

# The Expanding Role of Environmental Policy and Sustainability Management in Educating Professionals: The Case of Columbia University

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Track Two: Understanding Changing Markets and Engaging Stakeholders**

## **Introduction**

This paper describes Columbia University's graduate offerings in sustainability policy and management, highlighting the expanding role of executive-style training in the growing fields of environmental policy and sustainability management. *The purpose of the paper is purely descriptive:* to provide a summary of the goals, curricula, and audiences for these three programs to help other universities that may be engaged in planning similar courses of study.

Columbia University, across its many schools, provides a number of professionally oriented graduate degrees in environmental policy and sustainability management. This year, the School of International and Public Affairs launched a new concentration in Environmental Policy and Sustainability Management for the Executive Master of Public Administration (MPA) program. This concentration, coupled with the existing Executive MPA core, emphasizes integrated thinking, training students to analyze issues of environmental sustainability.

This new program highlights two important trends in education today: 1) the need to tailor our public service curriculum to the burgeoning need for sustainability managers and 2) to orient our program offerings toward working professionals. The Executive MPA concentration curriculum, taught on Saturdays, builds on the success of our Master of Science (MS) in Sustainability Management program at the School of Continuing Education, in which most courses are offered in the evening. While both programs are offered part-time, compared with the MS in Sustainability Management, the new Executive MPA concentration is designed to provide a more public policy-oriented sustainability degree

for working professionals. Both programs were heavily influenced by our one-year MPA in Environmental Science and Policy, a full-time program that has successfully trained environmental leaders for over a decade.

Today's students are increasingly interested in environmental sustainability studies and universities across the country, and globally, are developing programs to meet this need. Columbia University offers 24 different environmental degree programs. Further, in recognition of the importance of professional-level environmental study, Columbia acknowledged the need to develop varied program delivery options for environmental policy and management curricula, enabling this type of study to reach diverse audiences. Potential students are given an opportunity to further their education in a manner that allows them to work or take limited time off. Programs designed for working professionals can be fast-tracked, part-time, or certificates. Some provide great flexibility in terms of course selection, allowing part-time students to develop programs tailored to their specific professional goals. Flexible programs may be even more important as the landscape of education financing changes.

Particularly given the economic downturn and an increasing sensitivity to student debt, programs increasingly need to cater to "in-service" students who wish to continue working during their course of study. Following a decision by Congress in June of this year, which maintains a change made under the Budget Control Act of 2011, as of July 1, 2012 students in graduate and professional programs were no longer eligible for Federal Stafford Direct Subsidized Loans. In contrast to subsidized loans, unsubsidized loans accrue interest while the student is in school. For some professional studies students, this interest will accrue over extended periods of time as their programs are spread out due to work schedules. Until this recent decision which extended the lower fixed rate of 3.4% to undergraduate students, qualifying graduate students were able to access subsidized loans. Though the subsidized loans may not cover the entire cost of education, the end of access to the lower, subsidized rate can change willingness to incur

debt for graduate education. This change will shift the graduate school market in two ways: individuals may not enroll in graduate school at all, faced with increasing interest rates, or they may opt to finance the program on their own, making it more difficult to afford the costs of a full-time program. Flexible programs that limit this financial impact will increase in popularity. Programs must strategically plan for this change by catering to the needs of working professionals in order to remain competitive. While public tuition rates are under increasingly upward pressure, they are still a relative bargain when compared to private tuition and we may see some movement from private to public graduate programs.

Nevertheless, in our view, the need to both protect the environment and build a sustainable economy are too important to ignore, and we expect continued expansion of study in the field of sustainability policy and management. The Earth Institute, Columbia University has established itself as a global leader in sustainability education, providing a comprehensive set of offerings that meets the wide variety of professional-level needs in this growing field. The Earth Institute works with a number of Columbia's schools and departments to provide a variety of interdisciplinary professional certificates and terminal master's degrees in environmental sustainability policy and management. Its current offerings range from a non-degree, non-credit, part-time certificate to an intensive, full-time, 54-credit master's degree and include the programs pictured in Exhibit 1.

