

The University of Iowa
ABRD:3445 India Winterim 2017-18
CEE:4385 International Perspectives in Water Sciences and Management
Section 0002:

WATER POVERTY IN RURAL INDIA: A FRESHWATER CRISIS
CASE STUDY

Winter Session, December 27, 2017 – January 14, 2018
Gurgaon (near Delhi), India

Course Instructor: Allen Bradley, PhD, IIHR-Hydroscience & Engineering
(allen-bradley@uiowa.edu)

Course Director: Marian Muste, PhD, IIHR-Hydroscience & Engineering
(marian-muste@uiowa.edu)

Study Abroad Advisors: Amy Bowes and Emily Gruis
(india-winterim@uiowa.edu)

COURSE DESCRIPTION

We all know water is essential for life. Yet in Iowa, we often take freshwater for granted. Each day we use water for drinking, cleaning, and cooking. But we don't think twice about where the water comes from, what it takes to get it to us, or whether it is safe to use or drink. In a very real sense, the immediate availability of clean water is a miracle of life in the modern world.

But in many places in rural India, freshwater is a scarce resource. Homes do not have running water. Villages do not have a central water supply. The fortunate are able to retrieve water from a nearby source within walking distance. Still, fetching water is a time consuming daily chore. For those without a freshwater source nearby, water poverty means hardship. Hence, in many rural settings in India, the availability of freshwater defines one's daily life and determines one's economic wellbeing.

This course is a case study on water poverty in rural India. You will learn firsthand about the freshwater crisis that exists in the Mewat District, a rural agricultural valley in northern India that is under-developed economically even by India standards. Fresh groundwater is the primary water source for drinking and irrigation in the area. However, this resource is threatened by overuse, by increasing demand from a growing population, and by climatic changes in monsoon rains. During your time in India, you will be engaged in projects that investigate practices aimed at enhancing water supplies. Through these activities, and your interactions with our local partner and the population in Mewat, you learn how culture, economics, and the environment shape this region and determine the sustainability of water resources.

To see what you will learn and experience by taking this course, view the *Water Poverty in India* video by Joanna Krajewski, a student in the first offering of this course:

<https://www.youtube.com/watch?v=i9fakYMMwo>

PARTNER ORGANIZATION

The **S.M. Sehgal Foundation** (www.smsfoundation.org) is our host and partner in India. In 1999, the Sehgal Foundation registered as a trust to further the wellbeing of rural communities in India. The Sehgal Foundation envisions rural people across India motivated and empowered to make their lives more secure and prosperous through education, better health, improved skills and supportive governance. It develops need-based strategies and programs for poverty alleviation, undertakes research and creates knowledge on sustainable rural development, builds capacities for rural development, and analyzes the impact of local state and national policies on rural development.

A major initiative of the Sehgal Foundation in the Mewat District is the implementation of engineered practices designed to improve freshwater supplies in the area. These practices include the construction of check dams in the Aravalli Hills to enhance freshwater recharge, and the installation of rainwater harvesting systems at schools to store captured water in groundwater wells and create a freshwater pocket. Our collaboration with the Sehgal Foundation focuses on evaluating these efforts to enhance freshwater supplies.

The grounds of the Sehgal Foundation in Gurgaon, Haryana, will be our home base while in India. Gurgaon is located in the suburbs of New Delhi, India's capital city and the home of treasured historical and cultural sites. Sehgal's headquarters are an exemplary example of "green" building technologies, constructed according to the Platinum standards of Leadership in Energy and Environmental Design (LEED), set by the U.S. Green Building Council and the Indian Green Building Council. You will meet and interact with Sehgal personnel at the headquarters, and staff will escort us on our visits to village clusters in the Mewat District for field work.

ACADEMIC ACTIVITIES

This is a course for undergraduate and graduate students with an interest in water and real-world sustainability issues. Students come from different disciplines and bring different perspectives—from physical sciences and engineering, to sustainability studies and social science. Each student is expected to participate in group and individual projects activities (which are often tailored to an individual student's interests and skills). Our projects involve field work in Mewat designed to test hypotheses, and subsequent data analysis back in Gurgaon. At the end of the course, you will make a short presentation to share what was learned; you will also receive feedback about the impact of our project activities from



Sehgal Foundation personnel, and hear about its significance to their efforts to address the ongoing freshwater crisis.

Course work on projects is complemented with afternoon and weekend cultural activities. Visits are planned to Delhi, Jaipur, Agra, and Haridwar. Field trips to cultural and historic sites (e.g., Amber Fort, Taj Mahal, the Ganges River and Himalayas) are designed to strengthen your cultural awareness.

GRADING POLICY

Students earn 3 semester hours for this course. Components of the course include readings, discussions, classroom and field activities, individual investigations, working on a team, and a final presentation. Grades are based on activities conducted both before and during the trip.

