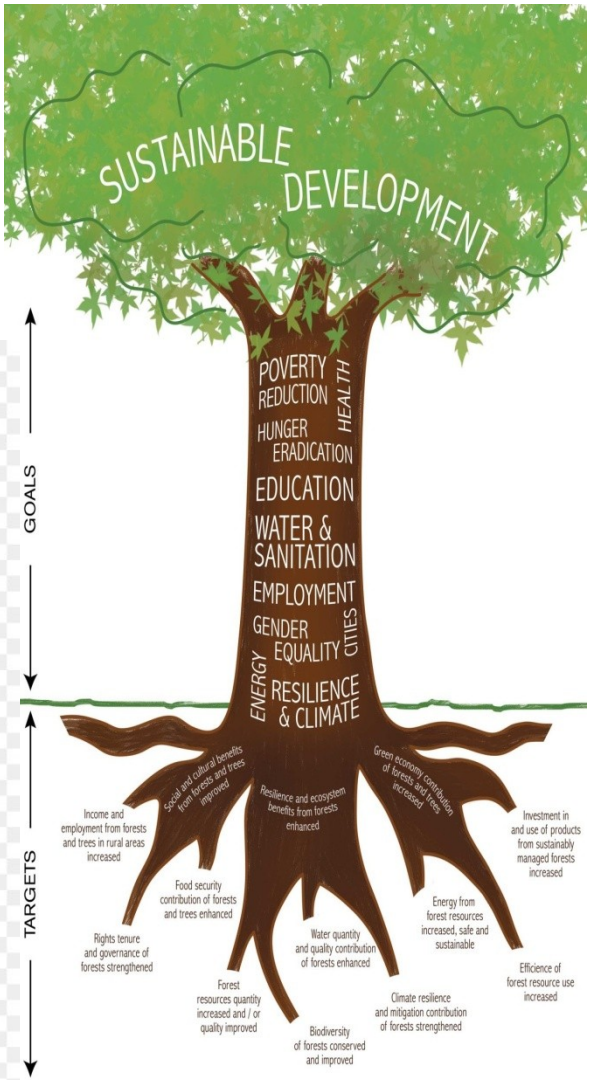
Sustainable development and Green Technology



DEFINITION

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

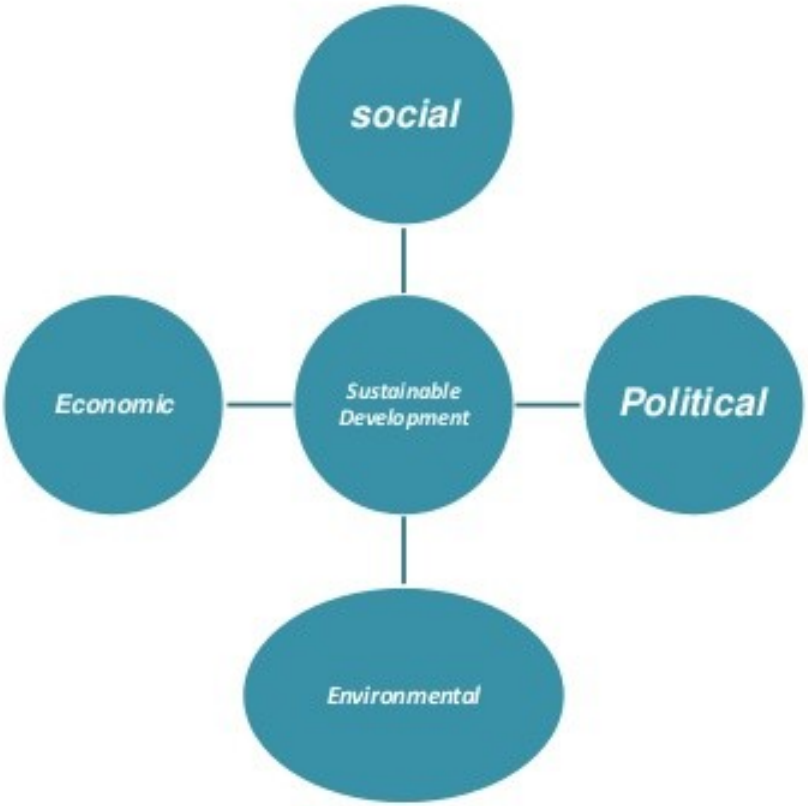
-WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT (BRUNDTLAND COMMISSION)

Environmental care married to development

Concept of sustainable development

Sustainable development is maintaining a delicate balance between the human need to improve lifestyles and feeling of well-being on one hand, and preserving natural resources and ecosystems, on which we and future generations depend.