The development of this portfolio of academic programs is evolving over time, growing from the need to develop problem-solving environmental professionals. While each program is unique, many of the programs share commonalities including a commitment to interdisciplinary study and practical hands-on training. All three programs summarized in this paper emphasize the complex and systemic nature of environmental issues and focus on the practical skills necessary to deal with such issues. They each offer students an interdisciplinary learning experience, combining courses in the natural sciences with traditional management, economics and policy courses. Further, environmental science is integrated

into management and policy course materials using carefully selected data, examples, cases, and assignments.

Exhibit 1: Earth Institute Environmental Professional Programs



This paper compares and assesses the curricula and audiences of three Columbia University environmental policy and sustainability management programs:

1. The full-time intensive one year MPA in Environmental Science and Policy
2. The part-time (or full time for 25% of its students) MS in Sustainability Management
3. The part-time Executive MPA Concentration in Environmental Policy and Sustainability Management

While each of the programs has a similar disciplinary focus of environmental policy and management, each program targets professionals with unique interests and varying availability. The following descriptions demonstrate the growth from one intense and focused, full-time sustainability program toward more flexible, part-time programs – how and why those programs were developed and the similarities and differences in these student bodies.

### **M.P.A. in Environmental Science and Policy**

#### Overview of the Program

The Master of Public Administration (MPA) in Environmental Science and Policy, offered through the School of International and Public Affairs, trains public managers and policymakers to apply innovative, systems-based thinking to environmental issues. The program began in 2002 and in its first year was offered at Columbia's Biosphere campus in Arizona. It was moved to Columbia's Morningside campus in New York City in its second year. The program is shaped by the idea that policymakers and managers must understand fundamental ecological interactions to maintain the health of Earth's interconnected environmental, institutional, economic, and social systems. The program challenges students to think systemically but act pragmatically. To meet this challenge, the program in public management and policy analysis emphasizes practical skills and is enriched by ecological and earth systems science.

Graduates of the Environmental Science and Policy MPA program are prepared for the roles of analyst, manager, and translator of environmental problems and proposed solutions. The program's students develop the skills, knowledge and experience required to be effective problem-solving environmental sustainability professionals. Most of its 600 and graduates have gone on to impressive careers working on solutions to the world's most pressing sustainability problems.

#### Curriculum

This program couples in-depth understanding of the issues of environmental policy with the traditional analytic, conceptual, and communication skills of a Master of Public Administration program. The curriculum assumes that only by combining knowledge of earth systems issues with management strategies will it be possible to cope with the threats to planetary sustainability. For this reason, the program requires more science than any other public policy program in the United States. Courses in environmental science enrich the training so that graduates will be able to inform the decision-making process and communicate with and manage scientific experts.

Students in this program study a core curriculum which prepares them to analyze, plan and implement public policy. In addition to the getting a firm foundation in policymaking, politics, and public and environmental ethics, students take core management, finance and economic courses where they learn about organizational analysis, budgeting, financial analysis and reporting, applied statistical analysis and microeconomics. The program emphasizes a hands-on approach so that students may acquire the analytic, communication and professional skills required to be problem-solving professionals. These skills include memo writing, presentations, team management and financial analysis. The program's curriculum includes all the basics of a traditional MPA: politics, economics, public management, financial management, public ethics and quantitative analysis. They enroll in an environmental science and policy concentration that spans the social, physical and natural sciences.

Exhibit 2 describes the curriculum of the MPA in Environmental Science and Policy.

Exhibit 2: Environmental Science and Policy MPA Courses		
<i>Summer</i>	<i>Autumn</i>	<i>Spring</i>

Environmental Chemistry	Sustainability Management	Financial Management
Risk Assessment and Environmental Toxicology	Microeconomics and Policy Analysis I	Microeconomics and Policy Analysis II
Climatology	Quantitative Techniques and Systems Analysis in Policymaking and Management	The Workshop in Applied Earth Systems Policy Analysis (Client-based capstone project)
Hydrology	Ethics, Values, and Justice	Environmental Data Analysis <i>(or Elective)</i>
Principles of Ecology	The Workshop in Applied Earth Systems Management II (Continuation of management simulation)	Sustainable Economic Development <i>(or Elective)</i>
Urban Ecology	Political Context of Public and Private Management <i>(or Elective)</i>	
The Workshop in Applied Earth Systems Management I (Management simulation)		
Earth Systems and Environmental Politics, Policy, and Management		

Environmental MPA students integrate the above mentioned curriculum by addressing real world environmental problems in a unique three semester workshop sequence. In the summer and fall they work in groups of 12-13 with a faculty advisor conducting a management simulation of the implementation of an environmental statute. In the spring, groups of students and their faculty advisor conduct analyses for public and nonprofit environmental clients.

