



## Environmental Policy and Legislation

4201-431

# ENVIRONMENTAL POLICY

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Lecture 1

Lecture notes and further information:  
<http://www.uni-hohenheim.de/apo>



## LECTURE OUTLINE



1. Introduction
  - Course Expectations
  - Lecture Topics
2. The Role of Economics in Environmental Policy
3. Development of Ideas on Natural Resources and the Environment

## INTRODUCTION



### Course Expectations

- *Your* expectations
- My goals and expectations

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### Lecture Topics (see extra spread sheet)

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### Exam:

- First appointed fixed date: July 18th, 2008, at 02.00 p.m.  
(room will be announced)
- Second possibility: October 09th, 2008, at 10.00 a.m.  
(room will be announced)

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## The ROLE of ECONOMICS in ENVIRONMENTAL POLICY

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## The ROLE of ECONOMICS in ENVIRONMENTAL POLICY



⇒ **ECONOMICS** is the study of the allocation of scarce resources

*Scarcity* = the gap between human wants and available resources.

- The theories of economics can be applied to any scarce resource, not just traditional commodities.
- Economics *is not simply about profits or money!* It applies anywhere constraints are faced, so that choices must be made.
- Economists study how people's behaviour is affected by incentives.

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## The ROLE of ECONOMICS in ENVIRONMENTAL POLICY



**What questions does economics address ?**

- What is the best way to allocate scarce resources among competing users?
- What and how much do people choose to produce and consume?
- How do nations, institutions, firms, individuals make decisions?

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## The ROLE of ECONOMICS in ENVIRONMENTAL POLICY



### Morality ↔ Economics

could be argued:

- Morality represents the way that people would like the world to work
- Economics represents how it actually does work

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## The ROLE of ECONOMICS in ENVIRONMENTAL POLICY



### What is an economic model ?

- Simplified representation of the world
- World (and humans) are too complex to make general assumption → models preserve the features essential to the question being analyzed.
- Unlike models in other social sciences, economic models make explicit assumptions (mathematical tools) and do a reality check (econometrics).

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## The ROLE of ECONOMICS in ENVIRONMENTAL POLICY



### What are key assumptions of economics?

- Individuals are rational and pursue self-interest.
- Individuals make their own choices and do what's best for them.

### How is economics done?

- Quantitative and qualitative results of economic analysis inform policy.
- Economics distinguishes between *what is* and *what should be*
  - Normative vs. Positive

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## The ROLE of ECONOMICS in ENVIRONMENTAL POLICY



### Normative vs. Positive

- **Positive analysis** explains observable behaviour – *what is*
  - Measures of observable phenomena
  - Examples:
- **Normative analysis** evaluates outcomes and recommends policies to improve the situation – *what should be*
  - Recommends what should be done
  - Requires judgement
  - Examples:

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## The ROLE of ECONOMICS in ENVIRONMENTAL POLICY



### ⇒ Why is economics important to environmental and natural resource policy?

- Economists strive to take a reasoned view of the incentives that drive all stakeholders, and to bring some order to the analysis of important policy issues.
- Economics are a need way of measuring trade-offs.
  - A trade-off usually refers to losing one quality or aspect of something in return for gaining another quality or aspect.
    - It implies a decision to be made with full comprehension of both the upside and downside of a particular choice.
    - Making decisions requires trading off one goal against another.

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## What is ENVIRONMENTAL and NATURAL RESOURCE ECONOMICS ?



### ENVIRONMENTAL and NATURAL RESOURCE ECONOMICS

= the application of the principles of economics to the study of how environmental and natural resources are developed and managed.

- ⇒ **Natural resources:** Resources provided by nature that can be divided into increasingly smaller units and allocated at the margin, e.g. oil, minerals, soils, water, wood, fibres, fish etc..
- ⇒ **Environmental resources:** Resources provided by nature that are indivisible (e.g. ecosystems, landscape, ozone layer).
- ⇒ Natural resources serve as inputs to the economic system. Environmental resources are affected by the system (e.g. pollution).

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## The ROLE of ECONOMICS in ENVIRONMENTAL POLICY



### ENVIRONMENTAL and NATURAL RESOURCE ECONOMICS

- Has own set of theoretical and analytical tools
- Differs from mainstream economics
  - Interdisciplinary: Integrates economics with natural sciences to get insights and policy perspective
  - Normative and positive analysis are important
  - Makes less general assumptions

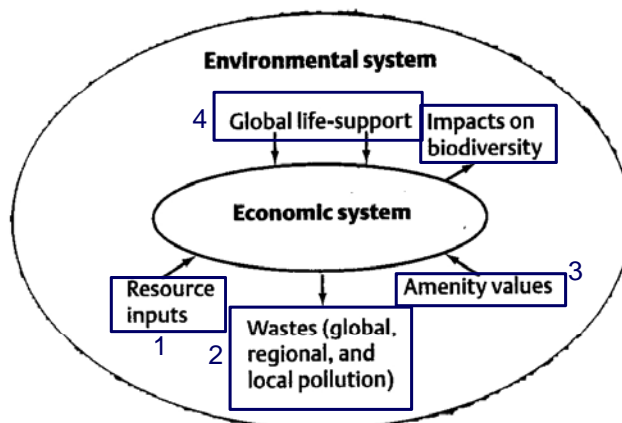
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## The ECONOMY and the ENVIRONMENT



### Economy-Environment Interactions:

Source: Hanley et al., 2001, p.5



☞ **Co-evolution**: the way in which the economic subsystem evolves over time depends on the changing conditions of the environmental subsystem, and vice versa.

