

PhD in Sustainable Development

PhD in Sustainable Development
School of International and Public Affairs
Columbia University

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About the Program

The sustainability of development presents some of the most important policy challenges concerning the future of our planet. None of these central issues can be understood from the sole perspective of a traditional discipline, whether in the social, natural, engineering or health sciences. The PhD in Sustainable Development combines a traditional graduate education in the social sciences, particularly economics, with study in the natural sciences and engineering, to prepare scholars who are uniquely situated to undertake serious research and policy assessments in furthering the goal of sustainable development. The program includes a set of rigorous core requirements in the social and natural sciences designed to provide a deep understanding of the interaction between natural and social systems, and provides students with the flexibility to pursue in-depth research in a broad variety of critical policy areas. No other doctoral program produces graduates with the unique combination of diverse skills and deep insight into the most challenging problems of future human welfare. Together with experts and faculty at Columbia, students in the program conduct research in a wide variety of areas including climate change and its social consequences, causes and solutions to extreme poverty, energy systems, agricultural transitions, water resources, infectious disease, global demographic change, ecosystems, disasters and conflict. Students also benefit from being part of the Earth Institute's research and practice programs that focus on sustainable development.

Many graduates will pursue academic careers in interdisciplinary graduate and undergraduate programs with a focus on policy and the environment as well as in the more traditional social science disciplines. Others will choose nonacademic positions, taking leadership roles in government ministries in the United States and throughout the world, working on environmental and sustainable development policy for NGOs; in international institutions such as the IMF and the World Bank; or in private firms engaged in environmental and development projects.

Housed at the School of International and Public Affairs (SIPA), the PhD program continues Columbia's recent initiatives in multidisciplinary doctoral education and also reflects SIPA's longstanding commitment to interdisciplinary graduate social science education for policymakers and analysts.

In just six years our PhD program, with its unique emphasis on rigorous scholarship and research at the boundary between social and natural sciences, has become the most sought after advanced degree of its kind in the world.

Applying to the Program

Rigorous work in the natural and social sciences at a graduate level requires that students have experience in mathematics and the natural sciences, as well as in the social sciences and economics, before embarking on the PhD program. For this reason (and in order to fulfill prerequisites for the required natural science course sequences), applicants should have outstanding undergraduate records. Generally, requirements include four semesters of college-level social science, including two semesters of economics, and six semesters of college-level math and science. Specifically, all applicants must have successfully completed two semesters of college-level calculus and demonstrate competence in multivariate calculus and linear algebra. Applicants must also have high scores on the GRE with particular emphasis on the quantitative score.

Application Deadline

Complete applications must be received by December 15th, at the latest, for admission for the following fall term. The program does not accept applications for the spring semester.

Curriculum

The distinctive and innovative nature of this program requires a core set of courses that provide an interdisciplinary grounding. Each of these courses is taught on the level expected of first- or second-year PhD students in the affiliated departments. The course structure is designed to provide students with PhD-level training in economics and a natural science field, complemented by integrative courses in sustainable development designed specifically for this program and courses in social sciences. The course structure is designed to combine flexibility to pursue an individual field of study, with the development of broad-based skills and knowledge. The core curriculum consists of 10 core courses, listed below. Students must also complete two social science electives, and a coherent sequence of four natural science courses. In addition to course work, students participate in an integrative seminar (U9200) throughout the first three years of the program, complete an MA thesis and take an Orals exam (leading to the MPhil degree) in addition to presenting and defending a PhD dissertation.

Due to the unique interdisciplinary content of the program, students entering with a master's degree earned at Columbia or elsewhere are still required to complete all MA and MPhil course requirements and examinations.

Requirements for the MA

(completed before the beginning of the third year)

1. **Completion of all required courses in the first two years as follows:**

Sustainable Development

These courses are designed and taught specifically for the PhD students in Sustainable Development, although they may be open to students from other programs.

- Human Ecology U9240
- Politics of Sustainable Development U9250
- Environmental and Resource Economics U9245
- Comparative Development U9260
- Macroeconomic Policy and Sustainable Development U9606

Core Economics Courses

All core economics courses are taught in the Economics Department and are drawn from the Economics PhD syllabus. More information about these courses can be found from the [Economics department Web site](#).

- Microeconomic Analysis I and II (G611 - G612)
- Introduction to Econometrics I and II (G6411 - G6412)

A third course in Quantitative Analysis is also required.

Natural Sciences

- [Environmental Science for Sustainable Development U6240](#): A foundation course in Earth Science, Climate, Hydrology, Ecology and Public Health.
- 3 natural science electives drawn from the following departments: the [Department of Ecology, Evolution, and Environmental Biology \(E3B\)](#); the [Department of Earth and Environmental Sciences \(DEES\)](#); the [Department of Environmental Health Sciences \(EHS\)](#) at the Mailman School of Public Health; and the [Department of Earth and Environmental Engineering \(DEEE\)](#) at the Fu Foundation School of Engineering and Applied Science (SEAS). For details of natural science electives previously taken by students in the program please see [here](#).

In total, students must complete a minimum of 60 credits with a B+ grade average.

2. Completion of the MA Project

The master's project should be completed by May 1, in the fourth semester and should address a problem in sustainable development using data and methodologies from the four natural science courses completed in the first two years of the program. The project consists of an article (around 30 pages long), which would be publishable in an appropriately refereed academic journal reflecting the disciplinary orientation of the project. For titles of MA projects previously completed by students in the program please see [here](#). Students should submit the Masters paper to their research advisor(s) who will grade it, with a reference copy to the DGS.

Advising

Students should establish a primary research advisor before the end of the fourth semester, ideally earlier. For the first two academic years the DGS will have the role of academic advisor. The role of the advisor is to guide and monitor research progress including reporting to GSAS on the progress of the student, sitting in on Orals and Defense committees and associated duties. Given the nature of the PhD program it is highly desirable that students have a second major advisor to ensure that social and natural science disciplines are both covered.

Requirements for the MPhil

(to be completed before beginning full-time work on the dissertation in the fourth year)

Students begin examinations for the MPhil in Sustainable Development only after they have completed all core courses described above, the natural science course sequence and the social science elective sequence, as well as the MA thesis. In order to take the oral examinations for the M. Phil., students must also submit a dissertation prospectus. Examination of the prospectus and fields of scholarship are completed at the end of the third year.

1. **Completion of the MA requirements described above**
2. **Completion of all *third-year required courses*, described below:**

Social Sciences:

Two social science electives. For details of social science electives previously taken by students in the program, please see [here](#).

Elective Course:

Continued participation in the Sustainable Development seminar is also required (students are required to register for the seminar in their first three years and are encouraged to attend throughout their tenure).

3. **Submission and approval of the *dissertation prospectus***
4. **Fulfillment of requirements to prove competency in *two research tools***

Students should possess at least two research tools before starting the dissertation portion of this program. Among these is an advanced understanding of quantitative methods, to be gained through the mandatory core courses in quantitative methods (Introduction to Econometrics I and II, and a third Quantitative Analysis course). The other research tool should be appropriate to the student's dissertation work. In consultation with the student's academic advisers, this second tool could be fulfilled through a two-course sequence in GIS or other analytic modeling systems, or through a proficiency examination in a language that may be particularly important for understanding the literature of the student's chosen specialty, and selected with the approval of the academic adviser. English is not accepted as a foreign language in fulfillment of this requirement.

5. **Successful completion of the *MPhil Qualifying Exams***

Students are eligible to take the qualifying examinations (Orals) for the MPhil at the end of their third year or early in their fourth year, and must take the exam before the end of the fourth academic year at the latest, after satisfactory completion of all required coursework, and having obtained a GPA not less than B+. The qualifying examinations are made up of a two-hour long oral exam designed to examine the candidates' formal learning and their capability to do independent research, including the presentation of a dissertation prospectus/proposal. The examination committee will consist of three faculty members, normally from the Sustainable Development core faculty, and will be chaired by the Director of Graduate Studies (DGS), who will lead the discussion of the prospectus. Students who fail to sit for their Orals by the end of the summer of their fourth year are at risk of being removed from the program.

To be eligible to take the Orals, candidates must have:

1. Completed coursework (60 credits of required and elective courses);
2. Presented a research project in the Sustainable Development Seminar SDEV9200.01. The research should have been conducted during the course of their PhD studies at Columbia and could form the nucleus of their subsequent MA thesis. This project should be presented during the course of the second year and will be graded by the Professor conducting the seminar. If the research does not prove satisfactory, the student may be required to present a different research project. A passing grade (B+) permits the student to complete the MA thesis and move on to take the Orals.
3. Submitted -- with satisfactory evaluation -- a Master's thesis, at least three months before the Orals.

The Orals will be divided into two distinct parts as follows:

- a. Examination of proficiency in fields most relevant to the proposed research, from within the following three subjects:
 - i. Economics (e.g. development economics, environmental economics etc.);
 - ii. Natural Science (e.g. hydrology, climatology etc.);
 - iii. Sustainable Development (the general, integrative field in which the relevant coursework and proposed research resides).

Students can choose, if they deem that relevant, to add an elective 4th field which could be another subfield of the above, or the study of a region, etc.

[The examination fields and associated reading lists have to be approved by the respective examiners AND by the DGS by the beginning of the semester in which the exam is taken.]

- b. A presentation of the dissertation prospectus/proposal. The dissertation can be in the form of a regular size document or in the form of 3 separate but connected papers. It needs to be distinct from the Master's thesis though it can build on the research done for the latter. The prospectus should be approximately 10 pages long and cover the methods and objective of the research project. For those writing 3 papers, the prospectus should describe all three. The candidate will give a five minute formal presentation of the prospectus, and all members of the examining committee, led by the DGS, will ask questions related to the prospectus.

Half an hour will be dedicated to each field exam, and half an hour to the dissertation prospectus, after which the examiners will deliberate.

Evaluation:

Each of the four components of the Orals, examination in the three chosen fields and presentation of the dissertation prospectus, will be given a separate grade on a scale of 1 to 5. If the average grade given by the examining committee is 3.5 or above the student receives a clear pass. If the average grade is below 3.0 the student will be considered to have failed and will be required to leave the program by the end of the current semester. If the average grade is between 3.0 and 3.5 or if any individual grade is below 3.0 the committee will discuss options that may include requiring the student to take further courses, revise their prospectus, or provide a revised research paper, among other options.

The student can be told informally about the results of the examination after the examiners' deliberations.

To Obtain the M. Phil Degree, the student should have:

1. Completed the coursework (60 credits of core requirements and specialization electives as approved by the DGS), with a B+ average.
2. Passed the Orals with a 3.5 grade.
3. Completed at least 4 out of 6 semesters of service requirements (TA or RA appointments). Students with outside funding need to complete a minimum of 2 TA appointments.

The Core faculty and the DGS will exercise their judgment in determining, on the basis of the student's full record, whether he or she should be awarded an MPhil and advance to the PhD candidacy.

Requirements for the PhD Dissertation

The PhD dissertation will be on a social science topic in sustainable development. The social science research will be informed by an understanding of physical and natural science constraints and opportunities influencing economic development.

Students with a regional area of interest to their dissertation may wish to conduct research abroad, to conduct field studies, use archives, improve language skills, or confer with local experts. In order that students may complete the PhD program without delay, it is preferred that they make use of summers to conduct such research. Students who feel they require a longer period of field research or language training need the approval of their adviser, the director of graduate studies, and – if relevant – the director of the associated regional institute at the School of International and Public Affairs. Students may not receive extended residence credit for study or research away from Columbia before the completion of all course work requirements and comprehensive examinations.

