

## **CEE-265A: Sustainable Water Resources Development**

### **Course Objectives**

- Understand the origins and significance of the global debates on sustainable development.
- Develop a working definition of sustainability that can be used to assess water resources projects, policies and strategies.
- Examine how cultural, economic, social, political, and organizational factors interact with technical factors to yield projects and policies that are unsustainable (or sustainable).
- Become familiar with key contemporary water management issues, such as those linked to drought management, mountaintop removal in mining for coal and hydraulic fracturing.
- Review environmental impact assessments (EIA), benefit-cost analyses and other approaches and tools used in planning and managing water resources.
- Analyze actions that governments, donor and lending agencies, private sector companies, nongovernmental organizations, community groups and other stakeholders can take to promote sustainable water resources development and management.
- Gain experience in writing short essays and a substantial term paper and in making oral presentations and leading group discussions.

### **Class Meetings and Assignments**

The class meets on Thursdays from 4:15 to 6:05 in Building 540, Room 103. There will be occasional extra class meetings among groups of students and times will be arranged among those who are meeting. There will also be several meetings with writing tutors (both tutors from the School of Engineering Technical Communication Program and peer reviewers).

Each student will meet once with Professor Ortolano as part of a small group that plans and leads the discussion of one class session. These meetings will generally be for an

hour on a Tuesday at a time to be arranged. Substantial preparation and communication among group members is expected before (and to a lesser extent after) these meetings.

### **Grading for Course**

Course grades will be based on:

- Term paper (written and oral presentation) – 60%
- Response to weekly assignments and active participation in class discussions on a week-to-week basis – 25%
- Group leadership of a class session (preparation and implementation) – 10 %
- Work with writing tutors and peer reviewers – 5%

## Laptops and Cell Phones

CEE 265A is a seminar class that is built around student engagement in discussion. Based on past experience, cellphone and laptop usage can be major distractions to class participants. The format of the class relies heavily on discussion and other activities and there is no need for wireless devices. Under the circumstances, please observe the following basic guidelines.

**Cellphones** -- During CEE 265A, cellphones should be **turned off**.

In the event that a student anticipates an emergency call, please tell Professor Ortolano in advance, sit near the exit, and place the phone on vibrate. If the student receives the emergency call, the procedure is simply to exit the class to take the call in a place that will not disturb other students in CEE 265A or nearby classrooms.

**Texting** at any time is **prohibited** in this class.

**Laptops:** Laptops are **not to be used** during CEE 265A and they should have lids down. If a student feels that the inability to use a laptop will interfere with learning the CEE 265A material, he or she should discuss the matter in advance of class with Professor Ortolano so that suitable arrangements can be made.

## Session Topics and Readings

Below is the *initial* list of readings for the course. Please note that the list of weekly readings below may be revised throughout the quarter. The revised readings will be listed in Word files containing weekly assignments; these will be on the CEE 265A Coursework for each week.

### **Week 1 – April 4**

#### ***Introduction to course***

### **Week 2 – April 11**

#### ***Alternative Conceptualizations of Sustainable Development***

Goodland, R., 1995, "The Concept of Environmental Sustainability," Annual Review of Ecology and Systematics. Vol. 26 (1), pp. 1-25.

Parris, T. and R. W. Kates, 2003, Characterizing and Measuring Sustainable Development, Annual Review of Environment and Resources, Vol. 28, pp. 559-586 (Volume publication date November 2003).

Mebratu, D., 1998, "Sustainability and Sustainable Development: Historical and Conceptual Review," *Environmental Impact Assessment Review*, Vol. 18 (1), pp. 493-520.

Khagram, S. et al, 2003, "From Human Security and the Environment to Sustainable Security and Development," *Journal of Human Development*. **Pages 299-301 ONLY.**

Anon., 2010, "Goal 7: Ensure Environmental Sustainability," 2010, UN Summit on MGDs, 20-22 September 2010, New York.

### **Week 3 – April 18**

#### ***Hydro-Politics (Part One): the Aswan High Dam on the Nile***

Waterbury, J., 1979, *Hydropolitics of the Nile Valley*, Syracuse University Press, pp. 87-115.

Rycroft, R.W. and J.S. Szyliowicz, 1980, "The Technological Dimension of Decision Making: The Case of the Aswan High Dam," *World Politics*, 33 (1): 36-61.

White, G. F., 1988, "The Environmental Effects of the High Dam at Aswan," *Environment*, Vol. 30 (7): 5-11 and 34-40.

