Sustainability Science: Policy Analysis and Design for Sustainable Development (IGA-944)
Harvard Kennedy School
Location: Weil Town Hall (B-L-1, ground floor of Belfer building)
M/W 2:40-4:00pm

Course Syllabus -- Fall 2013 -- *Ver 130831 (Subject to Change)*

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COURSE OVERVIEW

Sustainable development –- promoting human well-being while conserving the life-supporting services of the natural environment over the long run -– has emerged as a central challenge of the 21st Century.   This course provides an opportunity for policy professionals to explore how they can better contribute to meeting that challenge.   At the tactical level, participants in the class will learn to *assess* whether existing development trajectories are sustainable, to *diagnose* impediments to sustainable development, to *design* policy and technology interventions for overcoming those barriers, and to *evaluate* prospectively how those interventions are likely to perform.   At the strategic level, participants will hone a capacity to transform existing policy shops into operations that are better able to support the transitions toward sustainability that so many communities, firms, countries and international organizations are increasingly pursuing.

The course is grounded in conventional frameworks of applied policy analysis (eg. those explored in HKS API-505m).   It builds on those foundations by exploring the *politics and ethics* of defining goals and metrics for sustainable development; contemporary scientific understanding of the complex and adaptive *social-environmental systems* that constitute the stage on which efforts to promote sustainable development are acted out; and recent work by scholars and international organizations to characterize the potential for sustainable development in terms of a society's *productive base of assets, including* manufactured capital, human capital, natural capital, social capital and knowledge capital.   Participants will have the opportunity to apply the core concepts of the course to critique and extend some of the best contemporary policy studies addressing sustainable development. Several class sessions have been reserved to cover additional topics determined by the participants.

WHO SHOULD CONSIDER THE COURSE?

The course is designed for students who have achieved a degree of mastery in one or more sciences relevant to sustainable development (eg. policy analysis, economics, ecology, political science, engineering, earth systems science, public health, etc.) but who wish to understand how other bodies of expertise can complement their own in efforts to the promote sustainable development. No student (or the instructor) will have a sophisticated understanding of all the disciplinary perspectives we explore; all are expected to bring some relevant expertise to the table, and to integrate it with that of their classmates through discussion and teamwork. Second year masters students, mid-career masters students and doctoral students from throughout the university are welcome. Undergraduate seniors from Harvard, as well as students from neighboring universities with suitable backgrounds, may be admitted on written application to the instructor if space permits. (All students considering the course should attend the shopping session and initial class sessions).

DESIGN OF THE COURSE

The ultimate aim of the course is to provide its participants with an opportunity to join in the ongoing discussion of the broader professional community on how policy analysis and design can better support sustainable development. The course will therefore be conducted as a seminar. Most class sessions will center around group or full class discussions of the central question(s) listed for the day in the syllabus. I have selected these questions as among the most central and important that professionals involved in policy analysis for sustainable development are grappling with today. Few have unambiguous or totally satisfying answers. But all have been and are being illuminated by ongoing scholarship and reflective practice. Some of this I know about and will introduce into our discussions. But as it's a broad and rapidly developing field, I look forward to being exposed to new perspectives and experiences by participants in the class. More broadly, I recognize that other relevant questions exist. I have therefore set aside space in the syllabus for the class to select additional topics that it wants us to explore.

Full engagement in the course by of all its participants will be a critical component of the learning experience for both you and me. For most sessions the discussion will begin before class on the course web site. Participants will be asked to post short questions, comments and responses regarding the day's topic and readings. These initial contributions are intended to help us to focus in-class discussion on the hard or controversial parts of the day's topic, and to tap into the different disciplinary and professional perspectives of class participants. To give us all an opportunity to review the web site contributions before class, they will be due 9 hours before the beginning of each day's session.

In-class discussion will build on the assigned readings and web postings. For some sessions, especially early in the term, I will kick off the discussion with some prepared remarks. For other sessions, individual participants (or groups of participants) will be assigned in advance responsibility for leading the day's discussion. For still others, cold-calling will be the norm.

Periodic writing assignments (see below) will provide participants with an opportunity to consolidate their understanding of key class themes, to articulate open or problematic dimensions of those themes, and to receive feedback from their peers and instructor.

