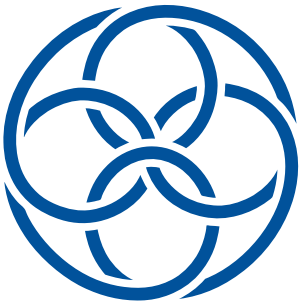


International Commission on Education for Sustainable Development Practice

FINAL REPORT

October 2008

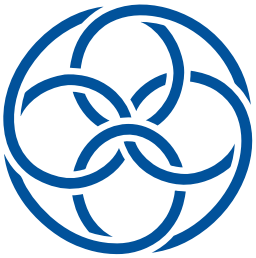
The Earth Institute AT COLUMBIA UNIVERSITY

MACARTHUR
The John D. and Catherine T. MacArthur Foundation

The International Commission on Education for Sustainable Development Practice was convened in 2007 to analyze existing training and education programs for development practitioners and to make recommendations for the future. All Commission members have participated in their personal capacities.

Finding a lack of comprehensive cross-disciplinary programs to train practitioners in the full range of challenges of sustainable development, the Commission proposes a set of recommendations for a new educational system focused on sustainable development practice. Central to the Commission's recommendations is the proposed Master's in Development Practice program. With emphasis on policy and implementation, the MDP program is rooted in four main disciplines: health sciences, natural sciences and engineering, social sciences, and management.

The Commission's recommendations are designed to meet the world's rapidly growing demand for highly skilled sustainable development practitioners.



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Foreword

I am delighted to introduce the final report of the International Commission on Education for Sustainable Development Practice. The Commission's starting premise—that current training for development practitioners does not sufficiently integrate health science, natural science, engineering and policy—first came to us in the form of a letter from John McArthur of the Earth Institute at Columbia University, in response to the MacArthur Foundation's request for new ideas from eminent thinkers across a variety of fields. He wrote to us with a paradox: a major category of development professionals, for example people working within Ministries of Finance in developing countries, at bilateral aid agencies, the World Bank or the International Monetary Fund, make decisions that affect the lives of millions of people. Yet their training is typically quite narrow or of short duration—certainly not aligned with the breadth of their responsibilities.

The situation is most poignant when considering that a typical two-year Master's program in development studies focuses on economics, other social sciences and organizational management. Compare that to the ten to twelve years of post-secondary training for a medical doctor whose decisions affect far fewer people. John McArthur and Jeffrey Sachs, Director of the Earth Institute, understand that extreme poverty in much of the world is rooted in a complex set of causes including poor agricultural productivity, the stress of climate change, the burden of tropical disease and the absence of basic infrastructure, such as roads and telecommunications. A major obstacle to achieving the Millennium Development Goals (MDGs) is the lack of a cadre of generalist professionals trained across fields of public health, agronomy, engineering, economics and environmental science that can recognize these interrelated challenges and know how to address them, drawing from specialist expertise as needed.

To meet this challenge, MacArthur provided support in January 2007 to the Earth Institute to launch the International Commission on Education for Sustainable Development Practice, in order to identify the gaps in current training for development professionals and to recommend improvements. The Commission is composed of an outstanding group of experts and practitioners across a variety of fields relating to international development. After an examination of current development training worldwide and consultations with stakeholders and experts on five continents, the Commission presents here a series of key recommendations.

These recommendations include the creation of new Master's in Development Practice (MDP) programs at universities worldwide. The MDP degree would combine classroom study in the natural and social sciences, health sciences and management with two summers of field training to educate a new generation of development practitioners prepared to tackle the challenges of poverty. Universities in developed and developing countries would be encouraged to partner to offer the full curriculum. The Commission has also launched a "global classroom" to allow students from Africa, India, China and the U.S., for example, to study sustainable development practice together online and to engage in discussions with their professors and fellow students worldwide in real time. The proposed new MDP programs will benefit from more such global classrooms, and will be assisted by an online, open-source curriculum that can be shared internationally.

An inspiration for the Commission's work has been The Flexner Report, which revolutionized U.S. medical training when it came out in 1910. When the Carnegie Foundation commissioned Abraham Flexner to write his report, many American medical schools were small trade schools unaffiliated with a college or university, with a degree often awarded after only two years of study. Flexner's recommendations led to requirements for collegiate study in basic sciences prior to medical school, and to a four-year medical degree at medical schools that were incorporated into universities.

At their best, foundations can play a key role in fostering innovation and change. MacArthur is committed to providing $15 million over the next three years to provide seed support to help a global network of universities initiate new MDP programs along the model set forth in this report. We look forward to the advancement of understanding across fields that will help aspiring practitioners tackle some of the greatest challenges of our century—thus helping to improve the quality of life for hundreds of millions who have not yet seen the benefits of economic development.

Jonathan Fanton
President, MacArthur Foundation
August 28, 2008
Chicago, IL

Preface

In recent years, we have had the privilege to work together to address the challenges of achieving the Millennium Development Goals (MDGs), the world's shared commitments to reduce hunger poverty and disease by 2015. We have pursued this work in several capacities: for two UN Secretaries-General, as scholars, and as leaders of an international non-governmental organization.

In the course of these experiences, we have witnessed and been able to contribute to several successful initiatives, but we have also seen glaring shortcomings in the ways that the complex global challenges involving the MDGs and other issues such as climate change are analyzed and addressed in practice.

The MDGs require a holistic approach, drawing on the core insights of many fields, such as agronomy, ecology, hydrology, engineering, public health, economics, politics, and management. They require conceptual understanding as well as hard-headed implementation skills. And perhaps most importantly, they require the ability to work in global networks and local teams across many professions and cultures, since the skills and knowledge required for success range far beyond a single discipline or profession, much less an individual practitioner.

While no individual can master all or even most of the skills required—in science, policy design, politics, management, and cross-cultural understanding—for the success of broad-based progress in sustainable development, we certainly need a new generation of development practitioners who can understand the "languages" and practices of many specialties, and who can work fluidly and flexibly across intellectual and professional disciplines and geographic regions.

Today's graduate education programs, alas, do not routinely and globally foster such knowledge across key disciplines nor the skills to work in large, multi-disciplinary, and multi-cultural teams including specialists from many fields and countries. More generally, there is a shortfall in the number of newly trained professionals equipped to work on the complex challenges of sustainable development, including poverty reduction, biodiversity conservation, disease control, climate change mitigation and adaptation, and the creation of livable and sustainable cities. This assessment, drawing on our own on-the-ground experience and that of our colleagues, led us to the idea that the challenges of sustainable development require a new and more

systematic approach to teaching, learning and problem solving for development practitioners.

It was against this backdrop that we first discussed the global educational challenge with Jonathan Fanton, the eminent and visionary President of the MacArthur Foundation. It was Jonathan's suggestion that an issue of this scope merited a structured cross-section of international experts to deliberate on the topic. From that first moment of the idea of an international commission, we have been thrilled to partner with Jonathan and the Foundation in the effort. We have been grateful that Milena Novy-Marx, the Foundation's highly creative and energetic Program Officer, has helped to lead this effort from the start. In the work of this Commission, the MacArthur Foundation has offered the Earth Institute a partnership of phenomenal support, insight, expertise, and inspiration.

We have been privileged that so many distinguished colleagues from around the world agreed to serve as Commission members. We thank all them for their continuous stream of ingenuity, strategic insights, and good spirits. We give special thanks to the Commissioners who served as regional coordinators around the globe, each convening consultations to survey opinions from a diversity of institutions and professional backgrounds. We thank the countless colleagues around the world who contributed to those consultations.

We are similarly grateful to the many institutions across twelve time zones that joined the pilot Global Classroom in early 2008, and to Frank Moretti and his formidable team in Columbia University's Center for New Media Teaching and Learning, who were all instrumental in bringing the Global Classroom to life. This phenomenal group of Commissioners and partner universities has already formed a fast-growing global network that is advancing the teaching and learning of sustainable development practice in innovative and exciting directions.

No one played a more important role in advancing the day-to-day work of the Commission than Katie Murphy, the enormously talented and dedicated project manager. Katie single-handedly coordinated all of the Commission's work, mobilized the technical experts and academic faculty around the world to launch the Global Classroom, and led the drafting for all of the key documents, including

this final report. We are deeply grateful for her steadfast and capable efforts, always made with incredible poise and good cheer. She has made a major contribution to educating future generations of sustainable development practitioners.

Finally, we believe that the Commission itself illustrates the new forms of global collaboration and professionalism that will be integral to success in sustainable development. The Commission constituted a global network of professionals from a diverse set of disciplines and from all parts of the world. Our work was empowered by cutting-edge technology, and suffused with a spirit of determination and problem solving. We are proud that the Commission has helped not only to launch a new program for training development practitioners, but also to mobilize a global community of scholars, teachers, and practitioners that will contribute to global problem-solving for years to come.

John W. McArthur and Jeffrey D. Sachs
Commission Co-Chairs
August 2008
New York, NY

Executive Summary

The interwoven challenges of sustainable development—from extreme poverty and disease control to climate change and ecosystem vulnerability—can only be resolved by leveraging knowledge and skills from a range of disciplines. Meaningful progress requires practical, well-managed policies and programs that incorporate insights from the health sciences, natural sciences and social sciences.

Consider, for example, the many areas of core knowledge necessary to effectively address the challenge of combating chronic hunger in sub-Saharan Africa. Knowledge of agriculture is required to understand the biophysical factors contributing to the stagnation of crop yields, and the technical solutions that could quickly boost food output and provide a source of quality nutrition in rural areas. Basic knowledge of environmental science is needed to manage the agricultural land environment and to understand its interactions with climate change. In order to promote nutrition and labor productivity among farmers and to fight the parasites that contribute to under-nourishment, knowledge of health, nutrition and disease control is required. Core knowledge of engineering is required to understand the fundamental infrastructure necessary to support energy, irrigation, storage, transportation and communications systems. To ensure both farm- and macro-scale policy solutions are economically sustainable, knowledge of economics is required to design long-term strategies for overcoming the poverty trap. Political science is required to understand the social promoters and inhibitors of investing in rural areas. Knowledge of anthropology is required to ensure that priorities and innovations are relevant and manageable in local contexts. Participatory planning skills are necessary to ensure multi-stakeholder design of solutions, while at the same time management and administration skills are necessary to promote institutional development at the local and national level.

Crucially, none of these individual areas of knowledge is sufficient on its own to solve the challenge of hunger; all are necessary. The same need for multi-disciplinary problem solving arises across a range of developing-country policy challenges, such as disease control, water management, energy service delivery, and climate change adaptation and mitigation.

It remains an unresolved paradox that the parameters for policymaking in all sectors—including education, health and the environment—are often set by

finance ministries and other powerful financial institutions that tend to have limited knowledge of the sectors whose outcomes they decide. Finance officials are typically classroom-trained in the theories of economics with insufficient background for evaluating the absolute or relative merits of a plan to control a disease, manage an ecosystem or deliver an energy service, for instance. With predominantly urban life experiences, such individuals may encounter difficulty in understanding the distinct nature of rural problems in diverse cultural, economic, social and environmental settings. Furthermore, they typically do not have much exposure to the ground-level practicalities of policy management and project implementation. Yet the consequences are of the highest order when decisions affect, and sometimes even cost, millions of lives at a time.

Few development practitioners are currently prepared to design and implement integrated solutions that would promote sustainable development. Even within development-related academic programs, individual disciplines tend to value inward-looking specialization rather than outward-looking problem solving, often discouraging practical connections across communities of expertise. Trained within the current system, professionals rarely have the background necessary to conduct effective cross-disciplinary policy management or problem solving.

The International Commission on Education for Sustainable Development Practice,[1] supported by the John D. and Catherine T. MacArthur Foundation and based at The Earth Institute at Columbia University, was established in early 2007 to identify the core cross-disciplinary educational needs to support problem solving in the realm of sustainable development. The Commission's work is anchored in an understanding that professionals working in the field of sustainable development—whether in inter-governmental organizations, developing-country ministries, developed-country aid agencies, non-governmental organizations or academic institutions—are not sufficiently prepared to surmount the challenges that they confront.

The Commission was launched with inspiration from ***The Flexner Report*** of 1910.[2] Just as the field of medicine suffered from inconsistent and often ineffective medical training prior to the release of that report, the practice of sustainable development suffers from the lack of comprehensive and systematic training to foster the core competencies required of an effective practitioner. By providing recommendations for the key components of a rigorous system for professional training, the present report aims to contribute to a vastly more rigorous approach to education in the field of sustainable development.