This 54-point MPA degree is offered only full-time and is taught over an intensive 12-month (three-semester) period during which students take 18 credits per semester. This integrated program is cohort-based with roughly 60-70 students enrolling each year. It is delivered through a highly structured format allowing for only three elective courses throughout the entire program. The program is rigorous and very prescriptive—45 of the 54 points are in specially designed required courses that provide both standard public policy/management and environmental sustainability instruction simultaneously. It is a



cohort program that begins the day after Memorial Day and is completed at the end of Columbia's spring semester. Out of class learning and a strong sense of shared mission leads to high morale and long-term identification with the program.

Students begin their studies with six (2 point or half-semester) environmental science courses in the summer semester. The science curriculum was carefully developed by top environmental research scientists at Columbia University's Earth Institute. It was carefully crafted to develop environmental generalists, providing an overview of the key issues in sustainability. All graduates leave with a solid foundation of the basic science underpinning a wide variety of environmental problems.

### Audience

Due to its rapid and intensive nature, The MPA in Environmental Science and Policy requires full-time attendance. Individuals who enter the program either take a year off from their current job or use the degree to transition into a new role. This structure differs from many public administration programs, including the traditional MPA degree offered at SIPA, which runs for two years. It is similar to the MPA at the Maxwell School and the Journalism degree at Columbia. Unlike the typical graduate school pace, which allows for a concentration and a wide allowance for elective courses, the MPA in Environmental Science and Policy program appeals to students who are looking for a shorter, condensed graduate format. It has less time for reflection, internships, and a full, in-resident school experience, but allows graduates to return to work after one year, taking only a short hiatus from their careers. They are not expected to work or intern during the program year. In fact, they are discouraged from doing so due to the intense time commitment required by the program's course load. For this reason, this program may be more appealing to individuals with work experience who are seeking the prescriptive educational experience rather than a more experimental student experience that allows time for exploration and active co-curricular participation.

The program also appeals to students who want to leave employment to study, but for as short a time as possible. Some students wish to maintain their career momentum, and others are concerned about the length of time they will not be able to generate income. The program's time table provides additional financial benefits. The program is 25% less expensive than SIPA's two year program, since it can be completed in three semesters rather than four. Students who are borrowing funds for both education and living expenses do so for half of the time of a traditional MPA program. Students still receive the benefits of a full-time, cohort-based program, but do so in a shorter time-frame and with less financial commitment.

The program's applicant pool is very heterogeneous. Students come from all over the world and have widely varied disciplinary backgrounds and professional experiences. Between 200 and 250 apply each year for 60-70 slots.

## **Master of Science in Sustainability Management**

### *Overview of the Program*

The MS in Sustainability Management program, offered through the School of Continuing Education, is a management degree oriented toward working professionals in the New York City region. The program was launched in 2010 in response to a need to provide the type of comprehensive, interdisciplinary training that the MPA in Environmental Science and Policy degree offered, but in a format that allowed part-time study. The demand for this type of format far exceeded expectations, with 250 students enrolled by the second year and 280 in the program's third year.

The program emphasizes integrating the physical dimensions of environmental sustainability into traditional management curriculum. In response to the increasing global challenges all organizations face, from limiting carbon emissions to managing scarce resources, the program combines academic leadership, scientific rigor, and professional practice to form a unique interdisciplinary community dedicated to making lasting advances in global sustainability practice.

