

University of Essex, Department of Economics

EC383 Environmental Economics

Autumn 2023

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Last Updated: October 31, 2023
Preliminary and subject to change

Meetings

Lectures: Tuesdays 1pm-3pm at LTB09 (Week 2-11)
Classes: Thursdays 1pm-2pm at EBS.2.34 (Week 3-11)
Office hours: TBA

Module Description

This module covers the theory of environmental and resource economics. Topics include the economics of market failures, how to set the targets of pollution, what are the main instruments to fight pollution, the tragedy of the commons, non-renewable and renewable natural resource extractions, groundwater markets and governance, forest conservation, climate change, and environmental considerations in economic geography. This module equips you with a basic theoretical framework to analyze environmental policy issues and introduces frontier academic research on these topics, with particular emphasis on real-world problems in developing economies.

Learning Goals:

By the end of this module, we hope you will be able to:

- Apply basic microeconomic theory to environmental policy issues and evaluate when and how government and market-based solutions to them are effective
- State the key environmental problems in developing countries and understand their possible causes and consequences
- Read and digest empirical research papers in environmental and resource economics, and understand their economic intuitions and policy implications

Main Textbook

The lectures will follow the textbook:

Perman, R. et al., *Natural Resource and Environmental Economics*, Fourth Edition, Pearson, 2011.

Other readings are listed below and additional readings may also be announced during the module.

Assessment and Feedback

The final mark will be the average between (i) the online assessment and (ii) the final exam mark.

Topics and Readings

Week 2: Introduction (Economic Development and the Environment); Market Failures

Required readings: Fullerton and Stavins (1998); Jayachandran (2022); Perman et al. Ch. 4

Optional readings: Barrett et al. (2023); Dasgupta (2010); Greenstone and Jack (2015)

Week 3-4: Pollution Targets; Pollution across Space

Required readings: Perman et al. Ch. 5, Ch. 16.4

Optional readings: Aldeco et al. (2021)

Week 5-6: Pollution Instruments; Pollution Policy with Imperfect Information

Required readings: Perman et al. Ch. 6, Ch. 7

Optional readings: Duflo et al. (2013); Greenstone et al. (2023)

Week 7: Causes and Consequences of Air and Water Pollution

Required readings: Garg et al. (2023); Greenstone and Hanna (2014); Lipscomb and Mobarak (2016)

Optional readings: Jack et al. (2022); Jayachandran (2009); Khanna et al. (2021); Oliva (2015)

Week 8: The Tragedy of the Commons

Required readings: Hardin (1968); Bardhan and Udry (1999) Ch. 13; Wydick (2007) Ch. 4;

Coppock et al. (2022); Ryan and Sudarshan (2022)

Optional readings: Cheung (1970); Dasgupta and Mäler (1995); Gordon (1954); Ostrom (1990); Ostrom and Gardner (1993); Seabright (1993); Mazur (2023)

Week 9: Non-Renewable Resources; Groundwater Markets and Governance

Required readings: Perman et al. Ch. 15; Jacoby (2017); Jacoby et al. (2004); Sekhri (2011)

Optional readings: Chakravorty et al. (2008); Foster and Rosenzweig (2008); Fishman et al. (2023); Giné and Jacoby (2020)

Week 10: Renewable Resources; Forests

Required readings: Perman et al. Ch. 17; Balboni et al. (2023); Jayachandran (2023); Jayachandran et al. (2017); Alix-Garcia et al. (2013); Abman et al. (2023); Szerman et al. (2022)

Optional readings: Angelsen (1999); Brander and Taylor (1998); Foster et al. (2002); Tsuda et al. (2023); Burgess et al. (2023); Burgess et al. (2012); Perman et al. Ch. 18

Week 11: Climate Change, Economic Geography, and the Environment

Required readings: Balboni (2019); Conte (2022); Jedwab et al. (2022); Tsuda et al. (2023)

Optional readings: Burgess et al. (2017); Kala et al. (2023); Morgan et al. (2022); Schlenker and Lobell (2010); Zhao et al. (2017); Burke et al. (2015); Hsiang et al. (2013)

