

TIMOTHY O. RANDHIR

Associate Professor

Department of Environmental Conservation

University of Massachusetts

160 Holdsworth Way, Amherst, MA 01003-9285, USA

Phone: (413) 545-3969; Email: randhir@eco.umass.edu; trandhir@gmail.com

Faculty Profile: <http://eco.umass.edu/people/faculty/randhir-timothy-o/>

Watershed Information Site: <http://www.ecowaters.com/wis/>

Web-based Decision Support: <http://aqua1.eco.umass.edu/>



EXPERTISE

Watershed science, water quality, ecohydrology, climatic change, systems ecology, nonpoint source pollution, ecological economics, simulation and optimization, GIS, spatial analysis, complex systems, Institutional economics, natural resources, agricultural economics, land use, international trade and development, bioenergy, common pool resources, policy design, and environmental sciences.

EDUCATION

Ph.D. (1995) Purdue University, West Lafayette, IN

Thesis: "Agriculture and water quality: Modeling NPS pollution under geographic state dynamics and biophysical simulation" – awarded "Outstanding Ph.D. Thesis" by department of agricultural economics.

Keywords: Natural resources conservation policy, regional planning, water resources protection, spatial dynamic programming, watershed management, ecosystem modeling, Geographic Information Systems (GIS), multi-attribute decision-making, and nonpoint source pollution.

M.S. (1988) Ag. Economics Tamil Nadu Ag. University, India

B. S. (1982) Agricultural Sciences, Annamalai University, India.

PROFESSIONAL EXPERIENCE

Sept 2007 – Present: Associate Professor (Tenured in 2007)

Sept 1997 – Oct 2007: Assistant Professor

Dept. of Environmental Conservation, Univ. of Massachusetts, Amherst, MA 01003

Tenure track position started in September 2002.

Faculty Affiliations:

Intercampus Graduate School in Marine Sciences and Technology

Department of Resource Economics

Center for Public Policy and Administration

UMass Extension

Appointment: *Research, Teaching, and Service*

- ♦ Research areas: spatial optimization, natural resource economics, watershed science, hydrology, nonpoint source pollution, biodiversity, urbanization, community science, sustainable development, GIS, multi-criteria decision making, ecological economics, global warming, incentive design, common pool resources, information technology, and systems modeling.
- ♦ Teaching: Watershed Science & Management, Watershed Management (Online), Ecological Economics and Sustainability, Ecosystem Modeling and Simulation, Advanced Watershed

Management, Water Resources Management & Policy, Water Resources, Blue Gold and World Water Wars.

Developed and coordinating the Professional Masters Program in Watershed Management offered by the department.

- ◆ Grant generation while at UMass (Total: \$1,395K (65% as a PI)):
PI: \$380K (MA EOEA), \$30K (WCS), \$93K (BHE), \$50K (USDA-MAES-Hatch), \$16K (USDA-MAES-Hatch-multistate), \$90K (USDA-MAES-Hatch-multistate), \$50K (USDA-MAES-Hatch), \$98K (USDA-FS), \$15K (FRG/UMass), \$5K (USDA-FS), \$10K (BRC)
Co-PI: \$80K (USDA-CSREES), \$86K (USDA-SARE), \$170K (MA DAR), \$212K (USDA-SARE), \$10K (MA DOE).
- ◆ Service: Training and outreach to agencies and communities throughout the Commonwealth of Massachusetts and New England, MA Director of SNE Chapter of SWCS, Editor of two environmental journals, developed participatory planning methods for landscape resources, involvement in national and international professional activities, Provost's Task Force on graduate admissions, UMass Faculty Senate Computer & Electronic Communications Committee, Ombuds Academic Honesty Board and chair of the department computer committee.

Jan 96 - Aug 97: Natural Resource Economist (Post Doctorate)

Dept. of Agricultural Economics, Purdue University.

- ◆ Post doctoral investigator and modeler in a \$2 million USDA-CSREES project (SDSS-Spatial Decision Support System) of Purdue Univ., Texas A&M Univ., and Univ. of Illinois.
- ◆ The project develops a spatial, participatory, multi-objective, dynamic optimization system to develop cost-effective and efficient soil and water conservation decisions.
- ◆ Other research conducted: global warming, international agricultural trade, watershed economics and policy, ecosystem-based planning and policies, conservation issues in developing economies, water quality policies, and management of common property resources

Aug 91 - Dec 95 Graduate Research Assistant

Dept. of Agricultural Economics, Purdue University.

Completed two research projects (for USGS and USDA) and a Ph.D. thesis.

Jan 89 - July 91 Assistant Professor

Dept. of Agricultural Economics, Tamil Nadu Agricultural University.

Teaching (40%), Research (40%), and Extension (20%).

Taught one undergraduate course and completed several projects on water allocation, village economics, cropping systems, and farm management as a Principal Investigator.

Professional Memberships

Soil and Water Conservation Society (SWCS)

American Geophysical Union (AGU)

American Association for Advancement of Science (AAAS)

American Water Resource Association (AWRA)

International Society for Ecological Economics (ISEE)

International Association for the Study of Common Property Resources

American Agricultural Economists Association (AAEA)

Northeastern Agricultural and Resource Economists Association (NAREA)

American Economic Association (AEA)

AWARDS AND HONORS:

Awards:

Lilly Teaching Fellow (2003-04), University of Massachusetts.
 Chancellor's Award for Outstanding Community Service (1999), University of Massachusetts
 Service Learning Fellow in Teaching (1998-99) awarded by Provost's Special Committee
 Berg Fellow (1997) of the Soil and Water Conservation Society.
 Outstanding Ph.D. Thesis Award (1995), Purdue University, Dept. of Ag. Economics.
 Nominated for Distinguished Teacher Award (UMass, 2004 and 2008), Nominated for Best Re-
 viewer (SWCS, 1997) and Nominated by Department for Outstanding Ph.D. Thesis (National
 competition of the American Agricultural Economics Association, 1995).

Merit Scholarship:

National Merit Scholar, India (1982).
 Merit Scholar, Tamil Nadu Ag. Univ., India (1986);

Medals: Pachaiyappa's Gold Medalist, India (1980).

Academic Honors:

Outstanding Ph.D. Thesis (1995) and nominated for AAEA Competition (1995).
 Honor rank in MS. Program (1988)
 Honor rank in BS. Program (1986)
 Rotary award for first rank in Secondary School Leaving Examination (1980).

Training:

Computational Hydraulics INC. course on "Stormwater Modeling with SWMM, PCSWMM, and
 GIS" Feb 21-23, 2000.
 NCAR Fellowship to participate in "An Institute of the Economics of the Climatic Resource" 5-7
 June 1995, National Center for Atmospheric Research, Boulder Colorado.

RESEARCH

Grants:

(* indicate grants while at UMass- Listed chronologically).