The potential of the class to move forward our joint and individual understandings of how policy analysis and design can better support sustainable development will depend heavily on each participant committing to: i) study, and grapple with, the assigned readings before class; ii) listen carefully and respectfully to one another, with a goal of understanding and empathizing with the differences among us; and iii) contribute your own perspectives -- responsively, critically, and succinctly -- to the on-line and in-class discussions; and iv) make our collective conversation work.   Students who are prepared to make these commitments to the class are welcome to join it; otherwise, not.

ASSIGNMENTS

The ultimate aim of this course is to give participants an opportunity for honing their capacity to transform existing policy shops into operations that are better able to support the transitions toward sustainability that so many communities, firms, countries and international organizations are increasingly pursuing. The written assignments for the course are directly tied to this objective.   In short, the final assignment is a "white paper" in which you will argue the case for setting up a unit to conduct policy analysis for sustainable development within the organization of your choice.   Your performance on that final paper, due during the reading period, will constitute a major part of your course grade.   Shorter assignments due earlier in the course will provide you with an opportunity to address the parts of the final assignment related to the material we are then covering in class. These shorter assignments will receive feedback from me and your peers, but will be not be graded beyond "submitted/not submitted."   I encourage you to make use of this feedback in revisions to the shorter assignments that you can use as foundations for your final paper. I hope that this approach will encourage you to be adventurous (rather than risk-averse) in the issues you discuss and problems you raise in the shorter assignments and provide you with an early opportunity to sense how others see the strengths and weaknesses of your arguments.   Ultimately, I hope it will help you to write a final paper that pulls together what you have learned from the course in a form that is potentially useful for your subsequent career.

Here are the (provisional) details on the assignments.   Details will be finalized once we know the size of the class.

A) Final Paper: A "white paper" in which you will argue the case for setting up a unit to conduct policy analysis for sustainable development within the organization of your choice. Topics to be addressed include "Why should the organization pursue sustainable development?" "How is policy analysis for sustainable development different from policy analysis as usually practiced in the organization?"   "How should the organization conceptualize its goals for sustainable development?"   "How should progress toward these goals be measured?"   "What data are needed to evaluate development trajectories with respect to

sustainability goals?"   "Which of these data are readily available? Which need to be newly collected?" "What special guidance should be provided to the policy analysis unit regarding the challenges of evaluating policy performance for sustainability in social-environmental systems?"   "With what sort of expertise should the unit be staffed?," etc.

      Length: 2500-5000 words (5-10 single spaced pages) + figures, tables, bibliography
      Due date: Dec 16, 12 noon local time.
      Grading: Letter grade; -1 letter grade per day or fraction of day late.

B) Shorter assignments: 4 shorter assignments will give you the opportunity to address the parts of the final assignment related to the material we are then covering in class.

      Length: ~500 words (1 single spaced page) + figures, tables, bibliography
      Due dates (provisional; final dates may vary by a couple of days): Sept 10, Oct. 10, Nov. 14, Dec. 3; all by 12 noon local time.
      Grading: Since the purpose of these assignments is to let you work through your ideas and receive feedback, they will generally be graded only "not received / received". Because of the tempo of the class, late papers will not be accepted.   That said, in deference to the reality of your busy lives, each participant will be allowed to skip 1 short assignment without penalty. On each short assignment you do submit on time, you will receive written feedback from me and commentaries from several of your peers (see below).

C) Commentary assignments: In order to tap the rich training and experience of class participants, you will also have the opportunity to comment in writing on one another's "shorter assignments."   The details will depend upon class size. But after each of the 4 "shorter assignments" is submitted, you should expect to write a brief commentary on several of your peer's submissions.   (I will assign which papers you comment on in order to maximize cross-fertilization). The purpose of these commentaries will be to draw on your own training and experience to suggest additional perspectives or evidence, point out reasoning that you find less than compelling, and generally to help your peers strengthen their arguments for the final paper.

      Length: ~250 words (1/2 page single spaced) + figures, tables, bibliography
      Due dates: The commentary is due 24 hours after the (provisional) due date for the specific "shorter assignment" that is being commented on.
      Grading: The purpose of the commentaries is to help one another.   They will therefore be graded only "received / not received." Because of the tempo of the class, late papers will not be accepted. That said, in deference to the reality of your busy lives, each participant will be allowed to skip 1 commentary without penalty.