References

- Abman, Ryan, Teevrat Garg, Yao Pan, and Saurabh Singhal**, "Agricultural Productivity and deforestation," 2023.
- Aldeco, Lorenzo, Lint Barrage, and Matthew A. Turner**, "Equilibrium particulate exposure," Technical Report, working paper 2021.
- Alix-Garcia, Jennifer, Craig McIntosh, Katharine RE Sims, and Jarrod R Welch**, "The ecological footprint of poverty alleviation: evidence from Mexico's Oportunidades program," *Review of Economics and Statistics*, 2013, 95 (2), 417–435. Publisher: The MIT Press.
- Angelsen, Arild**, "Agricultural expansion and deforestation: modelling the impact of population, market forces and property rights," *Journal of development economics*, 1999, 58 (1), 185–218. Publisher: Elsevier.
- Balboni, Clare, Aaron Berman, Robin Burgess, and Benjamin A. Olken**, "The economics of tropical deforestation," *Annual Review of Economics*, 2023, 15, 723–754. Publisher: Annual Reviews.
- Balboni, Clare Alexandra**, "In harm's way? infrastructure investments and the persistence of coastal cities." PhD Thesis, London School of Economics and Political Science 2019.
- Bardhan, Pranab and Christopher Udry**, *Development microeconomics*, OUP Oxford, 1999.
- Barrett, Christopher B., Ariel Ortiz-Bobea, and Trinh Pham**, "Structural Transformation, Agriculture, Climate, and the Environment," *Review of Environmental Economics and Policy*, June 2023, 17 (2), 195–216.
- Brander, James A. and M. Scott Taylor**, "The simple economics of Easter Island: A Ricardo-Malthus model of renewable resource use," *American economic review*, 1998, pp. 119–138. Publisher: JSTOR.
- Burgess, Robin, Francisco Costa, and Benjamin A. Olken**, "National Borders and the Conservation of Nature," 2023.
- , **Matthew Hansen, Benjamin A. Olken, Peter Potapov, and Stefanie Sieber**, "The political economy of deforestation in the tropics," *The Quarterly journal of economics*, 2012, 127 (4), 1707–1754. Publisher: MIT Press.
- , **Olivier Deschenes, Dave Donaldson, and Michael Greenstone**, "Weather, climate change and death in India," *University of Chicago*, 2017.
- Burke, Marshall, Solomon M. Hsiang, and Edward Miguel**, "Climate and Conflict," *Annual Review of Economics*, August 2015, 7 (1), 577–617.
- Chakravorty, Ujjayant, Michel Moreaux, and Mabel Tidball**, "Ordering the extraction of polluting nonrenewable resources," *American Economic Review*, 2008, 98 (3), 1128–1144. Publisher: American Economic Association.
- Cheung, Steven**, "The Structure of a Contract and the Theory of a Non-Exclusive Resource," *The Journal of Law and Economics*, April 1970, 13 (1), 49–70.
- Conte, Bruno**, "Climate change and migration: the case of africa," 2022. Publisher: CESifo Working Paper.
- Coppock, D. Layne, Luke Crowley, Susan L. Durham, Dylan Groves, Julian C. Jamison, Dean Karlan, Brien E. Norton, and R. Douglas Ramsey**, "Community-based rangeland management in Namibia improves resource governance but not environmental and economic outcomes," *Communications Earth & Environment*, 2022, 3 (1), 32. Publisher: Nature Publishing Group UK London.
- Dasgupta, Partha**, "The place of nature in economic development," in "Handbook of development economics," Vol. 5, Elsevier, 2010, pp. 4977–5046.
- and **Karl-Göran Mäler**, "Poverty, institutions, and the environmental resource-base," *Handbook of development economics*, 1995, 3, 2371–2463. Publisher: Elsevier.

