Environmental Economics and Environmental Policy

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This lecture will help you understand:

- Economic theories and their applications
- Environmental and ecological economics
- The aims of environmental policy
- U.S. environmental laws
- Different approaches to policy
Central Case: San Diego and Tijuana’s Sewage Pollution Problems and Policy Solutions

- San Diego sits on the U.S.–Mexico border next to the city of Tijuana, sharing a long stretch of Pacific coastline.
- Tijuana’s aging sewer system and its U.S.-owned factories have polluted waterways on both sides of the border.
- The problem has worsened in recent years, leading residents to press policy makers to do something.
Economics

- **Economics** studies how people use resources to provide goods and services in the face of demand for them.

- Most environmental and economic problems are linked.

- The root “*eco*” gave rise to both *ecology* and *economics*.
Types of modern economies

- **Subsistence economy** = people meet needs directly from nature and agriculture; do not buy most products

- **Centrally planned economy** = national government determines how to allocate resources

- **Capitalist market economy** = buyers and sellers interact to determine prices and production of goods and services
Environment and economy are linked

• Economies receive inputs from the environment that enable human society to function.

• Environmental and ecological economics accept that human economies depend on the environment.

• **Ecosystem services** support the life that makes economic activity possible.
Conventional view of economic activity

Conventional economics focuses on interactions between households and businesses and views the environment only as an external “factor of production.”
(a) Conventional view of economic activity

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Environmental view of economic activity

Environmental economists see the economy as within the environment, receiving resources and services from it.
Economic activity as viewed by environmental and ecological economists

Natural recycling: Climate regulation, air and water purification, nutrient cycling, etc. (ecosystem services)

Natural resources (ecosystem goods)

Waste acceptance (ecosystem service)

Agriculture, industry, business

Households

Economy

(b) Economic activity as viewed by environmental and ecological economists

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Ecosystem goods and services

• Natural resources are “goods” we get from our environment.

• “Ecosystem services” that nature performs for free include:
  • Soil formation
  • Water purification
  • Climate regulation
  • Pollination
  • Nutrient cycling
  • Waste treatment
Classical economics

- **Adam Smith**: Competition between people free to pursue their own economic self-interest will benefit society as a whole (assuming rule of law, private property, competitive markets).

- This idea is a pillar of free-market thought today.

- It is also blamed by many for economic inequality.
Neoclassical economics

… focuses on psychology of consumer choice.

The market favors equilibrium between supply and demand.
Precepts of neoclassical economics

- Resources are infinite or substitutable.
- Long-term effects are discounted.
- Costs and benefits are internal.
- Growth is good.

*Each of these can contribute to environmental problems.*
Precepts of neoclassical economics

Resources are infinite or substitutable.

• *Some can be replaced.*

• *Others are nonrenewable.*
  
  Can we count on their replacement once they are exhausted?
Precepts of neoclassical economics

Long-term effects are discounted (the future is given less weight than the present).

• Decisions are made that maximize short-term benefits…

• ... even if there are severe long-term costs.
Precepts of neoclassical economics

Costs and benefits are internal.

- Often, costs are external to the transaction.
- Uninvolved people are affected.
- Effects are, for example, water pollution downstream from the polluter.
Growth is good.

• *Growth as a means toward human happiness is one thing*;

• *Growth as an end in itself is another.*
Is economic growth sustainable?

Can we create endless improvements in technology and never run into shortages of resources that limit economic growth?

- **Environmental economists:** Human economies can be made sustainable through improvements in technology and efficiency.

- **Ecological economists:**
  - Any economy dependent on growth is ultimately unsustainable.
  - Economies cannot overcome environmental limitations.
  - Economies should be circular, not linear.
Steady-state economy

• This is an economy that does not grow or shrink but remains stable.

• This is the ecological economist’s preferred alternative.

