

ECON 350, Sustainable Development: Tentative Syllabus

Course Description

This course provides an overview of the economics of sustainable development. We review the interactions between the environment, the economy, human resources, and public policy. Ecological constraints (climate, disease ecology, physical resources) significantly shape the economic development, wealth and poverty and anthropogenic activities (farming, resource depletion, demographic stresses, and energy use) change the physical environment. We compare and contrast sustainability science and the public economics of sustainable development with other representations of sustainability including the 3R's, Natural Capitalism, self-sufficiency and moral imperatives. We consider why Hawaii is widely regarded as an ecological basket case and what solutions are suggested by environmental economics. Topics include the economic, environmental, and cultural dimensions of sustainability; global warming and energy use: water resources and watersheds; traffic congestion and other environmental problems in Hawaii; biodiversity and endangered species; pollution solutions; unsustainable recycling; and "smart," "greedy," and "win-win" growth.

Learning objectives (1) learn to distinguish and critically evaluate alternative approaches to sustainable development; (2) apply microeconomics to evaluate policies for pollution control, climate change mitigation, recycling, water resource management, invasive species control, the conservation/restoration of natural capital and (3) engage in critical thinking and applications of public policy analysis to other aspects of sustainable development.

Required text

Hackett. 2006. *Environmental and Natural Resources Economics: Theory, Policy, and the Sustainable Society*, 3rd Ed., M.E. Sharpe, Inc.

Laulima resources

Most of the references in this syllabus are already linked to laulima. If you are not directed to the specified resource, access laulima at <https://laulima.hawaii.edu/portal>. Provide your UH user id and password. Click the menu tab Econ-350. Click the "Resources" tab on the left then click "Lecture" or "References" folder.

Requirements and weights

Quizzes (5): 33%²

Final: 30%³

Project/paper: 24%⁴

Homework and citizenship: 13%⁵

¹ Office hrs: W1:30-3 and by appt.; 514 Saunders. Additional contact: Majah Ravago, majah@hawaii.edu

² No make-up quizzes. Pre-excused and doctor-documented absences will be taken into account for grading purposes.

³ Final is comprehensive. See [UHM Schedule of Classes](#) for schedule. Dec. 17, 2009, 9:45-11:45am.

⁴ Each group produces a paper and makes a Power Point presentation. Groups will select group leaders and discuss tentative roles for each member. The acknowledgement section of the term paper should include a description of the roles played by members, including team coordinator. Proposals due at the beginning of the 5th week. Presentation Power Points due on day of presentation. Revised Power Pt due one week later. Term paper (group) due on day of penultimate class. Grading rates success in using economic policy analysis to illuminate an issue and/or elevate a debate.

⁵ Late homework will not be accepted. Those pre-excused or w/ doctor's note will not be penalized.

Topics and readings

- I.
 - a. Introduction and review of microeconomics: Skim Hackett 1 and review 3 as needed. www.mathsisfun.com/equation_of_line.html
 - b. [Deontological, Teleological and Virtue Ethics](#)

- II. Environmental and resource economics
 - a. Externalities, market failure, and Pigouvian taxes: ch 4
 - b. Coase Theorem: Hackett, 161.
 - c. Resource economics: ch 5&6
 - d. Energy economics
 - i. [Roumasset, Fesharaki, and Isaac \(pdf\)](#)
 - ii. [The modern energy shock](#)
<http://www.nytimes.com/2008/07/28/business/worldbusiness/28subsidy.html?th&emc=th>
 - iii. Hubert's peak: <http://www.theoil drum.com/node/5521>
 - iv. [As Prices Rise, Farmers Spurn Conservation Program](#)
 - e. Benefit-cost: ch 7.
 - f. [Measuring non-market benefits](#)
 - g. Pollution solutions: ch 10.
 - h. [Optimal pollution control](#) (lecture notes)