1995-1997. **USDA:** "Spatial Decision Support System." \$2 million. Investigators: J.G.Lee, B.Engel, and S.
 Lovejoy. Participated in writing the proposal as a Ph.D. student. I was later appointed as an investigator
 and modeler in this multi-institutional, and multi-disciplinary project (Jan 1995 to Oct. 1997).

1998-1999: ***EOEA/ Commonwealth of Massachusetts.** "Watershed Initiative - UMASS-EOEA Con-
 tract" \$387,000. Principal Investigator (PI): T. O. Randhir, Asst. Professor, Dept. of Natural Resources
 Conservation. Managed a team of more than 15 under-graduates, 5 graduate research assistants, and
 one professional staff. Effectively managed the budget of 10 different sub-projects (Jan 98-Dec 99).

1998-1999 ***Board of Higher Education.** "Three Communities Connected by a River and Frameworks:
 Linking Science and Technology to Schools (\$20,000). PI:Randhir, Co-PI: Burbank (Sept 1998 to Aug
 1999).

1999-2000 ***Board of Higher Education.** "Three Communities Connected by a River: Sustainable Com-
 munities through State Curriculum" (\$25,000) PI: Randhir, Co-PI: Burbank; (Sept 1999 to Aug 2000).

1999-2000. ***USDA/CSREES.** "Watershed-based Education to Protect Water Resources and Ecosys-
 tems" \$80,000. PI: Jackson, CoPI: Randhir (Jan 98-Dec 99).

- 2000 - 2001. ***MA Board of Higher Education.** 2000-2001. "Three Communities Connected by a River: Sustainable Communities through State Curriculum Frameworks." \$48,000; PI: Randhir, Co-PI: Burbank. (Sept 2000 to Aug 2001).
- 2002-2007. ***USDA-Hatch (MAES).** Integrated Watershed Management to Protect Water Quality and Ecological Integrity." \$50,000 PI: Randhir. (Sept 2002 to Aug 2007).
- 2003-2005. ***USDA/Forest Service:** "Distance-Education in Forestry" \$98,000, PI: Randhir (Aug 2003-June 2005); Co-PIs: McComb and Loomis;
- 2003-2004. ***USDA/Forest Service.** "Urban Forestry Watershed Modeling" \$5,000, PI: Randhir (Aug 2003-June 2004).
- 2004-2005 ***USDA-Hatch (MAES).** "Environmental and Economic Impacts of Nutrient Management on Dairy Forage Systems" \$16,000. PI: Randhir; CoPI: Herbert (Sept 2004 to Aug 2005).
- 2005-2010. **USDA-Hatch (MAES). Multi-state (NE-132):** "Whole Farm Dairy and Beef Systems to Protect Environmental Quality" \$90,000 PI: Randhir; CoPI: Herbert (Sept 2005 to Aug 2010).
- 2006-2007 ***Faculty research grant/ Healy endowment grant, UMass,** "Decision Making under Environmental Uncertainty: An Experimental Investigation", (\$15K) PI: T. Randhir. Sept 2006 to Aug 2007.
- 2006-2008. ***USDA-SARE:** "Effective Cover Crop Seeding dates for Nutrient Recovery" \$85,953 PI: Herbert; Co-PI: A.M. Hashemi and T. Randhir (July 2006 to June 2008).
- 2007-2008. ***Mass DOE.** Economic Evaluation of Switchgrass for Biofuel. \$10K PI: Herbert; Co-PI: R. Probst, and T. Randhir. (May 2007 to April 2008).
- 2007-2010. ***USDA-SARE.** Assessing Pasture Species, Varieties, Blends. \$212K. PI: Herbert; CoPI: T. Randhir and others.
- 2007-2009. ***Mass DAR -Ag. Innovation Center.** Integrating Pasture Management on Dairy and Livestock Farms. \$170K. PI: Herbert; CoPI: T. Randhir and others.
- 2008-2010. **Wildlife Conservation Society.** Graduate student training - Nampindo. \$30K, PI: Randhir
- 2009-2014- ***USDA-Hatch (MAES).** "Protecting water security in watershed systems: Uncertainty in decision making" \$10K, PI: Randhir
- 2011-2012- ***Blackstone River Coalition (MA)** "Compilation of nutrient loading and GIS modeling in the Upper Blackstone Watershed" \$10K, PI: Randhir, CoPI: Paula Rees.
- 2012-2015 ***Mass DEP** "Minimizing Nonpoint Source Pollution from Two Horse Facilities through BMPs" \$338K, PI: Hashemi, CoPI: S. Herbert, T. Randhir
- Minor Grants:** Influence of Risk on Input Use in South India, 1990 (TNAU University Grant); Deforestation and Agricultural Productivity in India, 1991(TNAU University Grant); Contribution of the University to State Development, 1991(TNAU University Grant); Conjunctive use of Irrigation Water for Crop Production in P.A. River Irrigation System, 1990 (Indian Council of Agricultural Research Grant).

Publications:

(† indicates Prof. Randhir's graduate student)

SUMMARY: *Refereed Journal Articles (40); Refereed full papers in proceedings (3); Books (1); Book Chapters (5); Peer-reviewed selected/conference papers (46); Non-refereed conference papers (4); Other publications (11); and several in process or in review.*

Books

Randhir, T.O. 2006. ***Watershed Management: Issues and Approaches.*** International Water Association Publishing, London, UK. (168 Pages)

Refereed Journal Articles:

