

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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Sustainable development

- **Present scenario**
 - **Developed countries**
 - ❖ Exploited their natural resources rapidly
 - ❖ Also used the resources of developing countries
 - **Result**
 - ❖ Rich countries got richer
 - ❖ Poor countries became poorer



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Sustainable development (Contd.)

- **Need**
 - Every individual / community / nation needs development
 - Should use natural resources
 - But should not diminish the resources



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Sustainable development (Contd.)

History

- ❖ Theoretical framework for SD
- ❖ Evolved between 1972 and 1992
- ❖ Through a series of international conferences and initiatives

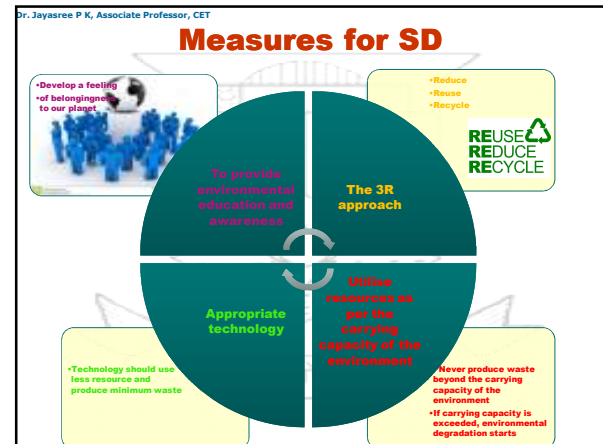
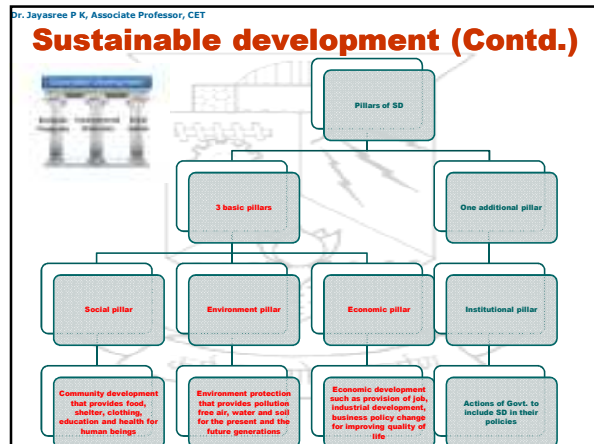
United Nations Conference on the Human Environment, Stockholm, 1972	<ul style="list-style-type: none"> • First major international gathering to discuss sustainability • A successful conference • Led to the development of Nations Environment 	
Earth Summit, Rio - de - Janeiro, 1992	<ul style="list-style-type: none"> • The next UN Conference on Environment and Development • 20 years after Stockholm conference • Eradication of poverty is indispensable • Development progress and protection must go hand in hand 	

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Sustainable development (Contd.)

- **Definition**
 - o Defined in 1987
 - o In the report entitled "Our Common Future"
 - o Published by the World Commission on Environment and Development
 - » Also known as Brundtland Commission
- **Defined as**
 - ❖ Development which meets the needs of the present without compromising the ability of future generations to meet their own needs
 - ❖ Most often quoted definition for SD





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Nexus between technology and SD

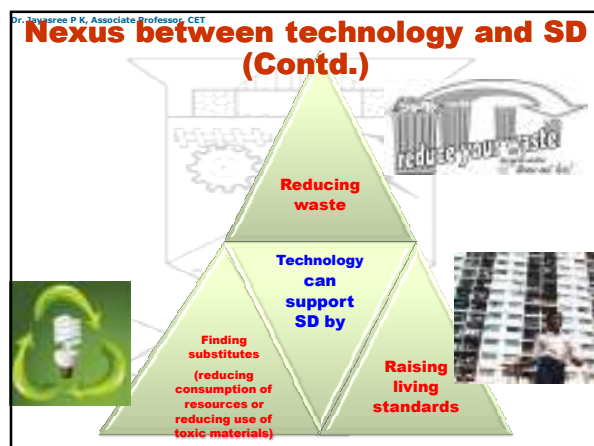
- Present scenario**
 - Majority of the world population lives in
 - Extreme poverty with inadequate
 - Food
 - Housing
 - Sanitation
 - Energy
 - Plus diseases that could be easily cured if clean water and simple drugs were made available

Poverty is not an accident. Like slavery and apartheid, it is man-made and can be removed by the actions of human beings.

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Nexus between technology and SD (Contd.)

