

UNIVERSITY OF COLORADO AT BOULDER, FALL 2006
NATURAL RESOURCE ECONOMICS, Econ 4535-001
Lectures: MWF 10:00 a.m. to 10:50 a.m. @ ECON 119

Instructor: Vijaya R. Sharma, Ph.D.
Office Hours: MWF 9:00 a.m.-10:00 a.m. @ Econ 4A

Best Reserve First, Path of efficient prices and scarcity rent under Zero MEC, Constant MEC, Increasing MEC, Impacts of changes in discount rate, Price of substitute, Stock, MEC, and Demand, Extraction under Monopoly, Negative externality, Effect of Price Ceiling, Effect of Recycling

Assignment #2 due on Sep 20 (mathematically derive and interpret the equilibrium condition of Hotelling model and describe with the help of a graph the effect on price path from any one case of a change in parameter or market failure discussed in the following reading):
The Economics of Resources or the Resources of Economics, by Robert Solow (from American Economic Review, vol. 64, no.2, May 1974, pp. 1-14; or from Economics of the Environment, Selected Readings, 3rd edition, edited by R. Dorfman and N. Dorfman, W.W. Norton & Company, New York, 1993, pp.162-178)

Exam 1 on the above materials on September 25, 2006, Monday

4. Equi-Marginal Principle of Allocating Surface Water and Benefit-Cost Analysis (Sep 27, 29, Oct 2, 4)
 Safe Yield Use Principle of maintaining water table in aquifers, optimal rate of depletion of aquifers
 Equi-marginal principle of allocating surface water – mathematical derivation, scarcity rent of water, marginal user cost, and marginal cost pricing of water
 Benefit-cost analysis of water development projects – B/C ratio, NPV, IRR, incremental analysis
Assignment #3 due on Oct 6 (mathematically derive the equi-marginal principle and interpret)
5. Timber Harvesting Model (Oct 6, 9, 11, 13)
 Growth characteristics of timber, stumpage value, Net present value from timber harvesting, the MAI rule of harvesting
 Optimal timber harvesting period (single crop vs. infinite cycles of rotation) – mathematical derivation and interpretations
Assignment #4 due on Oct 16 (mathematically derive and interpret the single crop timber harvesting rule and discuss the change in this rule when infinite rotation is allowed)
6. Fishery Sustainable Yield Model (Oct 16, 18, 20, 23)
 Fishery growth characteristics, Minimum threshold stock, Maximum sustainable stock, Physical relationship between stock and yield, Concept of Maximum Sustainable Yield (MSY)
 Economic model (graphical presentation) – assumptions, fishing effort, relationship between fishing effort and sustainable yield, Revenue and Cost graph, Optimum sustainable stock and yield, interpretations
Assignment #5 due on Oct 25 (clearly draw the graphical model, label the axes, show the optimum sustainable harvesting point, and interpret)
7. Use versus Non-use values of resources and measurement techniques (Oct 25, 27, 30)
 Basis for Option, Discovery and Existence Values: Uncertainty, Lack of Information and Possible Irreversible Consequences (Measures of Caution)
 Reasons for Higher Value of Resources in Future: Asymmetry of Technological Progress and Inability of technology to reproduce unique resources (supply side reason) and Changing Preferences in Favor of Natural Resources – learning by doing (demand side reason)
 Non-human value – the difference between economic value and environmental value
Assignment #6 due on Nov 1 (write a summary of the following reading):
Economic Assessment of Biodiversity and Protected Species, from Environmental Economics, Theory, Application, and Policy, by Duane Chapman, Addison Wesley Longman, 2000, pp. 273-281

Exam 2 on the above materials on November 1, 2006, Wednesday

8. Discussion on Energy Resources (Nov 3, 6, 8)
Assignment #7 due on Nov 3 (write a summary of the following reading):
Energy Resources - Cornucopia or Empty Barrel? by Peter McCabe, the American Association of Petroleum Geologists, 1998
 Warehouse concept of reserves, Resource Pyramid, Closed model and Open model, Theoretical production and price trends
Presentation by students on recent trend of oil prices, reasons, and interpretations on Nov 8

9. Discussion on Municipal water scarcity (Nov 10, 13, 15)
Assignment #8 due on March 20 (write a summary of the following two readings):
(a) Is Water Different? by R. Miller, D. Benjamin, and D. North, from The Economics of Public Issues, by the same authors, 10th edition, 1996, pp. 37-41
(b) Economic Analysis of Groundwater Use in Douglas County, by Paul Flack, 2005
 Average cost pricing vs. marginal cost pricing, Practice of tap fees, Price vs. watering restrictions for conservation of water
Presentation by students on water rights markets on Nov 15
10. Discussion on Forestry Resources (Nov 17, 27, 29)
Assignment #9 due on April 5 (write a summary of the following reading):
Free Market Forestry, by Mark Muro, from the Denver Rocky Mountain News, Sunday, June 1, 1997, pp. 1B
 Below-cost timber sales, allowing participation of environmental activist organizations in bidding for clear-cutting of forests, roadless forest initiative, forest services strategic plan 2004-2008
Presentation by students on roadless forest initiative on Nov 29
11. Discussion on Problems of Open Access (Dec 1, 4, 6)
Assignment #10 due on April 12 (write a summary of the following two readings):
(a) Individual Fishing Quotas, by Lauren Fluken, 2005
(b) Economic Incentives and Poaching of the One-Horned Indian Rhinoceros in Nepal, from the Poverty Reduction and Environmental Management No. 1, Jan 2005
 Coase theorem, applicability, issues with privatization, alternative ways of resolving open access problem
Presentation by students on Issues with Privatization on Dec 8
12. Population, Environment, Trends of Resource Scarcity, and Sustainability (Dec 8, 11, 13, 15)
 Neo-Malthusian Perspective on Population, Economic model of family size, Modern theory of demographic transition, Mutual relationship between economic growth and population growth, Ecological perspectives and Ecological Economics
 Trends of Economic Scarcity – Price, marginal extraction cost, and rent, Factors Mitigating Scarcity, Findings in the literature
Assignment #11 due on Dec 11 (write a summary of the following reading):
Trend of Natural Resource Commodity Prices

Classroom Behavior Policy

Students and faculty each have responsibility for maintaining an appropriate learning environment. Students who fail to adhere to behavioral standards may be subject to discipline. Faculty have the professional responsibility to treat students with understanding, dignity and respect, to guide classroom discussion and to set reasonable limits on the manner in which students express opinions. See policies at <http://www.colorado.edu/policies/classbehavior.html> and at http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code.

Honor Code

All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council (honor@colorado.edu; 303-725-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Additional information on the Honor Code can be found at <http://www.colorado.edu/policies/honor.html> and at <http://www.colorado.edu/academic/honorcode>.