This report outlines the Commission's recommendations for building a comprehensive new system of professional education anchored in a practical, cross-disciplinary approach to continuous learning throughout the lifecycle of a sustainable development practitioner. Throughout this report, "sustainable development" is defined as "meeting the needs of the present without compromising

1 See Appendix F for biographies of Commission members.

2 Flexner A. *Medical Education in the United States and Canada*. New York, NY: Carnegie Foundation for the Advancement of Teaching; 1910. The Flexner Report presented a review of 155 medical schools across Canada and the U.S., highlighting the extensive variation in the quality and rigor of programs, and recommending key elements of a medical training program including prerequisite requirements for incoming students, bed-side "clinical" training, faculty engagement in research, and stronger state regulations for state licensure. The findings and recommendations presented in the *Flexner Report* resulted in the standardization of medical education.

the ability of future generations to meet their own needs."[3] In practical terms, sustainable development entails increasing the material well-being of the poor while narrowing the proportionate gap with the rich; continuing the scope for improved material well-being of the rich; and ensuring the sustainable functioning of the Earth's ecosystems, including conservation of the Earth's biodiversity. Sustainable development is achieved through economic and social development that reflects the physical and environmental, as well as the political and cultural conditions in which human society operates.

3 Brundtland Commission. *Our Common Future*. London, England: Oxford University Press; 1987. The Brundtland Commission was convened by the United Nations in 1983 to address growing concern "about the accelerating deterioration of the human environment and natural resources and the consequences of that deterioration for economic and social development." It was this Commission and subsequent Report that first clearly outlined the idea of "sustainable development."

ANALYSIS AND DIAGNOSIS OF THE CURRENT STATE OF SUSTAINABLE DEVELOPMENT PRACTICE

As part of its mandate, the Commission conducted a basic diagnosis of the current state of sustainable development training and practice. Under the guidance of the Commission's six Regional Coordinators, the Commission launched a series of consultations, engaging a cross-section of practitioners from universities, government and non-government agencies, financial institutions, and other development-focused organizations in Africa, East Asia, Europe, Latin America, North America and South Asia. Consultations included interviews, regional conferences, surveys and questionnaires. Throughout the consultation process, Commissioners identified shortfalls in cross-disciplinary problem solving and the lack of systematic skill-development across a range of core competencies within both professional education programs and organizations working in sustainable development.

Diagram 1

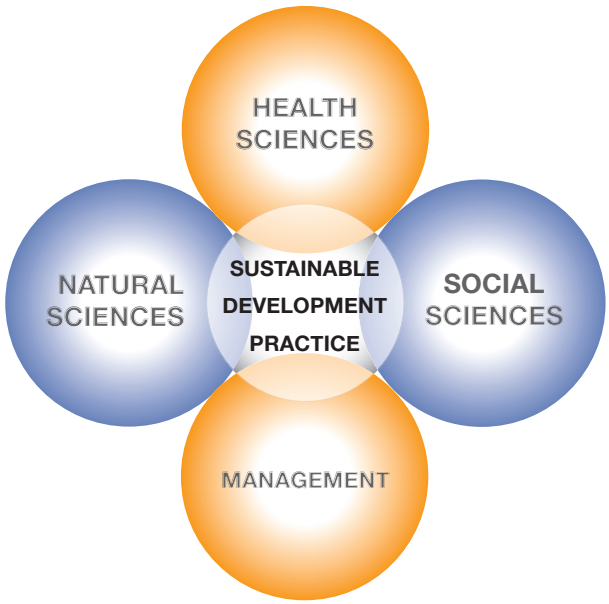
Missing Linkages Between Fields (Four Spheres)

Need for "Generalist" Sustainable Development Practitioners

The lack of cross-disciplinary knowledge and skills within the field of sustainable development highlights the need for a new type of "generalist" practitioner, one who understands the complex interactions among fields and is able to coordinate and implement effectively among the insights offered by subject-specific specialists. A new cadre of such generalists would fulfill a range of roles in government (such as ministers of planning and finance), non-governmental organizations (such as regional directors and program managers), the United Nations (resident coordinators, country directors and regional directors), bilateral and multilateral financial institutions and aid organizations, grant-giving foundations and corporations, and private sector companies working in the context of developing countries. While PhDs and other advanced specialists will continue to provide significant contributions within distinct fields of knowledge, generalists are needed to navigate across the intellectual and institutional silos of specialized disciplines to develop integrated policy solutions that are scientifically, politically and contextually grounded.

Diagram 2

Sustainable Development Practice at the intersection of the Four Spheres



Gaps in Graduate Degree Programs

While many universities around the world offer graduate degree programs that have a "development" label, programs typically focus on either social sciences or environmental sciences, and offer few opportunities for systematic, cross-disciplinary education or management training. Across these programs, there are no consistent standards for prerequisite training, core curriculum or program length. The acquisition of practical skills requires opportunities for reflective experimentation and "hands-on" experiences, yet too few programs stimulate learning around functional and practical knowledge, and students' opportunities

for course-related field work or internships remain rare. The Commission finds that while existing degree programs may offer some subset of the required skills, there are no programs that systematically provide students with the relevant skills and knowledge in health sciences, natural sciences and engineering, social sciences, and management, while developing practical skills through field-based training.

Lack of Appropriate Training Programs for Life-long Learning

Mirroring the lack of degree programs focused on cross-disciplinary learning, development professionals have almost no opportunities for refreshing and upgrading relevant skills throughout their careers. Executive education programs typically focus on management techniques rather than substantive training. In addition, training programs within organizations working in sustainable development generally do not provide staff and management with cross-disciplinary learning opportunities or requirements.

RECOMMENDATIONS FOR BUILDING A NEW FIELD OF SUSTAINABLE DEVELOPMENT

In order to succeed in the practice of sustainable development, professionals must be trained in a basic set of competencies that integrate cross-disciplinary knowledge for practical problem solving with management and leadership skills for effective implementation. With the aim of supporting future generations of professionals as well as those currently working in the sphere of sustainable development, the Commission makes the following recommendations.

1. Establish the Core Competencies of the Sustainable Development Practitioner

In consultation with a broad range of development practitioners, the Commission has identified fundamental "core competencies"—essential knowledge, skills and attributes—required of an effective sustainable development practitioner.

2. Launch a Global Network of Master's in Development Practice Programs

As the flagship of the new field, the two-year Master's in Development Practice (MDP) program would provide graduate-level students at key academic institutions around the world with the core skills and knowledge required of a generalist development practitioner.

- **Curriculum:** MDP programs would require full-time enrollment of graduate-level students for at least two full years, and would include rigorous study of cross-disciplinary topics spanning the following core disciplines:

Health Sciences—nutrition, population sciences and reproductive health, basic epidemiology of infectious and non-infectious disease, health policy, health system design and management

Natural Sciences and Engineering—agriculture, forestry and fishery management, water management, energy, engineering, environment and climate science

Social Sciences—anthropology, economics, education, politics and international political economies, statistics

Management—project design and management, budget planning and financial management, commodities management, communication and negotiations, critical self-reflection, geographic information systems and decision making tools, institutional resource and human resource management, information management systems and design

- **Practical learning through projects, exercises and case studies:** To support and enrich the core MDP curriculum, the program would integrate a variety of teaching and learning resources including practical, experiential learning through cross-disciplinary case studies and group exercises.

- **Global Learning Resources for Sustainable Development Practice:** Shared "open-source" curricula, global courses, communication portals for students and faculty, web-based collaborative activities, and other learning resources would enhance the MDP program at universities around the world by providing curricular support as well as real-time engagement in practical, cross-institutional learning and knowledge sharing.

- **MDP Network:** A vibrant network of universities, development agencies, research institutions and affiliated organizations would participate in academic exchanges, mentorship programs and curriculum development.

- **Field Training:** Designed to build practical "on the job" skills, the MDP field training program should include two separate assignments lasting a total of six months. Field training programs will work in coordination with partner universities and local development organizations to provide a holistic "clinical" training experience.

- **Variations on the MDP curriculum:** Apart from the core MDP curriculum, some academic institutions may choose to incorporate a regional focus, a discipline-based specialization, or complementary skill training within a specialized program of study.

- **Program Administration:** The innovative design of the MDP program would require a supportive administrative base, a select group of students with motivation, experience and academic preparation, and a dedicated faculty able to work collaboratively to develop cross-disciplinary curricula.

3. Establish Ongoing Professional Development Programs for Sustainable Development

To support multi-disciplinary and multi-functional professional learning at all stages of an individual's career, the Commission recommends the following:

- **Within the MDP network:** In collaboration with universities and organizations participating in MDP-type programs, new training programs should be developed to support ongoing professional development including condensed "mid-career" MDP programs, virtual learning, and certification programs to develop the core competencies of a sustainable development practitioner.

- **Organization-based initiatives:** Organizations tasked with responsibilities to plan or manage sustainable development interventions should require their senior staff to integrate cross-disciplinary knowledge and skills into their daily operations. New initiatives such as induction and in-service training programs would address this shortcoming, as well as competency-based criteria for promotion to senior-level positions and certification systems to ensure staff have obtained a minimal level of knowledge and skill in relevant areas.

4. Establish a Global MDP Secretariat

A global MDP Secretariat would work to build educational resources and standards for the global network of programs, and support broader outreach on behalf of MDP-related initiatives. Guided by an International Advisory Board comprised of experts in the field of sustainable development, the Secretariat's key responsibilities would include:

- Coordinating the MDP Global Network of universities and partner institutions
- Managing the development of MDP curricula
- Building and supporting the Open-Source Online Resource Center
- Coordinating global courses

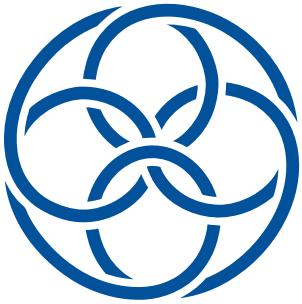
- Establishing eligibility guidelines for partner MDP programs
- Stewarding relationships with donors
- Assisting academic institutions in their preparation for MDP grant proposals

CONCLUSION

Through the course of its work, the Commission has been able to help mobilize a global network of efforts that are already providing momentum to its recommendations. There is clearly strong global demand for a cross-disciplinary education system to train the next generation of sustainable development practitioners. As this report goes to press, several universities are already preparing their own plans to launch Master's in Development Practice programs (see Appendix E). The very first group of students is scheduled to begin classes in August of 2009. And the newly formed Global MDP Secretariat is already at work to support the global MDP network and the new MDP degree programs.

The implementation of the Commission's recommendations would be a fundamental step forward for the practice of sustainable development. At the same time, the creation of new education programs alone will be insufficient in affecting long-term change. Coordinated efforts to revise and expand the ideas presented in this report will be needed to respond to the dynamic nature of sustainable development, and the evolving technologies that are empowering ever-richer forms of global communication and curriculum development. Innovative tools should continually be developed to effectively teach competencies and to measure and test competency development.

In a fragile planet that requires management of countless complex and delicate natural and social systems, future generations will require all the cross-disciplinary expertise that they can muster. By activating a vibrant network of academic institutions, development organizations, research institutions, governments and donors to engage in cross-disciplinary problem solving on an ongoing basis, the Commission's recommendations are poised to play a dynamic and constructive role in advancing the long-term sustainable development on which the world depends.



International Commission on Education for Sustainable Development Practice

I. The Practical Needs of Sustainable Development

The interwoven challenges of sustainable development—from extreme poverty and disease control to climate change and ecosystem vulnerability—can only be resolved by leveraging knowledge and skills from a range of disciplines. Meaningful progress requires practical, well-managed policies and programs that incorporate insights from the health sciences, natural sciences and social sciences. These compound challenges demand integrated, cross-disciplinary approaches guided and managed by skilled practitioners.

Consider, for example, the many areas of core knowledge necessary to effectively address the challenge of combating chronic hunger in Sub-Saharan Africa. Knowledge of agriculture is required to understand the biophysical factors contributing to the stagnation of crop yields, and the technical solutions that could quickly boost food output and provide a source of quality nutrition in rural areas. Basic knowledge of environmental science is needed to manage the agricultural land environment and to understand its interactions with climate change. In order to promote nutrition and labor productivity among farmers and to fight the parasites that contribute to under-nourishment, knowledge of health, nutrition and disease control is required. Core knowledge of engineering is required to understand the fundamental infrastructure requirements to support energy, irrigation, storage, transportation and communications systems. To ensure both farm- and macro-scale policy solutions are economically sustainable, knowledge of economics is required in order to design long-term solutions to the poverty trap. Political science is required to understand the social promoters and inhibitors of investing in rural areas. Knowledge of anthropology is required to ensure that priorities and innovations are relevant and manageable in local contexts. Participatory planning skills are necessary to ensure multi-stakeholder design of solutions, while at the same time management and administration skills are necessary to promote institutional development at the local and national level.

