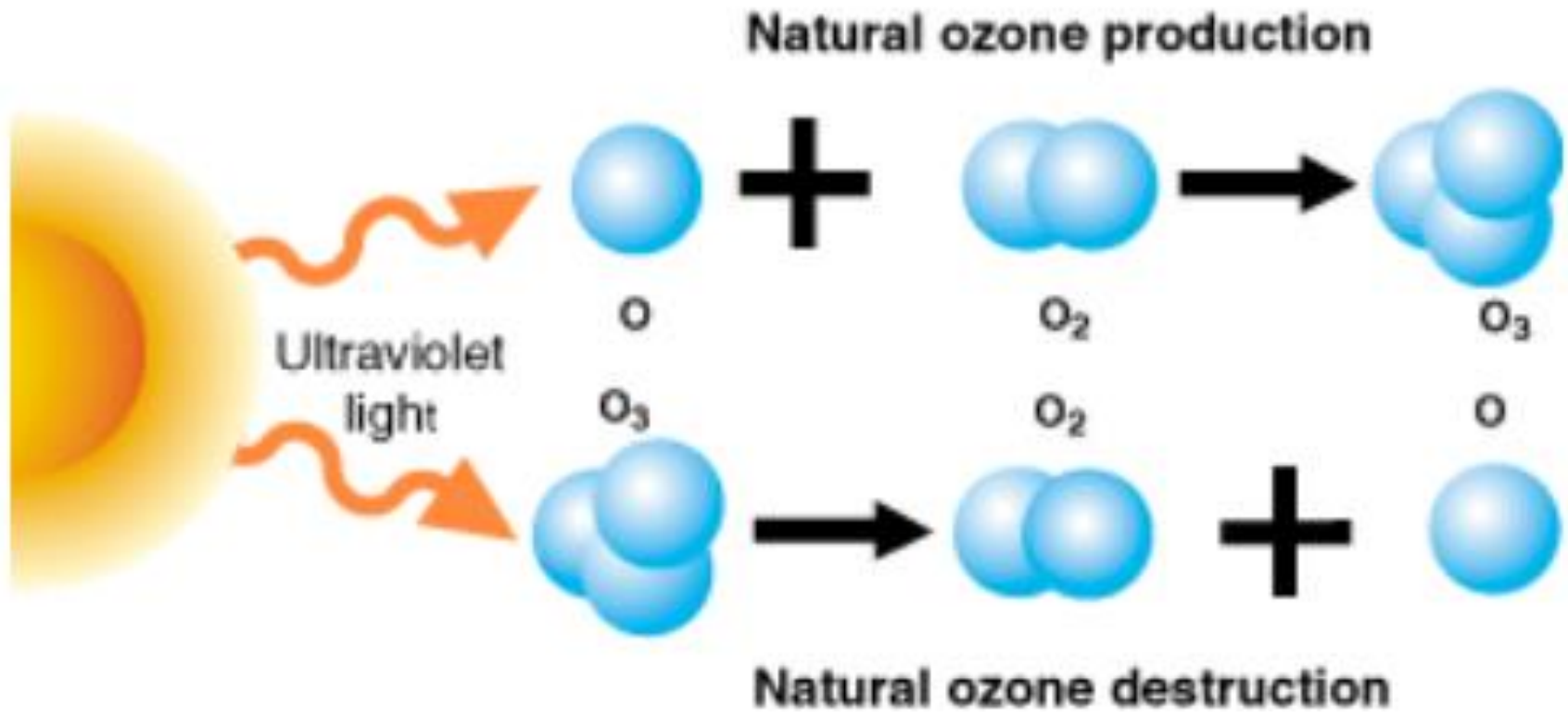
- The heating of the ground by sunlight causes the Earth's surface to become a radiator of energy in the long wave band (sometimes called infrared radiation).
- This emission of energy is generally directed to space . However, only a small portion of this energy actually makes it back to space.
- The majority of the outgoing infrared radiation is absorbed by the greenhouse gases Absorption of long wave radiation by the atmosphere causes additional heat energy to be added to the Earth's atmospheric system. The now warmer atmospheric greenhouse gas molecules begin radiating long wave energy in all directions. Over 90% of this emission of long wave energy is directed back to the Earth's surface where it once again is absorbed by the surface. The heating of the ground by the long wave radiation causes the ground surface to once again radiate, repeating the cycle described above, again and again, until no more long wave is available for absorption.

Global Warming (Climate Change) Implications

- Rise in global temperature: Global temperatures have risen by about 0.6 °C over the 20th century.
- Rise in sea level : The mean sea level is expected to rise 9 - 88 cm by the year 2100, causing flooding of low lying areas and other damages.
- Food shortages and hunger :Water resources will be affected as precipitation and evaporation patterns change around the world. This will affect agricultural output. Food security is likely to be threatened and some regions are likely to experience food shortages and hunger.

OZONE LAYER DEPLETION

- Earth's atmosphere is divided into three regions, namely troposphere, stratosphere and mesosphere.
- The stratosphere extends from 10 to 50 kms from the Earth's surface.
- This region is concentrated with slightly pungent smelling, light bluish ozone gas.
- The ozone gas is made up of molecules each containing three atoms of oxygen; its chemical formula is O_3 .
- The ozone layer, in the stratosphere acts as an efficient filter for harmful solar Ultraviolet B (UV-B) rays.
- Ozone is produced and destroyed naturally in the atmosphere and until recently, this resulted in a well-balanced equilibrium .


Natural ozone production
Ultraviolet light
O
O2
O3
O3
O2
O
Natural ozone destruction

$$O + O_2 \xrightarrow{240\,nm} O_3$$

$$O_3 \xrightarrow{290\,nm} O_2 + O$$

Natural Process

$$CFCl_2 \overset{\curvearrowright\ \curvearrowright}{\text{——}} Cl \xrightarrow{U.V.} \dot{C}FCl_2 + Cl^{\cdot}$$

$$Cl^{\cdot} + O_3 \longrightarrow ClO + O_2$$

$$(O_3 \longrightarrow O_2 + O^{\cdot})$$

$$O + ClO \longrightarrow O_2 + Cl^{\cdot}$$

Process continued.

- Ozone is formed when oxygen molecules absorb ultraviolet radiation with wavelengths less than 240 nanometres and is destroyed when it absorbs ultraviolet radiation with wavelengths greater than 290 nanometres.
- In recent years, scientists have measured a seasonal thinning of the ozone layer primarily at the South Pole. This phenomenon is being called the ozone hole.