1. Erol, A., and T.O. Randhir. 2012. Climatic Change Impacts on the Ecohydrology of Mediterranean Watersheds. In Print in ***Climatic Change***.
2. Flugman, E., P. Mozumder, and T.O. Randhir. 2012. Facilitating Adaptation to Global Climate Change: Perspective from Experts and Decision Makers serving the Florida Keys. ***Climatic Change***, 112(3-4): 1015-1035.
3. Randhir, T.O, P. Ekness†, O. Tsvetkova†. 2012. Climatic change impacts on watershed hydrologic dynamics: A systems approach to adaptation. ***Environmental Research Journal***. 6(3): 1-18.
4. Randhir, T.O. 2011. Towards sustainability of the earth system. ***Jl. of Earth Science and Climatic Change***, 2(2): 1-2.
5. Randhir, T.O., P. Ekness†, and T. Stevens. 2011. Economic Value of Riparian Ecosystems: An Attribute-based Conjoint Analysis. ***Int. Journal of Hydrology Science and Technology***, 1 (3/4): 176-190.
6. Randhir, T.O., and O. Tsvetkova†. 2011. Spatiotemporal dynamics of landscape pattern and hydrologic process in watershed systems. ***Journal of Hydrology***, 404:1-12. DOI: 10.1016/j.jhydrol.2011.03.019
7. Farsad, A., T.O. Randhir, S.J. Herbert, and M. Hashemi, 2011. Spatial Modeling of Critical Planting Date for Winter Rye Cover Crop to Enhance Nutrient Recovery. ***Agronomy Journal***, 103:1252-1257.
8. Schoenberg†, K., and T.O. Randhir. 2010. "Prioritization of watershed habitat for neotropical migratory birds." ***International Journal of Biodiversity Conservation***, 2(9): 250-262.
9. Mozumder, P., E. Flugman, T.O. Randhir 2010. Adaptation Behavior in the face of Global Climate Change: Survey Responses from Experts and Decision Makers Serving the Florida Keys, ***Ocean & Coastal Management***, 54(1): 37-44. DOI: 10.1016/j.ocecoaman.2010.10.009.
10. Randhir, T.O., and D.M. Shriver† 2009, Multiattribute optimization of restoration options: Designing incentives for watershed management, ***Water Resources Research***, 45, W03405, doi:10.1029/2008WR007169.
11. Randhir, T.O. and D.M Shriver†, 2009, Deliberative valuation without prices: A multiattribute prioritization for watershed ecosystem management, ***Ecological Economics***, doi:10.1016/j.ecolecon.2009.07.008.
12. Randhir, T.O., and P. Ekness†, 2009. "Urbanization effects on watershed habitat potential: A multivariate as-sessment of thresholds and interactions." ***Ecohydrology*** 2(1): 88-101. DOI 10.1002/eco.43.
13. Randhir, T.O., and O. Tsvetkova†, 2009. "Watershed-scale tradeoffs in water quantity and quality attributes for conservation policy" ***Water, Soil and Air Pollution***. 201(1-4): 347-363. DOI 10.1007/s11270-008-9949-8.
14. Randhir, T.O., and A.G. Hawes†, 2009. "Watershed land use and aquatic ecosystem response: Ecohydrologic approach to conservation policy" ***Journal of Hydrology***, 364: 182-199. doi:10.1016/j.jhydrol.2008.10.017.
15. Sekar†, I. and T.O. Randhir. 2009. Arsenic Contamination in Water Resources: Mitigation and Policy Options. ***Water Policy***, 11: 67-78. doi: 10.2166/wp.2009.005
16. Sekar†, I, K. McGarigal, J.T. Finn, R.Ryan, and T.O. Randhir. 2009. "Water quality response to economic development: Quantifying environmental Kuznets curve." ***Indian Journal of Ag. Economics***. 64(1):73-88.
17. Marshall†, E., and T.O. Randhir. 2008. "Spatial Modeling of Land Cover Change and Watershed Response using Markovian Cellular Automata and Simulation" ***Water Resources Research***. 44, W04423, doi:10.1029/2006WR005514.

18. Marshall†, E., and T.O. Randhir. 2008. Effect of Climate Change on Watershed Processes: A Regional Analysis. *Climatic Change*. DOI: 10.1007/s10584-007-9389-2
19. Sekar†, I., and T.O. Randhir. 2007. Policies for Sustaining Groundwater Resources. *Water International (Journal of International Water Resources Association)*. 32(5): 697-709.
20. Ekness†, P., and T.O. Randhir. 2007. Watershed-scale Influence of Spatial Dimensions and Landuse Disturbance on Habitat Potential: An Ecohydrologic Approach to Policy. *Journal of American Water Resources Association (JAWRA)*, December, 43(6): 1468-1482.
21. Shriver†, D., and T.O. Randhir. 2006. Integrating Stakeholder Values with Multiple Attributes to Quantify Watershed Performance. *Water Resources Research*. 42 (8): 1-15. doi:10.1029/ 2005WR004413.
22. Matteo†, M., T.O. Randhir, and D. Bloniarz. 2006 “Watershed-scale Impacts of Forest Buffers on Water Quality and Runoff in Urbanizing Environment” *Journal of Water Resources Planning and Management*. May. 132(3): 144-152.
23. Sekar†, I., and T.O. Randhir. 2006. Spatial Assessment of Conjunctive Water Harvesting Potential in Watershed Systems. *Journal of Hydrology*. 334(1-2):39-52. Doi:10.1016/j.jhydrol.2006.09.024:1-14.
24. Low†, S., and T.O. Randhir. 2005. “Watershed Management, Structural Characteristics, Information Processing, and Cooperative Strategies in Conservation Organizations.” *Journal of Soil and Water Conservation*. 60(6): 281-287.
25. Randhir, T.O. 2005. Managing Ecosystems in the Presence of Habitat Interactions and Market Imperfections in a Dynamic Setting. *International Journal of Ecological Economics and Statistics*. 3(5): 21-41.
26. Randhir, T.O., and C. Genge. 2005. “Watershed-based Institutional Approach to Develop Clean Water Resources.” *Journal of American Water Resources Association*. 41(2): 413-424.
27. Randhir, T.O. 2003. Watershed-scale Effects of Urbanization on Sediment Export: Assessment and Policy. *Water Resources Research*. 39(6): 1-13. doi:10.1029/ 2002WR001913.
28. Randhir, T.O., R. O'Conner, P. Penner, D. Goodwin. 2001. "A Watershed-Based Land Prioritization Model to Protect Water Quality." *Forest Ecology and Management*. 143: 47-56.
29. Randhir, T. O., J. G. Lee, and B. Engel. 2000. “Multiple Criteria Dynamic Spatial Optimization to Manage Water Quality at a Watershed Scale.” *Transactions of the American Society of Agricultural Engineers*. 43(2): 291-299.
30. Randhir, T. O., and T. W. Hertel. 2000. “Trade Liberalization as a Vehicle for Adapting to Global warming.” *Agricultural and Resource Economics Review*. 29(2): 159-172.
31. Randhir, T. O., and J. G. Lee. 2000. “Effect of Water Quality Standards on Farm Income, Risk and NPS Pollution.” *Journal of the American Water Resources Association*, 36(3): 595-608.
32. Loehman, E. T., and T. O. Randhir. 1999. "Resource Degradation and Income Inequality: Alleviating Effects of Externalities in a Dynamic Setting." *Ecological Economics*. 30(1).
33. Randhir, T. O., and J. G. Lee. 1997. “Economic and Water Quality Impacts of Reducing Nitrogen and Pesticide Use in Agriculture.” *Agricultural and Resource Economics Review*. 26(1): 39-51.
34. Lovejoy, S. B., J. G. Lee, T. O. Randhir, and B. A. Engel. 1997. “Research Needs for Water Quality Management in the 21st Century: A Spatial Decision Support System,” *Journal of Soil and Water Conservation*, January-February, pp: 18-22.
35. Randhir, T. O., and J. G. Lee. 1996. "Managing Local Commons in Developing Economies: An Institutional Approach." *Ecological Economics*, 16(1): 1-12.
36. Randhir, T. O., and S. Krishnamoorthy, 1993, "Optimal Crop Planning under Production Risk in Tank Irrigated South Indian Farms." *Indian Journal of Agricultural Economics*: 47(4). (Oct-Dec, 1993).
37. Randhir, T. O., 1991. "Influence of Risk on Input Decisions in Tankfed Farms of South India." *Indian Journal of Agricultural Economics*, 46(1). (Jan-Mar, 1991): 57-63.