The same need for cross-disciplinary problem solving skills arises when confronting the challenge of disease control in malaria-endemic areas. Core knowledge of epidemiology, vector control, ecology, climate variability, and effective pharmacological treatments and interventions is required. Moreover, an ability to design appropriate prevention and community education strategies is critical to promoting the distribution and use of bed-nets, the treatment or elimination of stagnant water and mosquito breeding grounds, and the training of parents to recognize the basic signs and symptoms of infection.

Yet knowledge and planning alone will not create interventions capable of confronting the challenge of endemic malaria. Interventions must also incorporate policies and financing mechanisms to support improved infrastructure, procurement and distribution systems, as well as effective and sustainable healthcare delivery systems. The design and implementation of a comprehensive malaria control strategy, therefore, requires a knowledge base that spans the disciplines of health,

environmental and biological sciences, education, infrastructure, policy systems, economics, budgeting and financial management.

In addition to problem solving and intervention design, policies must be in place to support implementation. Yet a lack of cross-disciplinary knowledge at the government and policy level often restricts development efforts. It is an unresolved paradox that the parameters for policymaking in all sectors—including education, health and the environment—are often set by finance ministries and other powerful financial institutions that tend to have limited knowledge of the sectors whose outcomes they decide. Finance officials are typically classroom-trained in the theories of economics with insufficient background for evaluating the absolute or relative merits of, for instance, a plan to control a disease, manage an ecosystem or deliver an energy service. With predominantly urban life experiences, such individuals may encounter difficulty in understanding the distinct nature of rural problems in diverse cultural, economic, social and environmental settings. Furthermore, they typically do not have much exposure to the ground-level practicalities of policy management and project implementation. Yet the consequences are of the highest order when decisions affect, and sometimes even cost, millions of lives at a time.

The same holds true of organizational management. Even within development-focused organizations, the skilled leadership needed to design and manage integrated approaches to confront development challenges is too often lacking. This often results in a focus on achieving small and isolated sector-specific gains. Working within the context of limited financial and human resources, poor coordination among institutions and programs also becomes a fundamental factor limiting sustainable development. Add to this the prevalence of inconsistent policies and poor coordination among institutions and the result can be redundant programs, weak synergies, tensions among institutions and other inadequacies in development processes.

In the absence of comprehensive, cross-disciplinary training, few practitioners are currently prepared to design and implement integrated solutions that would promote sustainable development. Even within development-related academic programs, individual disciplines tend to value inward-looking specialization rather than outward-looking problem solving, often discouraging practical connections across communities of expertise. Trained within the current system, professionals and organizations rarely have the background necessary to conduct effective cross-disciplinary policy management or problem solving.

In an effort to bolster the leadership and training of development practitioners, The International Commission on Education for Sustainable Development Practice,[4] supported by the John D. and Catherine T. MacArthur Foundation and based at The Earth Institute at Columbia University, was established in early 2007 to identify the core cross-disciplinary educational needs to support problem solving in the

4 See Appendix F for biographies of Commission members.

in the realm of sustainable development. Just as the field of medicine suffered from inconsistent and often ineffective medical training prior to the 1910 release of ***The Flexner Report***,[5] the practice of sustainable development suffers from the lack of comprehensive and systematic training to foster the core competencies required of an effective practitioner. By providing recommendations for the key components of a rigorous system for professional training, the present report aims to spark a profound transformation in the field of sustainable development.

As referenced in this report, "sustainable development" is defined as "meeting the needs of the present without compromising the ability of future generations to meet their own needs."[6] In practical terms, sustainable development entails increasing the material well-being of the poor while narrowing the proportionate gap with the rich; continuing the scope for improved material well-being of the rich; and ensuring the sustainable functioning of the Earth's ecosystems, including conservation of the Earth's biodiversity. Sustainable development is achieved through economic and social development that reflects the physical and environmental, as well as the political and cultural conditions, in which human society operates. To that end, this report outlines the Commission's recommendations for building a comprehensive new system of professional education anchored in a practical, cross-disciplinary approach to continuous learning throughout the lifecycle of a sustainable development practitioner.

5 Flexner A. *Medical Education in the United States and Canada*. New York, NY: Carnegie Foundation for the Advancement of Teaching; 1910. The Flexner Report presented a review of 155 medical schools across Canada and the U.S., highlighting the extensive variation in the quality and rigor of programs, and recommending key elements of a medical training program including prerequisite requirements for incoming students, bed-side "clinical" training, faculty engagement in research, and stronger state regulations for state licensure. The findings and recommendations presented in the *Flexner Report* resulted in the standardization of medical education.

6 Brundtland Commission. *Our Common Future*. London, England: Oxford University Press; 1987. The Brundtland Com mission was convened by the United Nations in 1983 to address growing concern "about the accelerating deterioration of the human environment and natural resources and the consequences of that deterioration for economic and social development." It was this Commission and subsequent Report that first clearly outlined the idea of "sustainable development."

II. Diagnosis: The Current State of Sustainable Development Practice

1. Demand for a New Type of "Generalist" Development Practitioner

The Commission's work is anchored in the observation that many professionals working in the field of sustainable development—whether in inter-governmental organizations, developing-country ministries, developed-country aid agencies, non-governmental organizations or academic institutions—are not sufficiently prepared to surmount the challenges they confront. Working in a field that lies at the intersection of several disciplines, development professionals must be able to gather and extract crucial insights from a broad range of specialized fields (e.g. agronomy, anthropology, climate science, economics, medicine) in order to form technically sound conclusions. As key decision makers for policies and programs that affect the lives of thousands or even millions of people, it is essential that they are able to demonstrate basic technical knowledge of core specialized fields coupled with refined management skills to guide the decision-making process.

While PhDs and other advanced specialists provide significant contributions within distinct fields of knowledge, these contributions too often remain circumscribed within the intellectual and institutional silos of their respective disciplines. This results too often in specialists overlooking simple and inexpensive solutions and instead relying on more complex, sector-specific approaches.

Commission members, representing a broad range of specialties and expertise, determined that there is an urgent demand for a new type of "generalist" practitioner—the "sustainable development practitioner"—–who understands the complex interactions among fields and is able to coordinate and implement effectively by drawing from the insights offered by subject-specific specialists. Sustainable development practitioners would fulfill a range of roles in government (such as ministers of planning and finance), non-governmental organizations (such as regional directors and program managers), the United Nations (resident coordinators, country directors and regional directors), bi-lateral and multi-lateral financial institutions and aid organizations, grant-giving foundations and corporations, and private sector companies working in the context of developing countries.

2. Demand for a New Educational System

To investigate the educational needs of development practitioners and to map out the landscape of existing training programs, the Commission engaged in regional consultations spearheaded by six Regional Coordinators working within Africa, East Asia, Europe, Latin America, North America and South Asia. Consultations included the European Development Training Survey as part of

the 2007 conference of European Association of Development Research and Training Institutes (EADI); a conference on Training for Sustainable Development in South Asia, hosted by TERI in New Delhi; a U.S.-based survey of training for sustainable development; and extensive interviews, research and meetings in Africa, East Asia and Latin America. Selected findings from these consultations are available on the Commission website (www.earth.columbia.edu/commission). A preliminary scan of relevant graduate degree programs was also conducted by an outside consultant working with the MacArthur Foundation. The summary table in Appendix A lists the university programs highlighted in the scan, along with programs that were reviewed during the regional consultation process. A full list of universities and institutions that participated in the consultation is presented in Appendix B. The findings are presented below.

2.1 Gaps in Graduate-level Degree Programs

Most academic degrees relevant to sustainable development, whether based in the natural sciences or social sciences, tend toward academic specialization within a particular discipline. While many universities around the world offer graduate degree programs that have a "development" label, typically with a focus on either social sciences or environmental sciences, these offer few opportunities for systematic, cross-disciplinary education or management training. Moreover, many programs that focus on social sciences do so at the expense of imparting essential knowledge of natural sciences or health sciences, and vice versa.

Diagram 1

Missing Linkages Between Fields (Four Spheres)

Among these programs, there are no consistent standards for pre-requisite training, core curriculum or program length. In addition, within programs there is great variation in the number of practice-focused faculty versus research-focused professors, despite the observation that students may learn practical skills for policy- and project-focused settings more efficiently from experienced practitioners. Furthermore, the acquisition of practical skills requires opportunities for reflective experimentation and "hands-on" experiences, yet few programs stimulate learning around functional and practical knowledge and students' opportunities for course-related fieldwork or internships are rare.

Table 1 distills the results of the Commission's review of current development-focused degree programs. As this figure shows, existing degree programs may offer a subset of the required skills for a sustainable development practitioner, but there are no programs that systematically provide students with the relevant skills and knowledge in health sciences, natural sciences and engineering, social sciences, and management while developing practical skills through field-based training.

Table 1

Scan of Current Degree Programs

○ low coverage

◐ some coverage

● more coverage

	Coverage of Development Knowledge Area				
	Health Sciences	**Natural Sciences**	**Social Sciences**	**Management**	**"Hands-on Skills"**
Master's of Public Administration	○	○	●	◐	○
Master's of Development Studies	◐	○	●	○	○
Master's of Sustainable Development	○	●	◐	○	◐
Master's of Business and Administration	○	○	◐	●	◐
Master's of Public Health	●	○	◐	◐	◐
Medical Doctor (MD)	●	◐	○	○	●

2.2 Lack of Appropriate Training Programs for Life-long Learning

Mirroring the shortage of comprehensive, cross-disciplinary degree programs, the Commission finds that development professionals have few opportunities for refreshing and upgrading relevant skills throughout their careers. Instead, professional development courses typically focus on management and leadership techniques. These courses are typically offered through an academic institution as "mid-career," "executive" or "continuing education" courses, through organizations as part of a staff training initiative, or through private companies that provide condensed workshops. While such programs may even be designed for professionals working in development, very

few address the essential cross-disciplinary knowledge and skills required of a sustainable development practitioner.

With no established minimum standards for professional competencies and no opportunities to round out their skills across the range of cross-disciplinary knowledge areas, professionals too often lack the ability to coordinate effectively across the needed range of technical specialists, policy-makers and implementers. On a practical level, there are no reference points for objectively evaluating competencies across disciplines. How does an economist know, for instance, whether a colleague's disease-related research or prescribed policy meets basic epidemiological standards? Or how does a health specialist know when a colleague's environment-related policy recommendation adheres to the standards and best practices of environmental sustainability? Such questions highlight the urgent demand for the "generalist" practitioner, defined by a new set of professional standards that would incorporate best practices and key competencies from a range of specialized fields. While a "generalist" may not have specialized expertise in all of the relevant fields, core standards for professional competency would enable her to identify strengths and weaknesses within a proposed policy and to understand the essential questions that must be answered in order to move forward.

As illustrated in Table 2, professionals working in sustainable development represent a broad range of educational backgrounds. Typically, these practitioners focus their professional activities on science and technology, policy, or implementation. Professionals working to identify or improve the best scientific or technological advances in the field of development usually are medical doctors or PhDs. Professionals working to design policies, deliver technology or implement interventions represent a broad range of educational

Table 2

Educational Backgrounds of Sustainable Development Professionals

KNOWLEDGE AREA	EXAMPLE QUESTION	EDUCATIONAL BACKGROUND OF PROFESSIONALS ADDRESSING ISSUE
Science & Technology	What is the best available science?	PhDs, MDs
Policy	What is the most effective way to navigate the policy environment?	MPAs, MAs, some PhDs
Management and Implementation	What is the best way to manage successful interventions?	MPAs, MBAs, BAs, BSs, technical schools, etc.

backgrounds including graduates with professional and undergraduate degrees (MPA, MBA, BA, BS, etc.) as well as practitioners with more limited formal education. In practice, the integration of science and technology in policy and implementation is critical to achieving sustainable development, yet very few professionals are trained and prepared to tackle problems spanning all three knowledge areas.

Within organizations working in sustainable development, the Commission finds that in-service training programs generally do not provide staff and management with adequate cross-disciplinary knowledge. Moreover, experts of a specific discipline are often promoted to assume ever-greater substantive and managerial responsibilities, but with no corresponding training. While most professionals possess requisite knowledge and skills within a particular field of development, often these experts lack sufficient training in relevant disciplines outside their fields of expertise, compromising their ability to analyze and diagnose complex, multi-faceted problems. Furthermore, they may not have the management skills required to function effectively at their level.

In summary, the clear shortage of comprehensive, cross-disciplinary education and training programs has severe implications within the field, as many professionals lack the ability to forge connections between distinct sectors to design integrated solutions.