FOUR DIMENSIONS



What are the Primary Goals of Sustainability?

- The end of poverty and hunger
- Better standards of education and healthcare - particularly as it pertains to water quality and better sanitation
- To achieve gender equality
- Sustainable economic growth while promoting jobs and stronger economies
- All of the above and more while tackling the effects of climate change, pollution and other environmental factors that can harm and do harm people's health, livelihoods and lives.
- Sustainability to include health of the land, air and sea

Sustainable development

- Organizing principle for human life on our planet.
- Utilize resources optimally and rationally.
- Sustainability is goal of sustainable development.

Objectives

- Healthy and productive life in harmony with nature
- Preservation of environment and sustainable use of natural resources
- Eradicate poverty
- Reduce disparities in standard of living
- Human rights
- Peace and security
- Preserve cultural diversity

WHY Sustainable Development?

Environmental concerns:

- Globalization and Green-house effect.
- Acid rain
- Desertification
- Ozone layer depletion
- Pollution causes 16% of all deaths globally.
- Technology in warfare-the use of chemicals and micro-organisms
- Species extinction

- Resources are fixed
- Drastic increase in global population and increasing human needs
- Terrible circulation
- Helpful in inventing alternative resources
- Promotes reuse and recycle of resources
- Reduce dependence on non-renewable resources and use it judiciously.
- Save for future generations
- Social equity
- Balance our economic, environmental and social needs

Threats to sustainability

- Use of traditional fuel wood, their collection and use:
- Modern utilization of biomass (organic matter) involves the large-scale harvesting of rapidly growing trees (for example, eucalyptus), or the conversion of crops into fuels (for example, sugar cane into ethanol).
- These may adversely affect biodiversity, natural habitats, visual amenity, and the quality of land, water, and air.
- Large hydroelectric schemes are widely regarded as unsustainable
- Wind-power developments can be bulky and obtrusive.
- Geothermal energy projects may release carbon dioxide (CO_2), hydrogen sulphide, and mercury.
- Tidal power projects, especially tidal barrages, may destroy or fundamentally change estuarine habitats

- Modern agriculture largely depends on the use of fossil fuel - based inputs, such as chemical fertilizers, pesticides, herbicides and labour saving but energy intensive farm machinery.
- The adverse effects of agricultural practices on the farm environment are, soil erosion, water availability, salinization, fertilizer and pesticide contamination, genetic erosion, etc.
- These are the steps towards unsustainable development.
- The threat to the human race due to environmental degradation is as great as the one from nuclear holocaust.
- But industrialization development cannot be stopped.
- So, we have to follow a middle path, i.e., "Sustainable Development

Overexploitation

- Overexploitation is the harvest of plants and animals at a rate which is higher than their natural reproduction rate

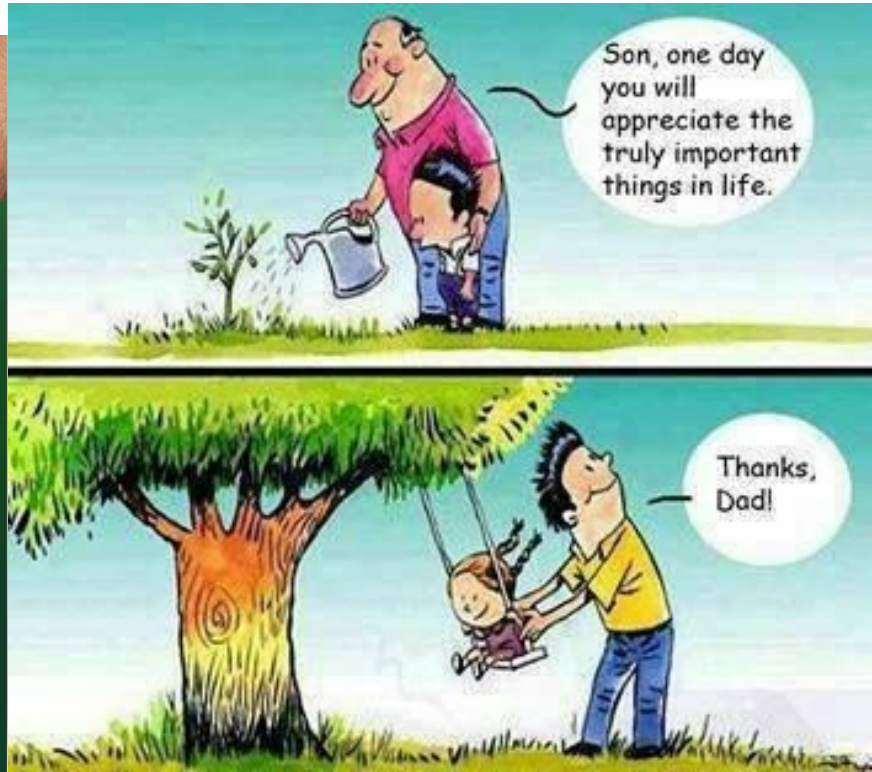
- Overexploitation for food, recreation, construction and medicine has lead to population fall and extinction