- III. Global warming
 - a. Hackett, ch 11.
 - b. James Hansen. "[Can we defuse the global warming time bomb?](#)" Scientific American, March 2004. "[The Challenge of Global Warming](#)" (1988)
http://www.islandpress.org/assets/library/73_jhchallengeglobalwarming.pdf
 - c. Strassel, Kimberly, "EPA silences climate critic," WSJ, 7/3/9.
<http://online.wsj.com/article/SB124657655235589119.html>
 - d. Broeker, A Businessman Executive's Guide to Global Warming.
 - e. *An Inconvenient Truth*
 - f. IPCC. Climate Change 2007: The Physical Science Basis. Summary for Policy Makers http://ipccwg1.ucar.edu/wg1/docs/WG1AR4_SPM_Approved_05Feb.pdf
International Panel on Climate Change on Wikipedia.
 - g. Klaus Lackner and Jeffrey D. Sachs, "[A Robust Strategy for Sustainable Energy](#)," Brookings Papers on Economic Activity, Issue 2, 2005.*⁶
 - h. Tarui, N. [Discounting for Mitigation of Climate Change](#) (PPT, Laulima)
 - i. Geoffrey Heal, Nature and the Marketplace, 2000. Chapter 5*
 - j. Lovins, Amory. "More Profit with Less Carbon," Scientific American, Volume 293, No. 3, Sept 2005 or [Ernst U. von Weizsacker](#), *Factor Four*, 1998.*
 - k. Nine Inconvenient Untruths (via British High Court)
<http://www.telegraph.co.uk/earth/main.jhtml?xml=/earth/2007/10/11/scigore111.xml>
 - l. Stern Review: The Economics of Climate Change (Executive Summary)*
 - m. Singer, S. Fred. 2008. Nature, not Human Activity, Rules the Climate. Available at <http://www.heartland.org/policybot/results.html?artId=22835> or scienceandpublicpolicy.org/other/nature_not_human_activity_rules_the_climate.html
 - n. [Do you know what ANWR is?](#)
 - o. [Unstoppable Global Warming: Every 1500 years](#)
 - p. Fargione et. al. "[Land Clearing and the Biofuel Carbon Debt](#)"

⁶ Readings marked w/ asterisk are recommended but not required.

- q. [Fuel Subsidies Overseas Take a Toll on U.S.](#)
 - r. [Lose-lose biofuels.](#)
 - s. [Policy Options for Greening Hawaii's Carbon and Energy Profiles](#)
 - t. Two more cents on Waxman-Markey: [Envi-Econ blog](#)
 - u. [Cap and trade essay for reason](#)
- IV. Economic growth and development
- a. Thinking long term: Hackett, ch. 13
 - b. Roumasset, "[Population and Agricultural Development](#)," The New Palgrave Dictionary of Economics, 2007. <http://ideas.repec.org/p/hai/wpaper/200702.html>
 - c. UN Population Division, World Population to 2300*
<http://www.un.org/esa/population/publications/longrange2/WorldPop2300final.pdf>
- V. The Economics of Sustainable Development
- a. Hackett, Part III
 - b. Roumasset and Endress, "[The Yin and Yang of Sustainable Development: A Case for Win-Win Environmentalism](#)," *Journal of the Asia Pacific Economy*, Vol. 1, No. 2, 185-194, (1996). PTTs: [HEA yin yang](#) and [YinYang](#)
 - c. Solow, "Sustainability: An Economist's Perspective." Chapter 26 in Stavins, *Economics of the Environment**
 - d. Dasgupta, "[The Idea of Sustainable Development](#)."
 - e. [Sense and sustainability](#)
 - f. [Smart, Greedy, Sustainable](#)
 - g. [Issues in the Economics of Sustainable Local Communities](#)
- VI. Other visions of sustainability: natural capital, energy, NGO's
- a. Barbier (1987) "[The concept of sustainable economic development](#)"
 - b. Munasinghe's sustainable development triangle
http://www.eoearth.org/article/Sustainable_development_triangle and figure 3.5, *Environmental Economics and Sustainable Development*, 1993
http://books.google.com/books?id=VmKwJa2iN0sC&dq=%22environmental+economics+and+sustainable+development%22+%2B+1993+%2B+munasinghe&printsec=frontcover&source=bn&hl=en&ei=6cspSpTcL6G6sgO_Yj0Cg&sa=X&oi=book_result&ct=result&resnum=4
 - c. [Sustainable development](#)
http://en.wikipedia.org/wiki/Sustainable_development#cite_note-0
 - d. Lester Brown: *Outgrowing the Earth*, W.W. Norton, 2004*; Plan B,
<http://www.cceia.org/resources/transcripts/1037.html> and Brown interview
<http://www.cceia.org/resources/transcripts/1037.html>
 - e. Hawkins, Lovins, and Lovins, [Natural Capitalism: Creating the Next Industrial Revolution](#), Rocky Mountain Institute, Colorado, 2003.
 - f. J. R. McNeill, *Something New Under the Sun**
 - g. Department for International Development. "Energy for the Poor," May 2002.*
 - h. International Energy Agency. *Toward a Sustainable Energy Future*. (OECD, 2001).*
 - i. Soft Energy and the Rocky Mountain Institute
http://en.wikipedia.org/wiki/Soft_energy_path
 - j. NGO's and the sustainability movement: http://en.wikipedia.org/wiki/Earth_Charter
http://en.wikipedia.org/wiki/World_Summit_on_Sustainable_Development
 - k. [178 Sustainability images.](#)
 - l. Selections from Hawkin, *Blessed Unrest: How the Largest Movement in the World Came into Being and Why No One Saw It Coming*, 2007.*