• Wealth and quality of life, they maintain, can continue to rise.
Nonmarket values

Ecosystem services have value that is not usually expressed in monetary terms.
Nonmarket values—some examples:

- **Use value**: worth of the direct use of a resource
- **Option value**: worth of things we conserve, possibly to use later
(b) Use values
(c) Option values
Nonmarket values—some examples:

- **Educational value:** worth for teaching and learning
- **Existence value:** worth of existence, even if we never experience something directly
(f) Educational values
(a) Existence values
Valuation of ecosystem services

- Environmental economists have assigned monetary values to ecosystem services.
- *Robert Costanza et al., 1997: $33 trillion per year!*
Soil formation
Genetic resources
Pollination
Habitat provision
Biological control
Erosion control
Climate regulation
Raw materials
Recreation
Water regulation
Gas regulation
Food provision
Water supply
Disturbance regulation
Waste treatment
Cultural uses
Nutrient cycling

Total global value per year (trillions of dollars)
Market failure

Markets “fail” when their prices do not take into account:

- Positive effects such as ecosystem services

  or

- Negative effects such as external costs
Combating market failure

Governments can use various methods to guard against market failure relating to environmental concerns:

- **Green taxes** penalizing harmful activities
- **Incentives** to encourage beneficial activities
- **Ecolabeling** to tell consumers how products were made or harvested

*These methods are examples of environmental policy.*
Viewpoints: Environment versus economy?

Pete Geddes

“...environmental quality is only one of several competing values people seek.”

Eban Goodstein

“...there is no net ‘jobs–environment trade-off’ in the economy, only a steady shift of jobs to cleanup work.”
Policy

- **Policy** = A set of plans and principles to address problems and guide decision making.

- **Public policy** consists of laws, regulations, orders, incentives, and practices designed to advance societal welfare.

- **Environmental policy** pertains to human interactions with the environment and generally aims to regulate resource use or pollution to promote human welfare and protect natural systems.
Environmental policy

- Pertains to human interactions with the environment
- Aims to regulate resource use or reduce pollution to protect human welfare and natural systems
- Requires input from science, ethics, and economics
Environmental policy

• Addresses issues of equity and resource use

• Ensures that some people do not harm others while benefiting from common resources

• Prevents free riders by ensuring, through enforcement or taxation, that all parties sacrifice

• Prevents external costs by ensuring that some parties do not use resources in ways that harm others
First wave of U.S. environmental policy

Laws to promote land settlement and resource extraction, for example:

- General Land Ordinances, 1785, 1787
- Homestead Act, 1862
- Mineral Lands Act, 1866
- Timber Culture Act, 1873
Land settlement

U.S. policy encouraged settlers like these in Nebraska, circa. 1860, to move west.
Resource extraction

Logging in Washington

Mining in Alaska
Second wave of U.S. environmental policy

To address impacts of the first wave—for example:

- Creation of national parks
- Creation of national forests
- Soil conservation policy
- Wilderness Act, 1964
Modern environmental activism and policy arose in response to pollution and other problems.

- *Silent Spring*
- Earth Day
- EPA and National Environmental Policy Act
- Clean Air Act, Clean Water Act
Rachel Carson and *Silent Spring*

Carson’s 1962 book brought attention to pesticide dangers and catalyzed environmental awareness.
Rivers on fire

The petroleum-polluted Cuyahoga River in Ohio caught fire, showing the need for action against water pollution.
Earth Day

Earth Day began in 1970...

...and is bigger than ever today.
NEPA  (National Environmental Policy Act, 1970)

- Created the Council on Environmental Quality

- Mandated environmental impact statements for public projects

  and has:

  - Prioritized understanding our impacts on the environment
  - Slowed down or prevented environmentally destructive development
  - Given citizens a say in the policy process
Was directed at its formation in 1970 to:

- Conduct and evaluate research
- Monitor environmental quality
- Set and enforce standards (e.g., for pollutants)
- Assist states in meeting standards
- Educate the public
Key Environmental Protection Laws, 1963–1985

Clean Air Act
Wilderness Act
Federal Water Pollution Control Act, Solid Waste Disposal Act
Wild and Scenic Rivers Act
National Environmental Policy Act
Marine Mammal Protection Act, Federal Pesticide Act
Endangered Species Act
Safe Drinking Water Act
Toxic Substances Control Act
Clean Water Act, Soil and Water Conservation Act
Comprehensive Environmental Response, Compensation, and Liability Act ("Superfund")
Food Security Act

The social context for environmental policy changes over time

• After substantial environmental reforms in the 1960s and 1970s, the U.S. political climate began to change.

• Since 1980, many efforts have been made at the federal level to roll back environmental reforms, particularly under the George W. Bush administration.