What is Needed to Achieve the sustainable development ?

- Eco Friendly
- Present generation should aware for needs of presence and future generation.
- And also ensure the productive assets available to future generation are not.
- Such technologies need to be developed and implemented which help to conserve resources,
- Prevent unnecessary pollution and help restore the environment wherever appropriate.

Important Strategies to Achieve Sustainable Development!

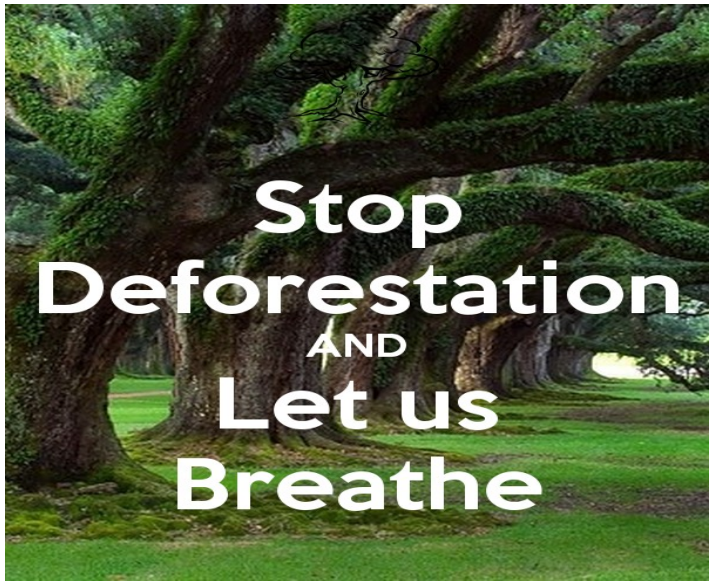
The Rio Summit established sustainable development as the guiding vision for the development efforts of all countries. The strategies for sustainable development to ensure socially responsible economic development while protecting the resource base and the environment for the benefit of future generations. To agree how the international community can best assist developing countries in meeting good of sustainability.



Strategy Formulation:

a. Country ownership and participation, leadership and initiative in developing their strategies.
b. Broad consultation, including particularly with the poor and with civil society, to open up debate on new ideas and information, expose issues to be addressed, and build consensus and political support on action.
c. Ensuring sustained beneficial impacts on disadvantaged and marginalized groups and on future generations.

d. Building on existing strategies and processes, rather than adding additional ones, to enable convergence and coherence.
e. A solid analytical basis, taking account also of relevant regional issues, including a comprehensive review of the present situation and forecasts of trends and risks.
f. Integration of economic, social and environmental objectives
g. Through mutually supportive policies and practices and the management of tradeoffs.



ENVIRONMENTAL EDUCATION

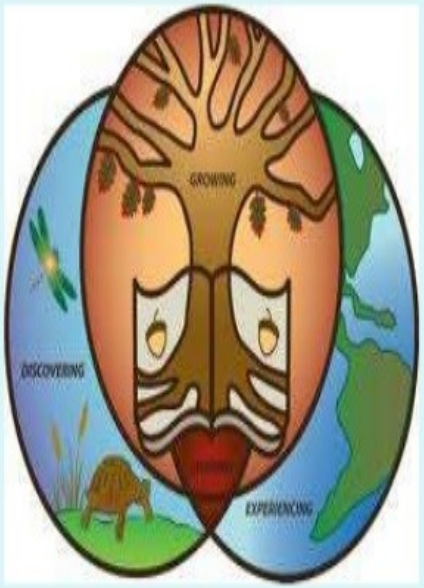
Man, as a part and parcel of the environment, has to recognize the role and importance of environment in order to protect it and to get protection from it, for this, he needs environmental education.

