

Environmental Sciences (ESI101)

19 April 2022

Human Use of the Earth

- From **global climate change to habitat loss** driven by human population growth and development, Earth is becoming a different planet right before our eyes.
- The global rate of environmental change are beyond anything in recorded human history.
- Our challenge is to acquire an improved understanding of Earth's complex environmental systems.

Environmental Ethics

Environmental ethics examines moral values to determine how humans should relate to the natural environment.

Environmental ethicists consider issues such as:

- What role we should play in determining the fate of Earth's resources?
- How we might develop an environmental ethic that is acceptable in the short term for us as individuals and also in the long term for our species and the planet?

- **Environmental ethics** considers not only the rights of people living today, both individually and collectively, but also the rights of future generations.
- This aspect of environmental ethics is critical because the impacts of today's activities and technologies are changing the environment.
- Addressing issues of environmental ethics puts us in a better position to use science and technology for **long-term environmental sustainability**.

Sustainable Ethic

- A sustainable ethic is an environmental ethic by which people treat the earth as if its resources are limited.
- This ethic assumes that the **earth's resources are not unlimited and that humans must use and conserve resources** in a manner that allows their continued use in the future.
- A sustainable ethic also assumes that **humans are a part of the natural environment and that we suffer when the health of a natural ecosystem is impaired.**

Environmental Justice

Environmental justice is the right of every citizen, regardless of age, race, gender, social class, or other factor, **to adequate protection from environmental hazards**.

- Environmental justice is a fundamental human right in an ethical society.
- It will be achieved when everyone **enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process** to have a healthy environment in which to live, learn, and work.

Introduction to Sustainability

What is Sustainability?

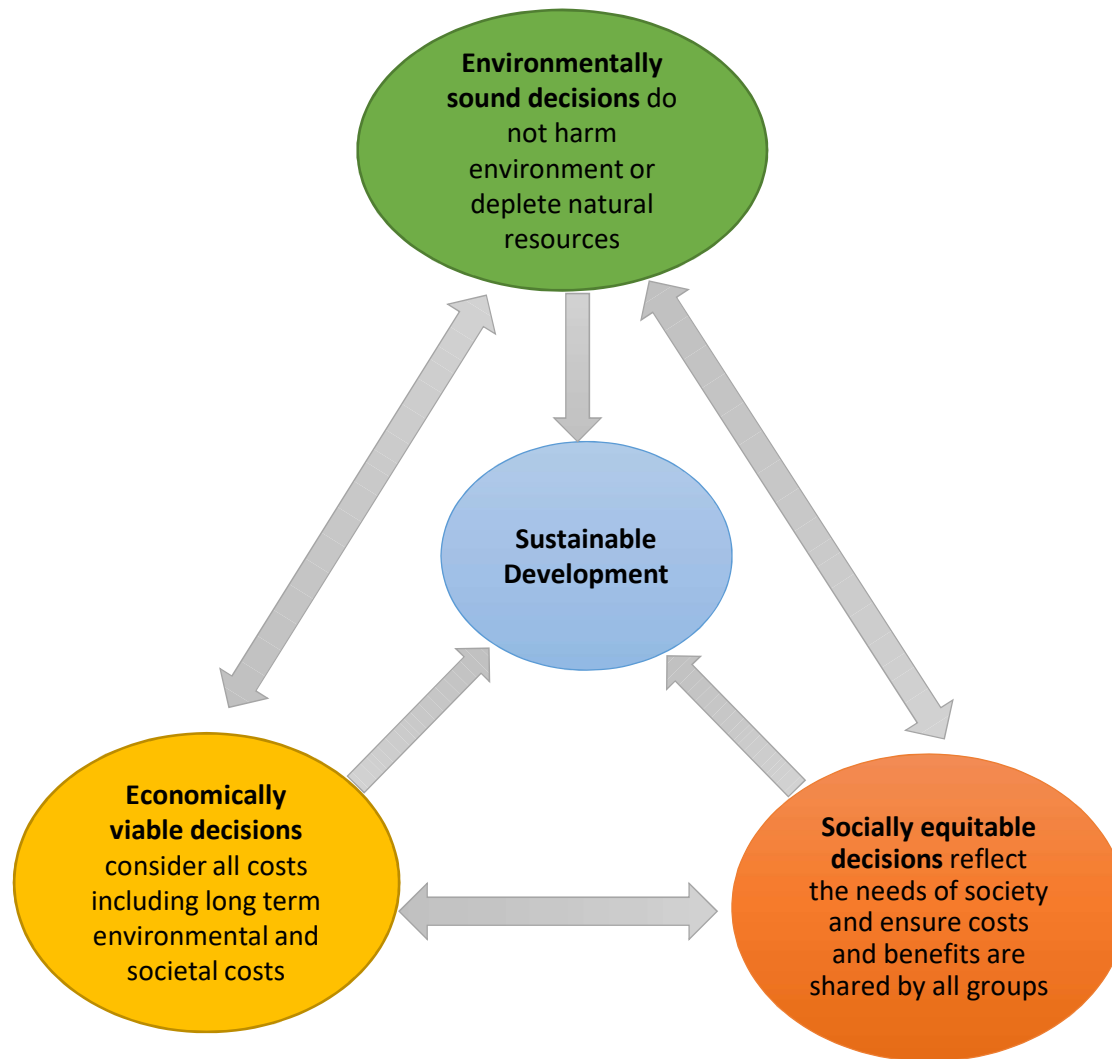
The U.S. Environmental Protection Agency (EPA) defines sustainability as **meeting the needs of the present without compromising the ability of future generations to meet their own needs.**