VII. Traffic congestion

- a. Arnott, Rave, and Schob, *Alleviating Urban Traffic Congestion* (MIT, 2005).*
- b. Arnott and Small, "[The Economics of Traffic Congestion](#)," *American Scientist* 82 (1994), 446-455.
- c. Selections from www.honolulutraffic.com

VIII. Regulating renewables: Water, fish, and marine ecosystems

- a. Hackett, ch 6.
- b. Water for Life: the history and future of water on Oahu
http://www.boardofwatersupply.com/files/Wfl_Website.pdf
- d. Global water scarcity: http://multimedia.wri.org/watersheds_2003/gm16.html
- e. [Privately Owned Fisheries May Help Shore Up Stocks - NYTimes.com](#) Roumasset, James A., and Barsharat, Pitafi A. "Integrated Water Management Policies for Oahu", *Water Resources Research Bulletin*, March, 2005.
- f. Jeremy Jackson et al. "Historical Overfishing and the Recent Collapse of Coastal Ecosystems." *Science* Vol 293 27 July 2001.*
- g. International Food Policy Research Institute, *Fish to 2020*, Washington, 2003*
- h. Roy, N. "The Atlantic Canada Resource Management Catastrophe: What Went Wrong and What Can We Learn From It?" *Canadian Journal of Economics*, Vol. 29, Special Issue, April 1996. pp. S139-144.*
- i. Pikitch, Ellen K., "The Gathering Wave of Ocean Extinctions," *State of the Wild* 2006, pg 195-201.*
- j. [Private property for sustainable fisheries](#)
- k. [Privately Owned Fisheries May Help Shore Up Stocks](#)
- l. [Economies of scales: A new way of saving fisheries shows it can work; it deserves more attention](#)
- m. [Fishing and conservation](#)
- n. [Costello, et.al "Can Catch Shares Prevent Fisheries Collapse?"](#)
- o. [Take a look at fishing cooperative to meet catch quotas](#)

IX. The Challenge of Biodiversity

- A. "Ecosystems and Human Well Being: Synthesis," Millennium Ecosystem Assessment, 2005. <http://www.millenniumassessment.org/proxy/Document.356.aspx>
 - B. Stuart Pimm and Clinton Jenkins, "Sustaining the Variety of Life," *Scientific American*, Vol. 293, No. 3, September 2005.*
 - C. Geoffrey Heal, *Nature and the Marketplace*, 2000. Chapter 4*
 - D. Convention on Biological Diversity. *Global Biodiversity Outlook*. CBD: Montreal, 2001 or CBD on Wikipedia.
 - E. Duffy, D. and F. Kraus. May 2006. Science and the Art of the Solvable in Hawaii's Extinction Crisis. *Environment Hawaii* 16(11)1: 3-6. . [View complete text in html format](#)
- [DOWNLOAD PDF FILE](#)
- F. Kaiser et al., *Environmental Valuation and the Hawaiian Economy*, exec summary.
 - G. [Economics of Invasive Species](#)
 - H. Livingston and Osteen, "[Integrated Invasive Species Prevention and Control Policies](#)" and TNC, "[Stop the Silent Invasion](#)".
 - I. Brewbaker et al., "Protect Environment to Preserve Economy" Advertiser <http://the.honoluluadvertiser.com/article/2003/May/04/op/op05a.html>