Chemistry of Ozone Depletion

- When ultraviolet light waves (UV) strike CFC* (CFCl 3) molecules in the upper atmosphere, a carbon-chlorine bond breaks, producing a chlorine (Cl) atom.
- The chlorine atom then reacts with an ozone (O3) molecule breaking it apart and so destroying the ozone. This forms an ordinary oxygen molecule (O2) and a chlorine monoxide (ClO) molecule.
- Then a free oxygen** atom breaks up the chlorine monoxide. The chlorine is free to repeat the process of destroying more ozone molecules. A single CFC molecule can destroy 100,000 ozone molecules.

Effects Of Ozone Layer Depletion

Effects of Ozone Layer Depletion

1) Effects on Human and Animal Health: Increased penetration of solar UV-B radiation is likely to have high impact on human health with potential risks of eye diseases, skin cancer and infectious diseases.

2) Effects on Terrestrial Plants: In forests and grasslands, increased radiation is likely to change species composition thus altering the bio-diversity in different ecosystems. It could also may affect the plant community.

3) Effects on Aquatic Ecosystems: High levels of radiation exposure in tropics and subtropics may affect the distribution of Phytoplankton's, which form the foundation of aquatic food webs. It can also cause damage to early development stages of fish, shrimp, crab, amphibians and other animals, the most severe effects being decreased reproductive capacity and impaired larval development.

4)Effects on Bio-geo-chemical Cycles: Increased solar UV radiation could affect terrestrial and aquatic bio-geo-chemical cycles thus altering both sources and sinks of greenhouse and important trace gases, e.g. carbon dioxide (CO_2), carbon monoxide (CO), carbonyl sulfide (COS), etc. These changes would contribute to biosphere-atmosphere feedbacks responsible for the atmosphere build-up of these greenhouse gases.

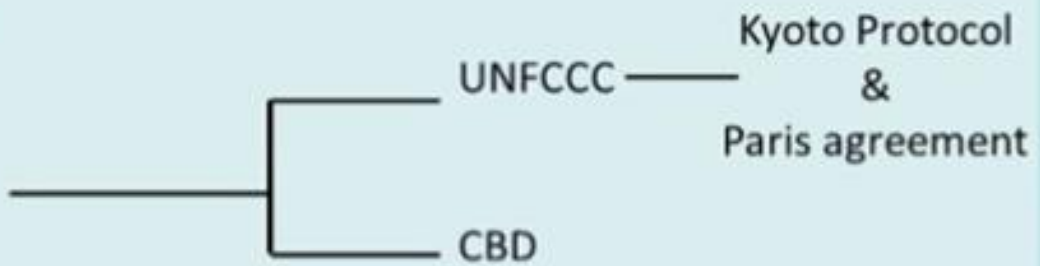
5) Effects on Air Quality: Reduction of stratospheric ozone and increased penetration of UV-B radiation result in higher photo dissociation rates of key trace gases that control the chemical reactivity of the troposphere. This can increase both production and destruction of ozone and related oxidants such as hydrogen peroxide, which are known to have adverse effects on human health, terrestrial plants and outdoor materials.

The ozone layer, therefore, is highly beneficial to plant and animal life on earth filtering out the dangerous part of sun's radiation and allowing only the beneficial part to reach earth. Any disturbance or depletion of this layer would result in an increase of harmful radiation reaching the earth's surface leading to dangerous consequences.

ENVIRONMENTAL CONFERENCES &LAWS

IMPORTANT ENVIRONMENT CONFERENCES

- STOCKHOLM CONFERENCE, 1972
- BRUNDTLAND COMMISSION, 1983
- BRUNDTLAND REPORT, 1987
- RIO CONFERENCE, 1992



STOCKHOLM CONFERENCE, 1972

In 1972, Stockholm, Sweden, hosted the first United Nations Conference on the Human Environment, which was attended by 113 delegates and two heads of state (Olaf Palme of Sweden and Indira Gandhi of India). This conference raised a generation's awareness of an issue hitherto little talked about, the global environment. The Stockholm conference secured a permanent place for the environment on the world's agenda and led to the establishment of the United Nations Environment Program (UNEP). The conference and its aftermath made known the international nature of the environment and introduced the idea of the relationship between development and the environment.

United Nations Conference on the Human Environment, 5-16 June 1972, Stockholm

- **The first world conference on the environment**
- The 1972 United Nations Conference on the Human Environment in Stockholm was the first world conference to make the environment a major issue.
- The participants adopted a series of principles for sound management of the environment including the Stockholm Declaration and Action Plan for the Human Environment and several resolutions.
- The Stockholm Declaration, which contained 26 principles.
- Environmental issues were placed at the forefront of international concerns and marked the start of a dialogue between industrialized and developing countries on the link between economic growth, the pollution of the air, water, and oceans and the well-being of people around the world.

Stockholm

- The Action Plan contained three main categories:
- a) Global Environmental Assessment Programme;
- b) Environmental management activities;
- c) International measures to support assessment and management activities carried out at the national and international levels.
- In addition, these categories were broken down into 109 recommendations.
- One of the major results of the Stockholm conference was the creation of the United Nations Environment Programme (UNEP).

BRUNDTLAND COMMISSION, 1983

In 1983, the UN General Assembly set up the World Commission on Environment and Development, known as the Brundtland Commission after its chairperson, Norwegian Prime Minister Gro Harlem Brundtland. Its aim was to link environmental issues to the findings of the 1980 Brandt report on North-South relations. The Brundtland report, published in 1987 as Our Common Future, declared that the time had come for integrating environment and the economy and used the term "sustainable development" as the way to ensure that economic development would not endanger the ability of future generations to enjoy the fruits of the earth.

BRUNDTLAND

Brundtland Commission

- World Commission on Environment & Development
- Set up by G.A. of UN in 1983
- Chairperson - Gro Harlem Brundtland

- Brundtland commission – in its seminal report – 1987 –
- "Our Common Future"
- Gave comprehensive definition of Sustainable Development.

