

C3 2018: Practising Interdisciplinary Research on the Environment

Instructor: Sharachchandra Lele (slele@atree.org)

Co-instructors/Associates: Veena Srinivasan, Nitin Rai, Bejoy K. Thomas

Credits: 3 (48 contact hours in the form of 16 sessions of 3-hours each)

Session time: Monday 9:50am-1pm (starting January 8th, 2018)

Course description:

This core course is meant to help students understand how to carry out interdisciplinary research on the environment. It will build on the disciplinary knowledge to which students were exposed in semester 1 and focuses on the challenge of linking and integrating this knowledge to study society-environment interactions holistically. It will begin by exploring the nature of environmental problems as a special class of social problems, of the inherently value-laden nature of such problems, and the need for and challenge of doing rigorous interdisciplinary but rigorous research in this context. It then will explore the specific normative ideas that are central the environment-development debate, and take students through different (often competing) perspectives on the society-environment relationship.

In the second half of the course, we will discuss in detail a series of examples of interdisciplinary research that have used one or more of these perspectives to frame and analyse a particular environmental problem. Attention will be paid to understanding the normative, theoretical, and methodological choices made in the studies, including specifically the interdisciplinary linkages and the within-disciplinary choices and modifications.

At the end of such a course, the student is expected to understand how their framing of their research problem involves normative and theoretical choices, be in a position to frame and flesh out an interdisciplinary research programme on the environment, and to understand the place of their research (now and future) in the wider action-research-policy context.

Session format

This course will be **reading- and writing-intensive**. It will be taught in 3-hour sessions. Each session will have readings assigned to it, and these readings will form the basis for class discussion.

Course assessments:

1. Students will be expected to submit written summaries of key readings related to the 8 case studies (40% of total marks) (*Guidelines will be provided*)
2. Students will be expected to participate actively in class discussions and to have completed readings even when written summaries are not required (30%). Marks will be given primarily for (but not exclusively for) the first 8 sessions. Missing sessions for non-medical/emergency reasons will lead to automatic deduction of participation points.
3. Students are expected to make a presentation of a proposal for interdisciplinary environmental research (preferably on their PhD topic) that addresses the challenges of framing, theoretical integration, linked variables, methods, scales,

etc. (30%) (*Guidelines on what is expected will be provided; but submission of the first outline is due by 5th March, and second outline by 16th April*).

Session-wise time-table (All classes Monday 9:50am to 1:00pm)

Sess-ion	Date	Title	Readings	Instructor
1	8-Jan-2018	Nature of environmental problems, need for inter- disciplinary and science-policy-practice bridges and challenges therein	[1], [2, 3], [4], [5]	Sharad
	15-Jan-2018	<i>HOLIDAY: Sankranti</i>	<i>Optional: [6] [7, 8],</i>	
2	22-Jan-2018	Key normative ideas (Conservation, Sustainability, Environmental Justice, Sustainable Development, Democracy)	[9], [10., upto p.10], [11], [12 ,chapter 1]; optional: [13], [14], [15]	Sharad
3	29-Jan-2018	Perspectives 1&2: Economics and Institutional Analysis	[16]-chapters 3 & 4, [17] [18]	Sharad
4	5-Feb-2018	Perspectives 3&4: Political Ecology and Env.Ethics	[16]-chapter 7 and chapter 5, [19]	Sharad
5	12-Feb-2018	Perspective 5: Population	[16]-chapter 2+ [20] +[21]	Sharad
6	19-Feb-2018	Perspective 6: Technology	[22], [23], [24], [25] + Optional: [26],	Sharad
7	26-Feb-2018	Implementing interdisciplinarity-I: Frameworks and worldviews	[27, 28]	Sharad
8	5-Mar-2018	Implementing interdisciplinarity-II: Variables, scales, methods & rigour	[1], [29] [30]	Sharad
9	12-Mar-2018	Forest Degradation: Soppinabettas	[31, 32-chapter 6, 33]	Sharad
10	19-Mar-2018	Forest Degradation: Som & Prabhakar	[34], [35], [36], [37] [38]	Sharad
11	26-Mar-2018	Forest degradation: Fairhead & Leach	[39]	Nitin
12	2-Apr-2018	Grasslands: Turner (TBC)	[40], [41], [42] (TBC)	Nitin
13	9-Apr-2018	Sustainable environment & livelihoods: Machakos	[43], [44],	Bejoy
14	16-Apr-2018	Water: case 1: GW in Chennai	[45], [46], [47]	Veena
15	23-Apr-2018	Water: case 2: Irrigation tanks	[48]—select chapters	Veena
16	30-Apr-2018	Water: case 3: Arkavathy basin	[49], [50], [51]	Veena
	EXAM WEEK DATE TBA	Student presentations		