X. Health and Poverty

- A. WHO Commission on Macroeconomics and Health, Macroeconomics and Health: Investing in Health for Economic Development, 2001*
- B. Barry Bloom, "Public Health in Transition," Scientific American, Vol. 293, No. 3, September 2005.*
- C. Jeffrey D. Sachs and Pia Malaney, "Economic Burden of Malaria," Nature, Vol. 415, February 2002.*
- D. Laurie Garrett, "The Next Pandemic?" Foreign Affairs, Vol. 84, Issue 4, July-August 2005.

Indicative schedule (THIS WILL CHANGE)

- 1: Course overview; review of microeconomics. Competitive equilibrium is efficient w/o externalities. In-class assignment on graphing and calculating market equilibrium and social optimum. Due in class 2. Homework: skim Hackett ch. 3, read chapter 4, especially figure 4.3.
- 2: Excess burden and review of market efficiency, market failure, and Pigouvian tax. Quiz. Homework: read first half of Hackett ch. 5, pp 88-102.
- 3: Two-period model of non-renewable resources. Homework: solve 2-period oil problem from lecture, except w/ $c = 6$, and $r = 10\%$. Reading assignment: finish ch. 5. Choose group project topics: benefit-cost of rail; b/c of Lanai/Molokai windfarms; assessment/economics of Sustainability 2050; Waxman-Markey and Obama energy policy; BWS/water management
- 4: Recycling. Hotelling, Naïve Hotelling, and Modified Hotelling. Explaining shocks. Reading assignment: first half of Hackett, ch 6. Homework on recycling. Bring topic list to class on Jan 27.
- 5: If disposables generate an external cost, correct it with a tax. A recycling subsidy will result in excess production. Real world recycling problem results from two underlying distortions. We under-price legal disposal and litter-law enforcement is not perfect. Solution is to increase price of legal disposal (but not to the first-best price) and allow a small subsidy of recycling. Mandates are likely to produce costs greater than benefits. Introduction to fisheries economics. Reading assignment: finish chapter 6.
- 6: Fisheries economics (cont.). Review of DOY, MEY, MSY, OA. When is DOY equivalent to MEY? When is it OA? Derivation of Pearce equation. What is MUC for non-renewables? For renewables?
- 7: Q&A. Quiz. Assignment: and read first 8 pages of chapter 7; skim rest of 7 and 8.
8. Benefit-cost analysis. Skim 9 and beginning of 10.
- 9: Proposals due. Discuss graphs in 8 and 9 and beginning of 10.
- 10: Makena Coffman's overview of Manoa Climate Commission. Presidents' commitment: achieve carbon neutrality. But how much by buying carbon offsets ala Gore/Kerry? First reduce waste, e.g. delamping, education. Mitigation: compliance w/ Act 234. Taxes or cap & trade? Hybrid cap and trade: give a portion (e.g. 85%) of efficient emission to existing firms as entitlement, then auction the rest. Firms that choose to reduce to below entitlement can sell some of their entitlement. So far no provision for offsets. This imposes unwarranted costs on Hawaii's people. Easiest solution: slap/auction quota on imports of oil, coal, and natural gas. Further imports can be allowed via offsets for net sequestered carbon. Adaptation: seawalls, pumps, artificial beaches, or flexible zoning?
- 11: Hawaii's renewable energy portfolio policy. [Policy Options for Greening Hawaii's Carbon and Energy Profiles](#). Ch 11 on global warming. Homework: Write 10 assertions, implications, innuendos, recommendations, or techniques of persuasion that are wrong, misleading, or exaggerated. For each, provide a brief critique. You can also substitute critiques of Inconvenient Truth and explain why said critique is wrong, misleading, etc. Feel free to use "Nature, not Human Activity, Rules the Climate" as a source of critiques or assertions that you will criticize.
12. Waxman-Markey. <http://www.upi.com/turl-17b303/>

13: Al Gore homework due. Continue ch 11. Skim Barbier, Munasinghe, and Sustainable development triangle refs.