Definition of SD

- The development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

General principles

1. Fundamental Human Rights
2. Inter-generational equity
3. Conservation & sustainable use
4. Env. Standards & Monitoring
5. Prior Env. Assessments
6. Prior notification access & due process
7. SD & assistance
8. General obligation to cooperate

UNITED NATIONS CONFERENCE ON ENVIRONMENT & DEVELOPMET

UNCED /(EARTH SUMMIT) /(RIO CONFERENCE)

The United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit was a major United Nations conference held in Rio de Janeiro from 3 to 14 June 1992.

In 2012, the United Nations Conference on Sustainable Development was also held in Rio, and is also commonly called Rio+20 or Rio Earth Summit 2012.

172 governments participated, with 116 sending their heads of state or government.

Some 2,400 representatives of non-governmental organizations (NGOs) attended, with 17,000 people at the parallel NGO "Global Forum" (also called Forum Global), who had Consultative Status.

systematic scrutiny of patterns of production — particularly the production of toxic components, such as lead ingasoline, 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 smoke

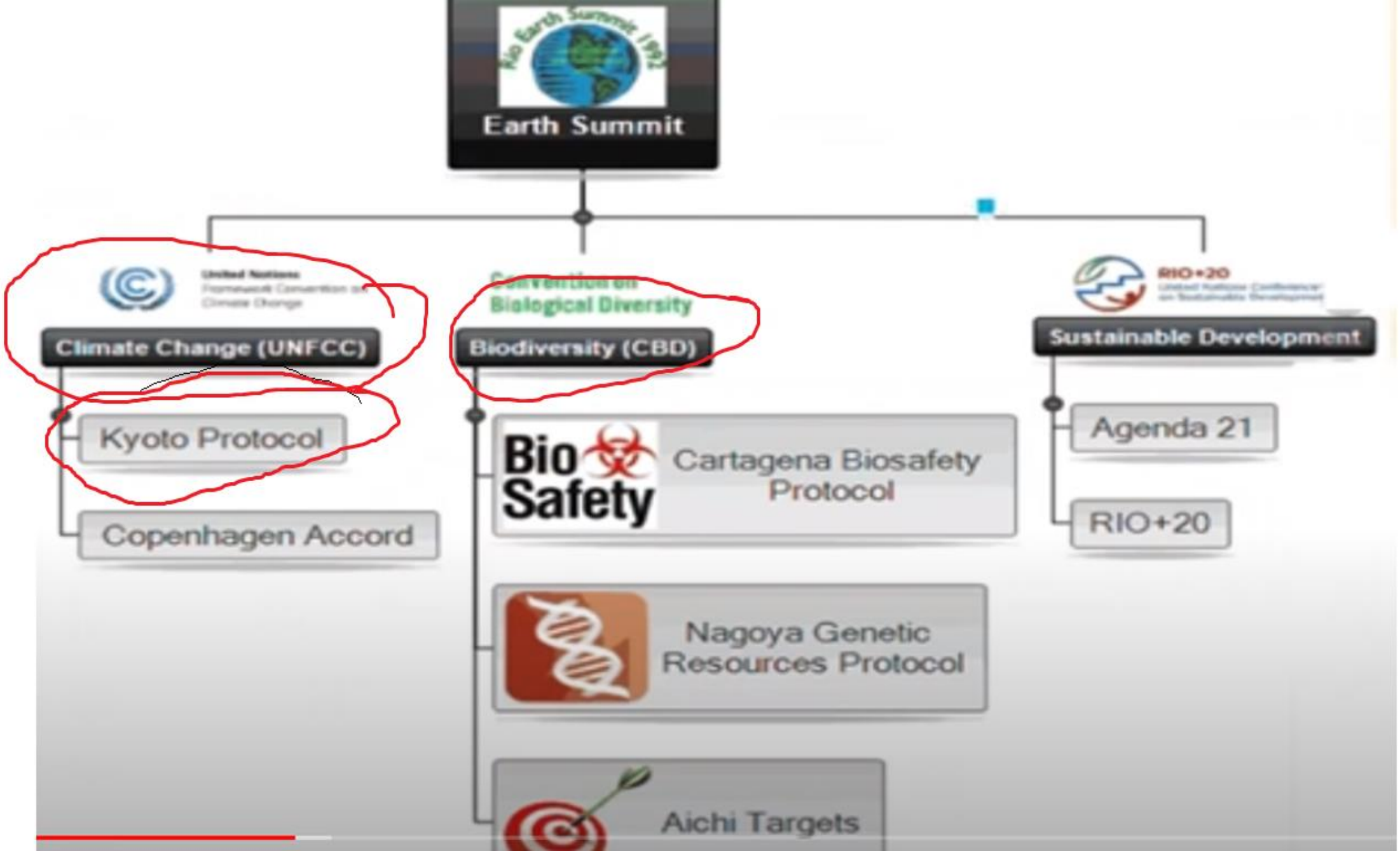
the growing scarcity of water

- **The Earth Summit resulted in the following documents:**

1. ***Rio Declaration on Environment and Development***
2. ***Agenda 21***
3. ***Forest Principles***

Legally binding agreements (Rio Convention) were opened for signature:

1. ***Convention on Biological Diversity***
2. ***Framework Convention on Climate Change*** ***(UNFCCC)***
3. ***United Nations Convention to Combat Desertificatio***


Earth Summit
Climate Change (UNFCC)
Kyoto Protocol
Copenhagen Accord
Convention on Biological Diversity
Biodiversity (CBD)
Bio Safety
Cartagena Biosafety Protocol
Nagoya Genetic Resources Protocol
Aichi Targets
RIO+20
Sustainable Development
Agenda 21
RIO+20

Rio Declaration on Environment and development

Short document produced at 1992 UNCED/Earth Summit

Consists of 27 principles intended to guide future sustainable development around the world

1. Role of Man
2. State sovereignty
3. Right to development
4. Environment protection in the development process
5. Eradication of poverty

6. Priority for the least developed
7. State cooperation to protect ecosystem
8. Reduction in unsustainable pattern of production and consumption
9. Capacity building for sustainable development
10. Public participation