This program, in contrast to the MPA in Environmental Science and Policy, aims to attract students who plan to work full-time while they study part-time. It aims to formally train sustainability practitioners – whether they currently work in the field or are utilizing the degree to leverage their existing professional experience into new roles in sustainability. Sustainability Management students are also more private sector focused in their backgrounds and career aspirations. However, public policy is incorporated into the curriculum, because the public sector plays a critical role in both encouraging sustainability and regulating the environmental impacts of private organizations.

### *Curriculum*

The 36-point degree program may be taken part-time in the evening or full-time and requires only two core courses. The remaining 30 points are fulfilled through field requirements in five general areas of study:

1. Integrative Courses in Sustainability Management
2. Economics and Quantitative Analysis
3. The Physical Dimensions of Sustainability Management
4. The Public Policy Environment of Sustainability Management
5. General and Financial Management

This structure provides flexibility for students to design a degree that uniquely fits their interests and needs, while ensuring that all students receive training in the core areas of management, finance, quantitative analysis, public policy, and science. The flexibility of the program allows students to enroll in courses offered directly by the sustainability management program, or to select courses offered by other Columbia professional schools and academic departments to best meet their diverse professional needs. This flexibility is one of the program's most distinctive features. Rather than offering a prescriptive core curriculum and specific concentrations or specializations, as in more traditional programs, the students in the Sustainability Management MS program can essentially craft their own degree to best support their career aspirations. For example, a student might want to jumpstart his or her career in the energy business sector. This student can choose courses across Columbia University which meet the needs of the five general areas, yet are specific to clean energy development. Others may look to coursework that allows them handle many sustainability efforts at a higher, managerial level and, therefore, need to have the appropriate discourse and background to hire, manage, and communicate with a variety of experts. Because the curriculum is so flexible, faculty advising is important. Advising plays a significant role in helping students to capture the opportunities available to them and to maximize their schedule and tenure at Columbia University.

The program teaches sustainability metrics, environmental science, management, finance and policy studies to help students fully understand the systematic and organizational role of sustainability in any organization. Students enroll in courses in environmental economics, statistical analysis, metrics, urban planning, architecture, energy efficiency, public policy tools, operations management, environmental markets, emerging technologies and other pertinent topics in sustainability. Professionals facing sustainability issues need to be able to appreciate complex systems of water, environmental services,

climate, waste and energy to be able to maximize efficient usage and minimize their negative impacts.

The suite of courses prepares them to execute these projects.

Exhibit 3: Selection of MS in Sustainability Management Courses
<b>Sustainable Futures</b>
<b>Architecture and the Sustainable Built Environment</b>
<b>Cost Benefit Analysis</b>
<b>Decision Models and Management</b>
<b>Sustainability Management</b>
<b>Environmental Conflict Resolution Strategies</b>
<b>Sustainable Cities</b>
<b>Sustainability Science</b>
<b>Sustainable Finance</b>
<b>Science of Sustainable Water</b>
<b>Sustainability Metrics</b>
<b>Sustainable Operations</b>
<b>Global Environmental Markets</b>
<b>Economics of Sustainability Management</b>
<b>Green Accounting</b>
<b>Financing the Green Economy: Markets, Business, and Politics</b>
<b>Workshop in Sustainability Management</b>
<b>Geographic Information Session (GIS) for Sustainability Management</b>
<b>Ethics and Values for Sustainability Management</b>
<b>Policy and Legal Context of Sustainability Management</b>

Audience

The flexibility of the curriculum attracts students from a wide variety of fields. Students are drawn from the public and nonprofit sectors as well as the private sector. The program is geared towards individuals currently working in the field and those looking to switch careers. Those individuals who have some form of sustainability responsibility in their current position are looking to deepen their understanding to better meet the current goals of their job. Those who are looking to switch career paths to pursue opportunities in this field need the interdisciplinary curriculum to be able to make this career move. The subject matter is focused on application and practice, rather than strictly on theory, and therefore

complements students' work in their careers. Students are often able to apply lessons they learn in the evening to their work the next day. Additionally, many of the professors are working practitioners in the field and can offer direct, topical insight into trends and challenges from the field.

