NYU Wagner School
Professor Maria Damon

University of Cape Town
Professor Martine Visser

SUSTAINABLE DEVELOPMENT AND THE ECONOMICS OF CLIMATE CHANGE

Syllabus

Course Description

This is a 10-day field course on environmental issues in developing countries, with an emphasis on issues surrounding global climate change. Poverty, natural resource management, and environmental degradation are inextricably linked, and this course explores ways that economic analysis can help identify underlying problems and formulate effective policy responses to them. Major topics include: relationships between economic growth, climate change and the environment; approaches for understanding behavior, social preferences, and responses to climate variability and disasters in poor communities; what these imply for the management of natural resources; choosing policy instruments for pollution (in particular carbon emissions) reduction and environmental protection; global climate policy and its implications for the developing world; and relationships between human health and the environment. Students will gain exposure to economic field research in developing countries, learn about behavioral and experimental approaches to understanding environmental problems related to climate change, and visit community projects that employ some of the principles discussed in the classroom.

Prerequisites

One intermediate microeconomics course (*e.g.* NYU Wagner P11.1018)

Requirements

The class format will consist of lectures, discussions, group or individual project presentations, laboratory experiments, and field trips. Grading is based on a group project with seminar presentation (30%), classroom participation (20%), and a comprehensive in-class final exam (50%).

For the group project, students will select a relevant topic that they would like to research in more depth. The topic can be one that is already on the syllabus or a different one, as long as it pertains to environmental policy related to climate change and development. Groups are required to read a minimum of two refereed publications on the topic, prepare a critical review of these publications, and present the review in class. (You can also supplement your research with non-refereed publications, but you must read at least two refereed papers.) No written review is required, but groups should be prepared to field in-depth questions from the professors and the class, particularly on specific relevance to environmental policy in developing countries.

Students also will participate in exercises and simulations related to common property resource management and public good provisioning.

SCHEDULE:

Sunday, January 8th

Arrival and check-in

Monday, January 9th

Morning: Course Introduction
Environmental Economics in the International Development Community
Climate Change – Historical background, scientific projections, and global policy

Lecturers: Maria Damon and Thomas Sterner

Afternoon: Orientation, presented by University of Cape Town staff
City tour of Cape Town (TBD)

Tuesday, January 10th

Morning: The Growth-Environment Relationship
Poverty and the Environment – linkages at the household level
Green Accounting
Sustainability – definitions and implications

Lecturers: Maria Damon and Thomas Sterner

Afternoon: Excursion to the South African Museum (oldest museum in Cape Town; exhibitions on the natural history, biological, and cultural resources of South Africa.) and District Six Museum (established in December 1994; devoted to memories of forced removals under Apartheid, and to "stimulating the recovery and development of different forms of knowledge of the city, identity and community")

Wednesday, January 11th

Morning: Environmental Policy Instruments in Developing Countries
International Climate Policy
Fairness and Distributional Issues

Lecturers: Martine Visser, Ant Dane, and Thomas Sterner

Afternoon: Off (time to start work on group/individual projects)

Thursday, January 12th

Morning: Site visit to Harvest of Hope – a community garden project in Khayelitsha: http://harvestofhope.co.za/

Lunch with Hotbox – uses the principle of insulated cooking to reduce fuel-wood consumption: http://www.thehotboxco.co.za/

Afternoon: Kuyasa CDM Project tour in Khayelitsha – a carbon finance pilot project involving the retrofitting of solar water heaters, insulated ceilings, and energy efficient lighting in low-cost homes: http://www.kuyasacdm.co.za/index.php

Friday, January 13th

Morning: Environmental and Social Institutions and Externalities
Common Property Resources
More on Fairness and Distributional Issues

Lecturer: Professor Martine Visser

Afternoon: In-class practical – students participate in a behavioral experiment related to common property resource management, public goods, and climate risk.

Saturday, January 14th

Class excursion to Cape Point; visit fishing communities along the way.

Sunday, January 15th

Day off. Optional excursion to local wineries and Robben Island.