Service Requirements

In addition to the completion of the requirements for the MA and the MPhil, students have to fulfill a teaching and research requirement. This entails six semesters of work as a teaching assistant or a research assistant, as assigned by the director of the program. Students typically serve as teaching assistants in SIPA masters-level classes as well as a few undergraduate courses. Students who secure external fellowship funding may reduce this requirement with the approval of the Director of Graduate Studies, but in all cases every student must teach at least two semesters.

Sixth Year

The PhD in sustainable development is designed and supported as a five-year program. It is recognized that some students may need to extend their studies for all or part of a sixth year. While this can be accommodated administratively, students cannot assume that funds will be available to support a sixth year of study and they are urged to make efforts to secure fellowship support or obtain funds through their advisors. Sixth year extension may be granted as exceptions and must not be assumed.

PhD Defense

1. Candidates must first apply for scheduling of the final examination with the Graduate School of Arts and Sciences at the time they submit a final draft of their thesis to the primary advisor. No fee is attached to this application. Application should be made to the Graduate School at the same time. The candidate is required to keep the Associate Dean informed when the thesis is submitted to the Advisory Committee, so the necessary administrative paperwork can be expedited.
2. The final examination will not be scheduled until the Director of Graduate Studies has recommended the dissertation for defense. Members of the PhD Examining Committee must be given a minimum of three weeks each to read the thesis, so the defense may comfortably be scheduled about two months after submission of the thesis to the Committee.
3. Before being recommending for defense, the candidate must submit to his/her Advisory Committee draft copies of the thesis, including figures, plates and tables and obtain the Advisory Committee's written approval of the draft. (Written approval by the Advisory Committee indicates only that the thesis as it stands or with revisions suggested by them is in good enough form to justify scheduling the defense.) The Director of Graduate Studies may then recommend scheduling of the final examination.
4. After the Advisory Committee has given this preliminary approval in writing, and the candidate has made any revisions suggested by them, he/she must distribute copies of the dissertation to the external readers. Instructions for the correct form for preparing the manuscript and information on publication options may be obtained via the Graduate School's website (<http://www.columbia.edu/cu/gsas/>) or from the Associate Dean.
5. The candidate must see that outstanding fees or loans to the University are paid and make sure that he/she has fulfilled all other Departmental requirements. When these requirements have been fulfilled and the Examining Committee has been appointed by the DGS, the candidate is notified of the examination date, usually about two weeks in advance.
6. After passing the final examination, the candidate must see to any minor revisions and their approval by the Examining Committee before final deposit. If major revisions were called for (a defense-vote of "incomplete"), these must be made and submitted within a stated period (usually no fewer than three months and no longer than one year from the date of the defense) to the supervising committee, whose approval will have to be certified to the dean in writing before the candidate can be recorded as having passed the final examination. From the time of the "pass" vote, the student has a maximum of six months to deposit the thesis.

Two copies of the final dissertation may then be delivered to the GSAS Dissertation Office, 107 Low Library, after securing a signed approval card from the Department chair.

Under either option, one extra copy of the 350-word abstract and one extra copy of the title page must be included, along with any University deposit fees (paid by the student, not from contracts and grants).

7. The doctorate is awarded in October, February, and May. Check the academic calendar for specific deadlines for the final deposit of the dissertation. (You may, however, call yourself “Dr.” as of the day of your deposit, since that date will appear on your official transcript.)

Open defenses

If both the candidate for a defense and the Advisory Committee choose to have an “open” defense, the following will apply:

- a. The candidate will have a maximum of 40 minutes to present major conclusions of the thesis research, with at least half of the time devoted to a description of new findings or insights in the field discussed that directly resulted from research by the student.
- b. Any member of the University community or other interested parties can attend the first part of the thesis defense.
- c. Questions following the initial presentation are permitted for a maximum of 10 minutes.
- d. Following the oral presentation by the candidate and the brief period for general questions, the defense committee will question the candidate in closed session for a period of up to 90 minutes.

If either the candidate or the Advisory Committee prefer, the procedures for “closed defense” (i.e., 20-minute oral presentation followed by questions from the defense committee in closed session for a period of up to 90 minutes) will be followed.

Governance and Faculty

The PhD in Sustainable Development is housed in the School of International and Public Affairs (SIPA) and the degree, as all graduate degrees at Columbia, is awarded by the Graduate School of Arts and Sciences. The program is co-directed by Professor Jeffrey Sachs and Professor Joseph Stiglitz.

Reflecting the diversity of the field faculty who participate in the program by advising students, teaching in required courses or serving on committees etc, are drawn from a wide variety of schools and departments in addition to SIPA. A student’s primary advisor need not be a SIPA faculty member but should be a member of the Columbia faculty.

Program Committee

The PhD Program Committee is the primary governing body of the program and is chaired by the Director of Graduate Studies (Professor John Mutter) and includes the Dean of SIPA (Professor John Coatsworth) and a number of other members, currently Professor Douglas Almond (SIPA and Econ), Professor Mark Cane (DEES and APAM), Professor Upmanu Lall (Engineering), Professor Wolfram Schlenker (SIPA and Econ.), Professor Geoffrey Heal (Business School and SIPA), Professor Patrick Kinney (Public Health), Professor Leigh Linden (Econ and SIPA), Mona Khalidi (Assistant Dean for Graduate Studies, SIPA). This committee is responsible for all

program oversight and management decisions including procedures for orals, defenses and curriculum issues in general.

Core faculty

In addition to the above committee the following listed faculty has indicated their interest in the program including their willingness to advise students and teach in the program. These faculty members are drawn from SIPA and other departments and schools of Columbia University in order to fulfill the interdisciplinary needs of the program

Sustainable Development PhD Program (SDEV): Core Faculty 2009-2010

Last name	First name	Title	Research Interests
Coatsworth	John	Dean, School of International and Public Affairs; Professor of International and Public Affairs and of History, Columbia University	Latin America, Mexico, Economic History
Sachs	Jeffrey	Quetelet Professor of Sustainable Development, and Professor of Health Policy and Management at Columbia University; Director, The Earth Institute; Co-Director, SDEV PhD Program; Economics	Development Economics, Agriculture/ Agricultural Economics, Education, Health, Environment, Welfare, Development
Stiglitz	Joseph	University Professor of International Affairs; Business School, Economics; Chaired Professorship of Finance and Business; Co-Director, SDEV PhD Program	Development Economics, International Finance, Economics of Information, Monetary Theory
Mutter	John Colin	Professor of International and Public Affairs; Professor, Earth & Environmental Sciences; Director of Graduate Studies, PhD in Sustainable Development.	Science-based Issues in Sustainable Development
Almond	Douglas	Associate Professor of International and Public Affairs and Economics	China, Health Economics, Education, Environment
Anderson	Lisa	James T. Shotwell Professor of International Relations	Middle East, Africa, State Formation, Comparative Politics,
Barrett	Scott	Lenfest Professor of Natural Resource Economics, SIPA	Interactions between natural and social systems
Calvo	Guillermo	Professor of International and Public Affairs	Capital Markets, Monetary Theory
Cane	Mark	G. Unger Vetlesen Professor of Earth and Climate Sciences, Department of Earth Environmental Science and Professor of Applied Physics and Applied Mathematics, School of Engineering and Applied Sciences	Climate Change and climate variability
Chiappori	Pierre	E. Rowan and Barbara Steinschneider Professor of Economics	Risk
Heal	Geoffrey	Paul Garret Professor of Public Policy and Business Responsibility, Business School and SIPA	Risk, Environmental Economics, Environment
Macartan	Humphreys	Associate Professor of Political Science;	Political Economy of Development, African Politics, Ethnic Politics, Democratic Developments, Methodology
Kinney	Patrick	Assistant Professor, Environmental Health Sciences, Mailman School of Public Health	Health

Lackner	Klaus	Maurice Ewing and T. Lamar Worzel Professor of Geophysics	Energy science and policy
Lall	Upmanu	Alan and Carol Silberstein Professor of Earth and Environmental Engineering and of Civil Engineering and Engineering Mechanics; Department Chairman - Earth and Environmental Engineering	Climate Change, Environment, Natural Resource Management, Water
Linden	Leigh	Assistant Professor of International and Public Affairs and Economics	Applied Microeconomics, Child Labor, Risk, Development, Development Economics, Education
MacLeod	W. Bentley	Professor of International and Public Affairs and Economics	Contract Theory
Modi	Vijay	Professor of Mechanical Engineering	Environment, Energy Policy
Naeem	Shahid	Professor of Ecology, Evolution and Environmental Biology	Ecology and biodiversity
Ocampo	Jose	Professor in the Professional Practice of International and Public Affairs	Trade, Economic History, Development Economics, Latin America
Palm	Cheryl	Senior Research Scientist, The Earth Institute; Associate Director, Center for Globalization and Sustainable Development; Director, Millennium Villages Project, The Earth Institute	Land Use Change, Degradation and Rehabilitation, Ecosystem Services in Tropical Landscapes
Panagariya	Arvind	Jagdish Bhagwati Professor of Indian Political Economy, International and Public Affairs and Economics	Trade, India
Pop-Eleches	Christian	Assistant Professor of International and Public Affairs and Economics	Applied Microeconomics, Applied Micro/Labor/Development, Demography, Development
Salanie	Bernard	Professor of Economics	Contract Theory, Insurance Economics, Labor Economics, Theoretical and Applied Econometrics
Sampat	Bhaven	Assistant Professor of Health Policy and Management	Health Policy, Innovation Policy
Sanchez	Pedro	Senior Research Scholar Program in Tropical Agriculture	Natural Resource Management
Schlenker	Wolfram	Assistant Professor of International and Public Affairs and Economics	Agricultural Economics, Natural Resource Economics, Applied Microeconomics, Water, Environmental Economics, Climate Change
Urquiola	Miguel	Assistant Professor of International and Public Affairs and Economics	Latin America, Education, Development
Vasi	Ion Bogdan	Assistant Professor of International and Public Affairs; Assistant Professor, Department of Sociology	Climate Change, Environment, Energy Policy
Verhoogen	Eric	Assistant Professor of International and Public Affairs; Assistant Professor, Economics	Trade, Development Economics, Development and Labor Economics, Latin America
West	Paige	Associate Professor, Anthropology, Barnard College	Environmental conservation and international development

Faculty Biographies

Douglas Almond, Associate Professor of International and Public Affairs and Economics

Douglas Almond is an assistant professor of International and Public Affairs and Economics. His primary research areas are health and applied microeconomics, with a particular interest in infant health and the environment. Professor Almond served as a staff economist at the Council of Economic Advisers during the Clinton Administration and studied the health effects of air pollution in China as a Fulbright scholar. He received his BA from Carleton College (Minnesota) and PhD from Berkeley, where he received the departmental award for research on public policy.

Research Interests: China, Health Economics, Education, Environment

Lisa Anderson, James T. Shotwell Professor of International Relations

Lisa Anderson is on public service leave for 2010-11 and 2011-12.

Lisa Anderson was the sixth dean to lead the School of International and Public Affairs, established in 1946. She has been on the faculty of Columbia since 1986 and just prior to her appointment, served as chair of the political science department at Columbia. Dean Anderson also served as director of Columbia's Middle East Institute from 1990 to 1993.

One of the United States' most eminent scholars of the Middle East and North Africa, Dean Anderson's academic specialty is state formation and regime change. She is the author of *Pursuing Truth, Exercising Power: Social Science and Public Policy in the Twenty-first Century* (Columbia 2003); *The State and Social Transformation in Tunisia and Libya, 1830–1980* (Princeton 1986); editor of *Transitions to Democracy* (Columbia 1999); and coeditor of *The Origins of Arab Nationalism* (Columbia 1991). She has also written more than 50 scholarly articles. She has testified before the Foreign Relations committees of both the House and the Senate, published commentary in the *New York Times*, the *Washington Post*, and the *Los Angeles Times*, and appeared as an expert on the news programs of the major television and radio networks.