38. Randhir, T. O., and S. Krishnamoorthy 1990. "Productivity Variation and Water Use in Farms of Madurantakam Tankfed Area of Chengalpattu District", *Indian Journal of Agricultural Economics*, 45(1) (Jan-Mar, 1990): 56-59.
39. Sekar, C, A. Alagiapillai, T. O. Randhir, and G. Kumaravelu. 1990. "Economic Analysis of Kapok under Agro-Forestry Conditions of Tamil Nadu." *Agricultural Situation in India*. (Nov, 1990): 537-540.
40. Randhir, T. O. 1990. "A Micro level Analysis of Variation due to Irrigational and Locational Status in Tankfed Rice-Based South Indian Farms", *Indian Journal of Soil Conservation*, 18 (1&2) (1990): 41-45.

Refereed, Selected Full Papers resulting from a Conference:

1. Cheng, C., and T.O. Randhir. A Sustainability Evaluation and Modeling Tool for Landscape Scenario Planning. Fábos International Conference on Landscape and Greenway Planning, Budapest, Hungary, July 8-11, 2010.
2. Ekness†, P. T.O. Randhir, E. Marshall†, D. Shriver†. 2003 Increasing Stream Health in Diverse Sections of an Urban River. *AWRA International Congress* on Watershed Management for Water Supply Systems. June 29 – July 2, New York.
3. Randhir, T. O. 1999. "Interactive Community Decision Modeling: Public Involvement in Watershed Policy Research." In Kendy, E. Science Into Policy: Water in the Public Realm. *American Water Resources Association*.

Book Chapters:

1. Randhir, T.O., and A.G. Hawes. 2010. Ecology and Poverty in Watershed Management. Invited chapter, DeClerck, F., J.C. Ingram, and C.R. Del Rio. *Integrating Ecology into Poverty Alleviation and International Development Efforts: a practical guide*. Springer Verlag Publication.
2. Randhir, T.O., P. Ekness, and O. Tsvetkova. 2010. Climatic change impacts on hydrologic dynamics of watershed systems. In Jeremy C. Vaughn. **Watershed: Management, Restoration, and Environmental Impact**. Nova Science Publishers, USA.
3. Randhir, T.O. 2003. Land Use Planning. In: *Water: Science and Issues*, ed. E. Julius Dasch. New York: Macmillan Reference USA. Pages: 7-11.
4. Randhir, T.O. 2003. Global Warming: Policy Making. In: *Water: Science and Issues*, ed. E. Julius Dasch. New York: Macmillan Reference USA. Pages: 134-137.
5. Randhir, T.O. and S. R. Subramanian. 1999. Hill Agriculture Development: Environmental Issues. In: Kainth, G.S. *Developing Hill Agriculture*. (Ed.). Vedams Press., Delhi, India.

Peer Reviewed, Selected/ Conference Abstracts:

1. Randhir, T.O., S.J. Herbert, M. Hashemi, and A. Farsad. Online Crop Decision Support for Nitrogen Recovery through Cover Crops. Paper presented at *2011 Annual Meeting of American Society of*

- Agronomy, Crop Science Society of America, and Soil Science Society of America*, Oct., 16-19, San Antonio, TX.
2. Randhir, T.O. and A. Erol. 2011. Conservation strategies to reduce nutrient loading in Lake Eğirdir Watershed of Turkey, Paper presented at 2011 *Soil and Water Conservation Society* Annual Meeting, Washington, DC., July 18-19.
 3. Randhir, T.O. and O. Tsvetkova. 2011. Soil and water conservation under climatic stress in selected watersheds in Russia, Paper presented at 2011 *Soil and Water Conservation Society* Annual Meeting, Washington, DC., July 18-19.
 4. Randhir, T.O. and S. Nampindo. 2011. Land use and climate change effects on watershed commons in the Albertine Rift Valley of Africa, Paper presented at 2011 *Soil and Water Conservation Society* Annual Meeting, Washington, DC., July 18-19.
 5. Randhir, T.O., S. J. Herbert, and A. Farsad. 2011. Online Crop Decision Support for Nitrogen Recovery through Cover Crops, 2011 *Land and Sea Grant National Water Conference*, January 30-31, Washington, DC.
 6. Farsad A., S. J. Herbert, T.O. Randhir, M. Hashemi. 2010. Optimum Planting Date for Rye Cover Crop: A Spatial Analysis. *SWCS* Annual Conference, St. Louis, MO, July 18-21, 2010.
 7. Farsad A., T.O. Randhir, S. Herbert, M. Hashemi. 2010. Using a spatial model for estimating the critical planting date for rye cover crop in Massachusetts. *NEBCSA* Conference, Cornell University, NY, June 27-29, 2010
 8. Herbert, S., S. Weis, T.O. Randhir, S. Bosworth, R. Gilker, M. Sanderson, K. Kaija, R. Brzozowski, and C. Majewski. 2009. Assessing Pasture Grasses, Legumes and Pasture Blends for Varying Soil Conditions in New England and Pennsylvania: A NE SARE Project. Poster 4th *National Conference on Grazing Lands*, Nevada.
 9. Ekness†, P., and T.O. Randhir. 2008. Effect of Spatial Configuration of Watershed Land Use on Hydrology. *American Water Resources Association* Proceeding. 2008 at New Orleans, LA.
 10. Mazzarino†, M., and T.O. Randhir. 2008. Hydrologic Effects of Climate Change in a Tropical, Glaciated Watershed in Peru. *American Water Resources Association* Proceeding. 2008 at New Orleans, LA.
 11. Sekar†, I., and T.O. Randhir. 2008. Efficiency of Small-Scale, Storage Networks in India, *American Water Resources Association* Proceeding. 2008 at New Orleans, LA.
 12. Randhir, T.O. 2008. "Effect of Climate Change in New England" in session "Adapting to Climate Change", *Southern New England American Planning Association* Conference, September 5, Providence, RI.
 13. Randhir, T.O. 2008. "Effect of climate change in Connecticut River Watershed." Workshop on "Climate Change in the Northeast: Preparing for the Future Workshop", *U.S. Fish and Wildlife Service, National Park Service, U.S. Geological Survey, and Minerals Management Service, U.S. Department of Agriculture's Forest Service, Department of Commerce's National Oceanic and Atmospheric Administration, Six New England states and New York, Workshop* – Regional Workshop CD proceedings. June 3 to 5, at Amherst, MA.