Students are attracted to the structure of this program since it can be taken part-time over a number of years or expedited and completed full-time in a year. A student can continue to work full-time or work at an internship and take varying levels of student status. The classes are offered after work hours from 6-8 PM and 8-10 PM, allowing students to come to campus after work and engage with their cohort after class for group projects. They can schedule their course load around their work schedule, coming to campus one day a week or as often as they like to use the facilities and resources on campus. Like the coursework, this program offers flexibility in how the student engages with Columbia and how it complements their professional goals.

While the 36 point requirement can allow students to complete the degree quickly if they wish, we have found that some students were interested in continuing their studies and were looking for a degree experience comparable to an MPA or MBA degree. We also found some practitioners who already held a master's degree wanted to re-tool in sustainability studies but did not want another degree. For these students we have developed a set of 12 point (4 courses) certificate programs. The first, launched this past fall, is a certificate in sustainability analytics. This certificate enables students to focus additional attention on the development of analytic tools such as sustainability metrics, green accounting, life cycle analysis and geographic information systems (GIS). Additional certificates are being developed in climate science and policy, sustainable water and environmental risk management.

This program is appealing also for students because of the financial flexibility. Like the one year MPA Environmental Science and Policy program, students in the Sustainability Management MS program can limit their student loans by completing it in one year. Part-time students who only enroll in one or two classes a semester borrow less than many of their graduate school peers. Many pay for one or all of their classes out of pocket, while others are eligible for support offered by their current employer.

### **Executive Master of Public Policy and Administration, Concentration in Environmental Policy & Sustainability Management**

#### *Overview of the Program*

The Executive Master of Public Administration (MPA), offered by the School of International and Public Affairs, provides a more public-policy oriented sustainability degree for executives and managers working in the New York region who are looking for a carefully structured and highly analytic part-time program. The new concentration, one of three offered in Columbia's Executive MPA, adds a sustainability context to the policy and management core curriculum. Core classes include sustainability or public management, microeconomics, and financial management, while concentration-specific courses (some shared with the MS in Sustainability Management program) include Financing the Green Economy, the Science of Environmental Sustainability, and Sustainable Cities and Built Environments.

Similar to both of the programs detailed above, this new concentration emphasizes integrated thinking when coping with issues of environmental sustainability. Since environmental sustainability has become central to government and business concerns, the goal of this concentration is to cultivate and train professionals that can manage earth systems in ways that will ensure the long-term viability of life on our planet. Though this program shares courses with the Sustainability Management MS program, the focus remains on public policy and management. The sustainability courses complement the traditional

MPA core curriculum. Students in this program are typically policy makers and public sector administrators.

Curriculum

This 54-credit part-time degree is offered on Saturdays and students are granted 9 graduate credit points of advanced standing for professional and management experience. Executive MPA graduates of this concentration will be prepared for careers in environmental sustainability across a variety of different professional interests, but they all share a commitment to serving the public interest.

The Executive MPA curriculum is designed to strengthen students' analytical and management skills and to deepen their policy knowledge; making them more effective in their chosen careers. Students enrolled in the Executive MPA program may complete the degree in either two or three years of study, depending on the course load they wish to carry. The rigorous nature of the Executive MPA program applies a hands-on approach to solving policy and management problems through a core curriculum and concentration electives. Core courses such as Public Management, Quantitative Analysis, Microeconomics and Policy Analysis, Financial Management, Accounting, and the Portfolio Presentation Workshop provide the essential tools of management and policy analysis and are required for students in all three concentrations. The Environmental Policy and Sustainability Management curriculum, which comprises 21 of the 54 credits, is summarized in Exhibit 4.

<b>Exhibit 4: EMPA Concentration in Environmental Policy &amp; Sustainability Management Courses (21 Points)</b>
<b>Sustainability Management (a core option in place of public management)</b>
<b>A sustainability economics course</b>
<b>Financing the Green Economy or Green Accounting</b>
<b>Environmental Politics, Policy and Management</b>
<b>The Science of Environmental Sustainability</b>
<b>Sustainable Cities and Built Environments</b>
<b>Sustainability Metrics and Analytics</b>
<b>Energy or Environment Elective</b>



### Audience

The Executive MPA Concentration in Environmental Policy and Sustainability Management is designed for the experienced and ambitious executive, who is looking for an analytic but practical graduate program but cannot take the time to pursue full-time study. The program provides the opportunity for working professionals to earn a master's degree in either two or three years while staying on the job.