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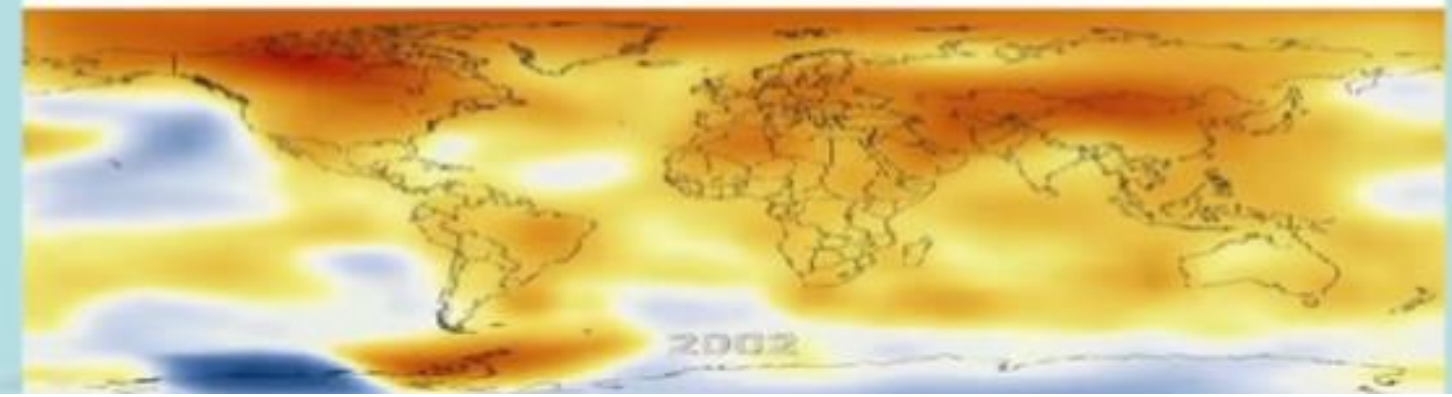
26. Resolution of Environment Disputes
27. Cooperation between state and people

UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)

UNFCCC

The UNFCCC, signed in 1992 at the United Nations Conference on Environment and Development, constitutes the foundational climate agreement that has provided the platform for most subsequent international climate agreements. The UNFCCC, for example, formulated both the Kyoto Protocol and Paris Agreement. The UNFCCC entered into force on Mar. 21, 1994, and has been ratified by 197 countries.



KYOTO PROTOCOL

NEHA GREEN PLANET
LEARNING FOR MAKING PLANET GREEN

Kyoto protocols

The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change, which commits its Parties by setting internationally binding emission reduction targets.

Recognizing that developed countries are principally responsible for the current high levels of GHG emissions in the atmosphere as a result of more than 150 years of industrial activity, the Protocol places a heavier burden on developed nations under the principle of "common but differentiated responsibilities."

The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. The detailed rules for the implementation of the Protocol were adopted at COP 7 in Marrakesh, Morocco, in 2001, and are referred to as the "Marrakesh Accords." Its first commitment period started in 2008 and ended in 2012.

KYOTO PROTOCOL

Kyoto Protocol 1997

- The Kyoto Protocol was adopted on **11 December 1997** and it was held at **Japan, Kyoto**.
- Due to complex ratification process it came into force on **16 February 2005**
- Presently there are **192 Parties**
- It was aimed to reduce the **CO_2 emission** and presence of **greenhouse gases (GHG**: CO_2, CH_4, N_2O, HFCs, SF_6, NF_3).
- It is international agreement for 37 **industrialised nations** plus the European Community to cut the emission of green house gases because global warming have been increased.

KYOTO PROTOCOL

Kyoto Protocol 1997

The **Paris climate agreement of 2015** replaced the Kyoto Protocol.

The protocol operationalizes the **UNFCC: United Nation Framework Convention on Climate Change**.

Carbon emission was fixed and there would be a provision of penalty if emission of country exceeds.

There were specific rules in the protocol for developed countries that they are following commitments and review of their information.

KYOTO PROTOCOL

Major Point or Characteristic of Kyoto Protocol 1997

- Developed countries made a promise to reduce annual carbon emission by an average **of 5.2% by year 2012**.
- EU pledged to cut emission by **8%**
- US and Canada would cut emission by **7% and 6% by 2012** but **US withdrew** fro the agreement or the grounds that mandate was unfair and would hurt **US economy in 2001**.
- To help developing countries to adopt technology to emit less GHG and **provide funding** to them.
- **China and India** were exempted from the treaty and more than **100 developing** countries also exempted.

KYOTO PROTOCOL

Major Point or Characteristic of Kyoto Protocol 1997

- This protocol separated countries into two

Annex I	Annex II
Developed Countries	Developing Countries

- Developing countries can **earn Carbon credit** and they can **sell or trade** these carbon credits to developed countries.

KYOTO PROTOCOL

Major Point or Characteristic of Kyoto Protocol 1997

Both **Annex I and non-Annex I** Parties must cooperate in the areas of:

(a) The development, application and diffusion of climate friendly technologies

(b) Research on and systematic observation of the climate system

(c) Education, training, and public awareness of climate change

(d) The improvement of methodologies and data for GHG inventories

KYOTO PROTOCOL

Major Point or Characteristic of Kyoto Protocol 1997

Three mechanisms:

1. The international Emission Trading Mechanisms
2. The Joint Implementation Mechanism
3. Clean Development Mechanism

These **mechanisms** enhance the flexibility of **Annex I Parties** to meet their emission reduction or limitation commitments, by allowing these Parties to take advantage of **lower-cost emission** reductions outside their territories.

CONVENTION ON BIOLOGICAL DIVERSITY

CONVENTION ON BIOLOGICAL DIVERSITY (CBD)

The Convention on Biological Diversity (CBD) is an international legally-binding treaty with three main goals: conservation of biodiversity; sustainable use of biodiversity; fair and equitable sharing of the benefits arising from the use of genetic resources. Its overall objective is to encourage actions, which will lead to a sustainable future. The Convention on Biological Diversity (CBD) was opened for signature at the Earth Summit in Rio de Janeiro on 5 June 1992 and entered into force on 29 December 1993. At present, this convention includes 193 Parties.

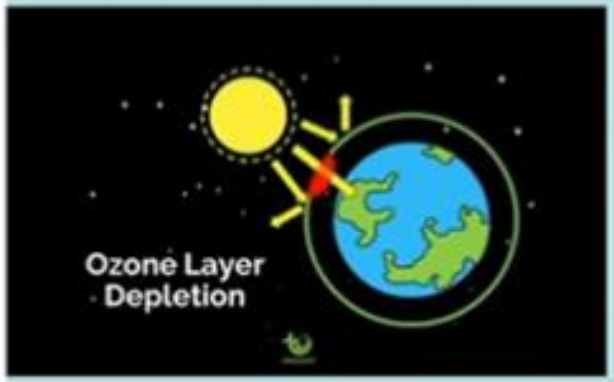
The conservation of biodiversity is a common concern of humankind. The Convention on Biological Diversity covers biodiversity at all levels: ecosystems, species and genetic resources. It also covers biotechnology, including through the Cartagena Protocol on Biosafety. In fact, it covers all possible domains that are directly or indirectly related to biodiversity and its role in development, ranging from science, politics and education to agriculture, business, culture and much more.

