

Engineering Ethics

Lecture 3



Social and Environmental Ethics

❑ The engineer's social responsibility of engineering projects embraces the following:

- ❑ Obligation to safety and health and respect for right of informed consent.
- ❑ Assess impacts, mitigate adverse impacts and monitor them.
- ❑ Moral competence.
- ❑ Accountability.
- ❑ Display due attributes of professionalism.

***“With Great Power
Comes Great
Responsibility”***

Spider-Man
Saturday - Nov 10, 2012(2:00 am)



Environment and Moral Framework

❑ Human Centered Ethics

❑ Sentient-Centered Ethics

❑ Biocentric Ethics

❑ Eco-centric Ethics

❑ Religious Prospective

Nature
Centered
Ethics



Human Centered Ethics

☐ Human Centered Ethics

☐ **Rights Ethics:** Rights ethics says we ought to respect human rights;

☐ **Duty Ethics:** Duty ethics says we ought to respect individuals' rational autonomy.

☐ **Utilitarianism:** Utilitarianism says that we ought to maximize the overall good, taking into equal account all those affected by our actions.

☐ **Virtue Ethics:** Virtue ethics says that good character is central to morality.

☐ **Self-Realization Ethics:** Self-realization ethics emphasizes the moral significance of self-fulfillment.



☐ Sentient-Centered Ethics

- ☐ Recognizes all sentient animals as having inherent worth; Sentient animals: Those that feel pain and pleasure and have desires.

☐ Biocentric Ethics

- ☐ Life-centered ethics regards all living organisms as having inherent worth

☐ Eco-centric Ethics

- ☐ Locates inherent value in ecological systems (rather than individual organisms)



Codes of Ethics and “Sustainable Development”

☐ ASCE, 1997:

- ☐ Engineers shall hold paramount the safety, health, and welfare of the public and shall strive to comply with the principles of sustainable development in the performance of their professional duties.

☐ IEEE:

- ☐ To accept responsibility in making engineering decisions consistent with the safety, health, and welfare of the public, and to disclose promptly factors that might endanger the public or the environment.

☐ NSPE:

- ☐ To accept responsibility in making engineering decisions consistent with the safety, health, and welfare of the public, and to disclose promptly factors that might endanger the public or the environment.



Sustainability



Sustainable development = development that meets the needs of the present without compromising the ability of future generations to meet their own needs
(From United Nations World Commission on Environment and Development, Our Common Future, 1987)



Engineers: Sustainable Development

- ❑ Historically, engineers were not as responsible concerning the environment as they should have been. They simply reflected attitudes predominant in society.
- ❑ Individual engineers differ considerably in their views, including their broader holistic views about the environment (e.g., politics affect)
- ❑ All engineers should reflect seriously on environmental values and how they can best integrate them into understanding and solving problems



Corporate Social Responsibility

SOCIAL RESPONSIBILITY



Values



Commitment



Integrity

Corporate social responsibility goals include the following.

- Pay attention to sustainability triple bottom line: economic, social and environment.
- Demonstrate integrity and transparency.
- Involve with community to enhance social welfare and support.
- Engage with and respect the stakeholders.



Charity



Partnership



Sensitivity



Green initiatives



Collaboration



Honesty

Social Sustainability

- ❑ The considerations of sustainable development are primarily on the environmental and natural resource issues.
- ❑ The **social impact** assessment is an integral element in the environmental impact assessment.
- ❑ The traditional ‘**hard**’ social sustainability factors such as employment and poverty alleviation are increasingly being complemented or replaced by ‘**soft**’ and less measurable concepts such as happiness, well being and sense of place.

Table 1. Factors and indicators for assessing social sustainability

Jobs	→	Livelihood
Work	→	Safety and health
Income	→	Equity
Housing		Equitable access to resources and services
Water supply and sanitation		Equity for disadvantaged members
Health care		Inclusion
Food		Democracy, governance, and self-determination
Energy		Human rights
Renewable energy		Sovereignty
Sustainable transport		Interconnectedness
Waste management		Regional sustainability
Education and training		Demographic change
Skills		Resources for future generations
Career prospects		Social dialogue
Capacity development		Equal opportunities
Participation		Quality of life
Sharing management and responsibility		Quality of life in relation to education, and employment
Grassroots information networks		Sense of place
Empowerment and responsibility		Sense of belonging
Nonconfrontational style leadership		Sense of self-worth
Personal and social development		Sense of connection to nature
Communication		Self-reliance
Sports and recreation		Autonomy
Amenities		Happiness
Use and misuse of infrastructure		Law and order
Techno-economic and social compatibility		Peace and harmony
Entrepreneurship		Violence
Credit and Insurance services		Crime
Marketing and business development support		Drug use and alcoholism
Agriculture extension		Security
Social capital		Justice