This new program fills a gap between the Environmental Science and Policy MPA program and the MS in Sustainability Management program. The Executive MPA retains the traditional MPA curriculum and the sustainability science, policy and management courses complement that core. It was built to attract students with a policy and public-sector focus – those who would typically gravitate towards the Environmental Science and Policy program, but possibly are more advanced in their career or for professional or personal reasons cannot take a one year break from work. The success of the Sustainability Management program for working professionals provided an impetus to develop the Executive MPA Concentration for this particular group of students. For those students who want some of the sustainability management courses but are looking for a public policy focused program, the Executive MPA better meets their needs than the MS in Sustainability Management program. This program recruits professionals who wish to pursue part-time study, but recruits professionals who want to remain public sector focused in their careers.

### **Analysis**

The three programs detailed above appeal to diverse audiences, but share some common curricular and co-curricular elements. The public sector focused programs in SIPA are quite prescriptive programs that combine a traditional MPA core curriculum with a concentration in environmental science and sustainability policy and management. The MS in Sustainability Management requires public policy

studies as well, but only requires a single public policy course and is not committed to educating public service professionals.

Each program targets individuals who have varying interests, professional aspirations, and availability for study. For those students who can take time off, both the MPA in Environmental Science and Policy and the MS in Sustainability Management are options since both can be completed in a year of full-time study. For those students who work full-time, the Executive MPA or the part-time MS in Sustainability Management program option can suit their needs. From among those choices, a prospective student can decide which program offers the curriculum and learning experience that will best further their career and personal development.

Regardless of which program a student enrolls in, the programs offer similar structure of balancing interdisciplinary backgrounds and goals. Each program highlights the need for sustainability managers and policy makers to be well versed in the following subject matter: environmental science, quantitative analysis, public policy, law, finance, economics and management.

The skills required to address sustainability issues are addressed by all three of these programs. Though the curriculum structure and methods of instruction of each program differs in certain aspects, the following professional skills are developed in each program:

- Team management;
- Communication skills such as concise memo writing and effective oral briefing;
- Managing organizations to be adaptable and innovative;
- Analyzing anticipated costs and benefits;
- Quantitative analysis;

- Ability to work under financial, bureaucratic and political constraints; and
- Ethics.

An individual versed in environmental policy and sustainability management who hones these skills can succeed in careers in the public and private sectors in a range of roles.

The programs are also strengthened by each other. Based on the success of the Environmental Science and Policy MPA program, subsequent programs share a similar structure and focus on developing the same skill set. Sharing courses and co-curricular activities are ways that these programs build upon each program's strengths and create a common pedagogy. By sharing courses, not only do students have a similar framework of decision-making skills and tools, but they also share the same discourse of the topics at large. This also allows the students across programs, backgrounds and goals to interact with each other, learn from each other, identify crosscutting themes, and build professional relationships.

## **Conclusion**

The programs developed by Columbia's Earth Institute and Schools of International and Public Affairs and Continuing Education are an effort to address the needs of the growing green economy and the important role of the public sector in encouraging and regulating sustainability practices. While these three programs undoubtedly compete with each other, they also complement each other and provide students with a wide range of options.

We recognize that the job market drives the options we will offer in the future. In some cases, sustainability projects are just one part of larger, broader responsibilities and therefore, some professionals seek advanced knowledge in this field but not a full master's program. Columbia University is now beginning to meet this need in the market by offering professional graduate-level

certificate programs, and non-credit programs for working professionals in the field of sustainability. These complement each of the three programs, and offer another avenue for reaching individuals interested in pursuing environmental education.

We believe that providing this material in multiple formats provides two signals to prospective students:

1. Columbia University is serious about sustainability studies and has a comprehensive set of offerings available; and,
2. Whatever format or focus a student prefers, we probably have a program that can be tailored to meet their needs.

While our location in New York City and Columbia's investment in the Earth Institute may be fairly unique, the demand for sustainability policy and management appears to be growing. Our hope is that this description of Columbia's programs will be helpful to other universities designing programs of their own.