- Duflo, Esther, Michael Greenstone, Rohini Pande, and Nicholas Ryan**, "Truth-telling by third-party auditors and the response of polluting firms: Experimental evidence from India," *The Quarterly Journal of Economics*, 2013, 128 (4), 1499–1545. Publisher: MIT Press.
- Fishman, Ram, Xavier Giné, and Hanan G. Jacoby**, "Efficient irrigation and water conservation: Evidence from South India," *Journal of Development Economics*, 2023, 162, 103051. Publisher: Elsevier.
- Foster, Andrew and Mark Rosenzweig**, "Inequality and the sustainability of agricultural productivity growth: Groundwater and the Green Revolution in rural India," in "Prepared for the India Policy Conference at Stanford University," Vol. 5 2008.
- Foster, Andrew D, Mark R Rosenzweig, and Jere R Behrman**, "Population growth, income growth and deforestation: Management of village common land in india," 2002. Publisher: Citeseer.
- Fullerton, Don and Robert Stavins**, "How economists see the environment," *Nature*, 1998, 395 (6701), 433–434. Publisher: Nature Publishing Group UK London.
- Garg, Teevrat, Maulik Jagnani, and Hemant K. Pullabhotla**, "Rural Roads, Farm Labor Exits, and Crop Fires," 2023. Publisher: Working paper.
- Giné, Xavier and Hanan G. Jacoby**, "Contracting under uncertainty: Groundwater in South India," *Quantitative Economics*, 2020, 11 (1), 399–435.
- Gordon, H. Scott**, "The Economic Theory of a Common-Property Resource: The Fishery," *Journal of Political Economy*, April 1954, 62 (2), 124–142.
- Greenstone, Michael and B. Kelsey Jack**, "Envirodevonomics: A research agenda for an emerging field," *Journal of Economic Literature*, 2015, 53 (1), 5–42. Publisher: American Economic Association 2014 Broadway, Suite 305, Nashville, TN 37203-2425.
- **and Rema Hanna**, "Environmental regulations, air and water pollution, and infant mortality in India," *American Economic Review*, 2014, 104 (10), 3038–3072. Publisher: American Economic Association 2014 Broadway, Suite 305, Nashville, TN 37203.
- **, Rohini Pande, Anant Sudarshan, and Nicholas Ryan**, "Can pollution markets work in developing countries? Experimental evidence from India," 2023. Publisher: University of Warwick. Department of Economics.
- Hardin, Garrett**, "The tragedy of the commons," *Science (New York, N.Y.)*, 1968, 162, 1243–1248.
- Hsiang, Solomon M., Marshall Burke, and Edward Miguel**, "Quantifying the Influence of Climate on Human Conflict," *Science*, September 2013, 341 (6151), 1235367.
- Jack, B. Kelsey, Seema Jayachandran, Namrata Kala, and Rohini Pande**, "Money (Not) to Burn: Payments for Ecosystem Services to Reduce Crop Residue Burning," Technical Report, National Bureau of Economic Research 2022.
- Jacoby, Hanan G.**, "'Well-fare' economics of groundwater in South Asia," *The World Bank Research Observer*, 2017, 32 (1), 1–20. Publisher: Oxford University Press.
- **, Rinku Murgai, and Saeed Ur Rehman**, "Monopoly power and distribution in fragmented markets: The case of groundwater," *The Review of Economic Studies*, 2004, 71 (3), 783–808. Publisher: Wiley-Blackwell.
- Jayachandran, Seema**, "Air quality and early-life mortality: Evidence from Indonesia's wildfires," *Journal of Human resources*, 2009, 44 (4), 916–954. Publisher: University of Wisconsin Press.
- **, "How economic development influences the environment,"** *Annual Review of Economics*, 2022, 14, 229–252. Publisher: Annual Reviews.
- **, "The inherent trade-off between the environmental and anti-poverty goals of payments for ecosystem services,"** *Environmental Research Letters*, 2023, 18 (2), 025003. Publisher: IOP Publishing.