Biswas, A.K., 2002, "[Aswan Dam Revisited. The Benefits of a Much-Maligned Dam.](http://www.inwent.org/E+Z/1997-2002/de602-11.htm)" *Development & Cooperation* 6/2002. <http://www.inwent.org/E+Z/1997-2002/de602-11.htm> . For a version of the same article with graphics, but smaller type, see: <http://www.thirdworldcentre.org/einvest.html> (scroll down the page to find the Biswas article)

Swain, A. 2011, Challenges for water sharing in the Nile basin: changing geo-politics and changing climate, *Hydrological Sciences Journal*, 56(4): 2011. **Read only pp. 692-693 (section on "Move to establish basin-based cooperation") and 695-700 (beginning with section on "Escalating conflict scenario").**

### **Week 4 – April 25**

#### ***Hydro-Politics (Part Two): Grand Coulee – The Decision Processes Leading to the Columbia River Basin Project***

Reisner, M., 1986, *Cadillac Desert, the American West and its Disappearing Water*. Viking, New York. pp. 159-175.

Ortolano, L. and K. Cushing, 2002, "Grand Coulee Dam 70 Years Later: What Can We Learn?" *International Journal of Water Resources Development*, Vol.18(3), pp.373-390.

Ortolano, L. et al., 2000, Grand Coulee Dam and Columbia Basin Project, USA.

Final Report, Chapter 6, “Options Assessments and Decision Making Processes.”

Pitzer, P., 2000, Shift from Low Dam to high Dam at Grand Coulee, Annex 15 in Ortolano, L. et al., 2000, Grand Coulee Dam and Columbia Basin Project, USA.

Pitzer, P., 2000, Negotiating the Columbia River Treaty, Annex 10 in Ortolano, L. et al., 2000, Grand Coulee Dam and Columbia Basin Project, USA. **(SKIM)**

Pitzer, P., 2000, Decision to Build the Third Power Plant, Annex 16 in Ortolano, L. et al., 2000, Grand Coulee Dam and Columbia Basin Project, USA.

Rucker, R.R., and P.V. Fishback, 1983, The Federal Reclamation Program, An Analysis of Rent- Seeking Behavior, in Anderson, T. Water Rights, Ballinger, Cambridge, MA, pp. 45-81. Coursework contains some notes (prepared by Professor Ortolano) that may be of assistance in reading the article by Rucker and Fishback.

Ortolano, L. et al., 2000, Grand Coulee Dam and Columbia Basin Project, USA. Final Report, Sections 5.3.2. – 5.3.5, pp. 108-110.

## **Week 5 – May 2**

### ***International Development Assistance Agencies with an emphasis on The World Bank.***

World Bank home page (for more on **how the World Bank operates**)

<http://web.worldbank.org/WBSITE/EXTERNAL/EXTABOUTUS/0,,contentMDK:20046292~menuPK:51123588~pagePK:50004410~piPK:36602~theSitePK:29708,00.html>

In addition to skimming the home page, take a look at the links to operations. Examine the link called investment loans and development policy loans on the operations page. Note that investment lending is new Bank terminology for “project-based lending,” and development policy lending is new Bank terminology for “policy-based lending.” Terminology at the World Bank changes often.

“Bretton Woods Project” website page on “Who pays for the Fund and the Bank?” at:

<http://www.brettonwoodsproject.org/art-563643>

Concentrate on IBRD and IDF sections of this webpage. It explains how the Bank and IDF are funded.

The two selections from the Gilbert and Vines book supplement the information on the web pages above and provide an introduction to some of the turmoil associated with the World Bank's ongoing redefinition of its purpose.

Gilbert, C. L. and D. Vines, 2000, “The World Bank: an overview of some major issues,” in Gilbert, C. L. and D. Vines, (eds.), *The World Bank: Structure and Policies*, Cambridge University press, Cambridge, UK, pp. 10-36.

Gilbert, C.L., A. Powell, and D. Vines, 2000, "Positioning the World Bank", in Gilbert, C.L. and D. Vines (eds.) *The World Bank: Structure and Policies*, Cambridge University press, Cambridge, UK, pp. 39-58.

Marschinski, R. and S. Behrle, 2005, "The World Bank: Making the Business Case for the Environment" Global Governance Working Paper No 15. Amsterdam, Berlin, Oldenburg, Potsdam: The Global Governance Project. **Read only pp. 4 – 18**

## **Week 6 – May 9**

### ***Hydro-Politics (Part Three): Sardar Sarovar Project with Emphasis on the Role of Non-governmental Organizations***

Blinkhorn, T.A. and W.T. Smith, 1995, "India's Narmada: River of Hope," in Fisher, W. F. (ed.), *Toward Sustainable Development*, M. E. Sharpe, Armonk, NY, pp. 89-112.