III. Recommendations for Building a New Field of Sustainable Development Practice

RECOMMENDATION 1:
Establish the Core Competencies of the Sustainable Development Practitioner

Effective, comprehensive development work requires proficiency in several cross-disciplinary skill and knowledge areas. These core competencies enable a sustainable development practitioner to analyze the cross-disciplinary nature of development issues; choose a course of action based on sound ability to diagnose the key drivers and the relevant obstacles of a situation, and the practical steps that can most directly affect outcomes; and effectively manage policies, programs and projects.

This work is rooted in each of the four key disciplines that must inform the training of the sustainable development practitioner. Drawing from the key disciplines of health sciences, natural sciences and engineering, social sciences and management, the core competencies define the essential knowledge, skills and attributes of an effective sustainable development practitioner. These include, but are not limited to, the knowledge areas and skill sets listed below.

Diagram 2

Sustainable Development Practice at the intersection of the Four spheres

HEALTH SCIENCES

- **Nutrition**—Malnutrition, particularly in pregnant women and children, is a leading cause of disease and death and represents a significant threat to any development effort.

- **Health and Epidemiology**—Development interventions are ineffective if they fail to address the basic life-and-death issues pertaining to child health, reproductive health, maternal health, infectious disease control (such as HIV/AIDS, malaria and tuberculosis) and non-communicable disease control. As just one example, child mortality rates in the poorest countries are often 30 to 50 times higher than in industrialized countries. Most interventions to reduce this gap require implementation of basic and proven technologies.

- **Population Sciences**—Population dynamics must be a key consideration in any long- or short-term development strategy. Understanding the strong connection between high fertility rates and poverty, practitioners must have basic knowledge of reproductive health, family planning and voluntary child spacing strategies, as well as interventions to promote gender equality and health education to enable women and men to make informed family planning decisions.

NATURAL SCIENCES & ENGINEERING

- **Agriculture, Forestry and Fisheries Management**—The majority of people living in extreme poverty throughout the world depend on agriculture, fisheries and forests for their livelihoods, although biophysical environments vary tremendously both by region and within regions. Food production and rural economic transformation often hinge on animal productivity, crop yields and forest production, which in turn depend on soil fertility, availability of inputs and land management.

- **Energy**—Essential to all aspects of development—including agricultural productivity, access to water, health, education and transportation—is a safe and consistent supply of energy. Well-designed interventions must consider how renewable or non-renewable energy sources will be harnessed and distributed, and the associated economic, environmental and health impacts.

- **Engineering and Urban and Rural Planning**—Public infrastructure is essential to poverty reduction and economic growth, including water supply systems, waste management systems, clean air systems, irrigation systems, roads and transportation systems and telecommunication systems. The strategic design of such systems must also take into account the environmental, economic and social impacts and include appropriate adaptations for predicted changes in climate.

- **Environment, Water and Climate Science** — Large numbers of the world's poor live in fragile ecosystems and many developing countries are experiencing severe ecosystem degradation as human settlement expands and natural resources are mined. Evolving ecosystems typically define patterns of disease transmission affecting human, animal and plant health. All of these dynamics are affected by climate patterns, which are shown to be shifting due to anthropogenic climate change. Policy analysis and recommendation is imprudent without a sound understanding of basic environmental, water and climate science.

SOCIAL SCIENCES

- **Delivery Science**—In order to achieve measurable success, development practitioners must know how to strategically apply, implement and deliver prescribed interventions, including technological innovations. Drawing upon the lessons of past successes and failures, practitioners must be able to identify and design the most appropriate and effective means of delivering a given intervention. This requires a keen understanding of the economic, political and logistical factors that must be considered in order to successfully implement and later "scale-up" interventions.

- **Economics**—Microeconomics is essential for understanding the ground-level incentives and practicalities of economic policy design. Macroeconomics is crucial for understanding how programs interact with large-scale government decision-making and budgets, and the movement of goods, resources and services across countries.

- **Education**—A critical component of any long-term development strategy, formal education systems must ensure students acquire the knowledge and skills that will bring them improved quality of life, appropriate competencies to prepare them for the work force, and creative problem solving skills to pave the way for future innovations. Non-formal and community-based education programs are also vital as they catalyze the adoption of improved agricultural, health and sanitation, nutritional and vocational practices, and can play a vital role in peace-building and conflict resolution.

- **Politics, Anthropology and Social Studies**—To affect long-term structural change, interventions must be designed with careful consideration for the culture, local history, local and regional politics, and political and institutional structures of a given location. In addition, development efforts must take into account power and social relations at various levels: within households, within communities and across societal groups.

- **Statistics**—The collection and analysis of critical information is essential for project design, management, monitoring and evaluation. In addition, key decision-makers must be able to understand and interpret statistical findings in order to make informed policy decisions and to design appropriate development strategies.

- **Technology and Innovation Systems**—Understanding the intricate network of actors involved in the research, design, development and diffusion of technology is essential in order to create supportive policies and mechanisms for the transfer and flow of knowledge and innovation.

MANAGEMENT

- **Budget Planning, Financial Management and Commodities Management**—Sustainable development practitioners must be able to design and manage programs and project budgets with transparency and efficiency. Knowledge of financial markets, credit and microfinance is required as well as the procurement, supply chain, production management and distribution of essential commodities.

- **Communications and Negotiation**—Project implementation and policy design at the local-, regional- or national-level require keen understanding of power relations and cultural interactions. Practitioners must be able to interact with local community leaders, colleagues, partners and stakeholders from diverse backgrounds and disciplines, as well as coordinate participatory planning processes to implement sustainable development programs. Effective practitioners must also have skills of social entrepreneurship such that they can pull together a variety of political, financial and institutional resources to imagine, build, market and deliver new ideas. In addition, practitioners need to be able to reflect on their own attitudes, perceptions and biases in terms of how they are formed, and how they affect their choices and performance.

- **Geographic Information Systems (GIS)**—Appropriate applications of GIS allow the development practitioner to effectively analyze agricultural, demographical, ecological, environmental, infrastructural, social and other conditions. This information is used to develop comprehensive needs assessments, risk analyses, implementation plans, as well as dynamic monitoring and evaluation tools.

- **Institutional and Human Resources Management**—As professionals advance in their careers, they must be able to lead, mentor and inspire ever-larger numbers of staff subordinates to achieve successful outcomes. Institutional development is a key element in building long-lasting programs that result in valuable, measurable solutions.

- **Information Systems Design and Management**—The rapidly evolving use of information management systems in the field of sustainable development provides growing opportunities for professionals to quickly transmit vital information and key indicators, to share best practices, and to engage in virtual mentorship. Practitioners must be able to collect, monitor and evaluate relevant information to inform and update policy and project implementation.

- **Project Design and Management**—Practitioners need to be able to design and manage work streams that measure progress against clear benchmarks. They often also require strong proposal-writing skills.

Mixed with an understanding of the global and cross-cultural influences on development, educational programs grounded in these core competencies would provide a major step forward in preparing professionals to confront the complex challenges of sustainable development.

RECOMMENDATION 2:
Build a Global "Master's in Development Practice" (MDP) Degree Program

As the cornerstone initiative for the emerging field of sustainable development practice, the Commission proposes the creation of a Master's in Development Practice (MDP) degree, designed to produce highly skilled "generalist" practitioners prepared to confront complex sustainable development challenges. Four guiding premises define the key elements of the proposed educational system, including the MDP program and the associated professional training programs:

1. Training for development practitioners should integrate health sciences, natural sciences and engineering, social sciences, and management.
2. Professionals working in the field of sustainable development should have ongoing access to training programs that cover a full range of skills required throughout the professional lifecycle.
3. Educational programs should include a greater practical element by combining the use of case studies, fieldwork and internships in developing countries.
4. Training programs should be forged through partnerships between institutions and students from the developing and developed world to promote cross-cultural education and collaboration.

While new programs would train "generalist" sustainable development practitioners, the program would also meet the demand of specialists like physicians and PhDs who require means to round out their knowledge base for the practice of sustainable development so that they can effectively contribute to cross-disciplinary teams. Moreover, the rapid pace of scientific and technological advancement underscores the need for a "lifecycle" approach to continuing education to continually upgrade professional knowledge and skills of sustainable development practice.

This section outlines the essential components of an effective MDP program including the cross-disciplinary curriculum and complementary learning activities and resources, the recommended student body and associated recruitment strategies, employment opportunities for graduates, indicative budgets, faculty composition, and organizational structures required to support the program.

2.1 MDP Core Curriculum

The MDP core curriculum would integrate substantive knowledge spanning the disciplines of health science, social science, natural science and engineering, and management and would be firmly grounded in the practices of policy analysis and formation, public administration and program management in order to foster the development of practical, cross-disciplinary skills necessary to prepare students for a practitioner

career in sustainable development. In addition, students would gain a solid understanding of a range of areas including: the political and socio-cultural context of development; data collection methods and statistical analysis used for the planning, monitoring and evaluation of development interventions; and necessary management and leadership skills for implementing interventions. The study of policy and management would also be explored within the context of the technical fields, and critical self-reflection would be supported at all stages of study.

MDP programs would require full-time enrollment of graduate-level students for at least two full years, and would include rigorous study of cross-disciplinary topics spanning the four core disciplines of health science, natural science and engineering, social science, and management. Expanding upon the core competencies of the development practitioner, the specific learning outcomes for the MDP program, detailed in Appendix C, identify essential knowledge and skills that each MDP graduate should acquire throughout the course of the program. Students would also be required to demonstrate basic proficiency in a non-native language, and would have the opportunity to enroll in foreign language classes during the MDP program.

Although the MDP learning outcomes are categorized by discipline and knowledge area, specific courses and learning activities would be anchored in an understanding of the inter-relationships among fields and course content would integrate cross-disciplinary approaches for sustainable development. While academic institutions with relevant, practice-focused courses may draw from existing courses to establish part of the MDP core curriculum, new courses would also be needed to ensure training across the broad range of knowledge areas. In designing new courses, the list of MDP learning outcomes is recommended as a guide for curriculum planning.

2.2 Enhancing Curriculum with Case Studies and Practical Exercises

To support and enrich the core curriculum, the MDP program would integrate a variety of teaching and learning resources including practical, experiential learning through cross-disciplinary case studies and group projects.

MDP Case Studies

New case studies, drawing from real-world development challenges, would be designed and incorporated into the MDP curriculum. MDP faculty members, practitioners and development organizations would work in coordination to design and revise MDP cases for the curriculum. Students would be challenged to provide comprehensive and cross-disciplinary recommendations for addressing each case.

The Importance of "Learning-by-doing"

Participants in the South Asian Consultation (representing Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka) asserted that the core skills of development practitioners are acquired through "learning-by-doing" rather than formal classroom training. For technical knowledge in subject areas such as economics, research analysis, management, energy, environmental science, participatory rural appraisal, logical framework, and project appraisal, both formal training and learning-by-doing contributed to skill acquisition among participants who responded to a survey.

Participants in the African Consultation emphasized the importance of required practical training programs. Said one participant, "Students interested in working in Africa need exposure to the real situation on the ground and should engage in field studies and internships with African development or research institutes. Within the formal academic setting, courses should incorporate real-life learning materials, such as interviews with farmers, health workers or development officers, as well as case studies or success stories from development agencies."

Group Projects: Practical Cross-disciplinary Exercises

Since the development of practitioner skills requires "hands-on" field experience, the MDP program would incorporate a variety of practical group projects to take place both inside as well as outside the formal academic setting. The active learning experiences would foster skills in problem solving, critical self-reflection and teamwork. In addition, they would forge linkages across sectors and encourage students to consider cross-disciplinary approaches to sustainable development.

During each semester of university-based study, students would work in teams to tackle specific issues related to poverty reduction and sustainable development. Drawing upon the technical and theoretical knowledge gained from coursework, as well as their past experiences working in development (if applicable), students would have the opportunity to work collaboratively on cross-disciplinary assignments.

Indicative group assignments include:

- Producing a comprehensive cross-disciplinary situation analysis for a specific region and recommending appropriate policies that would improve local standards of living.
- Developing an environmental protection plan for a threatened habitat.
- Developing a climate change adaptation and mitigation strategy for a geographic or political unit.

In each practical exercise, students would build key competencies of teamwork, cross-cultural communication and negotiation, problem analysis, problem solving, financial management, project design and project management.

2.3 Global Learning Resources for Sustainable Development Practice

The creative integration of appropriate technologies would foster a global, cross-disciplinary educational system promoting a dynamic learning environment, at the same time leveraging a broad range of MDP curriculum resources through the use of technology. While future applications of new technology may be limitless, specific early initiatives should include: shared or "open-source" curricula; communication portals for students and faculty including "global" courses; and web-based collaborative activities and exchanges that engage students with development-focused organizations, researchers, and private sector companies.