- , **Joost De Laat, Eric F. Lambin, Charlotte Y. Stanton, Robin Audy, and Nancy E. Thomas**, “Cash for carbon: A randomized trial of payments for ecosystem services to reduce deforestation,” *Science*, July 2017, 357 (6348), 267–273.
- Jedwab, Remi, Federico Haslop, Roman David Zarate, and Rodriguez-Castelan Carlos**, “The real effects of climate change in the poorest countries: Evidence from the permanent shrinking of lake chad,” 2022.
- Kala, Namrata, Clare Balboni, and Shweta Bhogale**, “Climate Adaptation,” *VoxDevLit*, 2023, 7, 3.
- Khanna, Gaurav, Wenquan Liang, Ahmed Mushfiq Mobarak, and Ran Song**, “The productivity consequences of pollution-induced migration in China,” Technical Report, National Bureau of Economic Research 2021.
- Lipscomb, Molly and Ahmed Mushfiq Mobarak**, “Decentralization and pollution spillovers: evidence from the re-drawing of county borders in Brazil,” *The Review of Economic Studies*, 2016, 84 (1), 464–502. Publisher: Review of Economic Studies Ltd.
- Mazur, Karol**, “Sharing risk to avoid tragedy: Informal insurance and irrigation in village economies,” *Journal of Development Economics*, 2023, 161, 103030. Publisher: Elsevier.
- Morgan, Seth, Alexander Pfaff, and Julien Wolfersberger**, “Environmental Policies Benefit Economic Development: Implications of Economic Geography,” *Annual Review of Resource Economics*, 2022, 14, 427–446. Publisher: Annual Reviews.
- Oliva, Paulina**, “Environmental Regulations and Corruption: Automobile Emissions in Mexico City,” *Journal of Political Economy*, June 2015, 123 (3), 686–724.
- Ostrom, Elinor**, *Governing the commons: The evolution of institutions for collective action*, Cambridge university press, 1990.
- and **Roy Gardner**, “Coping with asymmetries in the commons: self-governing irrigation systems can work,” *Journal of economic perspectives*, 1993, 7 (4), 93–112. Publisher: American Economic Association.
- Ryan, Nicholas and Anant Sudarshan**, “Rationing the commons,” *Journal of Political Economy*, 2022, 130 (1), 210–257. Publisher: The University of Chicago Press Chicago, IL.
- Schlenker, Wolfram and David B. Lobell**, “Robust negative impacts of climate change on African agriculture,” *Environmental Research Letters*, 2010, 5 (1), 014010. Publisher: IOP Publishing.
- Seabright, Paul**, “Managing local commons: theoretical issues in incentive design,” *Journal of economic perspectives*, 1993, 7 (4), 113–134. Publisher: American Economic Association.
- Sekhri, Sheetal**, “Public provision and protection of natural resources: Groundwater irrigation in rural India,” *American Economic Journal: Applied Economics*, 2011, 3 (4), 29–55. Publisher: American Economic Association.
- Szerman, Dmitri, Juliano J. Assunção, Molly Lipscomb, and Ahmed Mushfiq Mobarak**, “Agricultural productivity and deforestation: Evidence from Brazil,” Technical Report, Center Discussion Paper 2022.
- Tsuda, Shunsuke, Mari Tanaka, and Yoshito Takasaki**, “Human and Nature: Economies of Density and Conservation in the Amazon Rainforest,” 2023.
- Wydick, Bruce**, *Games in economic development*, Cambridge University Press, 2007.
- Zhao, Chuang, Bing Liu, Shilong Piao, Xuhui Wang, David B. Lobell, Yao Huang, Mengtian Huang, Yitong Yao, Simona Bassu, Philippe Ciais, Jean-Louis Durand, Joshua Elliott, Frank Ewert, Ivan A. Janssens, Tao Li, Erda Lin, Qiang Liu, Pierre Martre, Christoph Müller, Shushi Peng, Josep Peñuelas, Alex C. Ruane, Daniel Wallach, Tao Wang, Donghai Wu, Zhuo Liu, Yan Zhu, Zaichun Zhu, and Senthold Asseng**, “Temperature increase reduces global yields of major crops in four independent estimates,” *Proceedings of the National Academy of Sciences*, August 2017, 114 (35), 9326–9331.