Engineering, Ecology, and Economics

- ❑ Today, a wide consensus that we need concerted responses to ecological concerns that combine economic realism with ecological awareness
- ❑ Engineers play a key role in that consensus
 - ❑ Develop technical details on environmental impact, encourage corporations to be concerned about the environment
 - ❑ Help set policy, help follow laws
 - ❑ Help make it economically feasible



Engineering within Ecological Constraints

- ❑ New applications of technology and engineering must come to terms with the social and ethical values of the society in which they are to be made.
- ❑ Engineering must be applied in such a way that innovations make proper contributions to the greater community at large.
- ❑ The development of sound engineering practices can help conserve and restore the environment through a proper balance between engineering principles and environmental considerations.
- ❑ **Ecological engineering** uses ecology and engineering to predict, design, construct or restore, and manage ecosystems that integrate "human society" with its "natural environment" for the benefit of both.



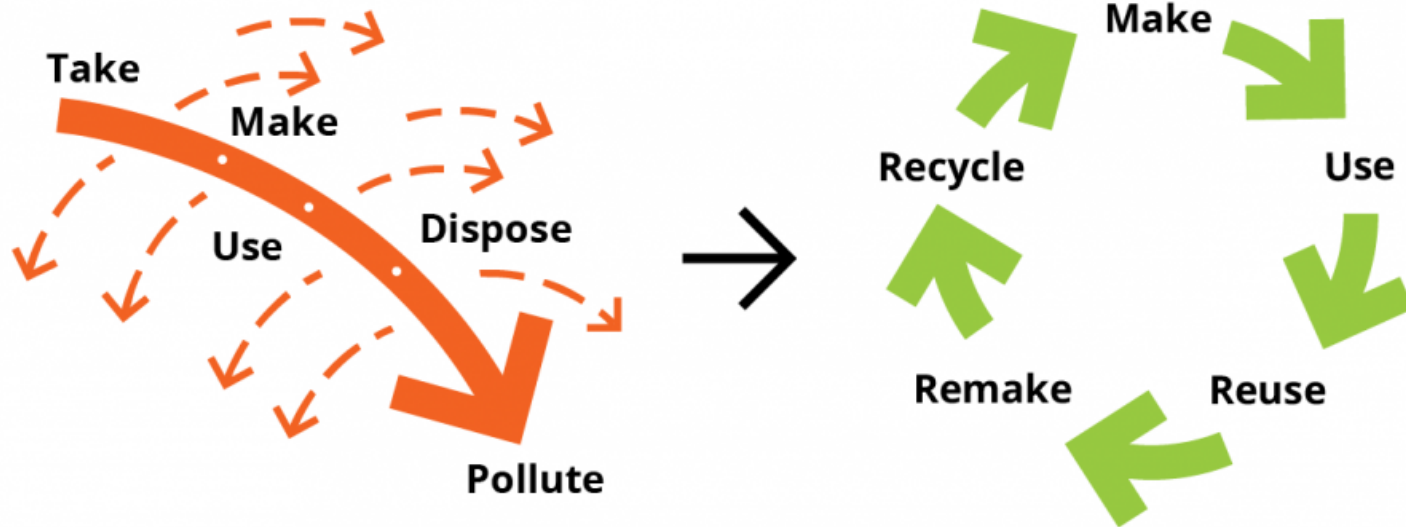
Ecology vs Economy

- ❑ An ecosystem is governed by the laws of growth and decay. These laws operate simultaneously, tending to move the system towards a state of **balance or equilibrium**.
- ❑ Economy, in general means disharmony with nature. Use is made of nature both directly and indirectly to transform raw-materials into final goods. During this production-process nature is polluted by emission and wastes.
- ❑ Hence the **conflict** arises due to sustainability of ecological system and business profitability of economic growth and expansion of world market.
- ❑ An ecological approach to engineering must consider that nature responds systematically, continuously, and cumulatively.