READING LIST

1. Lélé, S. and R.B. Norgaard, *Practicing interdisciplinarity*. BioScience, 2005. **55**(11): p. 967-975.
2. Redford, K.H., *Misreading the conservation landscape*. Oryx, 2011. **45**(3): p. 324-330.
3. Lele, S., *Re-reading the interdisciplinary mindscape: a response to Redford*. Oryx, 2011. **45**(3): p. 331-332.
4. Lackey, R.T., *Science, scientists, and policy advocacy*. Conservation Biology, 2007. **21**(1): p. 12-17.
5. Jones, P.C., J.Q. Merritt, and C. Palmer, *Critical thinking and interdisciplinarity in environmental higher education: the case for epistemological and values awareness*. Journal of Geography in Higher Education, 1999. **23**(3): p. 349-357.
6. Pielke, R.A., *The Honest Broker*. 2006, Cambridge, U.K.: Cambridge University Press.

7. Clark, S.G., et al., *College and University Environmental Programs as a Policy Problem (Part 1): Integrating Knowledge, Education, and Action for a Better World?* Environmental Management, 2011: p. 1-15.
8. Clark, S.G., et al., *College and university environmental programs as a policy problem (part 2): strategies for improvement.* Environmental Management, 2011. **47**(5): p. 716-726.
9. Gadgil, M., *Why conserve living diversity?*, in *The Hindu*. 1998: Bangalore.
10. Lele, S., et al., *Framing the environment*, in *Rethinking Environmentalism: Linking Justice, Sustainability, and Diversity*, S. Lele, et al., Editors. 2018, MIT Press: Cambridge, Mass. p. (in press).
11. Lélé, S., *Thinking about ecological sustainability.* Seminar, 2006. **565**: p. 48-52.
12. Joy, K.J., et al., *Watershed Development Review: Issues and Prospects.* 2004, Centre for Interdisciplinary Studies in Environment and Development: Bangalore.
13. Guha, R., *Towards a cross-cultural environmental ethic*, in *Varieties of Environmentalism: Essays North and South*, R. Guha and J. Martinez-Alier, Editors. 1997, Earthscan: London. p. 77-91.
14. Mace, G.M., *Whose conservation?* Science, 2014. **345**(6204): p. 1558-1560.
15. Spangenberg, J.H., *Sustainability science: a review, an analysis and some empirical lessons.* Environmental Conservation, 2011. **38**(3): p. 275-287.
16. Robbins, P., J. Hintz, and S.A. Moore, *Environment and society: a critical introduction.* 2nd ed. Environment and society: a critical introduction. 2014, Chichester, UK: Wiley-Blackwell.
17. Ostrom, E., *Reformulating the commons.* Swiss Political Science Review, 2000. **6**(1): p. 29-52.
18. Menon, A., *'Common property studies' and the limits to equity: some conceptual concerns and possibilities.* Review of Development and Change, 1999. **4**(1): p. 51-70.
19. Dietz, T., A. Fitzgerald, and R. Shwom, *Environmental values.* Annual Review of Environment and Resources, 2005. **30**: p. 335-372.
20. Martinez-Alier, J. and E. Masjuan, *Neo-Malthusianism in the early 20th century.* Encyclopedia of Ecological Economics, 2005.
21. Shaw, R.P., *Rapid Population Growth and Environmental Degradation: Ultimate versus Proximate Factors.* Environmental Conservation, 1989. **16**(03): p. 199-208.
22. Huesemann, M.H., *Can pollution problems be effectively solved by environmental science and technology? An analysis of critical limitations.* Ecological Economics, 2001. **37**(2): p. 271-287.
23. Mumford, L., *Technics and the nature of man.* 1966.
24. Richards, P., *A Green Revolution from below? Science and technology for global food security and poverty alleviation.* 2010, Wageningen University: Wageningen, The Netherlands.
25. Pursell, C., *The Rise and Fall of the Appropriate Technology Movement in the United States, 1965-1985.* Technology and Culture, 1993. **34**(3): p. 629-637.
26. Guha, R., *Lewis Mumford: The forgotten American environmentalist: An essay in rehabilitation.* Capitalism Nature Socialism, 1991. **2**(3): p. 67 - 91.
27. York, R., E.A. Rosa, and T. Dietz, *STIRPAT, IPAT and ImPACT: analytic tools for unpacking the driving forces of environmental impacts.* Ecological economics, 2003. **46**(3): p. 351-365.
28. Svarstad, H., et al., *Discursive biases of the environmental research framework DPSIR.* Land Use Policy, 2008. **25**(1): p. 116-125.

