

Introduction to Sustainable Engineering

BE 103

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Module I

- ❖ **Sustainability**
 - o Introduction
 - o Need and concept of sustainability
 - o Social, environmental and economic sustainability concepts
- ❖ **Sustainable development,**
 - o Nexus between Technology and Sustainable development
 - o Challenges for Sustainable Development
- ❖ **Multilateral environmental agreements and Protocols**
 - o Clean Development Mechanism (CDM)
 - o Environmental legislations in India
 - » Water Act
 - » Air Act

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Multilateral environmental agreements and Protocols

- **Multilateral environmental agreement (MEA)**
 - A legally binding agreement
 - Between two or more nations
 - Which contains commitments
 - ❖ To meet specific environmental objectives

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Multilateral environmental agreements and Protocols (Contd.)

- **Protocol**
 - A type of international law
 - An intergovernmental document
 - Intended as legally binding
 - with a primary stated purpose of preventing or managing human impacts on natural resources

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Multilateral environmental agreements and Protocols (Contd.)

- **Major conferences**
 - The United Nations Conference on the Human Environment, (UNCHE) Stockholm, 1972
 - ❖ The first conference on environment
 - ❖ Led to the establishment of
 - o United Nations Environment Programme (UNEP)
 - » Aimed to advance SD by identifying key conservation issues

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Multilateral environmental agreements and Protocols (Contd.)

- **Major conferences (Contd.)**
 - The First World Climate Conference, Geneva, 1979
 - ❖ Explored how climate change affects human activities
 - ❖ Established World Climate Programme (WCP) under the joint responsibility of
 - o World Meteorological Organisation (WMO)
 - o United Nations Environment Programme (UNEP)
 - o International Council of Scientific Union (ICSU)

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Multilateral environmental agreements and Protocols (Contd.)

• Major conferences (Contd.)

- **Montreal Protocol, 1987**
- **Set out a mandatory timetable for the phase out of Ozone Depleting Substances (ODS)**
 - ❖ CFCs - refrigerants, propellants (in aerosol applications), and solvents
 - ❖ HCFCs - refrigerants (in refrigerators, freezers and air conditioning systems)
 - ❖ Halons - fire extinguisher

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Multilateral environmental agreements and Protocols (Contd.)

• Major conferences (Contd.)

➤ Montreal Protocol, 1987 (Contd.)

ODS	Developed countries	Developing countries
CFCs	Phased out 1995	Total phase out 2010
Halons	Phased out 1993	Total phase out 2010
HCFCs	Total phase out 2020	Total phase out 2030

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Multilateral environmental agreements and Protocols (Contd.)

• Commission Report

- **Our Common Future**
- **Also called as Brundtland Commission Report**
- **Published in 1987**
- **Discussed the environment and development as a single issue**

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Multilateral Environmental Agreements and Protocols (Contd.)

➤ Some inter – governmental conferences

- ❖ The Villach Conference, October 1985
- ❖ The Toronto Conference, February 1989
- ❖ The Hague Conference and Declaration, March 1989
- ❖ The Noordwijk Ministerial Conference, November 1989
- ❖ The Cairo Compact, December 1989
- ❖ The Bergen Conference, May 1980
- ❖ The Second World Climate Conference, 1990

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Multilateral environmental agreements and Protocols (Contd.)

• Major conferences (Contd.)

- ❖ **The UN Conference on Environment and Development (UNCED), Rio – de – Janeiro, June 1992**
 - o 172 countries participated
 - o Adopted United Nations Framework Convention on Climate Change (UNFCCC)
 - o Issues addressed
 - » Systematic scrutiny of patterns of production
 - » Alternative sources of energy to replace fossil fuels
 - » Climate change
 - » New reliance on public transportation systems
 - » To reduce vehicle emissions
 - » Scarcity of water

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Multilateral environmental agreements and Protocols (Contd.)

• Major conferences (Contd.)

- ❖ **The UN Conference on Environment and Development (UNCED), Rio – de – Janeiro, June 1992 (Contd.)**
 - o Achievement
 - » An agreement on the climate change convention
 - » Led to the Kyoto Protocol (1997)

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Multilateral environmental agreements and Protocols (Contd.)

Major conferences (Contd.)

- ✧ Since 1995, United Nations Framework Convention on Climate Change (UNFCCC)
- ✧ Conducts yearly conferences called Conference of Parties (COPs)
- ✧ The First UN Climate Change Conference, Berlin, 1995



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Multilateral environmental agreements and Protocols (Contd.)

UNFCCC divides countries into two



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Multilateral environmental agreements and Protocols (Contd.)

Major conferences (Contd.)

Major COP

- ✧ Kyoto, Japan, 1997
- ✧ Estd. legal binding obligation to developed countries to reduce their green house gas emission (GHG)
- ✧ Kyoto Protocol agreed on 11th December 1997
 - Requires developed countries to reduce the collective emissions of 6 GHGs by at least 5.2% as compared to 1990 level during the period 2008 - 2012
 - » CO₂, CH₄, N₂O, set of per fluorocarbons, hydro fluorocarbons

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Multilateral environmental agreements and Protocols (Contd.)

Major conferences (Contd.)

Major COP (Contd.)

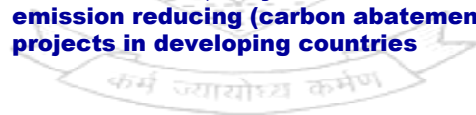
- ✧ Kyoto, Japan, 1997 (Contd.)
 - Did not get equal support from all Governments
 - Reason – their economies may suffer loss
 - Emissions of GHGs to be cut by 25% below the current level by 2050



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Clean Development Mechanism (CDM)

- A mechanism defined in Kyoto Protocol
- An arrangement made allowing Annex I countries to undergo a commitment for reducing GHGs
- To achieve this, they can invest in emission reducing (carbon abatement) projects in developing countries



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Environmental Laws

- Laws which address issues having direct impact on environment

National laws

- Adopted by Govt of an individual country

International laws

- Agreements between nations

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International laws

Public international law

- Agreements among nations

Private international law

- Agreements among corporations / groups of citizens belonging to different nations

Hard international law

- Agreements enforceable by a national / international body
- Legally binding

Soft international law

- Agreements meant to respect certain law
- No legal binding

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Environmental Acts in India

- India is the first country in the world to have provisions for protection and conservation of environment in its constitution

➤ Article 21

➤ Article 47

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Major Environmental Acts in India

The Water (Prevention and control of pollution) Act, 1974

- First law in India
- Prevention and control of water pollution
- Maintaining quality of water
- Establishment of boards for the same

The Air (Prevention and control of pollution) Act, 1981

- Prevention and control of air pollution
- Maintaining quality of air
- Establishment of boards for the same

The Environment Protection Act, 1986

- Protection and improvement of environment (air, water, land)
- Prevention of hazards to all living creatures and property
- Maintenance of harmonious relationship between human and environment