In addition to her responsibilities at Columbia, Dean Anderson is the past president of the Middle East Studies Association and chair of the board of directors of the Social Science Research Council. She is a member of the council of the American Political Science Association and serves on the board of the Carnegie Council on Ethics in International Affairs. She is member emerita of the board of Human Rights Watch, where she served as co-chair of Human Rights Watch/Middle East. She is also a member of the Council on Foreign Relations.

Dean Anderson holds a BA from Sarah Lawrence College and an MA in law and diplomacy from the Fletcher School at Tufts University. She earned a PhD in political science from Columbia University, 1981, where she also received a certificate from the Middle East Institute. She was awarded an honorary doctor of laws from Monmouth University in 2002. From 1981 to 1986, she was an assistant professor of government and social studies at Harvard University.

Research Interests: Africa, State Formation, Comparative Politics, Middle East

Scott Barrett, Lenfest Professor of Natural Resource Economics at SIPA and the Earth Institute.

Professor Barrett previously served on the faculty of Johns Hopkins University's Paul H. Nitze School of Advanced International Studies. Prior to serving Johns Hopkins, Professor Barrett taught at the London Business School, where he was also dean of the Executive MBA program.

Professor Barrett's research focuses on interactions between natural and social systems, especially at the global level. He is best known for his work involving international environmental agreements, such as the Kyoto Protocol. Barrett's work on international environment agreements earned him the Erik Kempe Award in Environmental and Resource Economics, bestowed by the European Association of Environmental and Resource Economists.

Published in 2007, Professor Barrett's book *Why Cooperate? The Incentive to Supply Global Public Goods* examines issues such as nuclear proliferation, infectious disease pandemics, overfishing, and the standard for determining the time to international development. His book on international environmental agreements *Environment and Statecraft: The Strategy of Environmental Treaty-Making*, was published in 2003.

Barrett has advised a number of international organizations, including different agencies of the United Nations, the World Bank, the OECD, the European Commission, the World Commission on the Oceans, the IUCN Commission on Environmental Law, and the International Task Force on Global Public Goods. He was a lead author of the Intergovernmental Panel on Climate Change second assessment report. He was previously a member of the Academic Panel for the UK's Department of Environment.

Professor Barrett holds a PhD in economics from the London School of Economics.

Research Interests: Interactions between natural and social systems

Guillermo Calvo, Professor of International and Public Affairs

Guillermo Calvo has joined the faculty at SIPA as of January 2007 and will direct the School's mid-career Program in Economic Policy Management. His recent positions include: Director of the Center for International Economics and Distinguished University Professor at the University of Maryland; Chief Economist at the Inter-American Development Bank, Senior Advisor in the Research Department of the International Monetary Fund; and Research Associate at the National Bureau of Economic Research (NBER). In addition, he is a member of the Academia Nacional de Ciencias Económicas, Argentina, and a fellow of the Econometric Society and the American Academy of Arts and Sciences. He is the former President of the Latin American and Caribbean Economic Association (LACEA), and the current President of the International Economic Association. Calvo has testified before the United States Congress on dollarization and on the 1994 Mexican crisis and has served as an economic advisor to several governments in Latin America and Eastern Europe. He has received Honors including the Simon Guggenheim Foundation Fellowship in 1980-1981 and the King Juan Carlos Prize in Economics in 2000. Calvo is returning to Columbia, where he was a member of the faculty from 1973 to 1986.

Research Interests: Capital Markets, Monetary Theory

Mark Cane, G.Unger Vetlesen Professor of Earth and Climate Sciences and Professor of Applied Physics and Applied Mathematics; Deputy Director, Lamont-Doherty, Dept Chair Earth Environmental Science

Dr. Mark Cane is the Chair of the Department of Earth and Environmental Sciences at Columbia University and the G. Unger Vetlesen Professor of Earth and Climate Sciences in the Department of Earth and Environmental Sciences and the Department of Applied Physics and Applied Mathematics.

Dr. Cane received his PhD in Meteorology from MIT in 1975 and his B.A. and MA from Harvard University. With Lamont colleague Dr. Stephen Zebiak, he devised the first numerical model able to simulate El Niño and the Southern Oscillation (ENSO), a pattern of interannual climate variability centered in the tropical Pacific, but with global consequences. In 1985 this model was used to make the first physically based forecasts of El Niño. Dr. Cane has served on numerous international and national committees and authored or co-authored over 200 scientific papers. In 1992 he received the Sverdrup Gold Medal of the American Meteorological Society and in 2003 he received the Cody Award in Ocean Sciences from Scripps Institution of Oceanography. He is a fellow of the American Meteorological Society; the American Association for the Advancement of Science; the American Geophysical Union, and the American Academy of Arts and Sciences.

Research Interests: Climate Change

Pierre-Andre Chiappori, E. Rowan and Barbara Steinschneider Professor of Economics

Pierre-Andre Chiappori is the E. Rowan and Barbara Steinschneider Professor of Economics at Columbia University. A former student of the Ecole normale supérieure, he received a Master in Mathematics at the University Paris VI in 1976 and a PhD in Economics at the University Paris 1 in 1981. He has taught in France (Paris 1, EHESS, Ecole Polytechnique, ENSAE) before joining the University of Chicago as Professor of Economics. He has been a faculty member at Columbia since 2004.

His research focuses on household behavior, risk, insurance and contract theory, general equilibrium and mathematical economics. He has been involved in numerous conferences as an organizer or keynote speaker and has been editor and co-editor of many international economic publications, including the *Journal of Political Economy*, published by the University of Chicago. He is a Fellow of the European Economic Association and of the Econometric Society.

Research Interests: Risk

John Coatsworth, Dean, School of International and Public Affairs; Professor of International and Public Affairs and of History, Columbia University

John Coatsworth is the author or editor of seven books and many scholarly articles on Latin American economic and international history. He is a member of the American Academy of Arts and Sciences, the Council on Foreign Relations, the Board of Directors of the Tinker Foundation, and numerous professional associations. He is a former president of the American Historical Association and was recently elected to the presidency of the Latin American Studies Association. He came to Columbia as a visiting professor in 2006-07 and joined the faculty in 2007. He became Acting Dean of the School of International and Public Affairs in 2007 and Dean in 2008.

Dean Coatsworth received his BA degree in History from Wesleyan University (1963) and his MA (1967) and PhD (1972) degrees in Economic History from the University of Wisconsin, Madison.

He taught at the University of Chicago from 1969 until he joined the Harvard faculty in 1992. From 1992 until 2007, he was Monroe Gutman Professor of Latin American Affairs at Harvard, where he also served as the founding director of the David Rockefeller Center for Latin American Studies from its creation in 1994 until 2006. He also chaired the Harvard University Committee on Human Rights Studies. His other academic posts have included visiting professorships at El Colegio de México, the National Autonomous University of Mexico, the National University of Buenos Aires, the Instituto Torcuato di Tella in Buenos Aires, and the Instituto Ortega y Gasset in Madrid. He has served on the editorial boards of numerous scholarly journals including the *American Historical Review*, the *Journal of Economic History*, and the *Hispanic American Historical Review* and as well as social science and history journals published in Britain, Germany, Mexico, Peru, and Spain.

Dean Coatsworth was awarded the John Simon Guggenheim Foundation Fellowship in 1986, served as Senior Fulbright Lecturer three times (for appointments in Argentina and Mexico), and has received research and institutional grants from public agencies and private foundations in the United States and elsewhere. He has also acted as consultant for program design or review to numerous U.S. universities and private foundations.

Research Interests: Latin America, Mexico, Economic History

Geoffrey M. Heal, Paul Garrett Professor of Public Policy and Business Responsibility

Professor Heal joined Columbia University in 1983 as a professor of economics at the Columbia Business School. He has served as a senior vice dean of the business school (1991–94) and as an academic director of the executive MBA (1995–99). In 1995 he was named the Garret Professor of Public Policy and Business Responsibility.

Professor Heal's current research interests include modeling the impact of markets for derivative securities on the allocation of risks in the economy, modeling the pricing of derivatives in a general equilibrium framework, and studying ways of controlling the impact of economic activity on the environment and ways of valuing the economic services provided by environmental assets. His publications include *Nature and the Marketplace* (Island Press 2000); *Environmental Markets* (Columbia 2000); *The Economics of Increasing Returns* (Edward Elgar 1999); *Valuing the Future: Economic Theory and Sustainability* (Columbia 1998); *Sustainability: Dynamics and Uncertainty* (Kluwer Academic Publishers 1998); and many articles in various economic, political, and business publications.

In addition to his responsibilities at Columbia, Dr. Heal has acted as the managing editor of the *Review of Economic Studies* and has acted on the editorial boards of many other journals. In the 1970s he founded a London-based consulting firm, and in the 1980s he founded a firm providing systems for telecommunications and data processing to the international securities business. He is a member of the Pew Oceans Commission (www.pewoceans.org), a director of the Union of Concerned Scientists (www.ucsusa.org), and a fellow of the Econometric Society. Dr. Heal has advised the International Brotherhood of Teamsters and the United Mineworkers of America, and previously served as an adviser to the secretary-general of OPEC.

Professor Heal earned his first class honors BA from Churchill College, University of Cambridge from where he also received his PhD in 1968. From 1966 to 1967 he was a Flood fellow at University of California, Berkeley. From 1969 to 1973 he served as the director of studies in economics at Christ's College, Cambridge. From 1973 to 1980 he was a professor of economics at University of Sussex, followed by a three-year appointment as a professor of economics at the same university. He has been a visiting professor at Yale University, Stanford University, Université de Paris XII, Princeton University, University of Stockholm, Institute for Mathematics

and Applications at University of Minnesota, University of Siena, and Université de Paris X Nanterre.

Research Interests: Risk, Environmental Economics, Environment

Macartan Humphreys, Associate Professor of Political Science

Macartan Humphreys works on the political economy of development and formal political theory. Ongoing research focuses on civil wars, post conflict development, ethnic politics, natural resource management, political authority and leadership and democratic development. He uses a variety of methods including survey work, lab experimentation, field experimentation, econometric analysis, game theoretic analysis and classical qualitative methods. He has conducted field research in Chad, Ghana, Haiti, Indonesia, Liberia, Mali, Sao Tome and Principe, Sierra Leone, Senegal, Uganda and elsewhere. A new series of projects underway use field experiments to examine democratic decision making in post conflict and developing areas. Recent research has appeared in the American Political Science Review, World Politics, Public Choice, the Journal of Conflict Resolution and elsewhere. He is a research scholar at the Center for Globalization and Sustainable Development at the Earth Institute.

Humphreys received his PhD (Government) from Harvard University in 2003, and his MPhil (Economics) from University of Oxford in 2000.