Monday, January 16th

Morning: Climate Variability and Risk Taking Behaviour: Experimental evidence from Southern and Eastern Africa

Lecturers: Martine Visser and Maria Damon

Afternoon: Research session – "Office hours" with professors and time to work on projects

Tuesday, January 17th

Morning: Cost-Benefit Analysis
Environmental Valuation
Intergenerational Tradeoffs and Discounting

Lecturer: Maria Damon

Afternoon: Student project presentations

Wednesday, January 18th

Morning: Vulnerability to Climate Change of Agriculture and Rural Municipalities
Costs of Adaptation

Lecturers: Jane Turpie and Herbert Ntuli

Afternoon: Off (time to study for final exam)

Thursday, January 19th

Morning: Final Exam (1.5 hours)

Sustainability – looking forward, and a closing policy perspective

Evening: Closing Dinner

READINGS:

The following table lists the required readings for each lecture. Reading assignments should be completed in advance of class and, given the condensed nature of the course, it is suggested that students read as much as possible before the course begins. Additional optional readings are listed and, while these are recommended, they are not required. If students would like to read more about any particular topic, the professors are of course happy to suggest further supplemental readings upon request.

Date	**Readings**
Jan 9	<u>Environmental Economics in the International Development Community</u> World Bank, *World Development Report 1992: Development and the Environment* (Oxford University Press, New York, 1992) – "Overview" (pp. 1-24) – **Just skim this reading to compare themes to the 2003 report .** World Bank, *World Development Report 2003: Sustainable Development in a Dynamic World* (Oxford University Press, New York, 1992) – "Roadmap" and Chapter 1 (pp. xiii-11) OPTIONAL: Toman, Michael, 1994. "Economics and Sustainability: Balancing Tradeoffs and Imperatives" *Land Economics* 70: 399-413. <u>Climate Change – Historical background, scientific projections, and global policy</u> J. W. Anderson (2006) "How Climate Change Policy Developed: A Short History" *The RFF Reader in Environmental and Resource Policy*, 2nd edition, RFF Press. IPCC Working Group (2007) "Summary for Policy Makers: Impacts, Adaptation, and Vulnerability: *Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Robert Stavins "Assessing the Climate Talks — Did Durban Succeed?" Blog post, December 12, 2011, http://www.robertstavinsblog.org/2011/12/12/assessing-the-climate-talks-did-durban-succeed/
Jan 10	<u>The Growth-Environment Relationship</u> R.T. Carson (2010), "Environmental Kuznets Curve: Searching for Empirical Regularity and Theoretical Structure" *Review of Environmental Economics and Policy* 4, 3-23. OPTIONAL: Gene M. Grossman and Alan B. Krueger, "Economic growth and the environment" (Quarterly Journal of Economics 110:353-377, 1995) OPTIONAL: David I. Stern, "The rise and fall of the environmental Kuznets curve" (World Development 32:1419-1439, 2004) <u>Trade and the environment: the pollution-haven hypothesis</u> M. Scott Taylor (2004) "Unbundling the pollution haven hypothesis" *Advances in*

	Economic Analysis & Policy 4(2) – pp. 1-6 and 21-23; skip Sections 2.1-2.4. OPTIONAL: Beata Smarzynska Javorcik and Shang-Jin Wei (2004) "Pollution havens and foreign direct investment: dirty secret or popular myth?" *Advances in Economic Analysis & Policy* 3(2). OPTIONAL: Josh Ederington, Arik Levinson, and Jenny Minier (2005) "Footloose and pollution-free" *Review of Economics and Statistics* 87(1): 92–99. <u>Poverty and the environment</u> Partha Dasgupta (2003) "Population, poverty, and the natural environment," Ch. 5 in *Handbook of Environmental Economics, Volume 1*, North-Holland, Amsterdam – Sections 1-3, 5, 9-10 (pp. 193-203, 213-216, 224-235) OPTIONAL: World Bank (2008) *Poverty and the Environment: Understanding Linkages at the Household Level*, Washington, D.C.: Ch. 1-2 (pp. 5-30) <u>Green accounting</u> World Bank, *Where is the Wealth of Nations?* (World Bank, Washington, D.C., 2006) – Ch. 1-2 (pp. 19-32) OPTIONAL: Lange, Glenn-Marie and Rashid Hassan, "Accounting for the Environment: Experiences from Southern Africa," Paper presented at the launch of the Environmental Economics Policy Forum for Ethiopia, January 9, 2003. OPTIONAL: World Bank, *Where is the Wealth of Nations?* (World Bank, Washington, D.C., 2006) – Ch. 3 and Appendix 1 (pp. 35-47, 143-158) OPTIONAL: Susana Ferreira and Jeffrey R. Vincent, "Genuine savings: leading indicator of sustainable development?" (*Economic Development and Cultural Change* 53:737–754, 2005) <u>The resource curse</u> OPTIONAL: Jeffrey D. Sachs and Andrew M. Warner (2001) "The curse of natural resources" *European Economic Review* 45, 827-838. OPTIONAL: Michael Alexeev and Robert Conrad (2009) "The elusive curse of oil" *The Review of Economics and Statistics* 91(3) [Read the introduction; the remainder is optional reading, and requires an understanding of multivariate regression.] OPTIONAL: Gavin Wright and Jesse Czelusta, "Why economies slow: the myth of the resource curse" (*Challenge* 47(2):6-38, 2004)
Jan 11	<u>Environmental policy instruments in developing countries</u> Perman, R., Ma, Y., McGilvary, J. and M. Common (2003) *Natural Resource and Environmental Economics*, 3rd Edition, Pearson Addison Wesley. Chapter 7. Sterner, T. (2003) *Policy Instruments for Environmental and Natural Resource Management*, The World Bank and Resources for the Future. Chapters 1 and 19. "Green Growth in the Post-Copenhagen Climate", Thomas Sterner and Maria Damon, *Energy Policy*, in press.