Open-source Online Resource Center

To facilitate and strengthen MDP programs around the world, the core MDP curriculum would be supported by an Open-source Online Resource Center where participating teachers and students can access case studies, lesson plans, learning materials, practical tools and educational activities. Practitioners and faculty members at MDP partner universities could also contribute their own materials to this resource center to assist in the development of wide-ranging online curriculum tools that ensure the inclusion of global perspectives.

In addition, as some universities may not be able to support all components of the MDP program in-house, the resource center would be a necessary asset to ensure that students receive a high-level of academic preparation in each of the core disciplines. For example, universities that do not have a strong agriculture department may access the open-source curriculum to receive teaching guides, syllabi, reading materials, lectures and other learning activities.

Global Courses

MDP programs should also incorporate "global courses" to foster cross-border and cross-disciplinary collaboration and to allow students and teachers to participate in collective assignments and learning experiences. Through web-conferencing, online portals for interactive communications, and shared course management sites, such courses may leverage available technology to enhance MDP programs around the world. They may also be interspersed throughout the curriculum to provide opportunities for students and teachers around the world to exchange insights and ideas. One illustration of these types of global courses is the Commission's inaugural "Global Classroom" that joined together eleven universities and one development institution in an interactive, online course titled "Integrated Approaches to Sustainable Development Practice." This global course provided the opportunity for students, faculty and practitioners from around the world to engage in live discussions on a broad range of development issues. Such cross-institutional initiatives are still in the early stages of development, and have enormous potential for exponential growth and refinement for future collaborations.

Global Classroom

On January 22, 2008 the Commission, in partnership with the Columbia Center for New Media Teaching and Learning (CCNMTL), launched a global course entitled: "Integrated Approaches to Sustainable Development Pratice" as a first effort to integrate cross-disciplinary components of sustainable development education. A practical illustration of the MDP curriculum, the global course provided an opportunity for some 240 students from 11 universities around the world and one international development organization to participate in a learning program involving classroom, online and research activities. Commission members, as international experts in the field of sustainable development, provide students with a diverse curriculum focused on core issues of sustainable development.

Using a combination of delivery methods including pre-taped lectures, classroom meetings, and simultaneous, online global discussion sessions, the investigation of course topics is grounded in a practical, multi-disciplinary approach focused on the inter-relationship between core fields of development practice including agriculture, engineering, economics, environmental science, health and nutrition, policy and management. Each week of the 14-week course showcases one aspect of the multidisciplinary curriculum, with a lecture given by one of the Commissioners.

The eleven universities and one international development organization participating in this first Global Classroom include CIDA (Canadian International Development Agency), Columbia University (US), the Institute for Development Studies at Sussex University (UK), University of Ibadan (Nigeria), Lee Kuan Yew School (Singapore), University of Malaya (Malaysia), Mekelle University (Ethiopia), Sciences-Po (France), The Energy Research Institute/TERI (India), Tsinghua University (China), University of International Business and Economics (China), and Universidad Internacional Del Ecuador (Ecuador).

2.4 MDP Network

Within the network of participating universities, development organizations, research institutions and affiliated organizations, students and faculty members would have the opportunity to participate in field training, internship programs and global exchange programs.

University Partnerships

MDP students may participate in academic exchanges as well as online discussions and collaborative learning activities. Such experiences would provide students with opportunities to learn from another university's particular area of expertise. Partnership programs could allow students to enroll at a particular university to complete the core requirements in, for example, natural sciences, engineering, and health sciences, and then complete training in social sciences, management, and quantitative and qualitative analysis at another institution. In addition, specialized MDP programs (i.e. programs focusing on a specific region or sector of development) may contribute relevant expertise to the curriculum resources and may host MDP students during a semester of specialized study.

Faculty members from MDP partner universities would also have the opportunity to engage in professional exchanges through web-based conferences, face-to-face meetings, short excursions and longer-term exchanges. During the longer-term exchanges, faculty would have the opportunity to teach at another MDP university while receiving guidance and mentorship from other MDP faculty members. Such exchanges would advance the overall skills and teaching capacities of MDP faculty through the cross-fertilization of knowledge, experiences and ideas.

Partnerships with Development Organizations

As an integral part of a global development network, development organizations would maintain close connections with MDP partner universities to ensure that the curriculum sufficiently prepares graduates to work effectively as sustainable development practitioners. In turn, partner universities and institutions would provide support to organizations in the development of training programs, and would play an important role in supporting graduates throughout their professional careers by providing special programs and educational events for alumni.

2.5 Field Training

The Commission recommends field training programs as an essential component of the MDP curriculum. Designed to provide a holistic learning experience, the field training would encompass a broad set of activities to foster the development of "on-the-job" practical skills, while providing students the opportunity to learn from local development experts. Each MDP student should engage in two distinct field training sessions each lasting three months. In many instances the MDP student will be assigned to a field training organized by a hosting partner institution, thereby allowing broader field exposure (see Diagram 3). These sessions should include all of the following key components:

- **"Clinical" Training**—Working closely with local development organizations or private sector companies involved in sustainable development, host universities would identify appropriate development projects that would be able to integrate students into a structured, "clinical" training program. The aspiring sustainable development practitioners would participate in individual work assignments under the guidance of an experienced professional mentor.

- **Field-based Academic Programming**—Host universities would organize a series of academic events for the visiting students to include site visits, meetings, and lectures focusing on the local challenges to sustainable development. This would provide the students with a forum to jointly reflect upon their individual fieldwork, while also providing an opportunity for local faculty to become involved in integrated problem solving approaches.

- **Social and Cultural Programming**—Organized by the host university and partner organizations, students would have the opportunity to participate in group activities and attend cultural events. Student would be expected to be aware of ethical issues that need to be considered vis-à-vis local religious, moral or cultural values.

- **Field Training Report**—Reflecting upon their experiences, students would complete a consolidated field training report. This report would include a comprehensive analysis of the local conditions (the challenges and opportunities for reducing poverty and a suggested road map for working toward sustainable development); a description of the observed project including the design, monitoring and evaluation process; a general analysis of the project; and a self-evaluation of the student's perceived weaknesses and strengths in light of the "core competencies of the sustainable development practitioner."

As a general principle, MDP programs would certainly need to implement minimum procedures to "do no harm," ensuring that students receive sufficient mentorship to observe and engage in real-world development interventions without creating added burden or negative consequences within the local context.

When designing a field training program, the following list may be used to assist preparations for the development of a successful program.

- **Identify partner institutions for training management**—Partner universities within the network of affiliated MDP institutions would serve as hosts, program coordinators and supervisors for groups of MDP students, and would work closely with local development organizations to identify appropriate accommodations and to provide orientation, guidance and support services for students.

- **Organize field training groups**—Each field training program would include an average of 20-30 participants, representing four or five MDP partner universities. While students would be able to share experiences with peers from their home institution, the field training program would also provide the opportunity to expand their professional and social network to include students from other MDP universities.

- **Launch pre-departure programs**—Prior to departure for the field training program, all students should explore a broad range of resources in order to gain essential background information relevant to their future site. This may include reviewing human development reports, political analysis, satellite imagery, maps, climate reports, historical accounts of the local populations, health reports, and agricultural, forestry and fishery production reports. A pre-departure seminar would provide an opportunity for students to learn more about the local cultural norms and context, to present findings from background research, and to participate in training modules for project management and participatory methodologies.

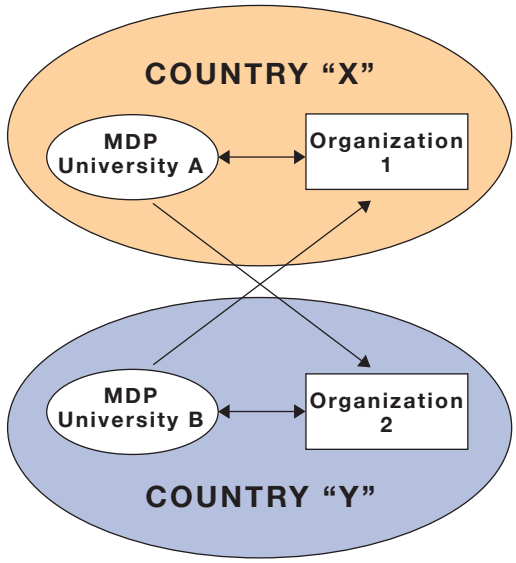
- **Ensure students have fulfilled language requirements**—Students would be required to have at least an intermediate level of language proficiency of a major operational language of the field location and some knowledge of the local language, if distinct from the national language.

- **Provide on-going support throughout field training**—Students should remain in communication with their home institution faculty advisor during their training experience to receive guidance and advice.

- **Organize de-briefing seminar**—After completion of the field training program, students and faculty members would convene for a de-briefing seminar. During this time, students would present their final training report and reflect upon what they have learned from the experience.

Diagram 3

International Field Training Partnership



2.6 Sample Academic Calendar

The suggested duration of the general MDP program is 25-27 months of full-time graduate-level academic training, of which at least 16 months (4 semesters) would be dedicated to university-based coursework and training in the core curriculum courses. Depending on the student's desired course load, students may also enroll in 2-3 elective courses or foreign language courses. The rest of the time would be for field training programs and other educational experiences outside the classroom. During each semester of university-based training, students would meet for weekly seminars culminating in a two-week "Cross-disciplinary Practical Exercise."

It is important to reiterate that although some courses may focus on a particular discipline, it is necessary that every MDP course emphasize learning across disciplines. To ensure that the curriculum is practical and cross-disciplinary, each individual course should be grounded in real-world challenges and the policy and management implications of such challenges. For instance, a course on the environment may focus on the core natural science knowledge, but the investigation of the problems associated with, for instance, increased desertification would require an investigation of relevant agricultural, economic, health and anthropologic factors as well as the associated challenges for policy formation and management.

While the precise sequence of courses, field investigations, group projects and work experiences would vary at each academic institution, the academic calendar outlined below offers a model MDP curriculum that includes a short semester of intensive refresher courses and introductory field seminars, two full years of academic study (4 semesters), and two field training assignments.

Table 3 Sample 25-month MDP Curriculum

Year 1	Course	Credit
August	• **Intensive Pre-MDP "Boot Camp"**—including math/statistics refresher, economics refresher, professional writing and communication practicum	0
	• **Introductory MDP Field Seminar**—field visits to local development projects	0
September - December	• **Economic and Policy Analysis**—microeconomics	3
	• **Global Classroom**: **Integrated Approaches to Sustainable Development Practice**	3
	• **Tropical Agriculture and Sustainable Development**—includes nutrition, health	3
	• **Global Health 1**—population sciences, reproductive health, health policy	3
	• ***MDP Cross-disciplinary Seminar and Practical Exercise***	0
January - May	• **Economic and Policy Analysis II**—microeconomics	3
	• **Practicum: International Energy and Environmental Policy**	3
	• **Managing Multi-sectoral Development Interventions**—reflective practice, delivery science, culture, anthropology and ethics	3
	• **Global Health 2**—epidemiology, infectious and non-infectious disease control, health education	3
	• **Field Study Pre-departure Seminar**	2
	• ***MDP Cross-disciplinary Seminar and Practical Exercise***	0

Year 2	Course	Credit
June - August	• **Intensive Field Study program** (3 months)	0
September - December	• **Environmental Sciences**—ecology, climate science, water systems, forestry	3
	• **Macroeconomic Policy and Sustainable Development**	3
	• **Human Ecology and Sustainable Development**	3
	• **Methods of Sustainable Development Practice**—participatory planning, project management, community education	3
	• **Elective**—non-native language, unless demonstrated proficiency is met	3

Year 2 Cont.	Course	Credit
January - May	• **Finance, Accounting and Commodities Management for Development Practice**	3
	• **Science, Technology and Sustainable Development**—includes engineering	3
	• **Advanced Applications of Policy and Planning Tools**	3
	• **Elective**—non-native language, unless demonstrated proficiency is met	3
	• **Workshop in Development Practice**	1

Year 3	Course	Credit
June - August	• **Applied Field Study (3 months); Global Colloquium for final presentations**	

Total Credits: 54

2.7 Variations on the MDP Curriculum

The MDP curriculum outlined in this report is not intended to be a "one-size-fits-all" degree program. Host institutions may develop specific variations of the curriculum to fit within the local context or the academic culture of participating universities. For example, academic institutions may modify the MDP curriculum to incorporate a regional focus, to include a discipline-based specialization, or to provide complementary skill training within a specialized program of study. Any variation, however, should be anchored in the core competencies outlined earlier in this report.