D) Class web site postings: As noted above, for each class session each participant will be expected to provide a brief web posting commenting on the readings and questions of the day, or replying to postings of other participants.   The goal is to help us to focus in-class discussion on the hard or controversial parts of the day's topic, and to tap into the different disciplinary and professional perspectives of class participants.   Participants should therefore use their postings to point out issues that they find confusing or underdeveloped, or to identify

additional points of view or resources, or otherwise to help enrich our collective discussion in the subsequent class.

Length: <250 words per posting; replies to other's postings are especially welcome; multiple postings are too, so long as they are interesting. ***Important note***: Because of the number of postings, it is crucial that you use the subject field intelligently (in original postings or replies) in order to signal what your posting is about.

Due dates: 9 hours before the beginning of each class (ie. by 5:40am the day of class; earlier is better).   Additional postings beyond the required first posting may, of course, be submitted at any time.

Grading: The purpose of the daily postings is to help one another.   They will therefore be graded only "received / not received." Because of the tempo of the class, late postings will not be given credit.   That said, in deference to the reality of your busy lives, each participant will be allowed to skip up to 5 postings without penalty.

E) General guidelines for all assignments, postings:

Adherence to the HKS Academic Code: All work performed in this class is expected to be in accordance with the HKS Academic Code. Note that your instructor is also chair of the Board that rules on cases of student misconduct, which generally involve failure to attribute sources or other forms of plagiarism.   A community of scholars cannot operate unless such codes are widely adhered to, and mostly they are.   But this is the only part of my job I hate, since it can (and does) involve the expulsion of students and the demolition of their careers.   And the only thing I hate more than misconduct cases in general is misconduct cases involving students in my own classes.   So please read the code, and take it seriously.   It's only 5 pages. A copy is available here: http://www.hks.harvard.edu/var/ezp_site/storage/fckeditor/file/pdfs/degree-programs/registrar/academic_code.pdf .   If in the slightest doubt, talk to me or your program head… even if it means being late with an assignment. Being late will just mess your grade a bit.   Screwing up with the Academic Code, in contrast, is about the only way you can realistically fail to receive your degree here.

Authorship: The default assumption is that all assignments and postings should be single authored by the individual named in the submission.   You may discuss the assignment with others or in study groups, but the words in the submitted assignment should be your own. (Technically, the default is the "Type 2 assignment" specified in the HKS Academic Code.) Collaborative work on any assignment may nonetheless be permitted under the following circumstance:

i) In the case of the "Final Paper" only, the co-authors submit a request for permission to co-author to me via email by noon on Dec. 2. This should explain the substantive justification for the collaboration, and assert that you understand that the work will be shared evenly and that the same grade will be given to each co-author.   All proposed participants should be included in the cc. line of the email.   You need a written email approval from me in order to proceed with a joint paper.

Note I: For approved "Final Paper" coauthorships, and coauthorship on any other assignments, the cover page of your submission must list all authors, describe

the division of work among the authors, and assert that you understand that all authors will receive the same grade for the submission.

Note II: All collaborative work is technically what is described as a "Type 4 assignment" in the HKS Academic Code: The collaborative team can discuss the assignment with anyone, but all the writing must be by the team named on the cover sheet.

Documentation and attribution of sources:

i) For the "Final Paper" and "Shorter Assignments" students should follow the rules for "Policy Memos" described on pg. 4 (item 2c) of the Academic Code.   That is, students are free to write the actual text of the assignment in whatever form they judge most effective for their intended audience. References and attribution may be accomplished either "in text" as with a standard academic paper, or in an appendix.   In either case, full citation data must be given for all sources, including those from the internet. Use any of the standard formats (eg. those in The Harvard Guide to Using Sources,
http://usingsources.fas.harvard.edu/icb/icb.do?keyword=k70847&tabgroupid=icb.tabgroup112025).
Which particular format you use is less important than consistency, and the ability of a reader like me to quickly follow up your citation to reach the right location in the full source.

ii) For "Commentary Assignments" and "Class web postings" citation rules are more relaxed. If you are using a direct quote or taking ideas from someone else, use the citation rules noted above.   But you don't have to document the sources behind the ideas you contribute in these informal forums.