In other words, sustainability attempts to balance the needs of people today with the future needs of our children and the natural systems that sustain all life.

Sustainable Development

Sustainable development is economic growth that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Environmentally sound decisions, economically viable decisions, and socially equitable decisions interact to promote sustainable development.



Sustainable Development

What is Sustainable Living?

Sustainable living describes a lifestyle that attempts to reduce an individual's or society's use of the Earth's natural resources, and one's personal resources.

Its practitioners often attempt to reduce their ecological footprint (including their carbon footprint) by altering their methods of transportation, energy consumption, and farming.

Sustainable Consumption

Sustainable consumption is the use of **material products, energy and immaterial services** in such a way that their use minimizes impacts on the environment, so that human needs can be met not only in the present but also for future generations.

Consumption refers not only to **individuals and households**, but also to **governments, business, and other institutions**.

Climate Change: The challenge of our generation

- For over the past 200 years, **the burning of fossil fuels**, such as coal and oil, and deforestation have caused **the concentrations of heat-trapping greenhouse gases (GHGs) to increase significantly** in our atmosphere.
- Human-induced climate change poses adverse, wide-ranging effects on a global scale.
- All nations, states and local communities are potentially vulnerable to the consequences of climate change.



Source: https://climate.nasa.gov/climate_resources/188/graphic-the-greenhouse-effect/

Effects of Climate Change



Temperatures will continue to rise



Changes in precipitation patterns



More droughts and heat waves



Sea Level will rise 1-8 feet by 2100

Some Indicators of Global Environmental Stress

Forests

- Deforestation remains a main issue.
- 1 million hectares of forest were lost every year in the decade 1980-1990.
- Recent estimates suggest that nearly two-thirds of tropical deforestation is due to farmers clearing land for agriculture.



Soil

- As much as 10% of the earth's vegetated surface is now at least moderately degraded.
- Trends in soil quality and management of irrigated land raise serious questions about longer-term sustainability.



- It is estimated that about 20% of the world's 250 million hectares of irrigated land are already degraded to the point where crop production is seriously reduced.

Fresh Water

- Some 20% of the world's population lacks access to safe water and 50% lacks access to safe sanitation.
- If current trends in water use persist, two-thirds of the world's population could be living in countries experiencing moderate or high water stress by 2025.



Atmosphere

CO₂ emissions in most industrialized countries have risen during the past few years and countries generally failed to stabilize their greenhouse gas emissions as required by the Climate Change convention.



Waste

- Domestic and industrial waste production continues to increase in both absolute and per capita terms, worldwide.
- In the developed world, per capita waste generation has increased threefold over the past 20 years and in developing countries, it is highly likely that waste generation will double during the next decade.



- Poor sanitation and waste management infrastructure is still one of the principal causes of death for the urban poor.

Thank You