



Department of Economics

Economics 381
(12084 - 381)
Institutional Economics
Environmental Economics
Public Economics

Environmental Economics
Sub-Module Framework
2022

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1. INTRODUCTION

Welcome to the Environmental Economics sub-module of Economics 381! I trust that you will find it interesting and useful. This component is designed to introduce, raise interest and awareness about the natural resource and environmental challenges associated with production and consumption in different resource sectors, and the role economic analysis can potentially play in environmental policy design. This document contains the sub-module outcomes, lists the prescribed material, and provides a lecture schedule with the outcomes and readings of each session. You should use it with the general module framework for Economics 381, which contains information about administrative aspects and assessments.

2. SUB-MODULE AIM AND OUTCOMES

At the end of the Environmental Economics sub-module, students must be able to:

- Distinguish between the classification and spatial distribution of natural resources, and explain the metrics to measure their scarcity.
- Explain the interdependence between environment and economic systems, as a basis for environmental policy design.
- Discuss the concept of market failure in the presence of natural and environmental resources, and their implications for resource allocation efficiency.
- Distinguish between the broad classes of economic policy instruments to improve on the inferior resource allocation associated with market failures, and apply them to solve environmental problems, for example pollution.
- Discuss the natural resource and environmental problems associated with production and consumption in selected urban and rural resource sectors, for example agriculture, freshwater, forests, soil, wildlife, rangelands, energy, solid waste, and urban air pollution.
- Discuss severity of resource and environmental problems, and qualitative consequences of policy inaction i.e., what society stands to lose if problems continue unabated.

3. PRESCRIBED TEXTBOOK

Thomas H Tietenberg and Lynne Lewis. 2018. *Environmental Natural Resource Economics (11th edition)*. Routledge.

Additional prescribed and recommended readings are provided topic-wise (see below). While I will endeavour to provide links to all prescribed readings in module page on SUNLearn, it is my expectation that will also engage with the library.

4. DETAILED MODULE DESCRIPTION

1. Introduction to environmental and natural resources.

- Classification.
- Occurrence and distribution.
- Measurement: abundance and scarcity.

Recommended reading:

Rees, J. (1990). *Natural Resources - Allocation, Economics and Policy*. Routledge

2. Interactions between economic and environmental systems.

- Open and closed systems.
- Material and utility flows.

Prescribed reading(s):

- Tietenberg and Lewis Chapter 2 – pages 18-19.

Recommended reading:

- Piussi, P. and E.P. Farrell (2000). Interactions Between Society and Forest Ecosystems: Challenges for the Near Future. *Forest Ecology and Management*, 132(1): 21-28.

3. Foundation concepts in environmental and natural resources economics.

Objective: use examples from the economics of pollution management to provide an overview of (i) the interdependence between environment and economic systems, (ii) economic circumstances that result in market failure i.e., competitive markets allocating resources inefficiently, and (iii) distortions associated with market failure.

3.1 Externalities.

- Positive and negative externalities.
- Private and social costs.
- Externalities as market failures.
- Pareto optimality.

- Non-existent or incomplete markets.
- Transaction costs.

Prescribed reading(s):

- Tietenberg and Lewis Chapter 2 – pages 21-44.
- Tietenberg and Lewis Chapters 14 – 16.

3.2 Property rights.

- Definition.
- Private property.
- Open access.
- Public goods.

Prescribed reading(s):

- Tietenberg and Lewis Chapter 2 – pages 21-44.

3.3 Government failures, asymmetric information, non-competitive markets, risk, uncertainty.

Prescribed reading(s):

- Tietenberg and Lewis Chapter 2 – pages 21-44.

4. Economic instruments for environmental and natural resources management.

Objective: use examples from the economics of pollution management to provide an overview of the broad classes of economic instruments that policy could use to improve on the inferior resource allocation associated with market failures. The presentation will be limited to defining the instruments and how they qualitatively work.