14: Q&A; quiz. Read ch 12.

15: Chapter 12. Sustainable development: history of thought – from Venn to modified Dasgupta. Venn as satisficing three objectives. This throws out policy analysis. Modified Dasgupta: just extend traditional policy analysis to include interactions and dynamics (w/ intergenerational equity). Sustainability science adds interaction between parts of the natural system, e.g. aquifer head, SGD, and limu. Curse of paradise.

Yin and Yang of Sustainable Development [YinYang](#) . Selectively read chs 13 and 14.

16: Chapter 13 and 14. Part I of [Sense and sustainability](#). Assignment: read 15.

17: [Sense and sustainability](#) , part II (positive sustainability). Chapter 15. Assignment. Prepare one or more questions from Smart, Greedy, and Sustainable Growth [Smart, Greedy, Sustainable](#).

18: Alice Waters clip from 60 minutes, Crossroads ppt from Laulima.

19: Ch. 16. Part I: Common property resources. Part II: “Keeping money in Hawaii.” If we eliminated all leakage by self-sufficiency policies, then multiplier thinking means that a \$1 injection will infinitely grow the economy. TANSTAAFL!

20: Q&A. Quiz. Read Dasgupta, “The Idea of Sustainable Development.”

21: Review of maximin vs. positive sustainability. [Dasgupta SS 2007 the idea of SD](#)

22: New Institutional Economics (Hardin, Demsetz (beaver vs. buffalo), Ostrom advocacy vs. Coasean comparative institutions). North restated the Demsetz conjecture, albeit substituting political costs to the primary action group, e.g. costs of getting an Act of Enclosure passed in the British Parliament. Anderson-Hill clarification using fencing as the costs of enforcement. Three quadrant formalization of increasing governance with resource scarcity enabling comparative institutional analysis.

23: Rail + Wind. Reading assignment: Duffy and Kraus (see syllabus). Kaiser et al., Environmental Valuation and the Hawaiian Economy (Google title), executive summary. Soft energy, http://en.wikipedia.org/wiki/Soft_energy_path

24: Group work on Duffy and Kraus (Hawaii as ecological basket-case). Assignment: read Livingston and Osteen, “Integrated Invasive Species Prevention and Control Policies” and TNC, “Stop the Silent Invasion.”

25: Dr. K. Burnett. Invasive species. Assignment: Skim downloadable readings from unit VI.

26: Q&A. Quiz.

27: Electronic submission of revised Power Pts due anytime today. Soft Energy and the Rocky Mountain Institute; Kaiser et al. on Env valuation. Governance Kuznets curve. Reading assignment: <http://ideas.repec.org/p/hai/wpaper/200702.html>; Lester Brown’s Plan B: <http://www.cceia.org/resources/transcripts/1037.html>

28: Population and Agricultural Development (including induced innovation)

29: Group term paper due (hard copy by 4:15). Also send electronic version. Discuss Honolulu Advertiser piece connecting Hawaii’s environment and economy. Valuing indirect benefits: congestion externalities. Protect environment to preserve economy. <http://the.honoluluadvertiser.com/article/2003/May/04/op/op05a.html> In class homework: Lester Brown’s plan B. List 6 claims, implications, recommendations, or argument characteristics (e.g. logic fallacies, use of metaphors in place of analysis and evidence) and 6 critiques. (Critiques of critiques can also be used.)

30: Q&A. Review: [Final Econ 350 Graphs](#) CS, PS, PV calculations. Shadow pricing. Non-operational sustainability. Positive sustainability. Hartwick = maximin = Max W w/ infinite inequality aversion. Weak = Negative Sust = Arrow Sust. Non-renewables, renewables, water (ground & surface). Block pricing.