	RFF Weathervane, "Changes In Market Mechanisms: The CDM Without China", by Lynann Butkiewicz, posted: 08/31/11. OPTIONAL: Hanley, N., Shogren, J. F., and B. White (2007) *Environmental Economics - In Theory and Practice*, 2nd Edition, Palgrave MacMillan. Ch. 4-5. OPTIONAL: Tietenberg T.H. (1990). "Economic instruments for environmental regulation". *Oxford Review of Economic Policy* 6: 17-33. OPTIONAL: "Getting REDD Right - Reducing Emissions from Deforestation and Forest Degradation (REDD) in the United Nations Framework Convention on Climate Change (UNFCCC)" from Environmental Defense Fund, Woods Hole Research Center and Instituto de Pesquisa Ambiental da Amazônia (IPAM). OPTIONAL: Sterner, T. (2003) *Policy Instruments for Environmental and Natural Resource Management*, The World Bank and Resources for the Future. Ch. 10, 12, and 18.
Jan 12	Field trips – no readings assigned.
Jan 13	<u>Environmental and Social Institutions; Common Property Resources</u> Hardin, Garrett, (1968) "The Tragedy of the Commons," Science 162: 1243-1248. Heyward, M. 2007. Equity in international climate change and negotiations: a matter of perspective. Climate Policy,7 (2007): 518-534 Lange, A., Vogt, C. and Ziegler, A (2007) "On the importance of equity in international climate policy: An empirical analysis," Energy Economics 29 (2007) 545–562. Ringius, L., Torvanger, A., Underdal, A., 2002, "Burden Sharing and Fairness Principles in International Climate Policy," International Environmental Agreements: Politics, Law and Economics, 2: 1-22. Saran, S., 2010, "Irresistible forces and immovable objects: a debate on contemporary climate politics," Climate Policy, 10:678 – 683. OPTIONAL: Hasson, Reviva, Åsa Löfgren, and Martine Visser (2009) "Climate Change in a Public Goods Game: Investment Decision in Mitigation versus Adaptation", EfD Discussion Paper 09-23, Environment for Development Initiative and Resources for the Future. Forthcoming in Ecological Economics. OPTIONAL: Brick, K. and Visser, M (2010), "Meeting a National Emission Reduction Target in an Experimental Setting," Forthcoming in Climate Policy. OPTIONAL: Brekke, K., Johansson-Stenman, O., 2008, "The behavioral economics of climate change," Oxford Review of Economic Policy, 24(2). OPTIONAL: Carlsson, Frederik, M. Kataria, A. Krupnick, E. Lampi, Å. Löfgren, P. Qin, T. Sterner, and S. Chung, 2010. "A Fair Share - Burden-Sharing Preferences in the United States and China," Jena Economic Research Papers 2010-074, Friedrich-Schiller-University Jena, Max-Planck-Institute of Economics.