Regional Variations

Consultations with academic institutions from around the world have confirmed support for the creation of distinct, regionally-focused MDP "hub" programs. The function of the regional MDP hubs would be two-fold: they would be able to pool academic and financial resources to support the MDP program, and at the same time they would establish themselves as regional centers of expertise in sustainable development.

For instance, in Africa and in Southeast Asia, regional education centers could be formed to draw together academic and financial resources from throughout the region to ensure that the MDP students have access to the range of academic disciplines and educational activities that are central to the overarching goals of the MDP program.

In other cases, universities may draw upon region-specific knowledge to design their MDP curriculum. For example, the University of Central Asia plans to include a focus on mountain communities within the MDP curriculum to address the particular conditions and challenges to development faced by indigenous communities living in mountainous regions. Similarly, Mekelle University in Ethiopia plans to build an MDP curriculum with a particular focus on dry-land agriculture and development. Likewise, University of São Paulo in Brazil has expressed its interest in an MDP curriculum with a focus on sustainable development within the Amazon.

Specialized Programs

In addition to the regional variations on the MDP degree, some students may wish to pursue a specialization in a specific field. While the two-year program outlined in this report provides rigorous training for generalist sustainable development practitioners, students may also have the option of enrolling in an extended (i.e. 32-month) program that would allow deeper study of a chosen area.

Specialized programs may be based on concentrations in a particular field

of development (i.e. agriculture, economics, engineering, environment or health), or they may focus on a particular region. Students with a regional focus would be required, if possible, to spend their final semester enrolled at a partner MDP program within that region (e.g., students with the "Central Asia and Mountain Communities" concentration would complete one semester of study at the University of Central Asia, participating in classes and field experiences relevant to their specialization).

Condensed MDP Programs to Complement Specialized Degree Programs

An abbreviated version of the MDP curriculum may be offered to students pursuing specialized degrees in relevant development fields. Such programs would include core coursework in the MDP disciplines to complement Doctoral- and Master's-level programs in fields such as public health, medicine, agriculture, economics, environmental science, and other core fields of sustainable development. By incorporating the "development practice" focus within a specialized degree program, students would have the opportunity to round out their skill set, enabling them to successfully work across disciplines to coordinate interventions.

2.8 Program Administration and Organizational Structure for New MDP Programs

In forming new MDP programs, each participating university should establish appropriate organizational structures to support program administration. While partner programs would be able to access shared, global curricula through the online learning resource center, each university would be responsible for directly overseeing the local management of the MDP program including academic planning, student recruitment and support services, as well as faculty support.

The following provides general guidance for the establishment of new programs, with the understanding that unique modifications may occur in each case.

Program Administration and Organizational Structure

As the MDP program draws from a range of academic disciplines, strategic coordination and institutional support is required in order to ensure effective management of the degree program. Each MDP program should be housed within a university department, institute or affiliated center that is capable of bridging together academics and practitioners from a range of disciplines and academic departments. A school of policy or public administration may serve as a logical home base for an MDP program if it is able to effectively integrate faculty from health sciences, natural sciences and engineering.

After determining the institutional home base for a new MDP program, the program's administrative office should be established including the program director and support staff. As selection of the program director may greatly influence the success of the program, recommended hiring criteria would provide guidance in choosing the best candidate. Such criteria would include: substantial professional experience working in the field of sustainable development; ability to coordinate with a diverse range of stakeholders including academic departments, faculty, students, development agencies, practitioners and government representatives; and proven ability to manage staff and faculty. A senior member of the university faculty would typically be chosen as program director.

Employment Opportunities for Graduates

A key incentive for students interested in pursuing the MDP degree would be the prospect of advancing their career in the field of sustainable development as sustainable development practitioners. Potential employers include UN agencies, government ministries, foundations, bi-lateral and multi-lateral financial institutions, national and international non-government organizations, as well as private companies working in developing countries. Graduates may serve as, for example, development officers, program managers, country directors, ministers of finance or planning, policy advisors, and so on. Within organizations, graduates may pursue two basic tracks: the "generalist" manager and coordinator or the "specialist" manager and coordinator. The specific track that a graduate pursues would depend on the individual's past training and experiences, as well as their professional interests.

After completing a rigorous, cross-disciplinary academic program embedded in practical exercises and field training experiences, the typical MDP graduate should be well positioned to secure a job as a sustainable development practitioner. The official launch of new programs should be advertised to an extended network of development organizations to ensure organizations working in development actively recruit and hire MDP graduates. In addition, under the supervision of host MDP universities, students would partner with local organizations during field training and internship programs. Such ongoing collaboration between the universities and the organizations would further strengthen the "employer pipeline."

Recruitment

A diverse student body would provide a wealth of perspectives and opportunities for cross-cultural interaction. The Commission recommends that each MDP program aim to create a student body that includes a minimum of students (perhaps 30%) from areas outside of the university's regional home. In addition, universities in developed countries should ensure that roughly half of the students come from developing countries. Ideally, more than half of all students in each program would already have had some professional experience working in a field related to sustainable development.

In order to attract qualified students, MDP programs must employ vigorous recruitment strategies. Universities should continually market the MDP program to development organizations, emphasizing the practical, real-world applications of the core competencies developed through the MDP program. Organizations and agencies working in development may also recommend the program as a pre-employment entry requirement for future staff or as a skill-upgrading option for current staff that may be interested in participating in a longer-term professional development program. MDP marketing would not only serve to attract potential students, but at the same time it would strengthen the ties between universities, development agencies, governments, foundations, and others within the network of global development practitioners.

The ability to assemble a diverse student body would depend on the program's capacity to provide sufficient financial aid, housing, and living stipends for qualified students. This would include financial support for students participating in the field training exchanges with partner MDP universities. Many applicants from developing countries or with scarce financial resources may not be able to afford the tuition for the MDP program and may not have the luxury of sacrificing their potential income to participate in a 25- or 27-month-long academic program. In order to encourage such candidates to apply, the MDP program must provide qualified students with tuition assistance and full scholarships. Substantial funding would be required to support student scholarships and universities should partner with foundations, governments and financial organizations to sponsor qualified students.

Prerequisites

Although students would represent diverse backgrounds, specific prerequisites would be required for all incoming students to ensure that they are sufficiently prepared for the advanced subject matter covered in the MDP program. Specifically, all prospective students should have completed at least a Bachelor's degree at an accredited university and most should have some experience working in a field relevant to sustainable development. Foundation classes for the MDP include coursework in physics, chemistry, biology, economics, math and statistics, and qualified students who have not completed all foundation classes may be required to take additional courses during the MDP program. Admission to the MDP program would be highly competitive and all applicants should be required to submit transcripts, resumes, test scores (such as the GRE, where appropriate), writing samples and personal statements of motivation.

MDP Faculty

Program faculty should include a cross-section of practice-focused and research-focused academics and professionals with expertise spanning the four core disciplines of sustainable development (health sciences, natural sciences and engineering, social sciences, and management). Some universities may be able to draw from existing faculty members to teach in the MDP program. In other cases, MDP program directors may have to launch a recruitment campaign to target leading practitioners within each of the core fields. Ideally, at least half of these experts would be recruited from senior ranks of development-focused organizations, including non-governmental organizations, international financial institutions, government ministries and agencies, and multilateral organizations. To attract the most qualified faculty, academic institutions will likely need to offer competitive compensation packages that include housing benefits, research stipends and competitive salary, with innovative tenure-track options for practice-focused academic faculty.

A lead faculty representative should be designated from each of the four core disciplines. Essential responsibilities for lead faculty members should include serving as advisors and mentors to a group of five to ten students per year, working with students on joint research and projects, aiding students in elaborating their plans for field training programs, and assisting the students in the transition from the MDP program to a professional career.

Timeline for Launching MDP Program

The following provides a general timeline for the first three years of launching a new MDP program:

Table 4

18-Month Launch Schedule for New MDP Program

Year 1	
January	• Conduct inter-departmental meetings, finalize plans for the establishment of the program in the home-base institution
March	• Secure start-up funding
May	• Recruit and hire Program Director, begin faculty recruitment
June	• Recruit and hire program staff, develop student recruitment materials, build program website, continue faculty recruitment
July - Sept	• Launch student recruitment campaign, coordinate with development organizations to market MDP degree and secure employer pipeline
Oct - Dec	• Regional information meetings for MDP candidates
Year 2	
January	• Hire faculty and junior faculty to begin work in August, applications due for MDP candidates
February	• Review student applications
March	• Admissions offers sent to qualified students, financial aid offers presented to qualified students
April	• Open house for admitted students
May	• Review and refine MDP curriculum, finalize plans for program launch in August
August	• **PROGRAM LAUNCH—Student orientation and summer session begins**

Financial Model and Budget

The launch of each MDP program would require financial support for the start-up costs associated with program development and administration as well as student and faculty recruitment. Financial models for the long-term support for MDP programs would differ at each educational institution depending on the varied costs of program administration, faculty support and scholarship awards, as well the projected enrollment rates and the varied levels of external support and tuition revenue.

Table 5

Typical Program Expenditures

Staff Salaries	• Program Director (1) • Program Staff (2-3), Financial Administration (1)
Administrative Support	• Office Supplies, Postage, Telephone, Copying & Printing • Audio-Visual & IT Support • IT Applications & Software, IT Equipment • Maintenance
Academic Meetings & Events	• Development Practice Exercise • General Meetings • Graduation • Memberships & Subscriptions
New Faculty Recruitment	• Travel & Accommodation • Recruitment Materials
Faculty & Teaching Support	• Senior Faculty (2-3) • Junior Faculty (3-4) • Adjunct Professor (2-3), Teaching Assistants • Research & Travel Support, Honoraria
Student Recruitment & Admissions	• Advertising & PR, Website Design & Maintenance • Photographic Services & Publications • Recruitment Travel & Accommodation • Student Open House • Student Scholarships
Academic Programming	• Consultation Services (curriculum, syllabai, etc.) • Identification of Field Sites

RECOMMENDATION 3:
Provide Ongoing Professional Development for Practitioners

To maintain the highest level of knowledge and effectiveness, development practitioners require opportunities to engage in cross-disciplinary learning throughout their professional careers. Dynamic and interactive resources for professional development should be made available through a network of sustainable devel opment institutions and organizations.

As an entry point into the vast possibilities of ongoing professional development, the Commission recommends the following core initiatives within academic institutions: the development of condensed "mid-career" MDP programs to be offered in coordination with the MDP partner universities and academic intuitions, as well as the development of shortened, virtual learning and certification programs focusing on the core competencies of sustainable development practitioners. Within development organizations, the Commission proposes the establishment of cross-disciplinary induction training for staff transitioning to a higher level on the career path as well as competency-based criteria for promotion to senior-level positions. These initiatives would also be supported by the activation of a professional network through the establishment of accreditation boards, academic journals, and networking activities, as discussed in the following section.

3.1 Within Academic Institutions

Through the development of the MDP curriculum including case studies, research, teaching guides and interactive learning tools, the MDP Network will build a wealth of cross-disciplinary resources for training and education, much of which will be available in the Open-source Online Resource Center. These resources may also be modified to fit the needs of professionals already working within the field of sustainable development practice. In addition, technology-based learning resources may be incorporated into online modules or certification programs.

Condensed "Mid-career" MDP Training

Professionals who have extensive experience working in sustainable development yet would like to expand and refine their cross-disciplinary knowledge and skills may enroll in condensed MDP programs that would be offered through MDP partner universities. Drawing from the example curriculum for the full MDP program, academic institutions would be able to create accelerated degree or certification programs to mid-career professionals.

The following provides an example of a condensed mid-career degree program for the sustainable development practitioner based on Columbia University's Program on Economic Policy Management (PEPM) at the

School of International and Public Affairs. This proposed 14-month program includes the core economics, policy and management courses from the PEPM curriculum, while incorporating coursework from the key MDP disciplines. The abridged timeframe does not allow time for the extensive field training component of the full MDP program; however, as mid-career professionals, the PEPM-MDP students should already have first-hand development experience before entering the academic program. In place of field training, PEPM-MDP students would have the opportunity to apply their new knowledge in a practical setting during the three-month internship component.