MONTREAL PROTOCOL

Montreal protocol

The Montreal Protocol, finalized in 1987, is a global agreement to protect the stratospheric ozone layer by phasing out the production and consumption of ozone-depleting substances (ODS). The stratospheric ozone layer filters out harmful ultraviolet radiation, which is associated with an increased prevalence of skin cancer and cataracts, reduced agricultural productivity, and disruption of marine ecosystems. The United States ratified the Montreal Protocol in 1988 and has joined four subsequent amendments. The United States has been a leader within the Protocol throughout its existence, and has taken strong domestic action to phase out the production and consumption of ODS such as chlorofluorocarbons (CFCs) and halons.

The Montreal Protocol has proven to be innovative and successful, and is the first treaty to achieve universal ratification by all countries in the world. Leveraging worldwide participation, the Montreal Protocol has sent clear signals to the global market and placed the ozone layer, which was in peril, on a path to repair. Full implementation of the Montreal Protocol is expected to result in avoidance of more than 280 million cases of skin cancer, approximately 1.6 million skin cancer deaths, and more than 45 million cases of cataracts in the United States alone by the end of the century, with even greater benefits worldwide.



On October 15, 2016, Parties to the Montreal Protocol adopted the Kigali amendment to phase down production and consumption of hydrofluorocarbons (HFCs) worldwide. HFCs

RAMSAR CONVENTION

Ramsar convention

The Convention on Wetlands, called the Ramsar Convention, is the intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources. The Convention was adopted in the Iranian city of Ramsar in 1971 and came into force in 1975. Since then, almost 90% of UN member states, from all the world's geographic regions, have acceded to become "Contracting Parties".

Wetlands are among the most diverse and productive ecosystems. They provide essential services and supply all our fresh water. However they continue to be degraded and converted to other uses.

The Convention uses a broad definition of wetlands. It includes all lakes and rivers, underground aquifers, swamps and marshes, wet grasslands, peatlands, oases, estuaries, deltas and tidal flats, mangroves and other coastal areas, coral reefs, and all human-made sites such as fish ponds, rice paddies, reservoirs and salt pans.

Under the "three pillars" of the Convention, the Contracting Parties commit to:

- work towards the wise use of all their wetlands;
- designate suitable wetlands for the list of Wetlands of International Importance (the "Ramsar List") and ensure their effective management;

CONVENTION ON CHEMICAL WEAPONS

The Chemical Weapons Convention (CWC)

The Chemical Weapons Convention (CWC) is a multilateral treaty that bans chemical weapons and requires their destruction within a specified period of time. CWC negotiations started in 1980 in the UN Conference on Disarmament. The convention opened for signature on January 13, 1993, and entered into force on April 29, 1997. The CWC is implemented by the Organization for the Prohibition of Chemical Weapons (OPCW), which is headquartered in The Hague with about 500 employees. The OPCW receives states-parties' declarations detailing chemical weapons-related activities or materials and relevant industrial activities. After receiving declarations, the OPCW inspects and monitors states-parties' facilities and activities that are relevant to the convention, to ensure compliance.

A unique feature of the Convention is its incorporation of the 'challenge inspection', whereby any State Party in doubt about another State Party's compliance can request a surprise inspection. Under the Convention's 'challenge inspection' procedure, States Parties have committed themselves to the principle of 'any time, anywhere' inspections with no right of refusal.

OPCW
↓
State Parties
↓
Declaration
↓
Challenge Inspection

CONVENTION ON INTERNATIONAL TRADE OF ENDANGERED SPECIES OF FLORA AND FAUNA

CITES

CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

Annually, international wildlife trade is estimated to be worth billions of dollars and to include hundreds of millions of plant and animal specimens. The trade is diverse, ranging from live animals and plants to a vast array of wildlife products derived from them, including food products, exotic leather goods, wooden musical instruments, timber, tourist curios and medicines. Levels of exploitation of some animal and plant species are high and the trade in them, together with other factors, such as habitat loss, is capable of heavily depleting their populations and even bringing some species close to extinction.

Because the trade in wild animals and plants crosses borders between countries, the effort to regulate it requires international cooperation to safeguard certain species from over-exploitation. CITES was conceived in the spirit of such cooperation. Today, it accords varying degrees of protection to more than 35,000 species of animals and plants, whether they are traded as live specimens, fur coats or dried herbs.

UNITED NATIONS ENVIRONMENT PROGRAMME

UNEP

The United Nations Environment Programme (UN Environment) is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system, and serves as an authoritative advocate for the global environment.

UNEP's work encompasses: assessing global, regional and national environmental conditions and trends; developing international and national environmental instruments and; strengthening institutions for the wise management of the environment.

UNITED NATIONS ENVIRONMENT PROGRAMME

Six Areas of Concentration

UNEP re-organised its work programme into six strategic areas as part of its move to results based management. The selection of six areas of concentration was guided by scientific evidence, the UNEP mandate and priorities emerging from global and regional forums.

1. CLIMATE CHANGE UNEP strengthens the ability of countries to integrate climate change responses by providing leadership in adaptation, mitigation, technology and finance. UNEP is focusing on facilitating the transition to low-carbon societies, improving the understanding of climate science, facilitating the development of renewable energy and raising public awareness.

2. POST-CONFLICT AND DISASTER MANAGEMENT UNEP conducts environmental assessments in crisis-affected countries and provides guidance for implementing legislative and institutional frameworks for improved environmental management. Activities undertaken by UNEP's Post-Conflict & Disaster Management Branch (PCDMB) include post-conflict environmental assessment in Afghanistan, Lebanon, Nigeria and Sudan.

3. ECOSYSTEM MANAGEMENT Facilitates management and restoration of ecosystems in a manner consistent with sustainable development, and promotes use of ecosystem services. Examples include the Global Programme of Action (GPA) for the Protection of the Marine Environment from Land-Based Activities.