Khagram, S. 2002, "Restructuring the Global Politics of Development: The Case of India's Narmada Valley Dams, in Khagram, S., Riker, J.V. and K. Sinnink (eds.) *Restructuring World Politics*, University of Minnesota Press, Minneapolis, MN, pp. 206-230.

Appa, G., 1992, "Narmada Projects Without World Bank Backing," *Economic and Political Weekly*, 27 (48): 2577-2580.

Wood, J.R. 2007, *The Politics of Water Resource development in India; The Narmadas Dams controversy*, Sage Publications, Thousand Oaks, CA, **skim** pp. 171—190 (top half) and **read** pp. 190 (bottom half) —194.

Udall, L. 1998, "The World Bank and Public Accountability: Has Anything Changed?" in Fox, J. A. and L. D. Brown, *The Struggle for Accountability: The World Bank, NGOs, and Grassroots Movements*, MIT Press, Cambridge MA , pp. 391-407 and 428-431.

## **Week 7 – May 16**

### ***Corporate Water Stewardship***

Lambooy, T., 2011, Corporate social responsibility: sustainable water use, *Journal of Cleaner Production*, 19: 852-866

Chapagain, A.K. and Tickner, D. 2012 Water footprint: help or hindrance? *Water Alternatives*, 5(3): 563-581

Sarni, W., 2011, *Corporate Water Strategies*, Earthscan, London, Pp. 164-167; 175-170 (SAB Miller discussion); and 191-195 (The Coca-Cola Company discussion)

Kaye, L., 2012, “Why partnering with NGOs for water stewardship makes business sense,” The Guardian Water Hub,  
<http://www.guardian.co.uk/sustainable-business/partnering-ngo-water-stewardship-business>

## Week 8 – May 23

### *Drought management in the context of climate change*

Kallis, G. 2008, “Droughts,” *Annual Review of Environment and Resources*, 33: 85-118.  
**Read only pp. 85-96, 105-109 (end before “Conclusions”).**  
<<http://www.annualreviews.org/doi/pdf/10.1146/annurev.envIRON.33.081307.123117>>

Wilhite, D.A., Hayes, M.J., Knutson, C. and K.H. Smith, 2000, “Planning for drought: Moving from crisis to risk management,” *Journal of the American Water Resources Association*, 36(4): 697-710. **(Skim)**

Steinemann, A., Hayes, M.J. and L. Cavalcanti, 2005, “Drought Indicators and Triggers,” in Wilhite, D. (ed.) *Drought and Water Crises: Science, Technology, and Management Issues*. CRC Press, Boca Raton, FL, pp. 71-92. **(Skim technical details)**  
<<http://water.washington.edu/Research/Reports/droughtindicatorsandtriggerschapter.pdf>>

Shepherd, A. 1998, “Drought contingency planning: Evaluating the effectiveness of plans,” *Journal of Water Resources Planning and Management*, 124 (5): 246-251.  
<http://water.washington.edu/research/Reports/droughtcontingencyplanning.pdf>

Botterill, L.C., and M.J. Hayes, 2012, Drought triggers and declarations: science and policy considerations for drought risk management, *Natural Hazards*, 64:139–151

## Week 9 – May 30

### *Water-Energy Nexus*

*The Readings below are required of all students. For this week, we will be splitting the class into 3 groups to focus on different topics within the water-energy nexus. Please note there will be additional short readings assigned to separate groups of the class, to be determined week 8.*

Water and Energy Interactions, 2011, J.E. McMahon and S.K. Price, *Annual Review of Environment and Resources*, 36:163–91. Read **only** pp. 164-167 (up to section 3.1.1) and 184-185

M. A. Palmer, et al., 2010, Mountaintop Mining Consequences, *Science*, 327, 8 January 2010: 148-149.

EPA, The Hydraulic Fracturing Water Cycle,  
<http://www.epa.gov/hfstudy/hfwatercycle.html>

Hydraulic Fracturing FAQs from the website of “gaslandthemovie”  
<http://www.gaslandthemovie.com/whats-fracking>

Apland Hitz, J. 2011, What are the Keystone XL Pipeline Risks to Water Resources?  
Columbia Water Center, 10.10.2011, <http://blogs.ei.columbia.edu/2011/10/10/what-are-the-keystonexl-pipeline-risks-to-water-resources/>

Additional readings will be assigned for each of three student groups with specialized topics: coal mining, hydraulic fracturing, and the Keystone XL pipeline.

### **Week 10 –June 6**

#### ***Student Presentations***