29. Khagram, S., et al., *Thinking about knowing: conceptual foundations for interdisciplinary environmental research*. Environmental Conservation, 2010. **37**(4): p. 388-397.
30. Ostrom, E., *A General Framework for Analyzing Sustainability of Social-Ecological Systems*. Science, 2009. **325**(5939): p. 419-422.
31. Lélé, S. and G.T. Hegde, *Potential herblayer production and grazing effects in anthropogenic savannahs in the moist tropical forests of the Western Ghats of India*. Tropical Grasslands, 1997. **31**(6): p. 574-587.
32. Lélé, S., *Degradation, Sustainability, or Transformation: A case study of villagers' use of forest lands in the Malnaad region of Uttara Kannada district, India*, in *Energy & Resources Group*. 1993, University of California: Berkeley.
33. Lélé, S., *Sustainable use of biomass resources: A note on definitions, criteria, and practical applications*. Energy for Sustainable Development, 1994. **1**(4): p. 42-46.
34. Prabhakar, R., E. Somanathan, and B.S. Mehta, *How degraded are Himalayan forests?* Current Science, 2006. **91**(1): p. 61-67.
35. Somanathan, E., R. Prabhakar, and B.S. Mehta, *Does Decentralization Work? Forest Conservation in the Himalayas*. 2005, Bureau for Research and Economic Analysis of Development: Cambridge.
36. Agrawal, A. and G.N. Yadama, *How do local institutions mediate market and population pressures on resources? Forest panchayats in Kumaon, India*. Development and Change, 1997. **28**: p. 435-465.
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39. Fairhead, J. and M. Leach, *Misreading the African Landscape: Society and Ecology in a Forest-Savanna Mosaic*. 1996, Cambridge: Cambridge University Press.
40. Turner, M., *Overstocking the range: A critical analysis of the environmental science of Sahelian pastoralism*. Economic Geography, 1993. **69**(4): p. 402-421.
41. Turner, M.D., *Spatial and temporal scaling of grazing impact on the species composition and productivity of Sahelian annual grasslands*. Journal of Arid Environments, 1999. **41**(3): p. 277-297.
42. Turner, M.D., *Political ecology and the moral dimensions of "resource conflicts": the case of farmer-herder conflicts in the Sahel*. Political Geography, 2004. **23**(7): p. 863-889.
43. Mortimore, M. and M. Tiffen, *Population Growth and a Sustainable Environment: The Machakos story*. Environment, 1994. **36**(8): p. 10-20.
44. Malakoff, D., *Are more people necessarily a problem?* Science, 2011. **333**(6042): p. 544-546.
45. Srinivasan, V., S.M. Gorelick, and L. Goulder, *A hydrologic-economic modeling approach for analysis of urban water supply dynamics in Chennai, India*. Water Resources Research, 2010. **46**(7): p. W07540.
46. Srinivasan, V., S.M. Gorelick, and L. Goulder, *Factors determining informal tanker water markets in Chennai, India*. Water International, 2010. **35**(3): p. 254-269.
47. Srinivasan, V., S.M. Gorelick, and L. Goulder, *Sustainable urban water supply in south India: Desalination, efficiency improvement, or rainwater harvesting?* Water Resources Research, 2010. **46**(10): p. W10504.
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