Jan 16	<u>Climate Variability and Risk Taking Behaviour: Experimental evidence from Southern and Eastern Africa</u> Hanley, Shogren and White, Introduction to Environmental Economics, Oxford University Press, Ch. 5, pp. 94-119. Perman, R., Ma, Y., McGilvary, J. and M. Common (2003). Natural Resource and Environmental Economics, 3rd Edition, Prentice Hall, UK. Irreversibility, Risk and Uncertainty, Chapter 15. Fisher, A.C. (2001) Uncertainty, irreversibility and the timing of climate change. available electronically at: http://stephenschneider.stanford.edu/Publications/PDF_Papers/timingFfisher.pdf Patt, A. Suarez, P. and Ulrich, H (2010) "How do small-holder farmers understand insurance, and how much do they want it? Evidence from Africa," Global Environmental Change 20 153–161 OPTIONAL: Maria Damon, Joshua Graff Zivin, and Harsha Thirumurthy (2010), "Health Shocks and Natural Resource Management: Evidence from Western Kenya", Working paper. OPTIONAL: Alpizar, Francisco, Fredrik Carlsson, and Maria Naranjo (2009), "The Effect of Risk, Ambiguity, and Coordination on Farmers' Adaptation to Climate Change: A Framed Field Experiment", EfD Discussion Paper 09-18. OPTIONAL: Gine, X. and D. Young. 2009. Insurance, credit, and technology adoption: Filed experimental evidence from Malawi. Journal of Development Economics, 89: 1-11.
Jan 17	<u>Environmental Valuation</u> Krupnick, A. and Juha Siikamaki. "How people value what nature provides." Resources. Spring 2007: 14-16. <u>Intergenerational Tradeoffs and Discounting</u> Brennan, T. (2006) "Discounting the Future: Economics and Ethics" *The RFF Reader in Environmental and Resource Policy*, 2nd Edition, Wallace E. Oates, editor, Washington: Resources for the Future. Nordhaus, W. (2007) "Critical Assumptions in the Stern Review on Climate Change." *Science* 317: 201-202 Stern, N., and C. Taylor (2007) "Climate Change: Risk, Ethics, and the Stern Review." *Science* 317: 203-204. OPTIONAL: Nicholas Stern (2006) "The Economics of Climate Change: The Stern Review," Executive Summary. OPTIONAL: Sterner, T., and U. M. Persson. 2008. "An Even Sterner Review: Introducing Relative Prices into the Discounting Debate." Review of Environmental Economics and Policy 2 (1): 61-76.

Jan 18	<u>Vulnerability of agriculture and rural municipalities to CC & costs of adaptation</u> Brooks, N., Adger, W.N., Kelly, P.M., 2004. The determinants of vulnerability and adaptive capacity at the national level and the implications for adaptation. Global Environmental Change 15 (2005) 151–163. Callaway, J.M., 2004. Adaptation benefits and costs: are they important in the global policy picture and how can we estimate them? Global Environmental Change 14 (2004) 273–282, UNEP Risf Centre, Roskilde. Leichenko, R., & O'Brien, K., 2001. The dynamics of rural vulnerability to global change: the case of Southern Africa. Mitigation and Adaptation Strategies for Global Change 7: 1–18, 2002. Mendelsohn, R., and A. Dinar. 2003. ''Climate, Water, and Agriculture.'' Land Economics 79(3): 328 – 41. Kurukulasuriya et al., 2006. Will African Agriculture Survive Climate Change? World Bank Economic Review, 20 (3). 367 – 388. OPTIONAL: Midgeley, G. , Scholes, R. , Blignaught, J, (2011) Scoping of the approximate climate change adaptation costs in several key sectors for South Africa up to 2050, Final report: SKMBT_C45010121508500 OPTIONAL: O'Brien, G.; O'Keefe, P.; Meena, H.; Rose, J.; Wilson, L., 2008. Climate adaptation from a poverty perspective. Climate Policy, Volume 8, Number 2, 2008 , pp. 194-201(8). Earthscan OPTIONAL: Adger, W.N., Huq, S., Brown, K., Conway, D. and Hulme, M., 2003. Adaptation to climate change in the developing world, Progress in Development Studies 2003 3: 179 http://pdj.sagepub.com/content/3/3/179 OPTIONAL: Kurukulasuriya, P., and S. Rosenthal. 2003. ''Climate Change and Agriculture: A Review of Impacts and Adaptations.'' Climate Change Series 91. Environment Department Papers, World Bank,Washington, D.C. OPTIONAL: Seo, S. Niggol & Mendelsohn, Robert & Dinar, Ariel & Hassan, Rashid & Kurukulasuriya, Pradeep, 2008. "A ricardian analysis of the distribution of climate change impacts on agriculture across agro-ecological zones in Africa," Policy Research Working Paper Series 4599, The World Bank. OPTIONAL: Turpie, J., Winkler, H., Spalding-Fecher, R. & Midgley, G. 2002 Economic Impacts of Climate Change in South Africa: A Preliminary Analysis of Unmitigated Damage Costs. Southern Waters Ecological Research & Consulting & Energy & Development Research Centre, University of Cape Town.
Jan 19	Final exam and closing lecture – no readings assigned.