14. Herbert, S., M. Hashemi, S. Weis and T.O. Randhir. 2007. Managing Cover Crops for Maximum Nitrogen Recovery Following Corn. 2007 ***Annual Meeting of American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America***, Nov 4-8, New Orleans, LA.
15. Hawest†, A., and T.O. Randhir. 2007. Effects of Watershed Land Use on Aquatic Ecosystems. ***Soil and Water Conservation Society***. Annual Conference, July 21 to 25 at Tampa, FL.
16. Ekness†, P., and T.O. Randhir. 2007. Economic value of riparian ecosystem attributes in an urban setting ***Soil and Water Conservation Society***, Annual Conference, July 21 to 25 at Tampa, FL.
17. Tsvetkova†, O. and T.O. Randhir Predicting 2007. Land Use Change and Water Quality Impacts. ***Soil and Water Conservation Society***. Annual Conference, July 21 to 25 at Tampa, FL.
18. Ekness†, P., and T.O. Randhir. 2005. Understanding Watersheds: Using water movement on-campus to investigate our natural surroundings. ***National Science Teachers Association*** – 2005 Annual Meeting Proceeding. Hartford, CT.
19. Marshall†, E., and T.O. Randhir. 2004. Mitigation of Climate Change Impacts on Water Balance at Varying Scales. ***American Water Resources Association Proceeding***. 2004.
20. Ekness†, P., and T.O. Randhir. 2004. Interaction between Riparian Systems and Stream Water Quality. ***American Water Resources Association Proceeding***. 2004.
21. Brouillette-Jacobson†, D., and T.O. Randhir. 2004. Sustainable Use of Water Supplies in Cape Code: Modeling and Policy Implications. ***American Water Resources Association Proceeding***. 2004.
22. Ekness†, P., and T.O. Randhir. 2003. Landuse Effects and Habitat Functions of Riparian Ecosystems. ***American Water Resources Association Proceeding***. 2003.
23. Marshall†, E. and T.O. Randhir. 2003. Impact of Global Warming on Water Quality in the Connecticut River Watershed. ***American Water Resources Association Proceeding***. 2003.
24. Shriver†, D. T.O. Randhir, and E. Marshall†, 2003. Watershed Classification for Prioritizing Habitat Restoration. ***AWRA International Congress*** on Watershed Management for Water Supply Systems. June 29 – July 2, New York.
25. Randhir, T.O. 2002. “Economic Policies to Address Urban Impacts of Watershed Processes.” ***American Water Resources Association Proceeding***.
26. Randhir, T.O., C. Genge., and S. Buckley. 2002. “Watershed Approach to Clean Water in Developing Countries: An Application in Honduras.” ***American Water Resources Association Proceeding***.
27. Randhir, T.O. 2002. “Integrated Watershed Modeling for Sustainability Planning.” ***American Water Resources Association Proceeding***.
28. Randhir, T.O 2001. “Coastal Watershed Conservation to protect Narragansett Bay.” ***Journal of Soil and Water Conservation***.
29. Randhir, T.O. 2001. Watershed Approach to Mitigate the Effects of Hurricanes: A Case Study of Hurricane Mitch in Honduras.” ***Journal of Soil and Water Conservation***.

30. Randhir, T.O. 2001. "Protecting Potential Water Supplies in Coastal watershed: The Case of Taunton Watershed." *Journal of Soil and Water Conservation*.
31. Randhir, T.O. S. Lowe†, and K. Norwood†. 2000. "Combining Species and Landscape Assessment to Evaluate Watershed Ecosystems" *Journal of Soil and Water Conservation*.
32. Randhir, T.O. 2000. Multiobjective Planning to Promote Community-based Watershed Conservation." *Journal of Soil and Water Conservation*.
33. Randhir, T.O., E. Keeler†, and K. Norwood†. 2000. Watershed Imperviousness as an Indicator of Water Quality." *Journal of Soil and Water Conservation*.
34. Randhir, T. O., and D. Goodwin. 1998. "Assessing Land Use Changes at a Watershed Level Using GIS." *Journal of Soil and Water Conservation*, 52(2): 169.
35. Randhir, T. O., and J. G. Lee. 1998. "Effect of Water Quality Standards on Agriculture." *Journal of Soil and Water Conservation*, 52(2): 157.
36. Randhir, T. O., S. Lovejoy, and J. G. Lee. 1998. "Multiobjective Decision-making in Watershed and Landscape Management." *Journal of Soil and Water Conservation*, 52(2): 172.
37. Randhir, T. O., and T. Hertel. 1997. "Trade Liberalization as vehicle for Adapting to Global warming." International Agricultural Trade Research Consortium Annual Meeting, Dec 14-16.
38. Randhir, T. O., and J. G. Lee. 1997. "Designing Spatial Incentives to Manage Agricultural Nonpoint Source Pollution." *American Journal of Agricultural Economics*, 79(5): 1721.
39. Jacque. A., and T. O. Randhir. 1997. "Multi-Crop Farming Systems in Developing Countries: Technological Interactions and Policy Implications." *American Journal of Agricultural Economics*, 79(5): 1727.
40. Randhir, T. O., and J. G. Lee. 1996. "Economic and Environmental Implications of Policies to Reduce Agricultural Nonpoint Source Pollution." Abstract. *American Journal of Agricultural Economics*. 77(5), January: 1388.
41. Randhir, T. O., B. Engel, and J. G. Lee. "A Distributed Parameter/ GIS approach to Agricultural Pollution." Abstract. *American Journal of Agricultural Economics*. 77(5), January 1996: 1358.
42. Randhir, T. O., and J. G. Lee. 1996. "Trading Cropping Rights in Erodible Lands under Conservation Reserve Program." Abstract. *American Journal of Agricultural Economics*. 77(5), January: 1371.
43. Randhir, T. O., and J. G. Lee. 1995. "Multiple Criterion Dynamic Optimization of Agricultural watersheds with non point source pollution." selected paper presented at *Southern Agricultural Economists Association Annual Meeting* at New Orleans, USA. 1995.
44. Randhir, T. O., and J. G. Lee. 1994. "Institutional Solutions to Resource Degradation in Developing Countries." Abstract. *American Journal of Agricultural Economics*, 76(5) December: 1262-1263.
45. Loehman, E. T., and T. O. Randhir. 1992. "Resource Degradation and Income Inequality: Effects of Externalities in a Dynamic Setting." selected paper at *International Association for the study of Common Property Resources Meetings*. Sept. Washington. DC., 1992.

46. Randhir, T. O., and M. Ravichandran†. 1991. "Economic Analysis of Watershed Management in Anakatti Region of Coimbatore District through National Perspective." *Indian Journal of Agricultural Economics*, 46 (3) (Aug.-Oct.): 301.