UNITED NATIONS ENVIRONMENT PROGRAMME

4. ENVIRONMENTAL GOVERNANCE UNEP supports governments in establishing, implementing and strengthening the necessary processes, institutions, laws, policies and programs to achieve sustainable development at the country, regional and global levels, and mainstreaming environment in development planning.

5. HARMFUL SUBSTANCES UNEP strives to minimize the impact of harmful substances and hazardous waste on the environment and human beings. UNEP has launched negotiations for a global agreement on mercury, and implements projects on mercury and the Strategic Approach to International Chemicals Management (SAICM) to reduce risks to human health and the environment.

6. RESOURCE EFFICIENCY/SUSTAINABLE CONSUMPTION AND PRODUCTION UNEP focuses on regional and global efforts to ensure natural resources are produced, processed and consumed in a more environmentally friendly way. For example, the Marrakesh Process is a global strategy to support the elaboration of a 10-Year Framework of Programs on sustainable consumption and production.

INDIA'S NATIONAL ACTION PLAN ON CLIMATE CHANGE

India recognized that maintaining a high growth rate is essential for increasing living standards of the vast majority of our people and reducing their vulnerability to the impacts of climate change. In order to achieve a sustainable development path that simultaneously advances economic and environmental objectives, the National Action Plan for Climate Change (NAPCC) was implemented in 2008.

The Government of India formulated national plan on water, renewable energy, energy efficiency agriculture and others – into a set of eight missions under the National Action Plan on Climate Change. The Action Plan was released on 30th June 2008 to address the future policies and programs for the climate mitigation and adaptation.

INDIA'S NATIONAL ACTION PLAN ON CLIMATE CHANGE

Eight Missions of the National Action on Climate Change (NAPCC)

The core of the implementation of the Action plan are constituted by the following eight missions, that will be responsible for achieving the broad goals of adaptation and mitigation, as applicable.

1) National Solar Mission: The NAPCC targets to promote the development and use of solar energy for power generation and other uses with the ultimate objective of making solar competitive with fossil-based energy options. The plan includes:
   - I. Specific goals for increasing use of solar thermal technologies in urban areas, industry, and commercial establishments;
   - II. A goal of increasing production of photovoltaics to 1000 MW/year; and
   - III. A goal of deploying at least 1000 MW of solar thermal power generation.

   Other objectives include the establishment of a solar research centre, increased international collaboration on technology development, strengthening of domestic manufacturing capacity, and increased government funding and international support.

INDIA'S NATIONAL ACTION PLAN ON CLIMATE CHANGE

2) National Mission for Enhanced Energy Efficiency: Current initiatives are expected to yield savings of 10,000 MW by 2012. Building on the Energy Conservation Act 2001, the plan recommends:
   - I. Mandating specific energy consumption decreases in large energy-consuming industries, with a system for companies to trade energy-savings certificates;
   - II. Energy incentives, including reduced taxes on energy-efficient appliances; and
   - III. Financing for public-private partnerships to reduce energy consumption through demand-side management programs in the municipal, buildings and agricultural sectors
3) National Mission on Sustainable Habitat: To promote energy efficiency as a core component of urban planning, the plan calls for:
   - I. Extending the existing Energy Conservation Building Code;
   - II. A greater emphasis on urban waste management and recycling, including power production from waste;
   - III. Strengthening the enforcement of automotive fuel economy standards and using pricing measures to encourage the purchase of efficient vehicles;
   - IV. Incentives for the use of public transportation.

INDIA'S NATIONAL ACTION PLAN ON CLIMATE CHANGE

4) National Water Mission: With water scarcity projected to worsen as a result of climate change, the plan sets a goal of a 20% improvement in water use efficiency through pricing and other measures.
5) National Mission for Sustaining the Himalayan Ecosystem: The plan aims to conserve biodiversity, forest cover, and other ecological values in the Himalayan region, where glaciers that are a major source of India's water supply are projected to recede as a result of global warming.
6) National Mission for a "Green India": Goals include the afforestation of 6 million hectares of degraded forest lands and expanding forest cover from 23% to 33% of India's territory.
7) National Mission for Sustainable Agriculture: The plan aims to support climate adaptation in agriculture through the development of climate-resilient crops, expansion of weather insurance mechanisms, and agricultural practices.
8) National Mission on Strategic Knowledge for Climate Change: To gain a better understanding of climate science, impacts and challenges, the plan envisions a new Climate Science Research Fund, improved climate modeling, and increased international collaboration. It also encourages private sector initiatives to develop adaptation and mitigation technologies through venture capital funds.

Constitutional Provisions

The provisions for environmental protection in the constitution were made within four years of Stockholm Conference, in 1976, through the 42nd amendment as follows :

Article 48-A of the constitution provides: *"The state shall endeavour to protect and improve the environment and to safeguard forests and wildlife of the country."*

Article 51A(g) provides: *"It shall be the 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 crea-*

WILDLIFE PROTECTION ACT, 1972

- This law was implemented in 1972
- **Indian Board of Wildlife (IBWL)** which was created in 1952 took up the task to establish National Parks and Wildlife sanctuary.



(*i*) It defines the wild-life related terminology.

(*ii*) It provides for the appointment of wildlife advisory Board, Wildlife warden, their powers, duties etc.

(*iii*) Under the Act, comprehensive listing of endangered wild life species was done for the first time and prohibition of hunting of the endangered species was mentioned.

(*iv*) Protection to some endangered plants like Beddome cycad, Blue Vanda, Ladies Slipper Orchid, Pitcher plant etc. is also provided under the Act.

(*v*) The Act provides for setting up of National Parks, Wildlife Sanctuaries etc.

(*vi*) The Act provides for the constitution of Central Zoo Authority.

(*vii*) There is provision for trade and commerce in some wildlife species with license for sale, possession, transfer etc.

(*viii*) The Act imposes a ban on the trade or commerce in scheduled animals.

(*ix*) It provides for legal powers to officers and punishment to offenders.

(*x*) It provides for captive breeding programme for endangered species.

