



- ENVIRONMENT
- Part 5

Ecology & Ecosystems

Ecology

- Ecology is the studies the interactions among organisms and their environment.
- Environment includes both biotic and abiotic components
- Ecology is the science to understand the ecosystems and how the various ecosystems are connected and how they influence each other and in the process evolves

Ecosystem

- An ecosystem is a community of living organisms in conjunction with the nonliving components of their environment as a system
- Ecosystem is dynamic - everchanging
- There is always transfer of material and energy between the living and non-living components of the ecosystem.
- Ecosystems are controlled and influenced both by external and internal factors
- The term ecosystem was first used in 1935 by Arthur Tansley while explaining the importance of transfers of materials between organisms and their environment

Biome

- A biome is a community of plants and animals that have common characteristics for the environment they exist in.
- Biomes can be found on different continents
- Biomes are distinct biological communities that have formed and emerged or evolved in response to a shared physical climate.
- Biomes can have variety of habitats

Biosphere

- Biosphere also known as ecosphere is the worldwide total of all ecosystems
- Biosphere is the global ecological system integrating all living beings and their relationships including their interactions with the elements of the various components of biosphere.
- Biosphere includes all lithosphere, hydrosphere and atmosphere.
- Biospheres are self regulating system
- The term 'biosphere' was coined by geologist Eduard Suess in 1875.

Pollution

- Pollution is the introduction of undesirable substances into the natural environment.
- These undesirable substance or conditions are called contaminants as they can be harmful or poisonous
- Contaminants cause adverse change in natural environment
- These adverse changes in environment affects human beings and threatens even their existence
- Undesirable substances are called pollutants
- Pollutants can be chemical substance or energy such as noise, heat or light.
- Pollutants can be foreign substances or naturally occurring

Types of Environmental Pollution

- Environmental Pollution occurs in different forms mainly:
 - Air pollution
 - Water pollution
 - Soil pollution
 - Noise pollution
 - Radioactive pollution
 - Light pollution
 - Heat pollution
- It is estimated that in 2015, pollution killed 9 million people in the world

Renewable Energy

- Renewable energy is produced/generated from renewable resources.
- Renewable resources are naturally replenished quickly without affecting the mother nature
- Renewable energy sources are
 - Sunlight
 - Wind
 - Rain
 - Tides
 - Waves
 - Geothermal heat

Climate Change Institutions & Conventions

UNCED Rio de Janeiro 1992

- The United Nations Conference on Environment and Development (UNCED) also known as Rio de Janeiro Earth Summit was a major conference of UNO from 3-14 June 1992.
- Issues of sustainability was thought to be needed corroborative efforts of all Member States.
- In 2012, the United Nations Conference on Sustainable Development was also held in Rio, and is commonly called Rio+20 or Rio Earth Summit 2012

Kyoto Protocol

- The Kyoto Protocol was adopted in Kyoto, Japan on December 1997 and entered into force on 16 February 2005.
- There are currently 192 parties to the Protocol. Canada withdrew from the protocol, effective December 2012.
- The Kyoto Protocol implemented the objective of the UNFCCC to reduce the onset of global warming by reducing greenhouse gas concentrations in the atmosphere to "a level that would prevent dangerous anthropogenic interference with the climate system" (Article 2). The Kyoto Protocol applies to the six greenhouse gases listed in Annex A: Carbon dioxide (CO₂), Methane (CH₄), Nitrous oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulphur hexafluoride (SF₆).

Kyoto Protocol

- Article 2). The Kyoto Protocol applies to the six greenhouse gases listed in Annex A: Carbon dioxide (CO₂), Methane (CH₄), Nitrous oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulphur hexafluoride (SF₆).
- The Protocol is based on the principle of common but differential responsibilities. It acknowledges that individual countries have different capabilities in combating climate change owing to economic development, and therefore puts the obligation to reduce current emissions on development countries on the basis that they are historically responsible for the current levels of greenhouse gases in the atmosphere.

Kyoto Protocol

- The Protocol's first commitment period started in 2008 and ended in 2012.
- A second commitment period was agreed in 2012, known as Doha Amendment to the Kyoto Protocol
- Many countries have withdrawn from the commitment of implementing 2nd commitment.
- As of May 2019, 128 states have accepted the Doha Amendment, while entry into force requires the acceptances of 144 states.
- Countries Withdrawn: Canada, US has not ratified

Why Canada withdrew from the Kyoto accord

- Canada withdrew from Kyoto Protocol to save the penalties an estimated \$ 14 billion which were to be levied and paid by Canada
- When Canada signed the protocol there was Government of Liberals and in 2012 the Government was of Conservative Party.
- The Kyoto Protocol committed major industrial economies to reducing their annual Carbon Dioxide emissions below 1990 levels, while providing financial supports to developing nations to encourage them to follow suit eventually.
- The Conservatives have committed to 17 per cent cuts from 2005 levels by 2020, a much lower threshold to meet than cutting below 1990 emissions level

Carbon Trading

- Carbon emission trading is a form of emissions trading that specifically targets carbon dioxide calculated in tonnes of carbon dioxide equivalent and is currently constitutes the bulk of emissions trading.
- Under Carbon trading, a country or a polluter having more emission of Carbon Dioxide can purchase the right to emit more and the country or entity having fewer emissions sells the right to emit carbon to other countries or entities.
- The cost of negative externalities is compensated by this method of buying the rights for emitting C more than the levels agreed upon.