Research Interests: Political Economy of Development, African Politics, Ethnic Politics, Democratic Developments, Methodology

Patrick L. Kinney, Assistant Professor, Environmental Health Sciences, Mailman School of Public Health

Dr. Patrick Kinney is an air pollution epidemiologist with a strong interest in exposure assessment. Dr. Patrick Kinney's teaching and research address issues at the intersection of global environmental change, human health, and policy, with an emphasis on the public health impacts of climate change and air pollution. His work in the 1990s on air quality and environmental justice in Northern Manhattan and the South Bronx led to important new insights into the impacts of diesel vehicle emissions on local air quality. Dr. Kinney has carried out numerous studies examining the human health effects of air pollution, including studies of the effects of ozone and/or particulate matter on lung health and on daily mortality in large cities. More recently, he developed a new interdisciplinary research and teaching program at Columbia examining the potential impacts of climate change on human health. Dr. Kinney was the first to show that climate change could worsen urban smog problems in the U.S., with attendant adverse health impacts. He also has projected future health impacts related to heat waves in the NYC metropolitan area. In a new research initiative, Dr. Kinney is working with dinidians at Columbia University Medical Center and NewYork-Presbyterian Hospital to understand how past and future climate may affect pollen-related allergic airway diseases. Dr. Kinney earned his doctorate at the Harvard School of Public Health, where he studied the effects of air pollution on lung function in children as part of the Harvard Six Cities Air Pollution and Health Study.

Research Interests: Health

Klaus S. Lackner, Maurice Ewing and T. Lamar Worzel Professor of Geophysics

Klaus Lackner's scientific career started in the phenomenology of weakly interacting particles. Later searching for quarks, he and George Zweig developed the chemistry of atoms with fractional nuclear charge. He is still participating in matter searches for particles with a non-integer charge in an experiment conducted at Stanford by Martin Perl and his group. After joining Los Alamos National Laboratory, Klaus Lackner became involved in hydrodynamic work and fusion related research. In recent years, he has published on the behavior of high explosives, novel approaches to inertial confinement fusion, and numerical algorithms. His interest in self-replicating machine systems has been recognized by Discover Magazine as one of seven ideas that could change the world. Presently he is developing innovative approaches to energy issues of the future. He has been instrumental in forming ZECA, the Zero Emission Coal Alliance, which is an industry-led effort to develop coal power with zero emissions to the atmosphere. His recent work is on environmentally acceptable technologies for the use of fossil fuels. B.S., Heidelberg, 1974; M.S., 1976; PhD, 1978.

Research Interests: Energy Science and Policy

Upmanu Lall, Alan and Carol Silberstein Professor of Earth and Environmental Engineering and of Civil Engineering and Engineering Mechanics; Department Chairman - Earth and Environmental Engineering

Dr. Upmanu Lall's principal areas of expertise are statistical and numerical modeling of hydrologic and climatic systems and water resource systems planning and management. He has over 20 years of experience as a hydrologist. He has been the principal investigator on a number of research projects funded by the U.S.G.S., the NSF, the U.S.A.F., N.O.A.A., U.S.B.R., D.O.E. and State of Utah agencies. These projects have covered water quantity and quality and energy resource management, flood analysis, groundwater modeling and subsurface characterization, climate modeling and the development of statistical and mathematical modeling methods. He has been involved as a consultant with specialization in groundwater flow and contaminant transport modeling covering mining operations, streamflow modeling and water balance, risk and environmental impact assessment, site hydrologic evaluation and as a reviewer and as an expert on a number of other hydrologic problems. He has taught over 20 distinct University courses.

Research Interests: Climate Change, Environment, Natural Resource Management, Water

Leigh Linden, Assistant Professor of International and Public Affairs; Assistant Professor, Economics

Leigh Linden is an assistant professor in both the School of International and Public Affairs and the Department of Economics.

A development and labor economist with an interest in poverty and income inequality in both developing and developed economies, his current research focuses on the welfare of children and the functioning of democratic institutions. Methodologically, he specializes in evaluation research and in particular, randomized evaluations. His current projects include evaluations of a number of education programs in India, Colombia, and the United States as well as ongoing research in the Indian political system.

Professor Linden received a BA in economics and a BS in mathematics from the University of Texas, Austin (1997) and a PhD in economics from the Massachusetts Institute of Technology (2004). He joined Columbia in the summer of 2004.

Research Interests: Applied Microeconomics, Child Labor, Risk, Development, Development Economics, Education

W. Bentley MacLeod, Professor of International and Public Affairs and Economics

Professor MacLeod's scholarship focuses on understanding incentive contracts in dynamic settings and how optimal contracts are the consequence of a complex interplay between reputation effects, market competition, and social norms.

His recent publications include "Caring About Sunk Costs: A Behavioral Solution to Hold-Up Problems with Small Stakes," with H. Lorne Carmichael in *Journal of Law Economics and Organization* (2003); "Optimal Contracting with Subjective Evaluation," in *American Economic Review* (2003); and "Complexity and Contract" in *The Economics of Contract in Prospect and Retrospect*, edited by E. Brousseau and J. M. Glachant (Cambridge 2002).

He was the recipient of the 2002 H. Gregg Lewis prize awarded by the Society of Labor Economists for his article "Worker Cooperation and the Ratchet" with H. Lorne Carmichael.

Professor MacLeod holds a BA and an MSc in mathematics from Queen's University and a PhD in economics from the University of British Columbia.

Research interests: Contract Theory

Vijay Modi, Professor of Mechanical Engineering

Vijay Modi is a professor in the Department of Mechanical Engineering at Columbia University. (PhD Cornell 1984, postdoctoral work MIT 1984–1986). His expertise is in the field of: energy sources and conversion, heat/mass transfer, and fluid mechanics. His current areas of research interest are related to: energy infrastructure, CO₂ sequestration (with Prof. Lackner in Earth and Environmental Engineering), fuel cells, distributed sensing/control of flow, and heat transfer.

Research Interests: Environment, Energy Policy

John Colin Mutter, Professor of International and Public Affairs; Director of Graduate Studies, PhD in Sustainable Development; Professor, Earth & Environmental Sciences

Professor Mutter's work has several dimensions. He conducts research and teaching in sustainable development. He created and teaches the core course "Environmental Science for Sustainable Development" which provides the basis of understanding Earth systems behavior needed to study sustainable development. He also created and teaches a seminar course in "Climate Change, Development and Human Rights." His specific field of research is in the role of natural disasters in reducing development opportunities for poor societies. How much of the global inequality in development status can be attributed to the particular burden that the poorest people face from natural extremes such as hurricanes and earthquakes? Meteorological extremes are expected to increase as a result of human-induced climate change, and his work attempts to assess who are the most vulnerable to horrific natural disasters like [Hurricane Katrina](#). Mutter also examines these questions through the lens of human rights, asking whether rights attainment can predict disaster outcomes, such as the response to Cyclone Nagris in Myanmar, and how the norms and principals of human rights can provide guidance for climate

adaptation strategies. The general theme of his research follows the relationship between natural systems and human well-being, with particular focus on the vulnerability of poor societies to natural variations and extreme environmental conditions, as this could inform an understanding of the human response to natural changes at all scales and intensity. Mutter also leads the Earth Institute's partnership with the UNEP's Post-Conflict and Disaster Management Branch, researching environmental degradation as both an outcome and driver of disasters and conflicts.

Mutter's original research interests are in the natural sciences, with a focus on the use of marine seismology technologies to study processes in the formation of the earth's crust and mantle at mid-ocean ridge and continental rift settings. He has studied active rifting in the Woodlark Basin off Papua New Guinea and recently, as mentioned above, he spent most of the summer of 2008 as chief scientist aboard Columbia's research vessel, the Marcus G. Langseth, conducting the first [3-D seismic imaging](#) experiment of seafloor spreading at the East Pacific Rise. This study will reveal how magma rises from deep in the earth's interior to create new crust and controls the distribution of biological communities at hydrothermal vent systems.

Mutter is also one of the principal investigators on the [Earth Institute's National Science Foundation-funded ADVANCE](#) program, which is designed to create institutional change that will improve the opportunities for women in earth science and engineering at Columbia.

One of Mutter's other current innovative projects is an Earth Clinic-funded collaborative, the [Bamboo Bikes](#) initiative that addresses the need for a new type of bicycle for Africans living in remote and poor villages who must utilize bicycles for a variety of uses. The bamboo frames are significantly tougher than people realize and actually dampen vibrations from unpaved road. Mutter and his team hope that the bikes can aid in Africa's use of sustainable transportation and economic development, since they are locally manufactured.

Research Interests: Science-based issues in sustainable development

Shahid Naeem, Professor of Ecology, Evolution and Environmental Biology

Shahid Naeem studies the ecological and environmental consequences of biodiversity loss. He is interested in how changes in the distribution and abundance of plants, animals, and microbes, affect how ecosystems function and, by extension, how ecosystem services are affected. His work combines theoretical, observational, and experimental studies under field and laboratory conditions, to uncover the mechanistic bases for the impacts of biodiversity loss on ecosystems. His work has demonstrated how the loss of species from ecosystems affect their ability to resist invasion by other species, affect production and nutrient cycling, and affect the reliability and stability of ecosystems. He is actively involved in bringing the science of biodiversity and ecosystem functioning to conservation, restoration, and policy development.

Research Interests: Environment, ecology and biodiversity

José Antonio Ocampo, Professor in the Professional Practice of International and Public Affairs

José Antonio Ocampo is a Professor of Professional Practice in International and Public Affairs and director, Economic and Political Development Concentration at the School of International and Public Affairs, Columbia University. He will teach courses in the PhD program in Sustainable Development and is a member of Columbia's Committee on Global Thought.

Prior to his appointment, Professor Ocampo served in a number of positions in the United Nations and the Government of Colombia, most notably as United Nations Under-Secretary General for Economic and Social Affairs; Executive Secretary of the Economic Commission for Latin America and the Caribbean (ECLAC); Minister of Finance and Public Credit, Chairman of the Board of Banco del República (Central Bank of Colombia); Director, National Planning Department (Minister of Planning); Minister of Agriculture and Rural Development, Chairman of the Board of Banco Cafetero (Coffee Bank) and Caja de Crédito Agraria, Industrial y Minera (Agrarian Bank) and Executive Director, FEDESARROLLO.

Dr. Ocampo received his BA in Economics and Sociology from the University of Notre Dame and his PhD in Economics from Yale University, 1976. He was a Professor in the Advanced Programme on Rethinking Development Economics at Cambridge University, a Professor of Economics at Universidad de los Andes, a Professor of Economic History at the National University of Colombia, as well as a Visiting Fellow at Yale and Oxford.

He is the author of numerous books and articles on macroeconomics policy and theory, economic development, international trade and economic history. His recent publications include *Stability with Growth: Macroeconomics, Liberalization and Development*, with Joseph E. Stiglitz, Shari Spiegel, Ricardo French-Davis and Deepak Nayyar, (New York: Oxford University Press, 2006).

"José Antonio Ocampo brings to SIPA the knowledge and insight of a first rate policy economist and economic historian together with broad experience as a leading international public servant and former cabinet minister. His appointment also strengthens Columbia's growing community of Latin American specialists and especially the Institute for Latin American Studies. This is an outstanding appointment for Columbia," said John Coatsworth, SIPA's dean.

Research Interests: Trade, Economic History, Development Economics, Latin America

Cheryl Palm, Senior Research Scientist

Cheryl A. Palm is a Senior Research Scientist in the Tropical Agriculture and Rural Environment Program of the Earth Institute at Columbia University where she is also the Science Director of the Millennium Villages Project. A tropical ecologist focusing on land use change, Dr. Palm received her PhD in soil science from North Carolina State University after completing her bachelor's and Masters' degrees in zoology at the University of California, Davis. She served as Principal Research Scientist of the Tropical Soil Biology and Fertility Program in Nairobi, Kenya from 1991-2001. She has served on the faculties of North Carolina State University, Colorado State University and spent a year as visiting scientist at the University of California, Berkeley. She was elected a Fellow of the American Society of Agronomists in 2005 and is currently the chair of the International Nitrogen Initiative (INI).