Prior to departure (10% of final grade):

- Attendance at all required meetings prior to departure
- Individual assigned readings related to the class (one project related, and one about a cultural or historical site we will visit)

During the stay in India (90% of final grade):

- Participation in class and field work
- Daily progress on individual and team assignments
- Individual contribution to project objectives
- Technical presentation at the host institution

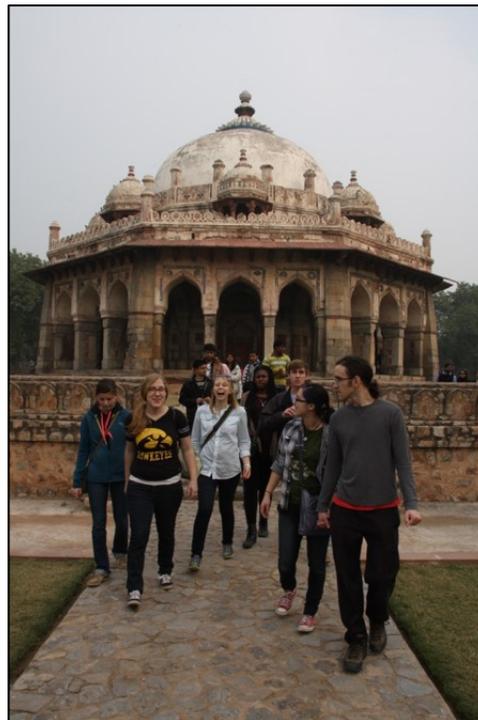
After returning, students are expected to present their work (as a group) at a planned seminar at the University of Iowa.

PASS/NONPASS

Students participating in Study Abroad programs of four weeks or less may not take Study Abroad courses on a Pass/Nonpass (P/N) basis.

ELIGIBILITY AND PREREQUISITES

The course is open to all students with good academic and disciplinary standing, and an interest in participating in a project-based course on water and sustainability issues. The instructors will thoroughly review each application and make the final decision on admission.



Class enrollment is limited to 15 students for logistical reasons (repeated field trips with smaller size vehicles in rural areas). Initially, applications will be reviewed and approved in the order they are received. Once the approved enrollment reaches 12 students, admission to the course will be made on a competitive basis. Specific criteria will include prior course work and cumulative GPA, the student's personal statement (as evaluated by the instructors) and academic classification (preference given in order to graduate students, seniors, juniors, and then sophomores), and the time of application (preference given to earlier applications). Final decisions for all applicants will be made before or shortly after the final application deadline (20 September).

Study Abroad will maintain a waitlist and will notify any students who are waitlisted. Further information will be sent out to waitlisted students about next steps.

COURSE INSTRUCTOR AND DIRECTOR

Allen Bradley is a Professor in Civil & Environmental Engineering, and a Research Engineer at IIHR-Hydrosience & Engineering (IIHR) at The University of Iowa. His research expertise is in hydrology and water resources, including watershed modeling, river forecasting, and risk assessment. Dr. Bradley teaches courses in hydrology and hydraulics, water resources engineering, and atmospheric sciences. He has participated as the course instructor of this India Winterim course on two occasions (2014 and 2016), and as an instructor in two other *International Perspectives in Water Science Resources and Management* courses through IIHR.

Marian Muste is a Research Engineer at The University of Iowa's IIHR-Hydrosience & Engineering (IIHR). He is an Adjunct Professor in Civil & Environmental Engineering and in Geographical and Sustainability Sciences, and has a complementary appointment with the UI's International Programs. His most recent area of research is the development of large-scale data/information management systems, sensors and sensor networks, and their implementation in research and education focused on sustainable use of water and land resources. Dr. Muste is an expert for UNESCO and World Meteorological Organization projects. Since 2001, he has led the *International Perspectives in Water Science Resources and Management* course organized by IIHR, and has led this India Winterim course as the course director on all four occasions.



COURSE DATES & TRAVEL

Exact travel dates will be confirmed only once airline tickets have been purchased. Planned departure from the U.S. on Wednesday, December 27, 2017 and return to the U.S. on Sunday, January 14, 2018.

PROGRAM HISTORY

India Winterim is an intensive, three week field-based program that provides students with the opportunity to learn from and directly interact with leading social entrepreneurs, non-profit organizations, and academic institutions within India's diverse cultural, socioeconomic, and geographical mosaic. India Winterim was founded in 2006 by Professor Rajagopal of the University of Iowa's Department of Geographical and Sustainability Sciences. The program began with 24 students and has since grown to the largest single program offered by UI Study Abroad. India Winterim was the recipient of the 2016 Institute of International Education (IIE) Andrew Heiskell Award for Innovation in International Education.

ADMINISTRATIVE HOME

International Programs (University College) is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 111 Jessup Hall or see: <http://uc.uiowa.edu/academics>.

This course is cross-listed in *Study Abroad* (ABRD:3445) and *Civil & Environmental Engineering* (CEE:4385). Students from the College of Engineering are encouraged to enroll in CEE:4385 if they wish to use the course as an Elective Focus Area elective or a graduate technical elective.

STUDY ABROAD INFORMATION

The priority application deadline is Tuesday, August 1, 2017, and the regular application deadline is Wednesday, September 20, 2017. The India Winterim program application is available on the Study Abroad web site under the *Application* tab (<http://international.uiowa.edu/india-winterim>). University of Iowa students submit their applications through an online form to Study Abroad. For interested students from other colleges or universities, please visit the web site for application instructions.

Students may contact Study Abroad advisors Amy Bowes or Emily Gruis to discuss the application process, scholarships, and financial aid. To schedule an appointment, please call Study Abroad at 319-335-0353 (Monday through Friday, 8:00 AM to 5:00 PM) and the receptionist can help you set up an appointment with Cory in International Programs, 1111 University Capitol Centre. For information about **scholarships** and **financial aid**, go to: <http://international.uiowa.edu/study-abroad/funding>.

For students in the **College of Engineering**, there are additional opportunities for study abroad scholarships, including the *Global Engineering Scholarship*. For additional information on scholarships or advising on study abroad in engineering, please contact Anat Levtov (anat-levtov@uiowa.edu), Director of Global Experiences, or stop by the Student Development Center (3124 SC) to schedule an appointment.