(*a*) **Drawbacks of the Wildlife (Protection) Act, (1972)**

- It seems as if the Act has been enacted just as a fallout of Stockholm Conference held in 1972 and it has not included any locally evolved conservation measures.
- The ownership certificates for animal articles (tiger, leopard skins etc.) are permissible which very often serve as a tool for illegal trading.
- The wildlife traders in Jammu and Kashmir easily get illegal furs and skins from other states which after making caps, belts etc. are sold or smuggled to other countries. This is so happening because J & K has its own Wildlife Act and it does not follow the Central Wild Life Act. Moreover, hunting and trading of several endangered species prohibited in other states are allowed in J & K, thereby opening avenues for illegal trading in such animals and articles.
- The offender of the Act is not subject to very harsh penalties. It is just upto 3 years imprisonment or a fine of Rs. 25,000 or both.

FOREST CONSERVATION ACT, 1980

FOREST CONSERVATION ACT, 1980

- After implementation of the Act, Central government was provided with more power to decide on Forest management.
- Advisory committee recommend Central Government on conservation of forest.
- State government has to seek permission of Central government for any non-forest activity.

FOREST CONSERVATION ACT, 1980

EIA (Environment Impact Assessment) is mandatory for proposal related to non-forest activity.

FOREST CONSERVATION ACT, 1980

NON FOREST ACTIVITIES INCLUDE:

1) Survey and exploration in National Park and Wildlife sanctuary
2) Mining
3) Silk cultivation
4) Cultivation of medicinal plant, fruit trees, oil yielding trees
5) Cultivation of coffee, tea, rubber etc.
6) Mulberry cultivation
7) Removal of stones from river flowing through forest.

FOREST CONSERVATION ACT, 1980

DRAWBACK

POOR LOCAL COMMUNITY PARTICIPATION

WATER ACT, 1974

■ WATER (PREVENTION AND CONTROL OF POLLUTION) ACT, 1974

It provides for maintaining and restoring the wholesomeness of water by preventing and controlling its pollution. Pollution is defined as *such contamination of water, or such alteration of the physical, chemical or biological properties of water, or such discharge as is likely to cause a nuisance or render the water harmful or injurious to public health and safety or harmful for any other use or to aquatic plants and other organisms or animal life.*

The definition of water pollution has thus encompassed the entire probable agents in water that may cause any harm or have a potential to harm any kind of life in any way.

The salient features and provisions of the Act are summed up as follows:

(*i*) It provides for maintenance and restoration of quality of all types of surface and ground water.

(*ii*) It provides for the establishment of Central and State Boards for pollution control.

(*iii*) It confers them with powers and functions to control pollution.

Central Pollution Control Board (CPCB):

- It advises the central govt. in matters related to prevention and control of water pollution.
- Coordinates the activities of State Pollution Control Boards and provides them technical assistance and guidance.
- Organizes training programs for prevention and control of pollution.
- Organizes comprehensive programs on pollution related issues through mass media.
- Collects, compiles and publishes technical and statistical data related to pollution.
- Prepares manuals for treatment and disposal of sewage and trade effluents.
- Lays down standards for water quality parameters.
- Plans nation-wide programs for prevention, control or abatement of pollution.
- Establishes and recognizes laboratories for analysis of water, sewage or trade effluent sample.

The **State Pollution Control Boards** also have similar functions executed at state level and are governed by the directions of CPCB.

- The Board advises the state govt. with respect to the location of any industry that might pollute a stream or a well.
- It lays down standards for effluents and is empowered to take samples from any stream, well or trade effluent or sewage passing through an industry.
- The State Board is empowered to take legal samples of trade effluent in accordance with the procedure laid down in the Act. The sample taken in the presence of the occupier or his agent is divided into two parts, sealed, signed by both parties and sent for analysis to some recognized lab. If the samples do not conform to the prescribed water quality standards (crossing maximum permissible limits), then 'consent' is refused to the unit.
- Every industry has to obtain consent from the Board (granted for a fixed duration) by applying on a prescribed Proforma providing all technical details, along with a prescribed fee following which analysis of the effluent is carried out.
- The Board suggests efficient methods for utilization, treatment and disposal of trade effluents.

AIR (PREVENTION AND CONTROL OF POLLUTION) ACT, 1981



Salient features of the act are as follows:

(*i*) The Act provides for prevention, control and abatement of air pollution.

(*ii*) In the Act, *air pollution has been defined as the presence of any solid, liquid or gaseous substance (including noise) in the atmosphere in such concentration as may be or tend to be harmful to human beings or any other living creatures or plants or property or environment.*

(*iii*) Noise pollution has been inserted as pollution in the Act in 1987.

(*iv*) Pollution control boards at the central or state level have the regulatory authority to implement the Air Act. Just parallel to the functions related to Water (Prevention and Control of Pollution) Act, the boards performs similar functions related to improvement of air quality. The boards have to check whether or not the industry strictly follows the norms or standards laid down by the Board under section 17, regarding the discharge of emission of any air pollutant. Based upon analysis report consent is granted or refused to the industry.

(*v*) Just like the Water Act, the Air Act has provisions for defining the constitution, powers and function of Pollution Control Boards, funds, accounts, audit, penalties and procedures.

(*vi*) Section 20 of the Act has provision for ensuring emission standards from automobiles. Based upon it, the state govt. is empowered to issue instructions to the authority incharge of registration of motor vehicles (under Motor Vehicles Act, 1939) that is bound to comply with such instructions.

(*vii*) As per Section 19, in consultation with the State Pollution Control Board, the state government may declare an area within the state as **"air pollution control area"** and can prohibit the use of any fuel other than approved fuel in the area causing air pollution. No person shall, without prior consent of State Board operate or establish any industrial unit in the "air pollution control area".

The Water and Air Acts have also made special provisions for appeals. Under Section 28 of Water Act and Section 31 of Air Act, a provision for appeals has been made. An **Appellate Authority** consisting of a single person or three persons appointed by the Head of the State, Governor is constituted to hear such appeals as filed by some aggrieved party (industry) due to some order made by the State Board within 30 days of passing the orders.

The Appellate Authority after giving the appellant and the State Board an opportunity of being heard, disposes off the appeal as expeditiously as possible.

ENVIRONMENT PROTECTION ACT, 1986

■ THE ENVIRONMENT (PROTECTION) ACT, 1986

The Act came into force on Nov. 19, 1986, the birth anniversary of our Late Prime Minister Indira Gandhi, who was a pioneer of environmental protection issues in our country. The Act extends to whole of India. Some terms related to environment have been described as follows in the Act:

(*i*) **Environment** includes water, air and land and the inter-relationships that exists among and between them and human beings, all other living organisms and property.