GOALS OF ENVIRONMENTAL EDUCATION

- To improve the quality of environment.
- To create an awareness among the people on environmental problems and conversation.
- To create an atmosphere so that people participate in decision-making and develop the capabilities to evaluate the developmental programmes.

OBJECTIVES OF ENVIRONMENTAL EDUCATION

i. Awareness
ii. Knowledge
iii. Attitudes
iv. Skills
v. Evaluation ability
vi. Participation



Importance of Environmental Studies

- Environmental Studies is useful in checking environmental pollution and related solutions.
- It helps in maintaining ecological balance.
- It helps to gain skills to assess the environmental impact of human activities. Environmental study will help to protect biodiversity.
- It gives us basic knowledge of environment and associated problems.
- It helps to achieve sustainable development .
- It helps to educate people regarding their duties towards the protection of environment.
- The knowledge of environmental science will be applied to the study of agriculture.

SCOPE
OF ENVIRONMENTAL EDUCATION

INTERDISCIPLINARY APPROACH

Urban sprawl

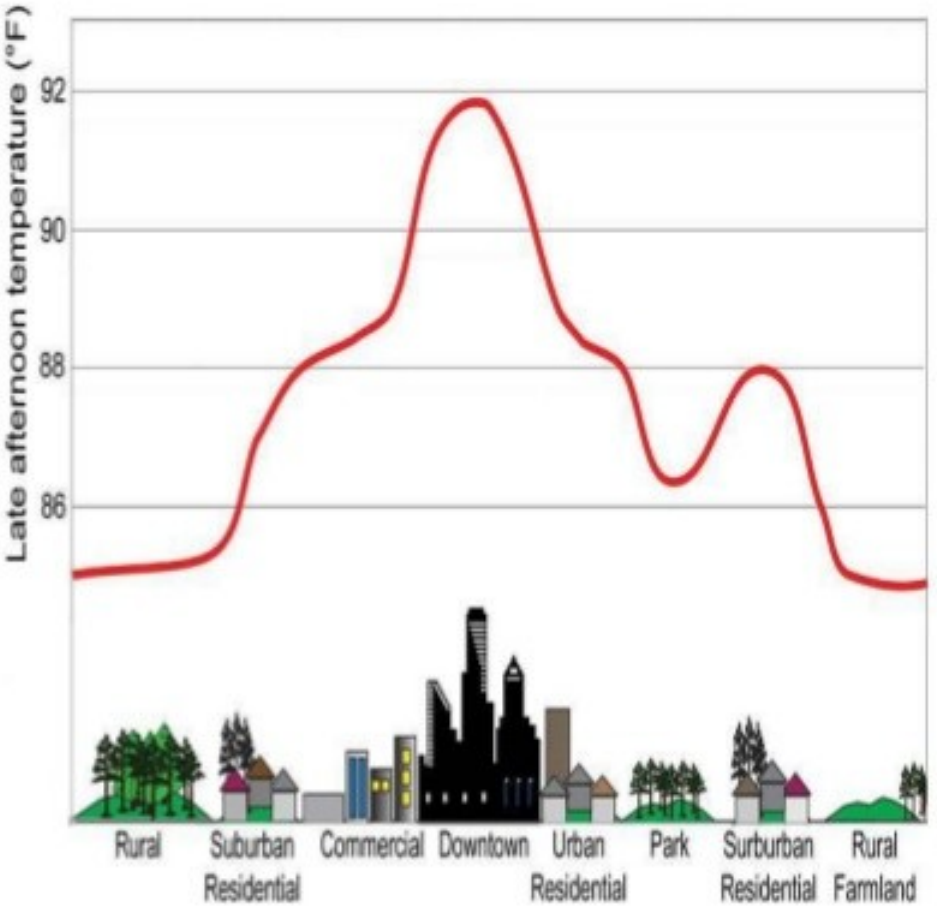
➢**Urban sprawl**, also called **sprawl** or **suburban sprawl**, the rapid expansion of the geographic extent of cities and towns, often characterized by low-density residential housing, single-use zoning, and increased reliance on the private automobiles for transportation.