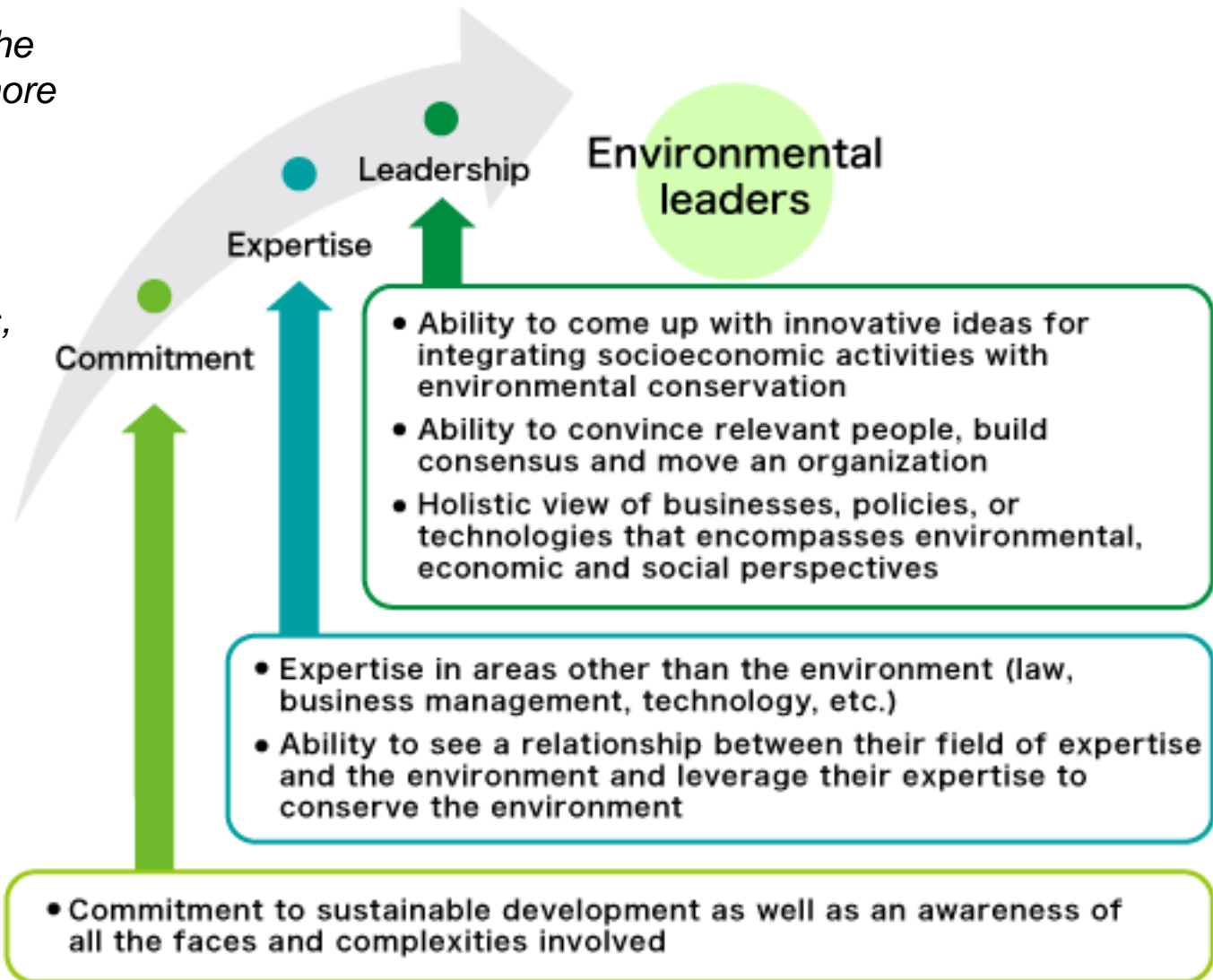
Ecology vs Economy

From leaky to loopy



Environment Leadership

Leaders who can make the socioeconomic system more harmonious with the environment through environmentally-friendly products, services, businesses, technologies, and policies



Government Initiatives: SDG

- ❑ The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by all United Nations Member States in 2015 as a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030.
- ❑ The 17 SDGs are integrated—that is, they recognize that action in one area will affect outcomes in others, and that development must balance social, economic and environmental sustainability.
- ❑ Through the pledge to Leave No One Behind, countries have committed to fast-track progress for those furthest behind first. That is why the SDGs are designed to bring the world to several life-changing ‘zeros’.