Dr. Palm's research focuses on land use change, degradation and rehabilitation, and ecosystem services in tropical landscapes. She led a major effort quantifying carbon stocks, losses and net greenhouse gas emissions following slash and burn and alternative land use systems in the humid tropics in the Brazilian and Peruvian Amazon, Indonesia and the Congo Basin. She has spent much of the past 15 years investigating nutrient dynamics in farming systems of Africa, including options for land rehabilitation. Most recent work includes the Millennium Villages Project, an integrated approach to achieving the Millennium Development Goals in rural Sub-Saharan Africa. The approach combines evidence based interventions and community based participation. The team is currently working with the Millennium Villages sites developing carbon offset projects for carbon sequestration in degraded landscapes that will provide additional ecosystem services and benefit local communities.

Research Interests: Land Use Change, Degradation and Rehabilitation, Ecosystem Services in Tropical Landscapes

Arvind Panagariya, Jagdish Bhagwati Professor of Indian Political Economy, International and Public Affairs and Economics

Arvind Panagariya is the Jagdish Bhagwati Professor of Indian Political Economy in the Department of International and Public Affairs and of Economics. He was formerly a professor of economics and codirector of the Center for International and Public Affairs at the University of Maryland, College Park, and the chief economist of the Asian Development Bank. He has also advised the World Bank, IMF, WTO, and UNCTAD in various capacities. Panagariya has written or edited more than a half-dozen books, including *The Economics of Preferential Trade Agreements* with Jagdish Bhagwati (1996); *The Global Trading System and Developing Asia* with M.G. Quibria and N. Rao (1997); and *Lectures on International Trade* with J. Bhagwati and T.N. Srinivasan (1998). A collection of his essays on regionalism appeared under the title *Regionalism in Trade Policy: Essays on Preferential Trading* (1999). Panagariya is the founding editor of the *Journal of Policy Reform*, which he edited with Dani Rodrik (1996–2001). He is currently an associate editor of *Economics and Politics*. His technical papers have appeared in the *American Economic Review*, *Quarterly Journal of Economics*, *Review of Economic Studies*, *Journal of International Economics*, and *International Economic Review*, while his policy papers have appeared in the *World Economy*, *Journal of International Affairs and Finance and Development*.

Panagariya writes a monthly column in the *Economic Times*, India's top financial daily. He has also written guest columns in the *Financial Times*, *Wall Street Journal*, *India Today*, and *Outlook*. He has appeared on the Jim Lehrer Newshour (U.S.A.), CNN (Asia), CNBC (Asia), CNBC (India), Reuters TV (Asia), Bloomberg TV (Asia), NDTV (India), Aaj Tak (India), Door Darshan (National-India), Chicago Public Radio, Minnesota Public Radio, and BBC Radio.

Panagariya holds a BA from Rajasthan University (1971) and a PhD in Economics from Princeton University (1978).

Research Interests: Trade, India

Cristian Pop-Eleches, Assistant Professor of International and Public Affairs

Cristian Pop-Eleches is an assistant professor of International and Public Affairs and Economics. His primary research area is applied development and labor economics with particular interest in demographic issues. He teaches courses in economic development and microeconomics.

His publications include "The Impact of an Abortion Ban on Socio-Economic Outcomes of Children: Evidence from Romania" and "The Supply of Birth Control Methods, Education and Fertility."

Cristian Pop-Eleches received his BA (1988) and PhD (2003) in economics from Harvard University.

Research Interests: Applied Microeconomics, Applied Micro/Labor/Development, Demography, Development

Jeffrey D. Sachs, Quetelet Professor of Sustainable Development, and Professor of Health Policy and Management at Columbia University; Director, The Earth Institute; Co-Director, SDEV PhD Program; Economics

Jeffrey D. Sachs is the director of the Earth Institute, Quetelet Professor of Sustainable Development, and professor of Health Policy and Management at Columbia University. He is also Special Advisor to United Nations Secretary-General Ban Ki-moon. From 2002 to 2006, he was Director of the UN Millennium Project and Special Advisor to United Nations Secretary-General Kofi Annan on the Millennium Development Goals, the internationally agreed goals to reduce extreme poverty, disease, and hunger by the year 2015.

Sachs is internationally renowned for advising governments in Latin America, Eastern Europe, the former Soviet Union, Asia, and Africa on economic reforms and for his work with international agencies to promote poverty reduction, disease control, and debt reduction of poor countries. He was recently named among the 100 most influential leaders in the world by *Time* magazine. He is author of hundreds of scholarly articles and many books. Sachs was recently elected into the Institute of Medicine and is a research associate of the National Bureau of Economic Research.

Prior to joining Columbia, Sachs spent over twenty years at Harvard University, most recently as director of the Center for International Development. A native of Detroit, Michigan, Sachs received his BA, MA, and PhD degrees at Harvard University.

Research Interests: Development Economics, Agriculture / Agricultural Economics, Education, Health, Environment, Welfare, Development

Bernard Salanie, Professor of Economics

Bernard Salanie has been on the faculty of Columbia since 2005. Before that he was a Senior Economist at the French Ministry of Finance and a professor at Ecole Polytechnique, where one of the classes he taught was Sustainable Development. He also held visiting professorships at Stanford University and at the University of Chicago. He has a BA from Ecole Polytechnique, and a PhD from Ecole des Hautes Etudes en Sciences Sociales. He was elected a Fellow of the Econometric Society in 2001.

Bernard Salanie has published across a broad spectrum of economics, from econometric theory to labor economics. His current area of research is applied microeconomics. He is the author of several textbooks on applied microeconomic theory: "The Economics of Contracts," "Microeconomics of Market Failures" and "The Economics of Taxation." He also published a popularization book titled "L'économie sans tabou," and until 2007, he maintained an influential blog with the same title on French economic policy.

Research Interests: Contract Theory, Insurance Economics, Labor Economics, Theoretical and Applied Econometrics

Bhaven Sampat, Assistant Professor of Health Policy and Management

Bhaven Sampat, PhD, is an economist by training, centrally interested in issues at the intersection of health policy and innovation policy. His current projects examine the political economy of the National Institutes of Health, the effects of patents on access to medicines in India, the interactions between patent laws and FDA regulation in the pharmaceutical industry,

the determinants of patent quality in the U.S. patent system, and challenges to evidence-based medicine in contexts of rapid technological change.

Bhaven received his PhD from Columbia, 2001.

Research Interests: Health Policy, Innovation Policy

Pedro Sanchez, Senior Research Scholar

Pedro Sanchez is the Director of the Tropical Agriculture and the Rural Environment Program, Senior Research Scholar, and Director of the Millennium Villages Project at the Earth Institute at Columbia University. Sanchez was Director General of the World Agroforestry Center (ICRAF) headquartered in Nairobi, Kenya from 1991-2001, and served as Co-chair of the UN Millennium Project Hunger Task Force. He is also Professor Emeritus of Soil Science and Forestry at North Carolina State University, and was a visiting professor at the University of California, Berkeley.

A native of Cuba, Sanchez received his BS, MS and PhD degrees in soil science from Cornell University, and joined the faculty of North Carolina State University in 1968. His professional career has been dedicated to help eliminate world hunger and absolute rural poverty while protecting and enhancing the tropical environment. Sanchez has lived in the Philippines (working at the International Rice Research Institute), Peru (working at the Peruvian National Research Institute), Colombia (working at the International Center for Tropical Agriculture) and Kenya. He is the author of "Properties and Management of Soils of the Tropics" (rated among the top 10 best-selling books in soil science worldwide), co-author of "Halving Hunger: It can be done" and author of over 250 scientific publications.

He is a Fellow of the American Society of Agronomy, the Soil Science Society of America, the American Association for the Advancement of Science, and has received the International Soil Science Award, the International Service in Agronomy Award and the Crop Science Society of America Presidential Award. He serves on the Board of Agriculture and Natural Resources of the National Academy of Sciences and the Board of Directors of Millennium Promise. Sanchez has received honorary Doctor of Science degrees from the Catholic University of Leuven, Belgium, the University of Guelph, Canada and The Ohio State University, USA. He has received decorations from the governments of Colombia and Peru, and was anointed Luo Elder with the name of Odera Akang'o by the Luo community of Western Kenya. Sanchez is the 2002 World Food Prize laureate and a 2004 MacArthur Fellow.

Research Interests: Natural Resource Management

Wolfram Schlenker, Assistant Professor of International and Public Affairs; Assistant Professor, Economics

Professor Schlenker teaches classes in environmental and natural resource economics. His research interests include the economics of climate change, water rights, and their impact on agricultural output, as well as models of exhaustible resources with endogenous discoveries.

His most recent publication is "Will U.S. Agriculture Really Benefit From Global Warming? Accounting for Irrigation in the Hedonic Approach" in *American Economic Review* (March 2005).

He holds a PhD in agricultural and resource economics from the University of California, Berkeley (2003) and a Master of engineering and management sciences from the University of Karlsruhe, Germany (2000), as well as a Master of environmental management from Duke University (1998).

Research Interests: Agriculture / Agricultural Economics, Natural Resource Economics, Applied Microeconomics, Water, Environmental Economics, Environment, Climate Change

Joseph E. Stiglitz, University Professor of International Affairs; Business School, Economics; Chaired Professorship of Finance and Business; Co-Director, SDEV PhD Program

Joseph E. Stiglitz is a professor of finance and business at Columbia University. In 2001, Stiglitz received the Nobel Prize in Economics for his work in a new branch of economics—the economics of information. Within this new branch of economics, Stiglitz has explored the consequences of information asymmetries and pioneered such pivotal concepts as adverse selection and moral hazard, which have now become standard tools not only of theorists, but of policy analysts. He has made major contributions to macroeconomics and monetary theory, development economics and trade theory, public and corporate finance, the theories of industrial organization and rural organization, and the theories of welfare economics and of income and wealth distribution. Stiglitz's work has helped explain the circumstances in which markets do not work well and how selective government intervention can improve their performance.

Stiglitz has written more than 300 articles, 12 books, and textbooks that have been translated into more than a dozen languages. *Globalization and Its Discontents* (Norton 2001) has been translated into twenty languages and is an international bestseller. His most recent book is *The Roaring Nineties* (Norton 2003). He also founded one of the leading economics journals, the *Journal of Economic Perspectives*. From 1997 to 2000 Stiglitz was the chief economist and senior vice president of the World Bank. During the Clinton administration, he served as the chair of the Council of Economic Advisors from 1995 to 1997.

A graduate of Amherst College, Stiglitz received his PhD from MIT in 1967 and became a full professor at Yale University in 1970. In 1979 he was conferred the John Bates Clark Award, given biennially by the American Economic Association to the economist under 40 who has made the most significant contribution to the field. He has taught at Princeton University, Stanford University, MIT, and was the Drummond Professor and a fellow of All Souls College, University of Oxford.

Research Interests: Development Economics, International Finance, Economics of Information, Monetary Theory

Miguel Urquiola, Assistant Professor of International and Public Affairs; Assistant Professor, Economics

Professor Urquiola teaches the key course on economic development at SIPA. His research focuses on educational issues in developing countries and the United States, covering topics such as the effects of voucher financing and accountability schemes. Prior to moving to Columbia, he was an assistant professor of economics at Cornell, and in the past also worked for the World Bank research department, the Bolivian government, and the Bolivian Catholic University's MBA and public policy programs. His research has appeared in academic journals and books, and he currently holds a postdoctoral fellowship from the National Academy of Education.

He received a BA from Swarthmore College and a PhD in economics from the University of California, Berkeley, 2000.

Research Interests: Latin America, Education, Development

Ion Bogdan Vasi, Assistant Professor of International and Public Affairs; Assistant Professor, Department of Sociology

Ian Bogdan Vasi is assistant professor at SIPA and the Department of Sociology. He teaches courses in quantitative research methods, consumerism, collective action, and social movements. His present research focuses on the adoption and implementation of local programs to address global climate change, the development of the wind energy industry, and on strategies for coping with tragedies of the commons.