Submission of assignments: All submissions should be via the class web site. Detailed instructions will be posted there.   (In emergency or if in doubt of the website's proper functioning, email your submission to the instructor by the due date, but keep trying to post to the web site.)

F) Grade Distribution: Your final grade will be computed from the following distribution:
Final Paper: 50%
Shorter assignments: 20%
Commentary assignments: 10%
Class participation and engagement (including web postings): 20%

COURSE MATERIALS

Required materials will be provided via the course web site. There are no required textbooks.   I will be posting specific readings as I get a better feel for the class size and preparation.

General background reading in policy analysis: For those participants who have never had a formal course in policy analysis, it may be helpful to review the short (and cheap) classic *A Practical Guide for Policy Analysis: The Eightfold Path to More Effective Problem Solving*, by Eugene Bardach, 4th Edition, 2012.   This is used in several HKS courses, including API-505.

Earlier editions are almost as good for our purposes. Another useful introduction of a more reflective bent is *The Policy Process: A Practical Guide for Natural Resource Professionals* by Tim W. Clark, 2002. (Yale Univ. Press, New Haven).

General background reading in sustainable development: For those participants interested in getting a feel for how the world is talking about sustainable development, I recommend:

1) United Nations. Sustainable Development Knowledge Platform (access to international committees, positions of national and NGO groups, history of international summits, etc.: http://sustainabledevelopment.un.org/index.html)

2) World Business Council for Sustainable Development (the business community's central site for solutions, studies, and positions: http://www.wbcsd.org/about.aspx)

3) International Institute for Sustainable Development (the great aggregator of NGO work around the world, as well as a substantial policy presence of its own: http://www.iisd.org/).

4) SciDev.net (a truly global and slightly edgy site for bringing science and development together through news and analysis: http://www.scidev.net/global/).

5) World Commission on Environment and Development (The Brundtland Commission). 1987. Our common future. UN. (This report launched the modern era of global thinking about sustainable development. It's clearly dated, but remarkable reading nonetheless.   See especially the Chairman's Foreword. Available through this link for on-line reading or free download: http://www.un-documents.net/wced-ocf.htm).

General background reading in sustainability science: For those participants interested in tracking scientific research on sustainable development, I recommend:

1) Kates, Robert W., ed. 2010. Readings in Sustainability Science and Technology. CID Working Paper No. 213. Center for International Development, Harvard University. Cambridge, MA: Harvard University, December 2010. (This Reader is one possible set of materials for advanced undergraduate and beginning graduate students of sustainability science, selected by Presidential Science Medalist (and Fellow of Harvard's Sustainability Science Program) Robert W. Kates. It consists of links to 93 articles or book chapters from which appropriate readings and internet sources can be chosen. These are organized around three major domains of sustainability science: Part 1: an overview of sustainable development; Part 2: the emerging science and technology of sustainability; and Part 3: the innovative solutions and grand challenges of moving this knowledge into action.

2) *Sustainability Science* section of the *Proceedings of the US National Academy of Sciences* (Arguably – but only that, since my service as an editor suggests the possibility of bias – the world's top journal for current research and special features on the subject; http://sustainability.pnas.org/).

3) *Ecological Economics* (a cutting edge journal "concerned with extending and integrating the study and management of nature's household [**ecology**] and humankind's household [**economics]**" http://www.journals.elsevier.com/ecological-economics/).

4) Journal of Industrial Ecology (another top journal focused on materials and energy uses and flows in products, processes, industrial sectors and economies; http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291530-9290).

5) Annual Review of Environment and Resources (the major review journal in the field, with authoritative reviews that, over each 5 year period, cover the field; http://www.annualreviews.org/journal/energy).

Note that most of these journals have RSS feeds that will let you keep up to date on new articles.

YOUR INSTRUCTOR AND THIS CLASS

My official bio and related material are available on my faculty web site at http://www.hks.harvard.edu/about/faculty-staff-directory/william-clark.   For the part relevant to this class, I am trained as an ecologist, but have been working on the interaction of development and environment for most of my professional career.   My initial foray into sustainable development was leading the program of that name at the International Institute for Applied Systems Analysis (Austria) in the mid-1980s, resulting in the interdisciplinary study *Sustainable Development of the Biosphere* (Cambridge University Press, 1985). After coming to Harvard in 1987, I co-chaired the US National Academy of Science's effort to identify research priorities in the field: *Our common journey: A transition toward sustainability* (NAP Press, 1999).   To provide a publication venue for that research, I founded and now co-edit the section on "Sustainability Science" of the *Proceedings of the National Academy of Sciences.*   At Harvard, I co-chair the *Sustainability Science Program* (http://www.hks.harvard.edu/mrcbg/sustsci), an effort to promote interdisciplinary training and research in the field.