Government Initiatives: SDG

1. Eliminate Poverty
2. Erase Hunger
3. Establish Good Health and Well-Being
4. Provide Quality Education
5. Enforce Gender Equality
6. Improve Clean Water and Sanitation
7. Grow Affordable and Clean Energy
8. Create Decent Work and Economic Growth
9. Increase Industry, Innovation, and Infrastructure
10. Reduce Inequality
11. Mobilize Sustainable Cities and Communities
12. Influence Responsible Consumption and Production
13. Organize Climate Action
14. Develop Life Below Water
15. Advance Life On Land
16. Guarantee Peace, Justice, and Strong Institutions
17. Build Partnerships for the Goals



<https://www.sdg.gov.bd/#1>



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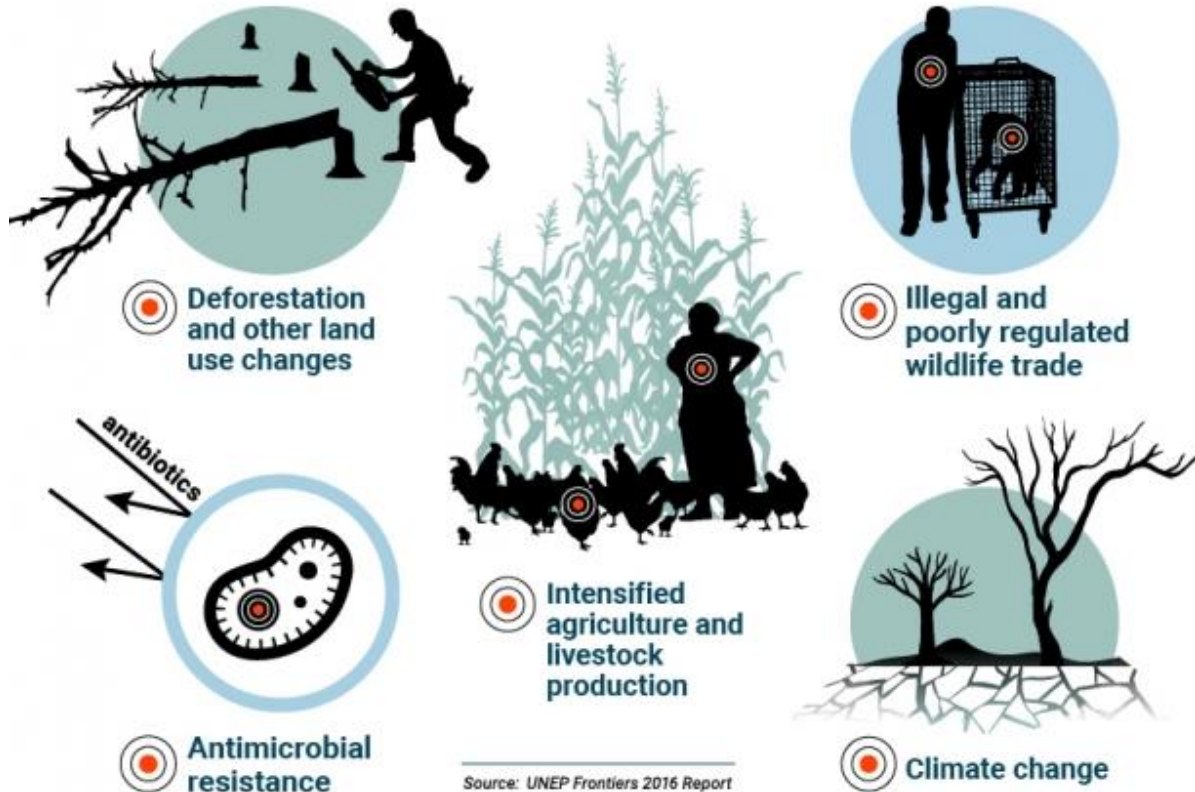


- ❑ Student: “I was working for a company that adjusted the level of waste dumped into a river according to the level of the river. In other words, they would dump excess (well over EPA regulations) amounts of waste into the river after periods of excess rain or would wait until the river rose so that they could dump more waste again.” **What should the engineer do?**
- ❑ Student: “I used to work for a civil engineer modeling a sewer system. We collected observations from survey crews. One day a photo came in of a company actively dumping industrial waste chemicals (paint) into a sewer. A note was attached, reporting that this is illegal. No one did anything about it.” **What should the engineer do?**



COVID-19 Cause and Effect

What factors are increasing zoonosis emergence?
(Diseases transmitted from animals to humans)



#COVID19

UN
environment
programme