➢Urban sprawl is caused in part by the need to accommodate a rising urban population; however, in many metropolitan areas it results from a desire for increased living space and other residential amenities.

➢ Urban sprawl has been correlated with increased energy use, pollution, and traffic congestion and a decline in community distinctiveness and cohesiveness. In addition, by increasing the physical and environmental "footprints" of metropolitan areas, the phenomenon leads to the destruction of wildlife habitat and to the fragmentation of remaining natural areas.

The Problem with Urban Sprawl

- Pollution- air, water, hazardous wastes
- Low density development- car dependent society
- Health problems- inactive, overweight
- Expansion of the Urban Heat Island Effect
- Increased cost of living
- Increased resource use and energy consumption



sustainable communities

The term "**sustainable communities**" has various definitions, but in essence refers to **communities** planned, built, or modified to promote **sustainable** living. **Sustainable communities** tend to focus on environmental and economic **sustainability**, urban infrastructure, social equity, and municipal government.

Elements of a Sustainable Community

- Equal opportunity for all individuals to participate in and influence decisions that affect each of their lives.
- Encourages individuals of all ages, gender, sexual orientation, ethnicity, religions, and physical ability to take responsibility based upon a shared vision.
- Satisfaction of basic human needs for clean air and water and nutritious, uncontaminated food.
- Protection and enhancement of local and regional ecosystems and biological diversity.
- Meaningful employment opportunities for all citizens.
- Provision of job training and education to help the workforce adjust to future needs.
- Maintains a place that is safe from crime and aggression
- Protection and enhancement of public spaces and historic resources.
- Provision for a healthy work environment.