His recent publications include "The New Anti-War Protests and Miscible Mobilizations" in *Social Movement Studies* (2005), "The Fist of the Working Class: The Social Movements of Jiu Valley Miners in Post-Socialist Romania" in *East European Politics and Societies* (2004), and "The Mobilizer's Dilemma: Crisis, Empowerment, and Collective Action," with Michael Macy in *Social Forces* (2003).

He earned a BA from the University of Bucharest (1996), an MA in sociology from the Central European University (1998), and a PhD in sociology from Cornell University (2005).

Research Interests: Climate Change, Environment, Energy Policy

Eric Verhoogen, Assistant Professor of International and Public Affairs; Assistant Professor, Economics

Eric Verhoogen is an assistant professor of International and Public Affairs and Economics. His research fields are development economics, labor economics, and trade, with a focus on the microeconomics of industrial and urban sectors in developing countries. His current work focuses on the reactions of Mexican manufacturers to new product-market conditions brought about by the 1994 peso crisis, and their implications for wages and wage inequality.

Verhoogen received a BA from Harvard College (1991), an MA from the University of Massachusetts, Amherst (2001), and a PhD from the University of California, Berkeley (2004).

Research Interests: Trade, Development Economics, Development & Labor Economics, Latin America

Paige West, Assistant Professor, Anthropology, Barnard College

Paige West received her MA in Environmental Anthropology from the University of Georgia and her PhD in Cultural Anthropology from Rutgers University. She is currently Assistant Professor of Anthropology at Barnard College and Columbia University. Since 1996, drawing on the theories, methods, and insights of both cultural anthropology and political ecology, she has conducted fieldwork in Papua New Guinea, Australia, Germany, England, and the United States. In 2002 she received the American Anthropological Association's Anthropology and Environment Junior Scholar award for her work. She is a cultural and environmental anthropologist with interests in

the linkages between environmental conservation and international development, the material and symbolic ways in which the natural world is understood and produced, the aesthetics and poetics of human social relations with nature, and the critical analysis of the creation of commodities and practices of consumption. Dr. West has recently completed a book entitled *Conservation is our government now: The politics of ecology in Papua New Guinea*, published by Duke University Press and available June 1, 2006.

Research Interests: Environment

Students**6th Year Students:**

Saifedean Ammous	sha2106
Jessica Barnes	jeb2118
Mo Ji	mj2147
Jose Carlos Orihuela	jo2110

5th Year Students:

Chandra Kiran Krishnamurthy	cb2322
Gordon McCord	gm2101
Anisa Khadem Nwachuku	akc2114
Marta Vicarelli	mv329

4th Year Students:

Jesse Anttila-Hughes	jka2110
Mukul Ram Fishman	rf2241
Solomon Hsiang	smh2137
Mark Orrs	msø21008
Aly Sanoh	as3047

3rd Year Students:

Nicole Ngo	nsn2106
Anna Tompsett	alt2117

2nd Year Students:

Geoffrey Johnston	glj2108
Geoff McCamey	grm2119
Kyle Meng	km2455
Xiaojia Bao	xb2112

1st Year Students:

Johannes Castner	jac2130
Denyse S. Dookie	dsd2123
Marion Dumas	mmd2172
Amir Jina	asj2122
Booyuel Kim	bk2267
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Lily Parshall	llp15

Pre-MPhil

Jesse Antilla-Hughes is a fourth-year student in the Sustainable Development program and an NSF IGERT-IDG Fellow. His areas of interest include climate change, disasters and rare events, finance, corruption and crime, and environmental economics. After graduating from Harvard University in 2002 with an A.B. in physics, Jesse spent time studying at Peking University, followed by several years doing statistical analysis and corporate finance in Citigroup's investment bank, where he learned to appreciate applied statistics as well as the joys of working on too many projects at once. Outside of academic work, Jesse enjoys a variety of pursuits, most notably cooking, traveling, exploring cities, and martial arts. He speaks varying degrees of French, Mandarin, Japanese, and Spanish, as well as very poor Russian.



Xiaojia Bao is a first-year student in the PhD program in Sustainable Development. Her research interests focus on the interaction of environment and economic development, especially the relationship between environment pollution and economic growth. Besides, Xiaojia also has a deep interest in water pollution issues in China.

Xiaojia obtained her B.A. in Public Affairs Management in 2006 and MA in Resource and Environmental Economics in 2008 from Renmin University of China, with a master thesis on economic growth model with environment pollution consideration. She has worked as research assistant on Yellow River Pollution Water Pollution Control Project, and Sanjiang Plain Wetland Restoration Project. In 2007, she worked part-time in World Bank Beijing Office on air pollution and economic development in China. In 2008, she worked as program assistant in CAI-Asia on urban air pollution, especially PM10 pollution.



Johannes Castner is a first-year student in the Sustainable Development program. His research interests are resource scarcity and resource distribution as they are linked with the environment and with societal failures. Positivist questions about poverty and inequality, as well as questions in Moral and Political Philosophy concerning deprivation and poverty and the rich world's moral obligations toward the world's poor.



Denyse S. Dookie is a first-year student in the PhD program in Sustainable Development. A Caribbean national, Denyse is interested in learning more about the impact of climate change on small island developing states, and intends to explore solutions of reducing local vulnerability and enhancing resilience through adaptation to climate change. Denyse recently graduated with an MA in Climate and Society from Columbia University, and has previously completed an MA in Development Studies/Economics of Development from the Institute of Social Studies in The Hague (2004), as well as a postgraduate diploma in International Relations (2002) and a BSc in Economics and Mathematics (2001) both from the University of the West Indies (UWI) in Trinidad and Tobago. She has worked as a research fellow with the Inter-American Development Bank in Trinidad and Tobago, most notably with the Multilateral Investment Fund, in addition to several

research assistantships relating to sustainable and economic development in the Caribbean.



Marion Dumas is a first-year student in the PhD program in Sustainable Development. She graduated from the Massachusetts Institute of Technology with a B.S. degree in Earth and Atmospheric Sciences and from the Swiss Federal Institute of Technology with an M.Sc in Ecology and Evolution. She also worked as a consultant in sustainability strategies of companies in France. Her current research focuses on phosphorus scarcity and its impact on agriculture: she is building a dynamic modeling of the phosphorus cycle on a global scale and the use of such a model to evaluate the impacts on agro-ecosystems of various management strategies. Other research interests include restoration of ecosystem functions and the theory and practice of decision-making applied to sustainability.



Mukul Ram Fishman grew up in Israel, and for a long time his academic interests were focused on the beauty of theoretical physics. But he always had strong feelings about the environment, and during years of travel in developing countries, mostly in Asia, and involvement in humanitarian activities, he became aware of the broader issues of poverty and development. The program in sustainable development seemed to offer the vehicle to apply quantitative skills in tune with these concerns.

Ram holds a B.Sc. in Mathematics from Tel-Aviv University, and a M.Sc. in Physics from the Weizmann Institute of Science. He is currently working on groundwater depletion in India and on the theory of hyperbolic and heterogeneous time discounting.



Solomon Hsiang graduated from the Massachusetts Institute of Technology with degrees in Earth, Atmospheric and Planetary Science and Urban Studies and Planning. His research interests include the impacts of climate change and climate variability; as well as environmental, development and public economics. His current research is on the impact of tropical cyclones and surface temperature variability; the role of climate in conflict and migration; and the design of institutions that foster sustainable development. Solomon is an NSF-IGERT fellow and an EPA-STAR fellow.

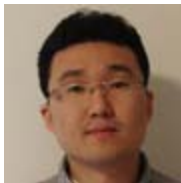


Amir Jina is a first-year student in the PhD program in Sustainable Development. His main research interests lie in community-based climate change adaptation and community development. Prior to joining the program, Amir completed an MA in Climate and Society from Columbia University during which, among other things, he had the opportunity to travel to India and Bangladesh to aid the International Federation of the Red Cross and Red Crescent Societies in South Asia in implementing climate change adaptation projects. He hopes to continue this relationship with the Red Cross as his studies progress.



Geoffrey Johnston is a second-year PhD student in the PhD program in Sustainable Development. His goal for the program is to explore and develop methodologies for helping peoples lift themselves out of poverty, especially in developing countries. He is interested in building spatiotemporal mathematical models of malaria transmission that can be utilized to develop optimal sets of interventions. He is also interested in market failures and agent modeling in economics.

After graduating from the University of Notre Dame with a BS in pure mathematics and a BA in philosophy, summa cum laude, Geoffrey Johnston was a corps member in Teach for America, teaching high school in Mississippi for two years and grade school in Cleveland for an additional year. He was a 2001 U.S. Presidential Scholar, has coauthored a paper on modeling magnetoplasmadynamic thrusters for NASA, worked at the White House Office of Science and Technology Policy, and studied law, physics, and maths for a year at New College, Oxford. He is an NSF Graduate Research Fellow as well as an IGERT International Development and Globalization Fellow. He encourages you to visit unicef.org and give whatever you can.



Booyuel Kim is a first-year PhD candidate in the PhD program in Sustainable Development. His research interests lie primarily in development economics, particular as it applies to microfinance and social business enterprise.

Prior to Columbia, Booyuel was a negotiation officer of Republic of Korea Air Force HQ for three years. He was involved in major defense acquisition programs such as F-35 JSF program, F-15K program, Airborne Warning and Control System(AWACS) program, Patriot Advanced Capability-3(PAC-3) program, etc negotiating with USAF, Boeing, Lockheed Martin, and other defense industries.

Booyuel received his Bachelor of Economics at Handong Global University, South Korea in 2003 and master of international affairs at SIPA, Columbia University in 2009.

He is currently a father of two daughters, Hannah and Sarah, and wants to be a father of three before he finishes the SD program.



Geoff McCarney is a second-year student in the PhD program in Sustainable Development. His interests include the economics of climate change, environmental valuation, natural resource management and linking public policy and patterns of resource use to development. He also has research experience in the areas of econometrics and experimental economics.

Geoff obtained his B.A. in History and Economics from the University of Ottawa in 2002 and his M.Sc. in Agricultural and Resource Economics from the University of Alberta in 2006. Following his Masters', Geoff remained at the University of Alberta for two years where he taught undergraduate natural resource economics and researched questions of land use change and the management of ecosystem service values in the boreal forest.



Kyle Meng is in his second year in the PhD program in Sustainable Development. His research interests lie primarily in the economics of climate

change drawing on tools from applied microeconomics, public economics, and industrial organization. In particular, Kyle's research focuses on the design and efficiency of climate policy, the economic impacts of climate change, and the treatment of climate uncertainty in economic modeling. Kyle also has complementary interests in carbon mitigation in China.

Prior to Columbia, Kyle was a research fellow at Environmental Defense Fund where, as a member of EDF's China team, his research and advocacy focused on issues relating to China and the international climate negotiations. Kyle also led EDF's efforts to reform the Clean Development Mechanism.

Kyle received his B.S.E. in environmental engineering at Princeton University where his undergraduate thesis examined opportunities for carbon capture and storage demonstration projects in China. The 2005 recipient of Princeton's post-graduate Martin Dale Fellowship, Kyle conducted studies on Chinese environmental perceptions as a researcher at Tsinghua University in Beijing. He is currently a recipient of the Paul and Daisy Soros Fellowship for New Americans.



Nicole Ngo received her undergraduate degree from the University of California, Irvine with a B.A. in Economics and a B.S. in Earth and Environmental Science. Her focus is in urban air pollution, both indoor and outdoor, and understanding the cost behind strategies for mitigating pollutants.