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## The ECONOMY and the ENVIRONMENT



### Economy-Environment Interactions:

1. The environment provides the economic system with *inputs* of raw material and energy resources.
  2. The economy uses the environment as a *waste sink*.
  3. The environment provides households with a direct source of *amenity*.
  4. The environment provides the economic system with basic *life-support services*.
- ☞ Obvious point: if the economy increases its demand on the environment with regard to any one of these four service flows, then this can impact on the environment's ability to provide other services.

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## WHY STUDY ENVIRONMENTAL ECONOMICS?



### **In general, prices reflect the relative scarcity of goods.**

- However, in environmental economics, markets, and thus prices, often do not exist.

### **What aspects of environmental and natural resource economics make it unique?**

- Market failures:
- Dynamics:
- Irreversibility:
- Linkages between the economic and ecological system:

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## KEY QUESTIONS for ENVIRONMENTAL ECONOMICS



### 1. What is market failure ?

- Typically, externalities are a problem.  
However, we will also deal with other market failures.

### 2. What type of intervention works best ?

- The problem in environmental economics is often that there is no market for environmental resources.
- ⇒ Thus, one option is to create a market.
- ⇒ However, economists realize that this is not always the best solution.

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## KEY QUESTIONS for ENVIRONMENTAL ECONOMICS



### 3. How to evaluate environmental programs ?

- **Ideally, we need to know what level of environmental protection is desired.**
  - Economists focus on decisions at the margin: equating marginal costs and marginal benefits.
  - The choice is not between clean air and dirty air, but rather between different levels of pollution.
- ⇒ **Note that this requires placing a value on environmental protection.**
  - Valuation is complicated by the lack of market prices.

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## KEY QUESTIONS for ENVIRONMENTAL ECONOMICS



### 4. Efficiency versus Equity

- *Efficiency* means society gets the most that it can from its scarce resources.
- *Equity* means the benefits of that resources are distributed fairly among the members of society.
- **Even when an efficient solution occurs, it might not be desirable.**
  - Equity issues are also important.
  - Policymakers need to consider how various groups will be impacted.
  - This can be complicated, esp. in environmental economics (e.g., how should the welfare of future generations be weighed when making global warming policy?)

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## What contribution can economics make to understand and solve environmental problems



- ⇒ **Economic and environmental systems are determined simultaneously.**
- ⇒ **The behavioural underpinnings of economics can be summed up as follows:**
  - **people make decisions 'at the margin'**
    - in other words: they try to balance out the costs and benefits of going one step further.
    - marginal benefit: The extra benefit resulting from a small increase in some activity.
    - marginal cost: The additional cost resulting from a small increase in some activity.
  - **people respond to incentives, as do firms**
  - **firms and households act in their own best interest**

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## What contribution can economics make to understand and solve environmental problems



⇒ **Environmental resources are *scarce*, using them in one way has an *opportunity cost*.**

- By *scarce* we mean that there are not enough environmental resources around to simultaneously meet every possible demand on them.

scarcity = The gap between human wants and available resources.

- By *opportunity cost* we mean the net benefits forgone from the next-best use.

opportunity cost = highest valued alternative that must be sacrificed to attain something or satisfy a want.

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## What contribution can economics make to understand and solve environmental problems



⇒ **Markets have proved to be the best way of allocating a vast range of resources:**

- Markets are extremely good at
  - coordinating actions and at transmitting information,
  - responding to changes in relative scarcity (as prices rise if a resource gets more scarce).
- Markets give people the opportunity to trade = a good way of increasing social welfare as a whole.
- Markets can also be made to work for the environment, e.g. tradable pollution permits.

⇒ **However, left to itself, the free market system can generate the 'wrong' level of environmental quality.**

- This problem is known in economics as *market failure*.

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## What contribution can economics make to understand and solve environmental problems



- ⇒ **Government intervention does not always make things better, it can make things worse (= *government failure*).**
- ⇒ **Environmental protection costs money:** Scarcity means that opportunity costs exist for all choices, even those driven by moral imperatives.
- ⇒ Whilst economic growth may not solve all environmental problems, and may be the cause of some, **very few people would swap their position today with the equivalent 200 years ago.**
- ⇒ **Many of the world's most serious environmental problems are global in nature.** Economics predict, that it is difficult to get countries to agree to do something about these problems (free-rider problem), but economics can help in designing institutional arrangements to reduce these problems.