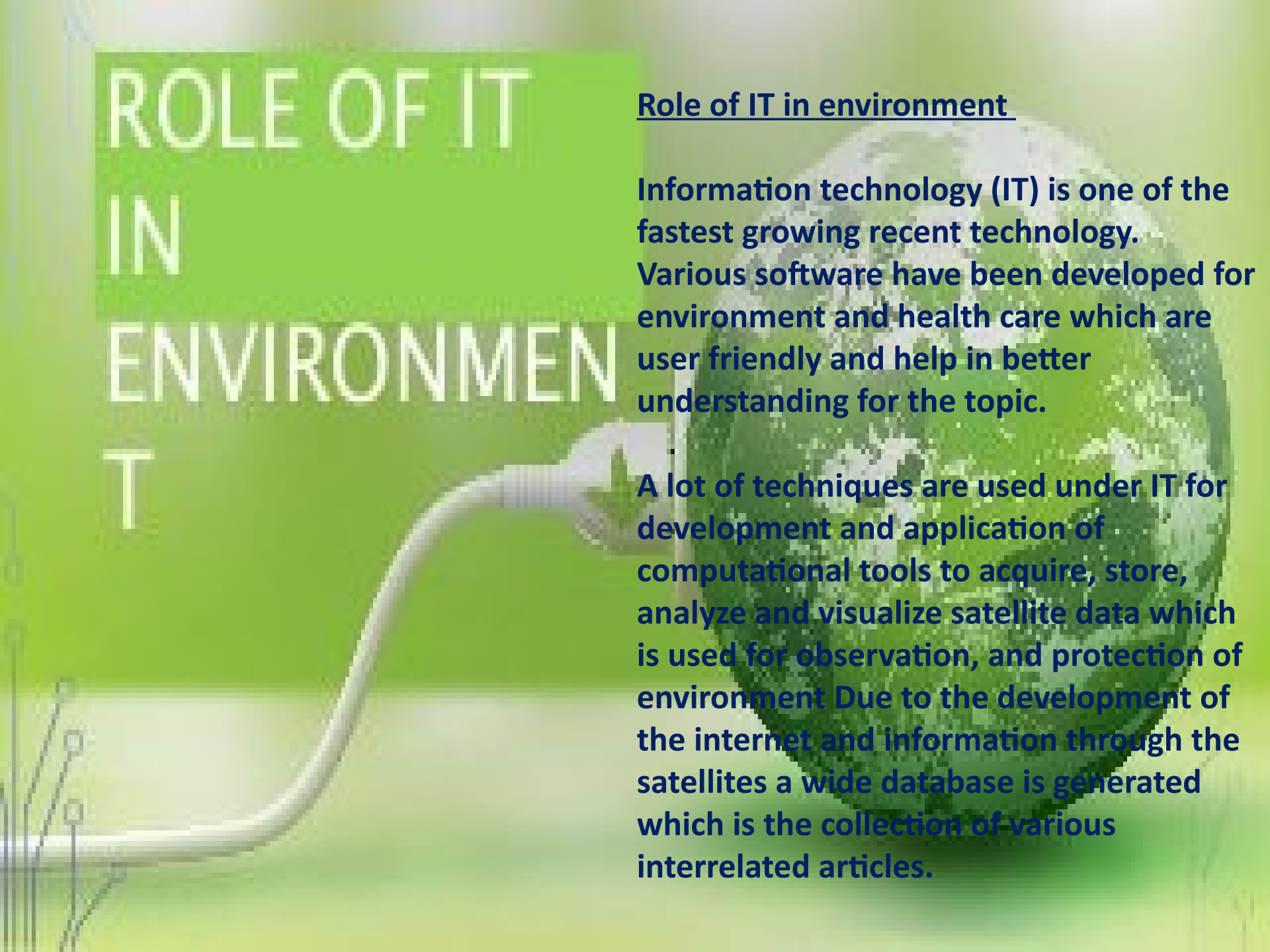
Human health

- A healthy population is essential for economic development. The poorest people on the planet tend to suffer most from the health effects from exposures to environmental hazards like air pollution and impure water.
- In turn, disease and disability related to polluted environments slows and blocks economic development.
- In addition to its toll on human suffering, illness carries a significant financial burden in the form of healthcare expenditures and lost productivity.
- For example, unhealthy children often cannot attend or perform well in school, and unhealthy adults cannot work or care for their families.

How can environmental health be integrated into sustainable development?

- Protecting and creating healthy environments is a critical component of sustainable development. Environmental health can be integrated into sustainable development by:
- Improving environmental quality for the poorest populations with the greatest burden of environmental diseases, by reducing exposures to air pollution in homes and villages from biomass burning, and providing clean water and sanitation
- Identifying efforts to address environmental problems that can also provide health benefits.
- For example, creating environments that encourage biking and walking for transportation reduces greenhouse gas and toxic air pollution emissions (environmental benefit) and increases physical activity (health benefit).

- Recognizing that some policies, practices, and technologies designed to promote sustainability and economic development may have unintended adverse environmental health effects, and attempting to prevent or mitigate these before they are implemented.



Role of IT in environment

Information technology (IT) is one of the fastest growing recent technology. Various software have been developed for environment and health care which are user friendly and help in better understanding for the topic.

A lot of techniques are used under IT for development and application of computational tools to acquire, store, analyze and visualize satellite data which is used for observation, and protection of environment Due to the development of the internet and information through the satellites a wide database is generated which is the collection of various interrelated articles.

- Remote Sensing and GIS (Geographic Information System) provides data and knowledge concerning the global environment as it is used for mapping and monitoring various natural resources.

- Ministry of Environment and Forest (MoEF) and Government of India (GOI) have created an Environment Information System (ENVIS). Different ENVIS centers are set up in different organizations for information collection, storage which work towards boosting the relationship between trade and environment

- IT is used for computer based modeling and simulation of environmental scenarios for analysis and prediction.

- It enables environmental scientists and researchers around the world to communicate, collaborate and coordinate.

Environmental Ethics

Environmental ethics is a branch of ethics that studies the relation of human beings and the environment and how ethics play a role in this. Environmental ethics believe that humans are a part of society as well as other living creatures, which includes plants and animals. These items are a very important part of the world and are considered to be a functional part of human life. Thus, it is essential that every human being respect and honor this and use morals and ethics when dealing with these creatures.

Environmental Ethics

The discipline that studies the moral relationship of human beings and also the value and moral status of the environment and its non human contents.

It considers the ethical relationship between humans and the environment.

Environmental Ethics Principles

Every life form is unique, and has intrinsic value, regardless of its perceived value to humans.

- We should have a profound respect for Nature.