For the past four summers she participated in the Significant Opportunities in Atmospheric Research and Science (SOARS) internship, where she worked at the National Center for Atmospheric Research (NCAR). Research at NCAR included examining marine policy and improving understanding of convective clouds through modeling. She is also interested in urban issues in growing cities in Sub-Saharan Africa and working with local communities to help resolve these problems. Through research and conversations at NCAR and Columbia University, she has a better understanding of the gaps in interdisciplinary work between economics and atmospheric science. Ultimately she wants to improve collaboration, as well as her understanding of the balance between these two disciplines in motivating policy, with emphasis on problems of urban air pollution.



Mark Orrs is a fourth-year student in the PhD program in Sustainable Development. His primary interest is African economic growth and development, with approaches from the perspectives of tropical agriculture and arid/semi-arid lands, gender and education, and child mortality.

He is co-author of two articles on HIV/AIDS stigma, which were published in major public health journals. At present, he is completing his Masters' thesis on the effects of a sanitary towel distribution campaign on girls' attendance, for which he traveled to Coast Province in Kenya last November to collect primary data.

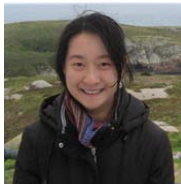
In 2003, Mark earned a BS in Sociology from Saint Joseph's University in Philadelphia. After a year of teaching fifth grade in Camden, New Jersey, he studied at the London School of Economics and Political Science, from which he received a Diploma in Economics with Distinction before being accepted into the Sustainable Development program. Mark has traveled to East Africa multiple

times, including in 2006 to film a documentary on street children in Nairobi. He has also worked at a home for HIV-positive AIDS orphans, socio-medical outreach projects into Nairobi's slums, income generating activities for slum dwellers, and the Millennium Villages Project on multiple, varied initiatives.



Aly Sanoh is a fourth-year student in the PhD program in Sustainable Development. He has worked on cost and access modeling of electrification in Senegal. His research interests include African economic development, community-based rural development, energy resources and technologies, and rural infrastructures. He is currently working on infrastructure provision and decentralization process in Mali.

Aly is from Guinea where he completed his Bachelor's degree in Applied Energy Studies from the University of Conakry in 1999. He obtained a Masters' degree in Energy and Environmental Policy from the University of Delaware in 2006.



Tse-Ling Teh is a first year PhD candidate in the PhD program in Sustainable Development. Her research interests are in public policy for the management of natural disasters. Tse-Ling received a Bachelor of Actuarial Studies (First class honours) and a Bachelor of Laws (First class honours) from the Australian National University (2006). An avid traveler, she has lived in many countries, most recently the Lao PDR working with the UNDP. Prior to resuming her studies, Tse-Ling was an actuarial analyst in the private sector.



Anna Tompsett is a third-year student in the PhD program in Sustainable Development. She graduated with a first class M.Eng. in Civil and Environmental Engineering from Imperial College London and the Universidad Politecnica de Madrid in 2004, and completed an MPhil in Engineering for Sustainable Development at the University of Cambridge in 2007.

Anna has consultancy experience in the UK in both water and structural engineering. Her overseas experience includes a year teaching high school Math and Physics in Uganda, and a year as an Engineers Without Borders UK volunteer, working on rural infrastructure projects in the Dadiya tribal lands of Gombe State, Nigeria, as well as involvement in improved-earthquake resistance adobe construction projects in El Salvador.

She currently works on research projects in Mali (using Landsat images to understand flood and agriculture patterns around Toya Millennium Village in the Niger Inland Delta) and in Bangladesh (as research assistant on a randomized field test of the impact of decentralization of decision-making in the provision of arsenic-safe water sources). Her research is broadly focused on understanding the interactions between different types of capital (physical, human, social, natural and financial).



Nan Zhong is a first-year student in the PhD program in Sustainable Development. She focuses on combined research on economic development and environmental policy.

Nan obtained her B.E. in Environmental Engineering and B.S. in Economics in 2009 from Tsinghua University of China. In 2008, she joined the on-going research project “An Analysis of Gasoline Tax Reform and its Implications in China” as a research assistant.

Post-MPhil



Saifedean Ammous is a sixth-year candidate for a PhD in the Sustainable Development program. His research interests include political and economic development, international development assistance, economic growth, Middle East politics, and alternative energy. He is currently working on his doctoral dissertation which is a multi-disciplinary study of the new biofuels program in Senegal. Saifedean is focusing on the Senegal program's prospects, political and economic dimensions, and how it relates to the global drive towards using biofuels.

Saifedean was born and raised in occupied Palestine and graduated from Ramallah Friends School in 1998. In 2003, he completed his Bachelor's degree in Mechanical Engineering from the American University of Beirut in Lebanon; he obtained a Master's degree in Development Management from the London School of Economics and Political Science in 2004.



Jessica Barnes is a sixth-year candidate in the PhD program in Sustainable Development. The focus of her research is on water management in Egypt's agricultural sector. Drawing on a year of ethnographic fieldwork in Egypt, her research traces the linkages between farmers' everyday practices of water use and regional, national, and international policy-making on water resources management. Jessica holds a Master's in Environmental Management from Yale's School of Forestry and Environmental Studies and a B.A. in Geography from Oxford University.



Mo Ji is a sixth-year PhD candidate majoring in Sustainable Development. Her research interests are economic development, economic growth, and the economies of East Asia, including China. She holds a B.A. degree with Great Distinction in Economics from Renmin University, P.R. China, a MA degree in Economics from Peking University, P.R. China, and a MA degree in Statistics from the University of Pittsburgh.

Mo Ji was a research assistant at the Graduate School of Business (GSB), Columbia University, a project programmer at the Committee on Global Thought (CGT) and the Initiative for Policy Dialogue (IPD), an intern at the United Nations Headquarters (UN), and a short-term consultant at the World Bank (WB). She was also the President of the student organization “Greater China Initiative” at Columbia University for the 2006-2007 term.



Chandra Kiran Krishnamurthy is currently in the fifth year of the PhD program in Sustainable Development and has varied research interests, including measuring climate change impact, valuing complex ecosystems, and modeling the dynamics of economic and environmental issues.

Chandra received a Bachelor's degree in Mechanical Engineering from Bangalore University (India), and a MPhil in Economics from the IGIDR (a Development Research Institute in Mumbai, India). His prior work, in his MPhil dissertation, focused on modeling the impact of emission restrictions on the Indian economy and evaluating the beneficial effects, economic and environmental, of the introduction of biological fuels in India.

His research at Columbia focuses on distinct issues, such as evaluating changes in extreme rainfall events for India and developing statistical models for monsoon rainfall prediction (for agricultural use), addressing the issue of groundwater management using a dynamic programming model, and estimating the impact of predicted changes in climate on agriculture in India.



Gordon McCord is a fifth-year student in the PhD program in Sustainable Development. Gordon has varied interests, including economic growth and poverty reduction, the role of geography in economic dynamics, and the interaction of epidemiology and poverty (particularly in the case of malaria). Before beginning the program, he worked as a special assistant to Jeffrey Sachs at the Columbia Earth Institute and at the UN Millennium Project. During those years, Gordon had the opportunity to travel all over the world supporting Prof. Sachs both in research and in working with country governments and international organizations. Gordon grew up in Latin America and received his B.A. in Economics from Harvard University, where he focused on economic development and Latin American studies, and wrote an undergraduate thesis on the effects of rural road improvement on family incomes in rural Peru.



Anisa Khadem Nwachuku is a PhD candidate in Sustainable Development with a concentration in public health and a National Science Foundation IGERT fellow in International Development and Globalization. Her research seeks to examine the relationship between vulnerability and sustainability particularly as it relates to health equity, resource management and materialism.

She has previously conducted policy research for the World Health Organization, Results for Development, UNICEF, the Center for Strategic and International Studies, The Carter Center, the State Department, and the Program of African Studies at Northwestern University. She holds a B.A. from Northwestern University in International Development Policy.



Jose Carlos Orihuela is a doctoral candidate in Sustainable Development. A recipient of the CICR Empedocle Maffia Fellowship, his doctoral dissertation examines the rise of the green state in Latin America by asking why green policy convergence takes place within institutional divergence in mineral-rich Chile and Peru. His research gives close attention to the critical role of policy-entrepreneurs at windows of opportunity and the evolving interplay of agency and structure. He is also involved in a research project with a group of scholars from the University of Oxford whose goal is to revisit the resource-curse

hypothesis by comparing six cases of institutional development across Latin America and Africa.

Jose Carlos holds a B.A. in Economics from the Pontificia Universidad Catolica del Peru and a MPA in International Development from Harvard University. His research interests include the political economy of environmental conflict, green governance and resource-based development.



Marta Vicarelli is a PhD candidate in the Sustainable Development program and is a research assistant at the Center for Climate Systems Research at Columbia University. Since 2004, she has been a research fellow at the National Aeronautic and Space Administration (NASA) Goddard Institute for Space Studies.

Her principal field of research is climate change and natural catastrophes risk management and financing. Her current research interests focus on, the balance between the public and the private sector (e.g. insurance, re-insurance) in risk sharing and cost sharing for different risk reducing measures; possible partnerships between international organizations (such as, OECD, UN, World Bank, and UNDP), governments and the private sector; impacts of public policies on insurance (and re-insurance) decision making and market behavior; and the potential role that insurance can play in encouraging mitigation for actions that reduce the impacts of climate change.

She is currently working as a contributing author to the Intergovernmental Panel for Climate Change (IPCC) Fourth Assessment Report, Working Group II, investigating observed changes and responses in natural and managed systems and sectors.

Thanks to a fellowship offered by the French Ministry of Education, Marta spent three years in France where she received a B.S. in Earth and Atmospheric Sciences from the École Normale Supérieure in Paris, and a Master's of Environmental Economics from École Polytechnique. She then moved to New York where she completed a Master of International Affairs at SIPA, Columbia University.

Alumni



Daiju Narita graduated from the PhD program in Sustainable Development in 2008. His research interest is the interrelationship of technology and policy with regard to the global climate change problem. He completed his dissertation about potential economic impacts of the carbon dioxide capture and storage (CCS) technology to reduce global greenhouse gas emissions. In his dissertation research, he is also analyzing the policy making mechanism on CCS, particularly the process of scientific assessment by the Intergovernmental Panel on Climate Change (IPCC).

He has a M.Sc. and a B.A. in Chemistry from the University of Tokyo, where he studied long-range chemical transport of air pollutants (ozone in particular) over

East Asia. After his Master's study in Japan, he worked in the Japanese Ministry of Education, Culture, Sport, Science and Technology, where he was involved in national research funding and nuclear safety regulation. He is currently in a postdoctoral fellowship at the **Kiel Institute for the World Economy** http://www.ifw-members.ifw-kiel.de/~daiju_narita_ifw_kiel_de



Margaret MacLeod graduated from the PhD program in Sustainable Development in 2009. Her research focuses on human capital formation and transfer in developing economies, specifically, education as well as maternal and infant health. Drawing from the field of Labor Economics, her methodological focus has been on randomized and quasi-experiments.

Margaret holds a B.S. from Georgetown University's School of Foreign Service and has studied at Nanzan University and the Delhi School of Economics. She speaks French, Japanese, Hindi, and Gujarati.