Table 6

"Sustainable Development Practice" PEPM Concentration

Schedule	Course	Competencies
Summer 1		
(12 Credits)	**PEPM Core:**	
	• Quantitative Methods for Economic Analysis	• Applied **mathematics and statistics** including a review of data collection and analysis, probability, sampling, estimation, hypothesis testing, correlation and simple regression
	• Macroeconomics and Microeconomics	• Basic principles and theories of **micro and macroeconomics**, applied to context of dev. countries
	• Computer Skills for Economic Policy Management	• **Computer skills**
	• Effective Professional Writing and Public Speaking	• **Communication** (written and oral)
	Sustainable Development Practice Concentration (Columbia Courses):	
	• Fundamental Energy Concepts (3-days)	• **Energy** conversions; global energy flows; basic physical, business and market structures of oil, natural gas, coal, nuclear, electricity production transportation/transmission, distribution and demand
	• 5 day introductory practicum on cross-disciplinary development challenges (NEW)	• **Project management, critical problem solving, leadership skills, negotiation skills, facilitation skills**
Fall		
(18 Credits)	**PEPM Core:**	
	• Macroeconomic Policy Management • Microeconomic Policy Management	• **Macro/Micro economics**; key policies; growth strategies
	• Econometric Techniques for Policy Makers	• **Applied statistics for policy** (linear and multiple regression, specification tests, forecasting, limited dependent variable models, and logistic regression)

Table 6 Cont.

Schedule	Course	Competencies
	Sustainable Development Practice Concentration (Columbia Courses):	
	• Environmental Science for Sustainable Development	• Earth systems and climate science; water resource management; ecology/ biodiversity; public health/ epidemiology
	• Tropical Agriculture and Sustainable Development	• Agriculture, crop breeding, soil science, nutrition, forestry, fisheries, livestock management, food aid/ politics
	• Introduction to Global Public Health	• Public health policy; health delivery systems;
Spring		
(12 Credits)	**PEPM Core:**	
	• Macroeconomics and Financial Issues in a Global Context	• **Macroeconomic policies** for internal and external stabilization, international banking, and financial markets
	• Public Economics and International Trade	• **International trade**; key private and social incentives to develop human capital and maintain income growth
	• Management Skills for Policy Makers	• **Organizational management, human resource management, communication, public finance**
	• Political Economy of Development	• **Development theory, governance, human rights, the influence of culture, religion, gender**
	Sustainable Development Practice Concentration (Columbia Courses):	
	• Technical Innovations in Sustainable Development (1.5 credits)	• **Technology and infrastructure**
	• Water Resources in Sustainable Development (1.5)	• **Water** supply systems, water storage and irrigation
	• Geographic Information Systems (GIS) for Resource, Environmental and Infrastructure Management	• **GIS** for planning and management of resources and infrastructure
	CROSS-DISCIPLINARY SUSTAINABLE DEVELOPMENT PRACTICUM	
Summer 2		
(6 Credits)	• Internship	

Condensed Part-time Modules

Accounting for the varied needs and time constraints of development professionals, particularly the opportunity cost associated with enrolling in full-time mid-career education programs, institutions could also develop an assortment of part-time programs in sustainable development practice, ranging from short (1-2 week) intensive modules to online degree programs. Some such modules may also be offered as certification courses, described more below.

3.2 Organization-based Initiatives

Organizations tasked with the responsibility of planning or managing sustainable development interventions require leaders who are able to integrate cross-disciplinary knowledge and skills into their daily operations. Appreciating the broad spectrum of organizations working in the field of sustainable development, the Commission proposes the following three general recommendations for advancing and ensuring core competencies within such organizations: (1) cross-disciplinary induction training for staff; (2) staff rotations and exchanges; and (3) competency-based criteria for promotion to senior-level positions. These recommendations can be adapted to fit within the appropriate organizational context.

Induction and In-service Training Programs

Condensed, cross-disciplinary training programs should be required of staff transitioning to new assignments that involve the coordination or planning of multi-sectoral interventions. Such programs would ensure that individuals have received sufficient preparation across the range of sustainable development competencies before assuming new responsibilities. They should specifically target those responsible for leading, managing or influencing complex interventions such as program managers, country representatives, regional managers, ministers of planning, and so on.

In many organizations, training for incoming staff includes core modules in program management and organizational operations. However to more fully prepare a new sustainable development professional, additional substantive content areas must be included such as: environmental sustainability, climate change, econometric methods and decision-making tools, public health management, innovations in infrastructure, and energy systems for sustainable development. Existing modules on management and leadership should integrate practical exercises to develop core skills of communication, financial management, human resources management, monitoring and evaluation, and project management.

To provide guidance to organizations as they identify the core content areas of a comprehensive training program, the MDP learning outcomes may serve as a reference point for induction training. Organization-based training programs would likely not be able to delve into the key disciplines of the MDP program at the same level of depth as a full-length graduate degree program; however, condensed, cross-disciplinary modules may be created to provide practitioners with the key concepts essential to the practice of sustainable development.

As one example of a cross-disciplinary module that could be part of a typical induction training program, staff members could participate in an intensive course in food production management that would analyze the key factors affecting agricultural, ecological, economic, health and social systems relevant to improved food production. A brief description of this example module is found in Appendix D. As illustrated in this example, all core substantive modules should be grounded in technical knowledge, policy and management, and should emphasize cross-sectoral challenges and solutions.

Staff Rotations and Exchanges

Alternative strategies for in-service training could also include exchanges between organizations and university-based professional schools to encourage integrated project planning. Staff should also engage in short "rotations" across the other areas of expertise to ensure that they have the opportunity to test and apply basic knowledge of challenges within each field, plus the basic technical language employed by the different groups of experts. Junior staff should receive systematic feedback and evaluation from senior specialist staff across the relevant range of substantive and managerial skills.

Competency-based Criteria for Promotion and Certification

Those in an organization's senior-level positions typically set the standards and tone for all staff. The majority of senior-level positions within development-focused organizations require "generalist" practitioner competencies as outlined in this report in order to effectively coordinate across sectors and to plan and manage complex development interventions. Many senior-level staff members may have entered their organizations as specialists in a particular field of development (i.e. agriculture, economics, education, nutrition, and so on) and may have never had the opportunity to round out their skills in other core areas. Many others may have focused their time on program management, and not had the opportunity to stay abreast of the latest research and evidence pertaining to their field.

Development organizations should implement competency-based criteria for promotion to senior-level positions, and map out clear opportunities

for obtaining those competences through skill upgrading or refresher courses. This would be important to ensure that all senior-level staff members demonstrate the essential skills and competencies relevant to their role. It would also help set incentives for junior staff to develop cross-disciplinary competencies as a path to career advancement. Competency criteria would vary depending on organizational context and defined roles. However the core competencies and the MDP learning outcomes outlined in this report may provide guidance to organizations as they determine specific promotion criteria.

As an effective method to ensure professionals have obtained a core level of knowledge and skill in a particular area, certification systems should be considered within the field of sustainable development. Each organization should evaluate the unique blend of certification needs at different levels of seniority. Certification requirements should be tied to learning outcomes rather than particular courses or requirements. A professional may decide which methods or instruments they would use to acquire the skills and competencies. Tests and other measures can be utilized to assess skill proficiency. Eventually, certification systems may be carried out by national or international certification bodies.

RECOMMENDATION 4:
Establish the MDP Secretariat and International Advisory Board

To serve as the umbrella overseeing all MDP activities around the world, the Commission recommends establishing a strategically designed MDP Secretariat. The Secretariat's role would range from establishing MDP curriculum standards to representing the MDP at major academic forums. An International Advisory Board comprised of practitioners, academics and MDP program directors would also be created to provide ongoing impartial advice to the Secretariat and facilitate the MDP network's engagement with other academic and professional communities. Together, these bodies would manage and coordinate collaborative exchanges, educational resources, publications and events.

4.1 Key Responsibilities of MDP Secretariat

The Secretariat's immediate and intermediate responsibilities would include:

- **Coordinating the MDP Global Network** that would serve to scaffold the building of new training and education programs that integrate international, cross-cultural and cross-disciplinary teaching and learning experiences. This dynamic network would include academic institutions, development organizations, government agencies, individual practitioners, and donors involved with this program.

- **Managing the development of the MDP curriculum** at institutions around the world by overseeing teaching guides, lesson plans, case studies, assignments and practical teaching tools.

- **Supporting the Open-source Online Resource Center** for participating institutions. The community of sustainable development practitioners would contribute to a dynamic repository of educational resources and tools including case studies, lectures, manuals, and so on. Such resources would not only support MDP programs, but also in-service training programs, certification programs, and continuing education programs for professionals working in sustainable development.

- **Coordinating global courses** with MDP partner universities to provide the opportunity for students to engage in collaborative assignments and interactive discussions to build a community of cross-border problem-solvers. Courses may be developed to target specific levels of professional development (graduate-level, junior professional, senior-

level generalist, and specialist), to connect learners from around the world to participate in interactive learning modules. Courses should also include case studies, collaborative learning activities and opportunities for cross-cultural exchanges to reinforce linkages between practitioners and academic institutions to encourage an ongoing exchange of knowledge and practical experience.

- **Establishing eligibility guidelines** for academic institutions interested in creating an MDP program. These guidelines would be developed with the International Advisory Board.

- **Identifying new participant institutions** in conjunction with donors and development organizations.

- **Serving as the public face of the global MDP program** at conferences, events and before the press.

- **Stewarding relationships with donors**, both existing and potential, and serving as the liaison between donors, institutions and other key participants.

In the future and in close concert with the International Advisory Board along with a broad range of expert academics and practitioners, the Secretariat's role would include:

- **Establishing curriculum standards and accreditation** based on the core competencies of sustainable development practice and corresponding learning outcomes for the MDP. Spearheaded by the International Advisory Board and in consultation with a broad range of expert academics and practitioners, accreditation standards should adhere to the core competencies of the generalist sustainable development practitioner.

- **Creating certification programs** in close coordination with MDP program directors and faculty to ensure proficiency in professional competencies. Innovative systems may be established to measure existing competencies, such as online "sustainable development IQ tests," which may be used to identify gaps in knowledge and skills areas.

- **Reviewing MDP curriculum** periodically to ensure that the program remains up-to-date and relevant, addressing recent technological innovations, scientific discoveries, or emerging challenges to sustainable development.

Strong leadership from the MDP Secretariat and International Advisory Board would be crucial to the success of the MDP program. Without their support and guidance, individual institutions may be able to offer distinct pieces of the proposed curriculum, yet they would be challenged to support a comprehensive MDP degree complete with all the various coursework, field training and other components that rely on well-coordinated global partnerships and rigorous cross-disciplinary degree standards.

IV. Timeline for Next Steps

Implementing the recommendations outlined in this report will require strategic coordination among all members of the MDP Global Network including academic institutions, development organizations, governments and donors.

The following timetable outlines some target dates for the Commission's proposed initiatives:

2008 Establish the global MDP Secretariat and support universities preparing to launch new MDP programs.

Establish and convene the International Advisory Board to define MDP Secretariat operations, define eligibility requirements for partner MDP programs, and refine plans for the launch of new programs.

Begin Global MDP Secretariat's work to build curriculum and planning for the launch of the first MDP program at one or two key institutions by 2009.

Distribute request for proposals to potential MDP partner institutions.

Secure MDP program financial partners to support collaboration and coordination activities.

Identify institutions eligible to support the launch of new MDP programs by 2010 and confirm commitments of financial support.

Confirm initial commitments from institutions wanting to launch high quality, cross-disciplinary training modules or mid-career degree programs in sustainable development practice by 2009.

Confirm initial commitments from development organizations wanting to implement MDP-based competency criteria for the promotion of senior-level staff by 2010.

2009 Establish accreditation criteria for the emerging MDP programs and certification criteria for professional training programs, and establish a plan for program evaluations in consultation with the International Advisory Board.

Convene International Advisory Board to plan for network expansion, build practical learning and knowledge resources, and review and revise MDP curriculum.

Finalize programmatic framework for the MDP curriculum including academic schedules, plans for cross-institutional exchanges, and joint field training programs with MDP institutions.

Recruit and hire program faculty and administrative staff at partner MDP institutions, and recruit qualified students for MDP program.

Determine role-based competencies and corresponding certification requirements for senior-level staff in development organizations and construct plans to implement promotion criteria.

Plan and launch cross-disciplinary training modules or mid-career degree programs in sustainable development practice in at least four institutions.

Collect training materials, learning resources, case studies and additional relevant materials for the MDP Open-source Online Resource Center.

Launch flagship MDP program at one or two key institutions.

2010 Launch MDP programs comprised of approximately 30 students at four to five additional institutions around the world and confirm commitments from additional academic institutions to launch MDP programs by 2012.

Convene expanded members of International Advisory Board to review and revise MDP curriculum, and devise plans to incorporate technological innovations into network operations.

Activate promotion criteria for senior-level staff in participating development organizations based on the cross-disciplinary core competencies.

Design and implement plan to provide supplemental training programs to senior staff members working in development organizations to enhance and upgrade cross-disciplinary technical skills.

Evaluate cross-disciplinary training modules and mid-career degree programs to make appropriate adjustments to new programs.

2011 Launch cross-disciplinary, organization-based training programs for incoming staff, and mandatory certification courses for senior-level staff of development organizations.