We must maintain a harmonious relationship with other species.

- Everyone should take responsibility for his impact on nature.
- Local and indigenous environmental knowledge should be respected.
- We must plan for the long term.

Environmental economics

Environmental economics is a distinct branch of economics that acknowledges the value of both the environment and economic activity and makes choices based on those values. The goal is to balance the economic activity and the environmental impacts by taking into account all the costs and benefits. The theories are designed to take into account pollution and natural resource depletion, which the current model of market systems fails to do.

The Economic Importance of the Environment

- **Environmental Economics**
  - The study of relationships of the importance of the environment to the economy
  - Includes:
    - The impact of environment as a result of economic activity
    - Regulation of the economy and economic processes
    - The objective of balancing environmental and economic goals of society
    - Development of economic policy to minimize environmental degradation
    - Finding solutions to environmental problems

GREEN BUILDING

OBJECTIVES OF GREEN BUILDING

- Green Buildings are designed to reduce the overall impact on human health and the natural environment by the following ways:
- Using energy, water and other resources efficiently.
- By reducing waste, pollution, and environmental degradation.

FUNDAMENTAL PRINCIPLES

- Structure design efficiency
- Energy efficiency
- Water efficiency
- Materials efficiency
- Waste and toxic reduction

- **STRUCTURE EFFICIENCY:**

➢ It is the concept of sustainable building and has largest impact on cost and performance.

➢ It aims to minimize the enviornmment impact associated with all life-cycles.

- **ENERGY EFFICIENCY:**

➢ The layout of the construction can be strategised so that natural light pours for additional warmth.

➢ Shading the roof with trees offers an eco-friendly alternative to air conditioning.

- **WATER EFFICIENCY:**

➢ To minimize water consumption one should aim to use the water which has been collected, used, purified and reused.

- **MATERIAL EFFICIENCY:**

➢ Materials should be use that can be recycled and can generate surplus amount of energy.

➢ An example of this are solar power panels,not only they provide lightening but they are also a useful energy source.

- **WASTE AND REDUCTION:**

➢ It is probable to reuse resources.

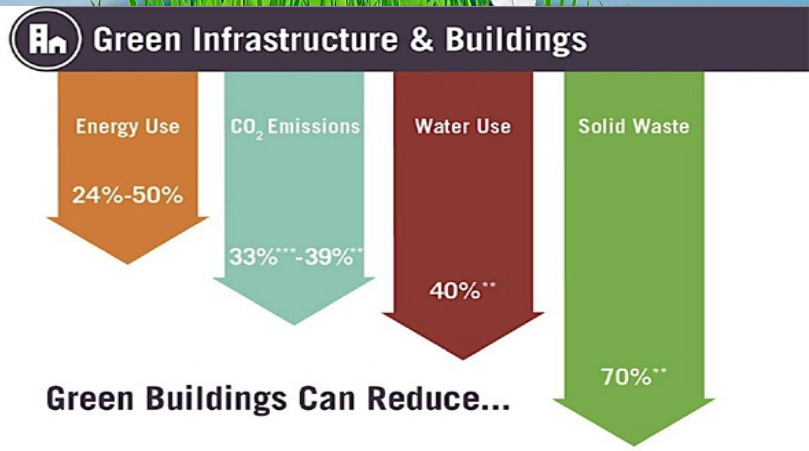
➢ What may be waste to us may have another benefit to something else.

RAJIV GANDHI INTERNATIONAL AIRPORT,HYDERABAD.

INDIA'S first greenfield airport is undeniably amongst the top 10 green buildings in India.
It is the first airport in Asia to be certified with silver rating.

BENEFITS OF GREEN BUILDINGS

Protect Biodiversity and Ecosystems
Improve air and water quality
Reduce Waste streams
Conserve natural resources



Clean Development Mechanism(CDM)

Clean Development Mechanism(CDM) is a unique instrument based on understanding and cooperation among the nations for adopting a new outlook for economic activities aiming at protecting the world eco-system.

The CDM was established under Article 12 of the Kyoto Protocol on Dec.11. 1997.