Non- refereed Conference Papers:

1. Randhir, T.O., J. G. Lee, B. A. Engel, H. Manguerra, J. Frankenberger, and A. Spacie. 1997. "Ecosystem-based Least-Cost Planning in watersheds: A Spatial Optimization Approach." paper presented at SWCS conference on "Investigating Ecosystem Dynamics at a Watershed Level." at Athens Georgia, April 13-16.
2. Randhir, T.O, J. G. Lee, B. Engel, and S. Lovejoy. 1997. "Improving Water Quality through Watershed Planning: A Spatial Optimization Model." Paper presented the ESEI Environmental Symposium, Purdue University, West Lafayette, IN 47907.
3. Randhir, T. O., and J. G. Lee. 1994. "Combining Economic and Biophysical Models in Farming Systems Research." Paper presented at Workshop on "Applied Research and Education in Sustainable Agriculture: What Have We Learned?" April 11-12, Indianapolis, Indiana, USA.
4. Lee, J. G., T. O. Randhir, and S. B. Lovejoy. 1993. "Nitrate and Pesticide Levels in Indiana Rural Domestic Wells." Paper presented at First Purdue University Environmental workshop, Aug. 20, Purdue Univ., West Lafayette, IN, USA.

Other Technical Publications:

1. Randhir, T.O. 2004. (Ed.) Watershed Conservation 2004 Proceedings, Sept. 17th University of Massachusetts, Amherst. 2004.
2. Randhir, T.O. 2002. (Ed.) Watershed Conservation 2002 Proceedings, Sept. 20th University of Massachusetts, Amherst. 2002.
3. Randhir, T.O. 2000. (Ed.) Watershed Conservation 2000 Proceedings. June 2. University of Massachusetts. 2000.
4. Randhir, T.O., 2000. Sustainable Watershed Planning in Blackstone River Watershed. Technical Report to EOEAWatershed Initiative. 2000.
5. Randhir, T.O. 1999. Ware River Watershed Land Acquisition Model. Technical Report to MDC. 1999.
6. Randhir, T. O., and J. G. Lee. 1993. "Hybrid Criterion Optimization under Dynamic Simulation of Non point Source Pollution." Technical report, Fiscal year 1992-1993. Indiana Water Resources Research Center. Purdue University. West Lafayette, IN, USA. (1993): 1-16.
7. Randhir, T. O., J. G. Lee, and Ronald Lacewell. 1994. "Effect of Agricultural Practices on Surface Water Quality." Technical Report of Research Project funded by United States Geological Survey.

8. Randhir, T. O. 1991. "Influence of Risk on Farm Decisions concerning Input Use in Tankfed Zone of Chengaianna District, South India." Staff Report. No.R1. Agecon.364. Department of Ag. Econ., Tamil Nadu Ag. Univ., Coimbatore, India.
9. Ramasamy, C., and T. O. Randhir. 1991. "Agricultural Growth in Tamil Nadu- Contribution by Tamil Nadu Ag. Univ.," Staff Report, Tamil Nadu Ag. Univ., Coimbatore. India.
10. Randhir, T. O., R. Venkataraman, and N. Ajjan. 1989. Farm Management: Practical Manual (Under graduate Teaching Manual of AGECE 402).

Current/ Recent Research projects:

- ◆ Climate change and Mediterranean watersheds (Turkey)
- ◆ Climate change, land use, and ecosystem services (Albertine Rift, Africa)
- ◆ Water resources, sustainability, and climate change (Continental US)
- ◆ Glacial processes and watershed impacts (Ganges, India)
- ◆ Water conservation and policy in MA communities (Massachusetts, USA)
- ◆ Water harvesting in urbanizing watershed systems (Taunton Watershed)
- ◆ Deliberative group decisions (Chicopee Watershed)
- ◆ Modeling multiple contaminants and Land dynamics (Blackstone Watershed)
- ◆ Coliform contamination and chlorine by-products (Uganda)
- ◆ Multi-attribute watershed classification for restoration (Chicopee Watershed)
- ◆ Performance measures for Watershed systems (Chicopee Watershed)
- ◆ Impact of climatic change on watershed systems (Connecticut River Watershed)
- ◆ Watershed dimensions and biodiversity (Westfield River Watershed)
- ◆ Institutional solutions to water resources (Honduras)
- ◆ Urbanization in Watersheds (Blackstone Watershed)
- ◆ Urban Modeling of Pervious cover (Mill River Watershed, Springfield)
- ◆ Modeling Land use - Land cover change (Connecticut Watershed)
- ◆ Structure and performance of watershed organizations (Nationwide)
- ◆ Watershed impacts of animal feed operations (Middle Connecticut Watershed)
- ◆ Internet-based, watershed information site for Watershed Communities (Comprehensive site for watershed information)
- ◆ Watershed education (website with resources for teaching)

Working papers:

Articles

Submitted or In Review:

- *Oluka, S.O., A. Steigen, and T.O. Randhir. "Coliform Contamination and Chlorine by-products in Urban Water Supply System in Uganda." *In Review with Urban Water Journal*
- *Mozumder, P. and T.O. Randhir. Decision-making under Surprise and Uncertainty: Arsenic Contamination of Water Supplies." *In Review with American Journal of Agricultural Economics.*

*Randhir, T.O. (In review with FAO) Economic and environmental impact of producing and utilizing biodegradable packaging in developing countries. In: Pascall, M. *Biodegradable Packaging Opportunities and Options for Developing Countries* (Ed.). FAO, Rome (With editor for final approval)

Books

*Randhir, T.O. (In Preparation) *Watershed Science and Management*. (In contract). Springer-Verlag.

TEACHING EXPERIENCE

G – Graduate ; UG – Undergraduate (* courses taught at UMass)

(URL: <http://www.ecowaters.com/wscourse/>)

1. *(G/UG) NRC 577 Ecosystem Modeling and Simulation (Fall session of Odd years). Approximately 25 students per semester.
2. *(G/UG) NRC 597WR Water Resources Management and Policy (Fall session Even years) Approximately 15 students per semester.
3. *(G) NRC 597R Watershed Science and Management (Spring session - all years). Approximately 20 students per semester.

Recipient of Service Learning fellowship (1998) awarded by Provost's special committee

This graduate-level course is interdisciplinary and combines theory and practice of watershed science. The main focus is to develop skills in using scientific techniques, computers, field methods, and the Internet to solve environmental problems.

4. *(G) 697R Advanced Watershed Science (Spring of Even years) – interdisciplinary, topical course – 10 students.
6. *(G) NRC 697Z Ecological Economics and Sustainability (Spring of Odd years) – 10 students.
7. *(UG) UNIVRSITY197NRC1 Water Resources (Fall) – 15 students.
8. *(UG) HONORS 391D Blue Gold and World water wars (Spring) – 16 students.
7. *(G/UG) W&FCON 597S Coastal Watersheds: Issues and Problem Solving (Spring 2001). One time offering with more than 25 Students.
Focused on combining science and technology into watershed education offered as off-campus, field-based course.
6. *(G/UG) W&FCON, FOREST 597O Watershed Science and Management Online. (Spring).
Enrolment 20 Students per semester.
Unique offering as a distance education through multimedia, distributed projects, and threaded discussions.
7. (UG) Economics of Farm management (AGEC 401), TNAU, 1988-91.