- 4.1 Command and control-based instruments: direct provision of public goods, regulation of technology, and regulation of performance.
- 4.2 Property rights-based instruments: tradable permits.
- 4.3 Price-based instruments: Pigouvian taxes, charges and earmarking, taxes on inputs and outputs, subsidies and subsidy removal, two-part tariff systems.
- 4.4 Other instruments: legal based and information provision.

Recommended reading(s):

- Tietenberg and Lewis Chapters 14 – 16.

- Sterner, T and J. Coria (2021). Policy Instruments for Environmental and Natural Resource Management. RFF Press (Chapters 4 – 8).

5. Analysis of key resource sectors

Objective: provide an overview of (i) natural resource and environmental challenges associated with production and consumption in a selected urban and a selected rural resource sector, (ii) magnitude or severity of such problems, and (iii) qualitative evidence of the consequences of policy inaction (what society stands to lose should the problems continue unabated).

5.1. Municipal Solid Waste (MSW)

- Municipal Solid Waste (MSW): types, amounts and composition.
- Sources of MSW.
- Impacts of MSW on natural resources.
- Impacts of MSW on the environment.
- Options for sustainable MSW management.

Prescribed reading(s):

- Tietenberg and Lewis Chapter 8.

5.2. Wildlife and rangelands

- Wildlife protected areas (PAs): definitions, types (e.g., national parks and reserves) and justification for protected areas.
- The resource and environmental benefits of PAs.
- Private protected areas (e.g., conservancies).
- The illegal wildlife harvest (poaching) problem and its impact on sustainability.
- Common property and open access forest and rangeland resources: utilized for subsistence needs (e.g., firewood, livestock graze, honey, rooibos, water extraction, hunting, fibre, etc.), but without any formal protection.

Recommended reading(s):

- Agrawal, A. and C. Gibson. (1999). Enchantment and Disenchantment: The Role of Community in Natural Resource Conservation. *World Development*, 27(4): 629-649.
- Wainwright, C. and W. Wehrmeyer. (1998). Success in integrating conservation and development? A study from Zambia. *World Development*, 26 (6): 933-944.
- Berkes, F., D. Feeny, B.J. McKay and J.M. Archeson. (1989). The benefits of the commons. *Nature*, 340: 91-93

5. TEACHING SCHEDULE

Week	Date	Topic
1	Monday (2022/04/04)	No lecture
	Wednesday (2022/04/06)	Introduction to Economics 381 (Environmental Economics).
	Friday (2022/04/08)	1. Introduction to environmental and natural resources.
2	Monday (2022/04/11)	TBA
	Wednesday (2022/04/13)	1. Introduction to environmental and natural resources.
	Thursday (2022/04/14) – follow Friday timetable	1. Introduction to environmental and natural resources.
3	Monday (2022/04/18)	TBA
	Wednesday (2022/04/20)	2. Interaction between economic and environmental systems.
	Friday (2022/04/22)	3.1. Externalities.
4	Monday (2022/04/25)	3.2. Property rights.
	Wednesday (2022/04/27)	Public holiday
	Friday (2022/04/29)	3.3. Government failures, asymmetric information, non-competitive markets, risk, and uncertainty.
5	Monday (2022/05/02)	Public holiday
	Wednesday (2022/05/04)	4.1. Command and control policy instruments.
	Friday (2022/05/06)	4.2. Property rights-based policy instruments.
6	Monday (2022/05/09)	TBA
	Wednesday (2022/05/11)	4.3. Price based policy instruments.
	Friday (2022/05/13)	4.4. Other instruments: Legal based policy instruments and information provision.
7	Monday (2022/05/16)	TBA
	Wednesday (2022/05/18)	5.1. Municipal Solid Waste.
	Friday (2022/05/20)	5.2. Wildlife and rangelands.
	Saturday (2022/06/11)	Assessment 2 Semester 1 (A2S1)