Lily Parshall is a sixth-year PhD candidate in Sustainable Development and recipient of an NSF IGERT Fellowship in International Development and Globalization. She studies energy systems and policy, with a focus on the urban scale. She is interested in how cities use energy, why some cities are more efficient than others, and what cities can do to reduce fossil fuel consumption and address climate change. Currently, she is working on two projects. The first uses spatial analysis to estimate urban energy consumption in U.S. cities, with policy implications for energy-efficient urban development and local energy governance. In the second, she is developing a spatially explicit model of demand for heat and power in New York City buildings and determining the technical feasibility and relevant scales of distribution for several alternative technology options. Her previous research includes modeling national electricity grid expansion in Senegal and Kenya. She has conducted research for the International Energy Agency, the World Bank, and the New York State Energy Research and Development Authority. She holds a B.A. in Earth and Environmental Science from Columbia University. She currently holds a research position at Goldman Sachs New York.

Courses 2010-11**Required for MA****First Year****Fall Semester**

Mathematical Methods for Economists (ECONG6410)
Microeconomic Analysis I (ECONG6211)
Introduction to Econometrics I (ECONG6411)
Environmental Science for Sustainable Development (SDEVU6240)
Sustainable Development Seminar (SDEVU9200)

Spring Semester

Politics of Sustainable Development (SDEVU9250)
Microeconomic Analysis II (ECONG6212)
Introduction to Econometrics II (ECONG6412)
Human Ecology (SDEVU9240)
Natural Science Elective #1
Sustainable Development Seminar (SDEVU9200)

Second Year**Fall Semester**

Environmental and Resource Economics (SDEVU9245)
Quantitative Analysis for Sustainable Development (SDEVU9622)
Comparative Development (SDEVU9260)
Natural Science Elective #2
Sustainable Development Seminar (SDEVU9200)

Spring Semester

Science and Technology Policy for Development (SDEVU9255)
Sustainable Development Seminar (SDEVU9200)
Natural Science Elective #3
Sustainable Development Seminar (SDEVU9200)

Electives**Other SDEV Courses**

Economics, Science and Sustainability (SDEVU9265)
Macroeconomic Policy and Development (SDEVU8606)
Development Policy: Multidisciplinary Roads (SDEVU6254)
Topics in International Finance (SDEVU9400)

Courses 2010-11

Required for MA

First Year

Fall Semester

Mathematical Methods for Economists (ECONG6410)

This course is an introduction to a number of mathematical techniques that are useful for economics research. It is impossible in a single course to cover all of the mathematics that is used in modern economics research. Therefore, our goal is to provide some essential techniques, along with an overview of how mathematics is used so that students may be able to learn the areas of mathematics that are relevant to their research.

Microeconomic Analysis I (ECONG6211)

This graduate economics class is intended primarily for Economics PhD candidates and Business School Economics and Finance students. The class will cover consumer theory, production theory, choice under uncertainty and partial equilibrium.

Introduction to Econometrics I (ECONG6411)

Designed for first-year economics PhD students, this course covers basic probability and statistics theory that is essential for subsequent study of econometrics and other subjects of economics. It will also cover basic theory of linear regression. In addition, extreme estimation and large sample inferential theory will be introduced.

Environmental Science for Sustainable Development (SDEVU6240)

The Earth's physical and natural systems are experiencing dramatic changes that bring into question the sustainability of our planet. Essential to addressing these changes is an understanding of the functioning of the earth and natural systems. This course provides fundamental knowledge of the topics within the natural sciences that are critical to address the issues of sustainable development. The interactions between the natural and human environment are complex and interconnected. A strong understanding of the functioning of the earth's processes is essential to addressing sustainable development challenges. This course provides a rigorous survey of the key areas of natural science that are critical to understanding sustainable development. The goal of the course is to provide students with a fundamental understanding of natural science topics that are essential to addressing issues of sustainable development. The course will provide the theories, methodological techniques and applications associated with each natural science unit presented. The teaching is designed to ensure that students have the natural science basis to properly appreciate the co-dependencies of natural and human systems, which are central to understanding sustainable development. Students will learn the complexities of the interaction between the natural and human environment. After completing the course, students should be able to incorporate scholarly scientific work into their research or policy decisions and be able to use scientific methods of data analysis.

Sustainable Development Seminar (SDEVU9200)

A year-long seminar in which students present their research work and have it critiqued by fellow students and faculty. Students are also given presentations on several aspects of research and career building including job market advice.

First Year

Spring Semester

Politics of Sustainable Development (SDEVU9250)

Much is assumed in policy-making for sustainable development. We behave as if there were consensus about the values that serve sustainability, the nature of the states that manage it, the character and the economic change that shapes it, the international context in which development takes place, the sources of expertise about the environment and about the economy that inform it, and the identities of the stakeholders that care about it. In fact, of course, there is no consensus and yet, at our peril, we ignore the mechanism through which conflicts are framed and resolved, that is, politics.

This course is designed to permit exploration of those assumptions and the devices by which the conflicts they raise are debated and settled, and to develop a body of knowledge about them that can be shared by the class—and ultimately by others as well.

The first part of this course is designed to provide students with some of the background and history of the values, states, economic changes, international contexts, expertise and stakeholders that inform sustainable development. The second explores the perspectives of some of the participants in policymaking around sustainable development—state bureaucrats, experts and technocrats, international official actors, NGOs, private firms—and the third examines several case studies.

Microeconomic Analysis II (ECONG6212)

This course is an introduction to Game Theory with Applications. The course shall be based upon Part Two of Microeconomic Theory by Mas-Colell, Whinston and Green. The goal is to introduce the student to game theory, particularly the notion of a Nash Equilibrium with some applications to industrial organization and labor.

Introduction to Econometrics II (ECONG6412)

Economics G6412 is a second course of econometrics at the graduate level. The first half of the course is devoted to the linear regression model, least squares and GMM. Both large and small sample properties are studied. The second part of the course focuses on time series models and methods. The goal is to be well on our way to practicing basic econometrics by the end of the semester.

Human Ecology (SDEVU9240)

This course describes the interactions between physical ecology and economic development, and stresses the two-way interactions between them. Ecological constraints (climate, disease ecology, physical resources such as soils and energy sources, topography and transport conditions) significantly shape the patterns of economic development, demography, and wealth and poverty. At the same time, anthropogenic activities (farming, resource depletion, demographic stresses, energy use) change the physical environment. This course aims to give an in-depth treatment of this two-way interaction, building on a rigorous foundation of earth systems processes to understand the ecological bases of human settlement.

This course differs substantially from a traditional course on economic development by placing the greatest stress on the interactions between the physical environment and human society. It does not deal at great length with traditional microeconomic topics of household consumption and saving, nor with industrial organization and risk-sharing in low-income settings.

Sustainable Development Seminar (SDEVU9200)

As above

Second Year

Fall Semester

Environmental and Resource Economics (SDEVU9245)

The goal of this course is to introduce students to the basic concepts of natural resource and environmental economics in about 14 weeks. It should hence be seen as a survey class that introduces the basic ideas of the field.

Quantitative Analysis for Sustainable Development (SDEVU9622)

Conducting empirical research that can be used to set policy or change practice requires a thorough understanding of causal inference. The primary goal of this course is to provide students with knowledge and experience necessary for answering causal questions in their own research using either observational or experimental data. The course will cover the statistical theory necessary for understanding the corresponding assumptions and methods. This framework will be used to explore both research design (randomized experiments, broken randomized experiments, observational studies) and analyses aimed at identifying causal effects. Examples from published research will be used throughout the course to illustrate key ideas and methods. The course will conclude with the statistical theory of linear regression analysis.

Comparative Development (SDEV U9260)

This course will first examine the nature, ingredients and gradations of the extraordinary success of several East Asian economies. The lessons of their experience have been the subject of an extensive literature. The course will introduce students to the main controversies. The second part will illuminate the debate by contrasting the experience and policies of East Asia with stylized trends and overviews of developments in each of the regions of Latin America, South Asia (Indian subcontinent), and Sub-Saharan Africa. These comparisons will be informed by the question of what the lessons of East Asian success are for these other regions.

Sustainable Development Seminar (SDEV U9200)

As above

**Second Year
Spring Semester****Science and Technology Policy for Development (SDEV U9255)**

Science and technology are increasingly viewed as important tools to address health, nutritional, and environmental challenges facing developing countries. They are also widely seen as means to create jobs, raise productivity, and thus improve living standards. Accordingly, there is growing consensus that science and technology policies are central to the process of sustainable development. This course provides an introduction to the academic and policy literature on science, technology and development. We begin with a discussion of the roles of technology in growth and development, drawing on the historical and macroeconomic literatures. Next, we turn to the literature on the microeconomics of innovation, learning and diffusion. Third, we discuss the main policy instruments used by governments in developed and developing countries to affect the rate and direction of technical change and diffusion. Much of the literature in this field historically has focused on developed countries, and the reading list reflects this. However, class participation and discussion will focus on drawing implications for economic development.

Sustainable Development Seminar (SDEV U9200)

As above

Electives**Economics, Science and Sustainability (SDEV U9265)**

The first aim of this course is to think explicitly about sustainability, what it is and how to measure it. We look at the theory and the practice of these issues, augmented by some case studies of sustainable and non-sustainable development. Subsequently we work at integrating scientific analysis of problems that are central to sustainable development - such as climate change and biodiversity loss - with economic analysis to produce integrated analyses of the issues involving economics and natural sciences. Finally we shall talk briefly about some of the policy options available for promoting sustainability.

Macroeconomic Policy and Development (SDEV U8606)

The course will focus on major macroeconomic policy issues relevant for developing countries. It will mix theory with institutional analysis and empirical evidence. It will analyze first questions relating to short-term macro adjustment and end with long-term growth, with a specific emphasis on the effects of financial development and capital account liberalization on macroeconomic performance in developing countries. Throughout the course, we will consider both orthodox and heterodox perspectives on macroeconomics, with an emphasis on policy issues.

Development Policy: Multidisciplinary Roads (SDEVU6254)

The course will focus on a selection of salient economic policy issues that confront the developing countries today. Whilst rooted in economic debates, the course will underscore the multidisciplinary nature of those challenges, examining both the technical and the political-economy dimensions of policy making. The main objective of the course is to help clarify the controversies that have dominated the policy debate in developing countries in recent years and to expose students to the considerations that go into making policy choices. The course is aimed at both PhD students, especially in sustainable development, and the Masters degree students at SIPA with some economics background.

The course will be organized around four modules. Module I: "Development and Reforms: The Big Controversies" will analyze how historical controversies on development have influenced the reform debate, and the political economy of reform. Module II: "Macroeconomics and Development Finance" will include the financing of the public sector. Module III: "Reforms of the Economic Structure" will deal with reforms pertaining to trade; industry and technology; agriculture; and privatization. Module IV: "Equity Dimensions" will analyze the implications of reform on equity. There will be three sessions in each module, except Module III which will have four.

Topics in International Finance (SDEVU9400)

The course is open to all graduate students that are interested in acquiring basic tools for the analysis of policy-oriented issues in international finance and open macro-economics. These issues include financial crises in emerging and mature markets (e.g., the subprime crisis), monetary policy under imperfect credibility in economies open to international capital flows, management of public debt and debt crises, dollarization and currency substitution.

Requirements: Students should be familiar with undergraduate-level macroeconomics; and have a working knowledge of calculus and differential equations, and basic econometric techniques. Although analytical requirements are not high, students must have the motivation to learn models and work out simple exercises involving those models.

Organization: The first half of the course will consist of lectures aimed at developing a basic analytical framework for the analysis of a variety of issues. The second part of the course will mostly consist of students' presentations of selected papers, or the students' own papers. In addition, I will likely invite leading scholars to talk about their research. There will be a recitation session in which technical material and exercises will be discussed. One objective of this session is to level the playing field and help those students that have relatively weak analytical skills. There will be mid-term and final exams based on homework and discussed in the recitation session.