CDM Objectives

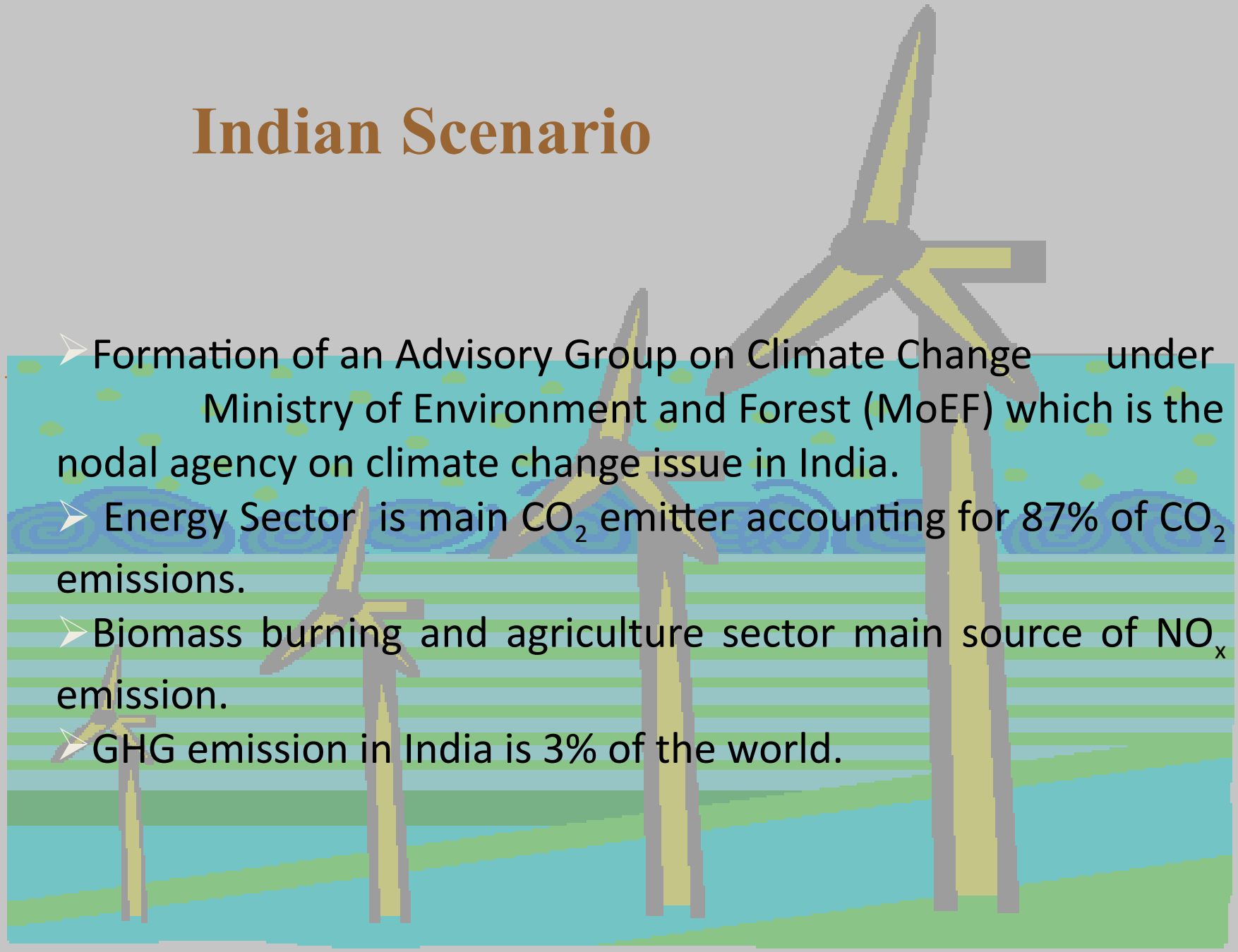
To assist developing countries in achieving sustainable development & in contributing to ultimate objectives of United Nations Framework Convention on Climate Change (UNFCCC)

To assist developing countries in achieving compliance with their qualified emission limit & reduction commitments

Eligibility Criterion

- Social well being
- Economic well being
- Environmental well being
- Technological well being

Indian Scenario



- Formation of an Advisory Group on Climate Change under Ministry of Environment and Forest (MoEF) which is the nodal agency on climate change issue in India.
- Energy Sector is main CO_2 emitter accounting for 87% of CO_2 emissions.
- Biomass burning and agriculture sector main source of NO_x emission.
- GHG emission in India is 3% of the world.