Bali Meet

- The 2007, December 3-15, United Nations Climate Change Conference took place in Bali, Indonesia.
- 180 Countries participated
- The proposal:
Global emissions to peak in 10 to 15 years and then to decline well below half for developing countries and for developed countries to achieve emissions levels 20-40% below 1990 levels by 2020.
- Developed countries did not agree for these targets.
- The resulted compromise mandated 'deep cuts in global emissions'.

COP 16

- The 2010 United Nations Climate Change Conference was held in Cancun Mexico, from 29 November to 10 December 2010.
- The conference is officially referred to as the 16th session of the Conference of the Parties (COP16) to the United Nations Framework Convention on Climate Change (UNFCCC).
- Decisions:
Developed countries should submit annual greenhouse gas inventories and biennial reports on their progress.
The developing nations will take nationally appropriate mitigation actions in the context of sustainable development

COP 16

- Developed countries to provide USD 30 billion for the period 2010-2012 and mobilizing USD 100 billion per year by 2020 to address the needs of developing countries
- It was decided to establish a Green Climate Fund to be governed by a board of 24 members.
- There was no agreement on how the fund will be raised or whether developing countries should have binding emissions reductions or whether rich countries would have to reduce emissions first

COP 17

- Was held in Durban, South Africa from 28 November to 11 December 2011.
- Objective: to establish a new treaty to limit carbon emission.
- Treaty could not be established
- It was agreed to establish a legally binding deal comprising all countries by 2015 to be effective from 2020.
- Green Climate Fund: It was decided that \$100 billion per year to be given to poor countries adept climate impacts
- India took a hard stand and said there should not be an attempt to shift the blame to developing countries

COP 19

- Was held in Warsaw Poland from 11 to 23 November 2013.
- Continued the deliberations on global climate agreement
- The conference led to an agreement that all states would start cutting emissions as soon as possible but preferably by the first quarter of 2015.
- The term intended Nationally Determined Contribution was coined in Warsaw upon a proposal from Singapore.
- INDCs term used for reductions in greenhouse gas emissions that all countries that signed the UNFCCC were asked to publish at the 2013 UNCCC
- China and USA both constitute 38% of total global emission.
India 4.1%

COP 20

- Took place from 1 to 12 December 2014 in Lima, Peru.
- The EU decided to aims a legally binding 40% drop in emissions by 2030 against carbon output in 1990 as baseline.

COP 21 Paris Climate Change Conference

- Held in Paris France from 30 November to 12 December 2015
- The conference negotiated the Paris Agreement, a global agreement on the reduction of climate change a consensus reached in 196 countries
- The agreement will enter into force when joined by at least 55 countries which together represent at least 55 percent global greenhouse emissions.
- On 22 April 2016 (Earth Day) 174 countries signed the agreement in New York and began adopting it within their own legal systems.
- The parties will also 'pursue efforts to' limit the temperature increase to 1.5°C . The 1.5°C goal will require zero emissions sometime between 2030 and 2050, according to some scientists.

COP 21 - 2015 Paris Climate Change Conference

- 146 nations presented national climate contributions (called 'Intended Nationally Determined Contributions'). These suggested commitment were estimated to limit global warming to 2.7 degrees Celsius by 2100.
- The EU suggested INDC is a commitment to a 40 percent reduction in emissions by 2030 compared to 1990

COP 23

- Was held at UN Campus in Bonn (Germany) from 6-17 November 2017.
- Organized by Republic of Fizi
- The purpose of the conference was to discuss and implement plans about combating climate change, including the details of how the Paris Agreement will work after it enters into force in 2020
- Although COP23 focused primarily on technical details of the Paris Agreement, it was the first conference of the parties to take place after President Donald Trump announced that the US would withdraw from the agreement

COP 23 - Talanoa Dialogue

- Talanoa is a traditional word used in Fiji and across the Pacific to reflect a process of inclusive, participatory and transparent dialogue
- Talanoa Dialogue is a process designed to help countries implement and enhance their Nationally Determined Contributions by 2020.
- The process of Talanoa involves the sharing of ideas, skills, and experience through storytelling
- It will be structured around three questions-Where are we? Where do we want to go? How do we get there?
- Originally called the facilitative dialogue, the name was changed to Talanoa dialogue.

- Thank you