- Present scenario (Contd.)**
 - Developing countries**
 - India, China, Brazil etc.
 - On the threshold of development
 - Helped by technology transfer and technological innovations
 - Underdeveloped countries**
 - In Africa, Asia and Latin America
 - Poverty still remains the main issue
 - Technological innovations like cellular phones and internet are not the need of the hour


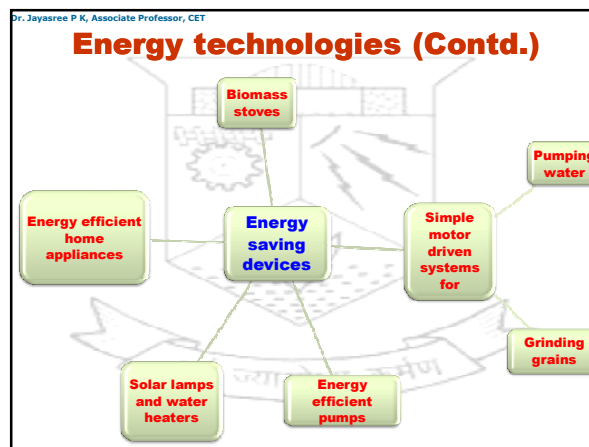
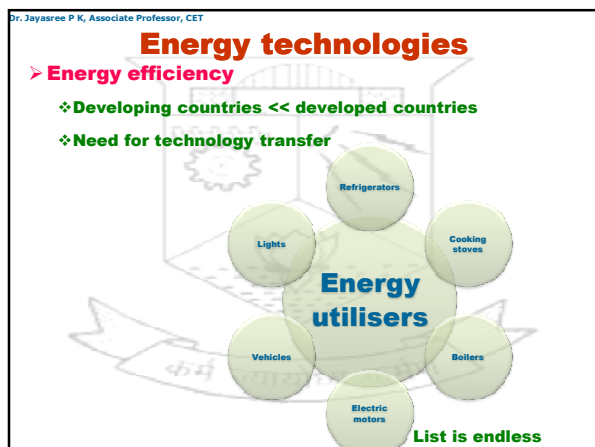
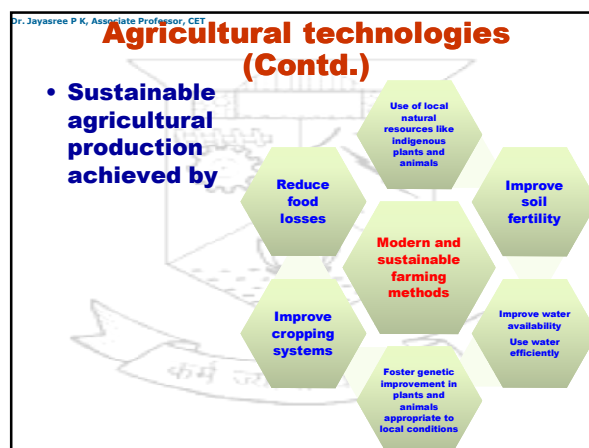


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Agricultural technologies (Contd.)

➤ **Present scenario**

- ❖ Fruits and vegetables – pesticide contaminated
- ❖ A lot of adverse environmental effects
- ❖ Situation worsened by
 - o Absence of Maximum Residue Levels (MRL) for pesticides in many countries

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Environmental technologies

• **Major environmental priorities**

➤ **Developing countries**

- ❖ Provision of basic facilities
 - o Access to drinking water
 - o Proper sanitation
 - o Gaseous, liquid and solid waste disposal services

➤ **Developed countries**

- ❖ Improved agricultural practices
- ❖ Forest management

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Biomedical technologies

➤ **Sustainable methods to be developed for**

- ❖ Increasing the life span of human being
- ❖ Decreasing the death rate due to communicable diseases
- ❖ Decreasing the child death rate (<= 5 years)
- ❖ Increasing the life expectancy at birth

➤ **Can be attained through**

- ❖ More research in the area
- ❖ Setting up more research centres indigenously
- ❖ Develop life saving machines and medicines indigenously

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Communication and Information Technologies

- ❖ Sustainable methods to be developed for
 - o Less costlier communication systems
 - » Satellite based personal communication systems
 - o Encouraging wireless technology
- ❖ Can be attained through
 - o More research in areas like
 - » Communication technology
 - » Satellite technology
- ❖ United Nations Sustainable Development Network (SDN)
 - o A major milestone where IT is used to assist developing countries maintain and apply data for domestic development activities

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Assignment no. 1

- Question no. 1
 - What are the challenges in sustainable development?
- Question no. 2