Others: Invited lectures in Environment and Society (NRC 100), Resource Policy (AGEC 616), 1996; Concentration coordinator for professional masters program in watershed management (Also designed the program), Invited lectures in Ecosystem Management at UMASS; Linear Programming (AGEC 601 lab), 1991.

Graduate Advisory Committee:

Chair: E. Ross Glacier-watershed interaction in tropics (MS 2013) ; K. Collins (MS 2012) Instream habitat and landscape changes; J. Hart (MS 2012) Environmental Management; R. Dublois (MS, 2009) Climate change and wetland dynamics; L. Galindo (2014 PhD) Landscape and watershed systems; S. Nampindo (2012 PhD) Climate change on water resources and biodiversity; P. Ekness (2012 Ph.D) Watershed ecosystem dynamics; O. Tsvetskova (2012 PhD) Complexity in watershed systems; O. Tsvetskova (2007 MS) Spatio-temporal Modeling; A. Hawes (2007 MS) Sediment and aquatic Impacts; I. Sekar (2007 PhD) Agriculture and water quality; E. Marshall (2005 MS) – Global Warming and Watershed Modeling; P. Ekness (2005 MS) – Riparian systems; Debbie Shriver (2004 MS) – Watershed Classification; K. Davis (2002 MS) – Neotropical bird habitat; M. Matteo (2002 MS) – urban watersheds; S. Lowe (2001 MS) - Biodiversity in watershed planning; E. Keeler (2000 MS) – urbanization;

Member: A. Sadeghpour (2014 PhD) Cover crop systems; Cortni Borgerson (2013 PhD) Primate ecology; Supagit Vinitpornswan (2012 PhD) Tiger Ecology; Malik Marjan (2012 PhD) Wildlife migrations; Ali Farzad (2010 PhD) Cover cropping; Dave Timmins (2010 PhD, Res. Econ) Bio-energy economics; Alex Manda (2009 PhD. Geosciences) – Hydrostructural domains, Colleen Samson (2011 MS) surface and groundwater monitoring; Emily Wright (2011 MS) Phosphorus loading in Landscape planning; Kimberley Klosterman (MS 2011) Baseflows and impervious cover; Sarah Raposa (2011 MS) sustainable city planning; Denise Luken (2009 MS) – Stream crossing; Jenny Allen (2006 MS) – Coastal Coliform Contamination, Jim Dedes (2005 Ph.D. UMass-Boston) – Watershed metrics; Joseph Ogradowczyk (2004 Ph.D) – Nonmarket valuation; Mike Lewis (2003 MS) – Stream Daylighting; Bruce Bayne (2002 MS)- Wetlands; Matt Donzella (2002 MS) – Forest Watersheds; JeanMarie Skalka (2001 MS)- Wetlands; Mike Stoltzfuz (2001 MS) – Wetlands; D. Corlett (2001 MS) – Riparian Modeling; Kristy Norwood (1999 MS) – GIS.

Students Services:

Advising Faculty for several undergraduate students (25 students per year in Environmental Science and NRC majors).

Staff mentor for a first generation and low-income student under HORIZONS Student Support Program of Purdue University (1996)..

SERVICE

Academic Service:

2009-current: Undergraduate Concentration Coordinator (NRC- Water Resources)

2009-current: Graduate Concentration Coordinator (Eco-Water, wetlands, and watersheds)

2003-Current: Faculty Senate Computer & Electronic Communications Committee

2002 – 2003: Interim Scientific Director, Water Resources Research Center, UMass

2002 - Provost's Task Force on Graduate Admissions to achieve diversity, UMass

2000 – Current: Academic Honesty Board, Ombuds Office, UMass

2000 – 2008: Chair, Computer committee, Dept. of Natural Resources Conservation.

1999 - Chair, Ad-hoc outreach-planning committee, Dept. of Natural Res. Conservation.

2002 – 2006: Member - Minority recruitment committee, Website committee.

Scholarly Review/Professional Activity:

2009-Current: Editor – Journal of Earth Science and Climate Change

2004- Current: Editor, International Journal of Ecological Economics and Statistics

2010 – Guest Editor – Northeast Naturalist

2008, 2009, 2010 – Tahoe Science Consortium- Peer Review
 2010 – National Science Foundation (NSF) and Regional Climate Prediction using Earth System Models (EaSM) – Proposal review
 2010 – International Foundation for Science (IFS) Peer review.
 2002-2003 UMASS Water Resources Research Center – Chair of Review Panel
 2003 USEPA-STAR – Review Panel member
 2000, 2002, 2004 USDA-National Research Initiative - Review Panel Member
 2002 The Netherlands Foundation for Advancement of Tropical Research (WOTRO) – Scholarly Review Panel
 2000- Current: American Water Resources Association Tech. Committees: Hydrology & Watershed Management Committee, International Committee, and Policy Committee.
 2003- Current reviewer of Water Resources Research
 2000 – Current: reviewer of the Journal of Hydrology
 1999 – Current: reviewer for the Transactions of American Society of Agricultural Engineers
 1998- Current: MA State Technical Advisory Committee of NRCS-USDA.
 1997 – Current: reviewer for Agricultural and Resource Economics Review (2 per year)
 1995- Current: reviewer of the Jl. of Soil and Water Conservation. (2 manuscripts/year)
 1996- Current: reviewer for The Journal of the American Water Resources Association, formerly Water Resources Bulletin. (5 to 6 manuscripts every year)
 1999- Current: reviewer for American Journal of Agricultural Economics.
 1997- Current: Member of Professional Activity Committee of American Ag. Econ. Assoc.
 1998- Current: Member of the International Committee of the American Ag. Econ. Assoc.
 1996: American Water Resources Association - Professional Technical Committees:
 (i) Water Policy; (ii) Geographic Information Systems and (iii) International Issues.
 1989: Three-member Expert Panel appointed by Vice Chancellor, T.N.A. Univ. to study the
 1997: Panelist in Berg Colloquium on “The Role of Groups and Organizations in the Policy Making Process” at SWCS 97 Meeting, Toronto.
 Invited panelist for Berg Forum on “National Natural Resource Conservation Issues” (Jan-Feb, 1998) held at Washington, DC.