• Meanwhile, other nations have increased their environmental efforts.
International Environmental Policy

• International law is vital to solving transboundary environmental problems.

• Several international organizations shape international environmental policy:
  • The United Nations
  • The World Bank
  • The European Union
  • The World Trade Organization
  • Nongovernmental organizations (NGOs)
International law

• Conventional law arises from conventions or treaties agreed to among nations.
  • (e.g., Montreal Protocol to protect ozone layer)

• Customary law arises from practices or customs held in common by most cultures.
  • (e.g., resource use should be equitable, and one nation should not cheat another)
The environmental policy process
1 Identify problem
Identify specific causes of the problem
Envision solution and set goals
Get organized
5 Cultivate access and influence
Manage development of policy
Legislative process

Bills go through a long process before becoming law, involving:

• Committees, subcommittees, and floor votes in both houses
• A joint conference committee
• Final approval
• Signature or veto by the president
House of Representatives

Member of House
introduces bill

If appropriate, bill
is referred to House
committee and
subcommittee

Subcommittee
marks changes and
votes on bill

Full committee
marks changes and
votes on bill

Bill is voted on
by the full House,
in a House
floor vote

A conference committee
made up of both House
and Senate committees
that worked on the bill
works out any differences
between the House and
Senate versions of the bill

House approves
final bill

The White House

Senate

Senator introduces
bill

If appropriate, bill
is referred to Senate
committee and
subcommittee

Subcommittee
marks changes and
votes on bill

Full committee
marks changes and
votes on bill

Bill is voted on
by the full Senate,
in a Senate
floor vote

Senate approves
final bill

The final bill is sent to the President,
who either signs or vetoes it. (If the
bill is vetoed, a two thirds majority of
the House and Senate can overturn the veto.)
Approaches to environmental policy

• **Command-and-control**: Set strict legal limits and threaten punishment.

• **Subsidies**: Government giveaway of cash or resources to promote environmentally sustainable activities.

• **“Green” taxes**: Taxing undesirable environmental activities.

• **Markets in permits**: Allow polluters to buy, sell, or trade pollution permits, with the aim of reducing pollution.

• **Ecolabeling**: Guides consumer buying choices.
Conclusion

• Equating economic well-being with economic growth suggests a trade-off with environmental quality.

• But if economic welfare can be enhanced without growth, economies and environmental quality can benefit mutually.

• Environmental policy draws from science, ethics, economics, and the political process.

• Command-and-control legislation and regulation are the most common approaches to policymaking. But innovative economic policy tools also exist.
QUESTION: Testing Your Comprehension

Which is NOT an assumption of neoclassical economics that can lead to environmental degradation?

a. Resources are limited.

b. Long-term effects are downplayed.

c. All costs and benefits are experienced by the buyer and seller alone.

d. Growth is good.
QUESTION: Testing Your Comprehension

Which is NOT an assumption of neoclassical economics that can lead to environmental degradation?

a. Resources are limited.
The first wave of environmental policy in the U.S. was designed to:

a. Prevent pollution problems.
b. Facilitate settlement and resource extraction.
c. Restrict use of public lands.
d. Restrict use of private lands.
The first wave of environmental policy in the U.S. was designed to:

b. Facilitate settlement and resource extraction.
Which is an ecosystem service?

a. Water purification in the atmosphere
b. Crop pollination by insects
c. Nutrient cycling in ecosystems
d. Waste treatment by bacteria
e. All of the above
QUESTION: Testing Your Comprehension

Which is an ecosystem service?

e. All of the above
What is a steady-state economy? Do you think this model is a practical alternative to the growth paradigm? Why or why not?
QUESTION: Seeking Solutions

Compare the roles of the United Nations, the European Union, the World Bank, the World Trade Organization, and nongovernmental organizations. If you could gain the support of just one of these organizations for a policy you favored, which would you choose? Why?
Think of one environmental problem you would most like to see solved. What policy approach do you think would be most effective in addressing it?
Based on what you have learned so far, do you believe environmental protection involves costs that are too high?

a. Yes—money spent on environmental protection could be better used elsewhere.

b. No—the costs are high, but the costs of NOT protecting the environment are higher.

c. No—environmental spending can lead to new industries and jobs, improving the economy.