(*ii*) **Environmental pollution** means the presence of any solid, liquid or gaseous substance present in such concentration, as may be, or tend to be, injurious to environment.

(*iii*) **Hazardous Substance** means any substance or preparation which by its physico-chemical properties or handling is liable to cause harm to human beings, other living organisms, property or environment.

The Act has given powers to the Central Government to take measures to protect and improve environment while the state governments coordinate the actions. The most important functions of Central Govt. under this Act include setting up of:

(*a*) The standards of quality of air, water or soil for various areas and purposes.

(*b*) The maximum permissible limits of concentration of various environmental pollutants (including noise) for different areas.

(*c*) The procedures and safeguards for the handling of hazardous substances.

(*d*) The prohibition and restrictions on the handling of hazardous substances in different areas.

(*e*) The prohibition and restriction on the location of industries and to carry on process and operations in different areas.

(*f*) The procedures and safeguards for the prevention of accidents which may cause environmental pollution and providing for remedial measures for such accidents.

Under the **Environmental (Protection) Rules, 1986** the State Pollution Control Boards have to follow the guidelines provided under Schedule VI, some of which are as follows:

(*a*) They have to advise the Industries for treating the waste water and gases with the best available technology to achieve the prescribed standards.

(*b*) The industries have to be encouraged for recycling and reusing the wastes.

(*c*) They have to encourage the industries for recovery of biogas, energy and reusable materials.

(*d*) While permitting the discharge of effluents and emissions into the environment, the State Boards have to take into account the assimilative capacity of the receiving water body.

(*e*) The Central and State Boards have to emphasize on the implementation of clean technologies by the industries in order to increase fuel efficiency and reduce the generation of environmental pollutants.

Under the Environment (Protection) Rules, 1986 an amendment was made in 1994 for Environmental Impact Assessment (EIA) of Various Development Projects. There are 29 types of projects listed under Schedule I of the rule which require clearance from the Central Government before establishing.

Others require clearance from the State Pollution Control Board, when the proposed project or expansion activity is going to cause pollution load exceeding the existing levels. The project proponent has to provide EIA report, risk analysis report, NOC from State Pollution Control Board, Commitment regarding availability of water and electricity, Summary of project report/feasibility report, filled in a questionnaire for environmental appraisal of the project and comprehensive rehabilitation plan, if more than 1000 people are likely to be displaced due to the project.

Under the Environment (Protection) Act, 1986 the Central Government also made the Hazardous Wastes (Management and Handling) Rules, 1989. Under these rules, it is the responsibility of the occupier to take all practical steps to ensure that such wastes are properly handled and disposed off without any adverse effects. There are 18 Hazardous Waste categories recognized under this rule and there are guidelines for their proper handling, storage, treatment, transport and disposal which should be strictly followed by the owner.

The Environment (Protection) Act, 1986 has also made provision for environmental Audit as a means of checking whether or not a company is complying with the environmental laws and regulations. Thus, ample provisions have been made in our country through law for improving the quality of our environment.

DRAWBACKS OF POLLUTION RELATED ACTS

- The power and authority has been given to central government with little delegation of power to state government. Excessive centralization very often hinders efficient execution of the provisions of the Acts in the states. Illegal mining is taking place in many forest areas. In Rajasthan alone, about 14000 cases of illegal mining have been reported. It becomes more difficult to check such activities at the central level.
- The provision of penalties in the Act is very insignificant as compared to the damage caused by the big industries due to pollution. The penalty is much less than the cost of the treatment/ pollution control equipments. This always gives a loose rope to the industries.
- The Act has not included the "right to information" for the citizens. This greatly restricts the involvement or participation of the general public.
- The Environment (Protection) Act, 1986 regarded as an umbrella Act, encompassing the earlier two Acts often seems superfluous due to overlapping areas of jurisdiction. For instance Section 24 (2) of the new Act has made a provision that if the offender is punishable under the other Acts like Water Act or Air Act also, then he may be considered under their provisions. Interestingly, the penalty under the older two Acts is much lighter than the new Act. So the offender easily gets away with a lighter punishment.
- Under Section 19, a person cannot directly file a petition in the court on a question of environment and has to give a notice of minimum 60 days to the central government. In case

no action is taken by the latter, then alone the person can file a petition which certainly delays the remedial action.

- Litigation, particularly related to environment is very expensive, tedious and difficult since it involves expert testimony, technical knowledge of the issues and terminologies, technical understanding of the unit process, lengthy prosecutions etc.
- The State Boards very often lack adequate funds and expertise to pursue their objectives.
- A tendency to seek to exercise gentle pressure on the polluter and out of the court settlements usually hinder the implementation of legal measures.
- For small units it is very expensive to install Effluent Treatment Plant (ETP) or Air pollution control devices and sometimes they have no other option but to close the unit. The Act should make some provision for providing subsidies for installing treatment plants or common effluent treatment plants for several small units.
- The pollution control laws are not backed by sound policy pronouncements or guiding principles.
- The position of chairman of the boards is usually occupied by political appointee. Hence it is difficult to keep political interference at bay.
- The policy statement of the Ministry of Environment and Forests (1992) of involving public in decision-making and facilitating public monitoring of environmental issues has mostly remained on paper.

Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006

FOREST RIGHT ACT, 2006

6. Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006

- The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, has been enacted to apprehend the rights of residing Scheduled Tribes and other traditional forest dwellers, who have been residing in such forests for generations.
- This Act recognizes the rights of forest dwellers to keep the forest land for habitation or for self-cultivation for livelihood, it also guarantees their hold over forest area resources which includes collection, use and disposal of community forest produce, it also provides the right to protect, regenerate or preserve or manage any community forest area for sustainable use.
- The Act also provides for utilization of forest land for public utility facilities managed with the aid of the Government, along with schools, dispensaries, fair price shops, electricity and telecommunication lines, water tanks, etc. With the advice of Gram Sabha's. Special Central Assistance provides monetary support to Tribal Sub Plan for infrastructure paintings viz. Roads, healthcare, primary education, sanitation, community halls, etc. for development of forest villages.
- Under Section 3(1)(h) of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, the rights of agreement and conversion of all forest villages, vintage habitations, un-surveyed villages and different villages in forests, whether recorded, notified, or not, into revenue villages have been identified as one of the forest rights of forest residing Scheduled Tribes and different traditional forest dwellers on all forest lands.