Community Service:

2011-2012 Massachusetts Director and Board member of Southern New England Chapter of Soil and Water Conservation Society.
 2010 (Sept-Oct): Director of “The Institute of Energy and Environment” to 21 international student leaders from 6 countries. Collaborated with ITD, South Amherst and sponsored by the US State Department.
 2004-2007: Board member of the Massachusetts Watershed Coalition, Leominster, MA.

Extension and Outreach Experience:

(* indicates outreach while at UMass).

- ◆ * Online decision support – <http://aqua1.eco.umass.edu/>
- ◆ * Provided intense training in Energy and Environmental issues (Sept – Oct 2010) to 21 international students from France, Brazil, Indonesia, Russia, Germany, and India in collaboration with ITD, Amherst. Sponsored by the US State Department.
- ◆ * Provided short training in 2008 on water resources management to International policy makers from Eurasia as a part of U.S. Department of Commerce’s Special American Business Internship Training (SABIT) program - Water Resources Management for Central Asia, Western Eurasia, and

the Caucasus. Participants were from Armenia, Georgia, Tajikistan, Turkmenistan, Kazakhstan, Kyrgystan, Moldova, Ukraine, and Uzbekistan.

- ◆ *Provide watershed information through web: <http://www.ecowaters.com/WIS/> and <http://www.ecowaters.com/wscourse/>.
- ◆ *Serve on a faculty role in the Natural Resources and Environmental Conservation (NREC) Program of the UMass Extension and worked with extension personnel in various outreach activities.
- ◆ *Organizer of Watershed Conservation Annual Conference that attracts agencies, universities, and citizens through New England States. Four conferences were conducted (Total of 480 attendees) participated from throughout the New England region.
- ◆ *Conducted several workshops on water quality and watersheds to farmers, K-12 teachers, community leaders, watershed team leaders, and high school students.
- ◆ *Directed the Water Resources Research Center, The Environmental Institute during 2002.
- ◆ *Developed outreach targeting for urbanizing areas through modeling and sustainable planning.
- ◆ *Conducted watershed-based environmental extension and outreach in several watersheds throughout Massachusetts.
- ◆ *Conducted training in watershed management to Mayors and Professionals from Honduras (areas affected by Hurricane Mitch) in collaboration with ITD, Amherst.
- ◆ *Conducted training in watershed management to Mayors and environmental scientists from Columbia in collaboration with ITD, Amherst.
- ◆ *Developed programs to connect student learning through community service (service learning and watershed internships) to watersheds in the New England region.
- ◆ Developed web-based applications to assist farmers, regional planners, local and federal decision makers in least-cost water quality and pollution management
- ◆ Participated (presented in two sessions) in a Midwest Extension Workshop in Indianapolis, IN (1995).
- ◆ Participated in farmer demonstrations and campaign programs in developing countries.
- ◆ Participated in farm-level surveys to identify collect data on local problems in resource use.

COMPUTING EXPERTISE

Web Applications: <http://aqua1.eco.umass.edu/>; <http://r1nas.eco.umass.edu/>; and <http://www.ecowaters.com/wis/>.

Operating Systems: Windows, UNIX, Solaris

Optimization: GAMS

General Equilibrium Modeling: GEMPACK/GTAP, MPS-GE

Econometrics/ statistics: S-PLUS, SYSTAT, SAS, LIMDEP, STATA, SHAZAM, FRAGSTAT

GIS: GRASS, ARCGIS

Simulation: STELLA, Anylogic, SIMILE, EPIC, GWLF, AGNPS, SWMM, SWAT, BASINS.

Mathematical: Mathematica, Matlab, Mathcad

Internet: Java, ASP, JSP, Web server administration, Frontpage

Programming: Java, C++.

SUMMARY STATEMENT OF INTEREST AND PROFESSIONAL GOALS

Research philosophy: "A systems-approach through using trans-disciplinary perspective." Natural resources and ecosystems form the natural capital of a society. Ecosystem dynamics, economic markets and institutions play a key role in management of these vital resources. The interaction between human and natural systems is often a complex process that includes biophysical, ecological, economic and cultural dimensions. To develop an appropriate approach, it is essential to understand the system in a four-dimensional, space-time continuum. Natural resources change in quality and quantity over geographic space and temporal space and depend on the feedback from economic and ecological processes. The use of mathematical models that involve calculus of variation and optimum control theory can improve modeling of these processes. Another important dimension is group decision-making involving multi-objective optimization and simulation. Advancements in social choice theory and institutional mechanisms design, ecosystem theories, general equilibrium theory, mechanism design of market and non-market instruments, and spatial and temporal control theory can be used to address such complex problems. For example, the spatial dynamic optimization (Ph.D. work) framework is an integrated approach to address problems that are related water quality, production, resource management, forest and wildlife management, location of firms, and ecosystem management. Quantitative techniques that involve a combinatorial use of mathematical programming, process simulation, Geographic Information Systems (GIS), and econometrics are also critical elements of successful research.

Teaching philosophy: "Enrich students with skills and knowledge to achieve excellence through pluralistic pedagogy." Teaching methods need to aim at enhancing creative and comprehensive learning. A community service learning approach (students involving in community problems) is a key to teaching success. Given the heterogeneity of a student body with respect to knowledge, learning abilities, personalities, and skills, teaching should aim at improving individual skills, while increasing the knowledge level of the entire group. This can be accomplished by using a careful mix of individual training, feedback mechanism, and interactive group discussions. Creative experiments in economic, social, and ecological systems, debates, role-playing, case studies and in-class projects are some examples of effective teaching methods. Multimedia tools, the Internet, topic research, reading assignments, discussion open houses, group projects, and critique of research and policies are other effective tools to train students in decision-making. Such teaching methods will also enable students to understand the underlying theory and principles, while developing practical skills in problem solving. Instead of traditional unidirectional flow of knowledge, it is essential to follow a pluralistic pedagogy (bi-directional teaching and learning) that includes learning about students' educational requirements.

Service Philosophy: "Service through innovative technologies and participatory training" Final end point of research and teaching efforts is to benefit the society. Working with grass-root level decision-makers is critical to respond to the needs of the public. There exists excellent scope in the use of virtual (Internet and computer based) and direct means (field contacts) to gather information and to disseminate improved approaches to problem solving at local, national, and international levels. A demand-driven, individual-based, and incentive-driven approach is essential to transfer knowledge and technology to address problems facing the public and communities. My philosophy is to involve public or clients of research earlier in the process, in problem definition, modeling, and analysis, rather than involving at the final stage of a program. Professional enhancement through national and international interaction is also important.

While research (R), teaching (T), and service (S) are usually compartmentalized as individual tasks, an effective approach is to integrate these three areas through student research (R \leftrightarrow T), community service learning (T \leftrightarrow S), and community-participated research (R \leftrightarrow S). An application of this integrated strategy can complement each other toward a win-win outcome in all the three areas. My academic objective is to achieve professional excellence through superior research, excellence in teaching, and outstanding public service.