

**Economics of Natural Resources**

ECO 6143 (Winter 2006)

University of Ottawa

200, Wilbrod st.

Ottawa, Ontario, Canada K1N 6N5

**Professor:**

Louis Hotte

1-613-562-5800 ext. 1692

lhott3@uottawa.ca

room 05

<http://aix1.uottawa.ca/~lhott3/>**COURSE OUTLINE**

We consider some of the main issues regarding the exploitation of natural resources in the world today. The main objective is to gain a better understanding as to why agents take decisions that lead to sub-optimal uses of natural resources. We also consider when and how governments can intervene to improve on the situation. Sometimes, though to a lesser extent, we will consider some political-economic aspects related to natural resource exploitation. The course is intended to be relevant to both rich and poor countries.

We first consider static models of resource use. This provides a simple framework to analyze basic institutional arrangements and some policy implications.

Dynamic models of natural-resource use are considered in the second part. We consider explicitly the cases of fisheries, forests, and non-renewable resources, such as mineral and oil deposits. Extensions to other resources, such as water, game, or pastures, will come naturally. Some policy measures are discussed.

In the final part of the course, we analyze in more details the role of institutions in affecting agents' decisions to use resources. Three basic classes of institutions are explicitly considered: exclusive property, free access, and common property.

**Prerequisites:** The analysis of natural-resource use as well as behavior in different institutional settings requires a heavy use of calculus, microeconomic tools and game theory. Students enrolled in this course should thus be at ease with those techniques.

**Evaluation:** There will be two mid-term tests and one final exam counting for 20% and 50% respectively. The final exam will be cumulative.

Although a course in natural-resource economics can be somewhat technical, it remains a course in economics as a social science. Much emphasis is thus put on interpreting the results and discussing their implications for society and economic policy. *The evaluation will reflect this.*

The ability to interpret and discuss results can only be properly achieved through long-term maturation of ideas. Students are thus expected to be up-to-date in their weekly material. To this end, exercises will be assigned every week. An *individual hand-written* copy is to be submitted the following week *in person* during the class break. Solutions will be provided but individual copies will not be corrected. It goes without saying that class

attendance is mandatory. Assiduous attendance and assignment completion will make up for the last 10%.

**N.B.** My **Office hours** are on Wednesdays 14h00 to 16h00. It is always a good idea to double-check the course's website for eventual changes of hours. Students are expected to consult the courses' web page on a weekly basis for up-to-date information regarding assignments, mid-term dates, office hours changes, etc.

## THEMES<sup>1</sup>

### A. Static Analysis of Resource Exploitation and Basic Institutional Considerations

1. Land use, Land Value, and the Concept of Rents (Hartwick and Olewiler 1998, ch 3)
2. Exclusive Property and Free Access (Hartwick and Olewiler 1998, ch 3)(Dasgupta and Heal 1979, ch 3) (Gordon 1954, Smith 1968, Brooks, Murray, Salant and Weise 1999, Hardin 1968)
3. A General Equilibrium Analysis of Rural Privatization (Samuelson 1974, Cohen and Weitzman 1975)
4. Enforcement Costs and Inefficient Private Property (de Meza and Gould 1992)
5. The Anti-Commons (Buchanan and Yoon 2000, Heller 1998)
6. **Review:** Elements of Game theory (Varian 1992, 15.1 to 15.5 for now)

### B. Dynamic Models of Resource Exploitation

1. Resource Depletion, Scarcity, and Sustainability (Perman, Ma, McGilvray and Common 2003, ch 2 and 14)(Hanley, Shogren and White 1997, ch 8)
2. Introduction to optimal control and the maximum principle (Perman et al. 2003, ch 14 and website)(Hanley et al. 1997, ch 7)(Chiang 1992)
3. The Economics of Non-Renewable Resources (Perman et al. 2003, ch 15)(Hartwick and Olewiler 1998, ch 8)(Pearce and Turner 1990, ch 15)
4. The Economics of the Fishery
  - (a) Steady-State Analysis (Perman et al. 2003, ch 17)(Hartwick and Olewiler 1998, ch 4)(Pearce and Turner 1990, ch 17)
  - (b) Dynamics and Present-Value Maximizing (Perman et al. 2003, ch 17)

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<sup>1</sup>Themes, references, and their timing are subject to change.

(c) Regulation of the Fishery (Perman et al. 2003, ch 17)(Hartwick and Olewiler 1998, ch 5)

5. The Economics of Forest Resources (Perman et al. 2003, ch 18)(Hartwick and Olewiler 1998, ch 10)(Tietenberg 2002, ch 12) (Repetto 1988, Binswanger 1991)

### C. Institutions and Resource Exploitation

1. Conceptualizing Property Rights

(a) Coase's Insight (**Coase, 1960**; Coleman, 1990, chap. 3)

(b) Towards a Definition of Property Rights

i. Property Rights, Agency, and economic organization (**Eggertsson 1990, chap. 2**)

ii. Explaining the rules (**Eggertsson 1990, chap. 3**)

iii. The economics of exclusive rights (**Eggertsson 1990, chap. 4**)

(c) The Emergence of Property Rights (**Eggertsson 1990, chap. 8**)

2. Common Property Resource Management

(a) Analyzing CPRM and Collective Action: Repeated interactions, co-operation, sanctions, and social norms (**Ostrom, 1990, chapters 1 and 2 ; Baland and Platteau, 1996, chapters 4, 5 and 6**; Coleman, 1990, chapters 9 and 10)

(b) CPRM in Practice

i. Analyzing long-enduring, self-organized, and self-governed CPRs (**Ostrom, 1990, chap. 3** )

ii. Were people traditionally conservationists? (**Baland and Platteau, 1996, chap. 10**)

iii. Recent changes affecting collective action at village level (**Baland and Platteau, 1996, chap. 11**)

(c) The Evolution of Social Norms (**Sethi and Somanathan, 1996**; Coleman, 1990, chapters 11 and 12)

3. Natural-Resource Exploitation with Costly Enforcement of Property Rights over Property Rights (Hotte 2005)

4. Conflicts over Property Rights and Natural-Resource Exploitation at the Frontier (Hotte 2001, Mendelsohn 1994)

## References

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