As a teacher, I have won both the Kennedy School's Carballo Award and the Harvard College Phi Beta Kappa award for excellence in teaching… but in both cases only after several years of learning with my students about how to approach the material.   This is only my second try at the present course, so I hope you will bear with me and lend a hand in my effort to improve it.

Communicating with me….

I'm at the Kennedy School rather than a think tank because I like working with students. So I welcome opportunities to interact with you. Some opportunities to do so will be in class; others through what I hope will be extended conversations on the class web site. Emails (william_clark@harvard.edu) are more likely to reach me than telephone calls (617-495-3981). I will hold regular office hours, with times posted on my door (L-360, main building of the HKS) and the class web site.   If my office hours and your schedule don't match, just get in touch with my incredibly effective assistant Lauren Bloomberg (lauren_bloomberg@hks.harvard.edu). She will find a time that fits for us both. She is also the surest way to reach me in emergencies (which do happen).

CLASS SCHEDULE (TENTATIVE VERSION OF 130831)

CLASS	DATE	DAY	CLASS TOPICS
0	9/4	W	Shopping: How can policy professionals contribute more effectively to meeting the challenges of sustainable development?
			Part I: Frameworks for analyzing sustainable development
1	9/6	F	What is the problem of sustainable development? Why haven't we solved it? How can policy professionals help us do better?
2	9/9	M	Goals and criteria: What are good goals for sustainable development? Good criteria for monitoring progress?
3	9/11	W	Analytic frameworks: What are strengths and weaknesses of the analytic frameworks linking capital assets to sustainability goals that have become central to contemporary policy analysis?
4	9/16	M	Natural capital: How much nature must be conserved to advance sustainable development?
5	9/18	W	Manufactured capital: What kinds of industrial systems are most compatible with sustainable development?
6	9/23	M	Human capital: How should people -- their numbers, health, and capacities -- be included in evaluations of policies for sustainable development?
7	9/25	W	Social capital: How do norms, institutions, and other aspects of social capital affect the prospects for sustainable development?
8	9/30	M	Knowledge capital: How can science and technology be better harnessed to support sustainable development?
9	10/2	W	Evaluating past performance 1: Are we consuming too much?
10	10/7	M	Evaluating past performance 2: Are we consuming the wrong things?
11	10/9	W	Critique: What are the capabilities and limitations of policy professionals in their role of evaluating and diagnosing past performance with respect to sustainable development?
	10/14	M	*-- Holiday --*

			Part II: Challenges in policy evaluation and design for sustainable development
12	10/16	W	What are the special challenges of policy evaluation and design for sustainable development?
13	10/21	M	The changing stage: How should policy professionals handle the long term, large scale "background" trends that set the stage for sustainable development?
14	10/23	W	Invisibilities: How should policy professionals handle the multiple "invisibilities" that hide consequences from decision makers in social-environmental systems?
15	10/28	M	Tipping points: How should policy professionals address the tipping points, discontinuities, and multiple equilibria that are ubiquitous in social-environment systems?
16	10/30	W	Resilience: How should policy professionals cope with the inevitability of errors in their evaluations and failures of their designs?
17	11/4	M	Evaluating policy alternatives 1: Where to put different human activities on the land?
18	11/6	W	Evaluating policy alternatives 2: Which climate policies promote sustainable development?
	11/11	M	*-- Holiday --*
19	11/13	W	Critique: What are the capabilities and limitations of policy professionals in their role of evaluating and designing policies for sustainable development?
			Part III: Additional topics chosen by class
20	11/18	M	Additional topic A
21	11/20	W	Additional topic B
22	11/25	M	Additional topic C
	11/27	W	*-- Holiday --*
			Part IV: Looking ahead
23	12/2	M	What do policy professionals most need from science to improve their contributions to sustainable development?
24	12/4	W	How would you justify and organize a policy shop to support sustainable development?

END.