Graduate first MDP program class; 100% of graduates offered at least junior-level positions within selected development organizations.

2012 Launch second wave of MDP programs for a total of at least 24 programs worldwide.

Ensure that within at least four development organizations, effective programs and policies are in place to support competency-based criteria for promotion, certification requirements for senior-level staff and cross-disciplinary training for entry-level development practitioners.

Reach target to have mid-career professional training modules offered at every MDP institution and at least 10 mid-career MDP degree programs in operation worldwide.

Expanded global network includes at least 50 universities, development organizations, government agencies, UN agencies, foundations, multi-lateral and bi-lateral aid organizations, and private sector representatives engaged in knowledge sharing, professional exchanges, the publication of the MDP academic journal, and the review and revision of accredited MDP programs and MDP-based training programs.

V. Conclusion

Through the course of its work, the Commission has been able to help mobilize a global network of efforts that are already providing momentum to its recommendations. There is clearly strong global demand for a cross-disciplinary education system to train the next generation of sustainable development practitioners. As this report goes to press, several universities are already preparing their own plans to launch Master's in Development Practice programs (see Appendix E). The very first group of students is scheduled to begin classes in August of 2009. And the newly formed MDP Secretariat is already at work to support the global MDP network and the new MDP degree programs.

In addition, throughout the past year the Commission's regional coordinators have actively engaged regional partners to comment on the emerging findings and to help launch new initiatives. Plans for the development of new MDP programs are already underway at several institutions around the world, and these institutions will collectively form the first phase of the MDP Network. In addition, universities that participated in the pilot Global Classroom in early 2008 are now repeating the course in a new semester, as part of an expanded network. These institutions will undoubtedly continue to work in coordination with the Commission and the Secretariat to refine the MDP curriculum, identify funding strategies, and participate in cross-institutional exchanges. Eligible universities within the MDP network may work with the Commission and the MacArthur Foundation to develop their own MDP programs and contribute to the Open-source Online Resource Center.

The implementation of the Commission's recommendations would be a fundamental step forward for the practice of sustainable development. At the same time, the creation of new education programs alone will be insufficient in affecting long-term change. Coordinated efforts to revise and expand the ideas presented in this report will be needed to respond to the dynamic nature of sustainable development, and the evolving technologies that are empowering ever-richer forms of global communication and curriculum development. Innovative tools should continually be developed to effectively teach competencies and to measure and test competency development.

In a fragile planet that requires management of countless complex and delicate natural and social systems, future generations will require all the cross-disciplinary expertise that they can muster. By activating a vibrant network of academic institutions, development organizations, research institutions, governments and donors to engage in cross-disciplinary problem solving on an ongoing basis, the Commission's hopes its recommendations are poised to play a dynamic and constructive role in advancing the long-term sustainable development on which the world depends.

Appendix

A **Summary Table of Graduate Degree Programs in Development**

B **List of Consulted Institutions and Organizations**

C **MDP Learning Outcomes**

D **Example Training Module: Food Production Management**

E **Partner Universities in the Commission's Early Initiatives**

F **Biographies of Commission Members**

Appendix A Summary Table of Graduate Degree Programs in Development

ACADEMIC INSTITUTION	NAME OF MASTER'S DEGREE	CORE COURSES (% of total credits)	ECON. COURSES (% of core)	AVAILABILITY OF ELECTIVES IN: ENVIRON.	AGRICULTURE	HEALTH
AFRICA						
Univ. of KwaZulu-Natal (South Africa)	Development Studies	High	Low	Policy	-	-
Mzumbe University (Tanzania)	Development Policy	High	Medium	-	Policy	-
Univ. for Development Studies (Ghana)	Integrated Development Studies	Low	Medium	-	-	-
Institute for Development Studies, University of Nairobi	Development Studies	Medium	Low	Policy/science	Policy	Policy/ science
African Economic Resource Consortium	Economics	High	High	Policy	Policy	Policy
AUSTRALIA						
Australia National University	International & Development Studies	Medium	High	Policy	Policy	Policy
University of Melbourne	Development Studies	Low	Low	Policy	Policy	Policy
EAST ASIA						
Asian Institute of Technology (Thailand)	Rural and Regional Development	High	Medium	Policy	Policy	-
Chulalongkorn University (Thailand)	International Development Studies	-	-	-	-	-
Foundation for Advanced Studies on International Development (Japan)	International Development Studies	Medium	High	Policy	-	-
National University of Singapore	Social Science/ International Studies	Low	Low	-	-	-
EUROPE						
University of Cambridge (U.K.)	Development Studies	Medium	Low	Policy	Policy	-
University of East Anglia (U.K.)	Development Studies and others	Medium	Low	Policy	Policy	Policy
University of Helsinki (Finland)	Development Studies	Medium	Low	Policy	-	-
London School of Health & Tropical Medicine (U.K.)	Public Health in Developing Countries	Medium	Very low	-	-	Policy/ science
London School of Oriental & African Studies (U.K.)	Development Studies	High	Low	Policy	Policy	-
London School of Economics (U.K.)	Development Studies	Medium	Medium	Policy	-	Policy
University of Oxford (U.K.)	Development Studies	High	Low	Policy	Policy	Policy
University of Sussex (U.K.)	Development Studies	Moderate	Low	Policy/science	Policy/science	Policy/ science
University of Sussex (U.K.)	Science, Society & Development	High	Low	Policy/science	Policy/science	Policy/ science

Appendix A cont. Summary Table of Graduate Degree Programs in Development

ACADEMIC INSTITUTION	NAME OF MASTER'S DEGREE	CORE COURSES (% of total credits)	ECON. COURSES (% of core)	AVAILABILITY OF ELECTIVES IN: ENVIRON.	AGRICULTURE	HEALTH
LATIN AMERICA						
FLACAM/UNLa (Argentina)	Sustainable Development	High	Low	Policy	Policy	-
Universidad Católica Argentina	Environ. Engineering & Sustainable Dev.	High	Medium	Policy/science	Policy/science	Policy
University of Chile	Environ. Science/ Sustainable Dev.	High	Medium	Policy/science	Policy/science	-
Tecnológico de Monterrey (Mexico)	Sustainable Development	Medium	Medium	In core (p/s)	Policy	-
Univ. Nacional Autónoma (Mexico)	International Relations	Low	Low	Policy	Policy	-
NORTH AMERICA						
American University (U.S.)	M.S. in Development Management	Medium	Medium	-	-	-
Columbia University (U.S.)	International Affairs	High	Low	Policy	Policy	Policy
Cornell University (U.S.)	Professional Studies in International Dev.	Low	Low	Policy/science	Policy/science	Policy/ science
Duke University (U.S.)	International Development Policy	Medium	Low	Policy	Policy	Policy
Humber College (Canada)	International Project Management	High	Low	General	-	-
Johns Hopkins University (U.S.)	International Relations	High	High	Policy	Policy	Policy
Harvard University (U.S.)	Public Admin in International Dev.	High	High	Policy/science	Policy	Policy
Princeton University (U.S.)	Public Affairs	Medium	High	Policy/science	-	Policy
Queens University (Canada)	Global Development Studies (in 2008)	-	-	-	-	-
SOUTH ASIA						
Bangladesh Rural Advancement Committee	Development Studies	High	Low	Policy	In core	Policy
University of Dhaka (Bangladesh)	M.D.S. - Development Studies	Medium	Medium	Policy	Policy	Policy
Delhi School of Economics (India)	Development Economics	Medium	High	Policy	Policy	-
University Of Peradeniya (Sri Lanka)	PG Diploma - Dev. Practice and Mgnt.	Medium	-	-	-	-
University of Colombo (Sri Lanka)	Development Studies	-	-	-	-	-

Appendix B List of Consulted Institutions and Organizations

Through the course of its work, the Commission conducted a variety of consultations with individuals and organizations around the world. Individuals working in the following organizations were among the many experts who contributed feedback either in their personal or professional capacities

African Development Bank
Aga Khan Fund for Economic Development
Arup Consulting
ASEAN Academy of Engineering and Technology
Brandeis University
Brookings-Tsinghua Center, Tsinghua University
Canadian International Development Agency
CARE
The Carter Center
Centers for Disease Control & Prevention, Coordinating Office for Global Health (COGH)
Chinese University of Hong Kong
Columbia University
Cornell University
Duke University
Emory University
The Energy and Resources Institute
Forum for Agricultural Research in Africa
Ford Foundation
Fudan University
Georgetown University
Ghana Institute of Management and Public Administration (GIMPA)
Government of Brazil, Amazonas, Brazil
Government of Jordan
Harvard University
Hong Kong University
Hong Kong University of Science & Technology
Institute of Development Studies, Sussex
Institut Tadbiran Awam Negara
Intergovernmental Panel on Climate Change
International Association of Universities
International Water Management Institute
Instituto Tecnológico Autónomo de México
Johns Hopkins University, Paul H. Nitze School of Advanced International Studies
Kyoto University
L'Institut du Développement Durable et Des Affaires Internationales
Makerere University
Malaysia School of Economics and Administration
Malaysian Institute of Management

Appendix B cont. **List of Consulted Institutions and Organizations**

McGill University
Mekelle University
Microfinance Management Institute
National University of Singapore, Lee Kuan Yew School of Public Policy
Open Society Institute
Osaka University
Peace Corps
Peking University
Partnership for Higher Education in Africa
Population Council (Regional Office for Sub-Saharan Africa)
Princeton University, Woodrow Wilson School of Public and International Affairs
Regional Institute for Population Studies
Renmin University
Right to Play
Save the Children USA
Seoul National University
Sun Yat-Sen University
Taiwan Cheng-Chi University
The John D. and Catherine T. MacArthur Foundation
Tsinghua University
University of British Columbia
University of California at Los Angeles, School of Public Health
United Nations Development Group
United Nations Human Development Programme
United Nations Educational, Scientific and Cultural Organization
United Nations Children's Fund (UNICEF)
United Motor Works
Universidad de las Américas
University of California, Berkeley
University of Central Asia
University of Ibadan
University of Malaya
University of Minnesota, School of Public Health
University of Southern California, School of Policy, Planning, & Development
University of Tokyo
U.S. National Academy of Engineering
United States Agency for International Development, El Salvador
World Bank
Yale University
Yonsei University

Appendix C MDP Learning Outcomes

Health Sciences

Competency Area	Intended Learning Outcomes		
	Core Knowledge	**Policy**	**Management**
Nutrition	• **Basic nutritional and caloric requirements** for human populations • **Major causes of malnutrition** and its affect on human development and economic growth	• Knowledge of policies to support **increased investments in nutrition and health programs** • Policies to support **school-feeding** programs • Policies and insurance to protect poor against **food insecurity** due to drought, floods and other risks	• **Assessing nutritional needs** for a local population and designing interventions to effectively address those needs • Designing, managing and implementing **local nutrition programs** such as school feeding programs and seed banks
Health and Epidemiology	• **Basic epidemiology** of infectious and non-communicable disease • **Tropical disease epidemiology** and vector control • **Control and prevention strategies** used to combat infectious and non-communicable diseases in developing countries • Priority initiatives to improve **child health and survival** • Risk reductions strategies to mitigate the effect of **behavior of environmental contaminants (chemical, physical or other exposures)** on human populations	• **Epidemiologic methods** used to measure disease rates, and their use in the development and evaluation of health programs and policies, and in prevention of infectious diseases • Policies and regulations required to support **quality health systems** in resource-poor settings • Rational and informed approaches to **health policy formation** • **Financing mechanisms** for health and development	• **Managing health delivery systems** including infrastructure, medical supply chain management, and human resource management • Effective and appropriate techniques used in **community health education** to promote improved sanitation and hygiene, to prevent disease and injury, and to promote community participation and local management of the health care system

Appendix C cont. **MDP Learning Outcomes**

Health Sciences

Competency Area	Intended Learning Outcomes		
	Core Knowledge	**Policy**	**Management**
Population Science	• Key interventions required to improve access to quality **maternal health, reproductive health and family planning services** • **Reproductive health, family planning and child spacing strategies** • Connections between **high fertility rates and poverty**	• Policies to promote **gender equality and health education** to enable women and men to make informed family planning decisions	• Assessing the health status of a population to identify priority areas for intervention and developing appropriate **frameworks for action to address priority health issues**

Appendix C cont. **MDP Learning Outcomes**

Natural Sciences

Competency Area	Intended Learning Outcomes		
	Core Knowledge	**Policy**	**Management**
Agriculture, Forestry and Fisheries Management	• Sustainable agriculture, forestry, and fisheries **practices, technologies and innovations** • Factors affecting **land degradation, soil fertility, plant growth, pest control, forestry, fisheries and animal production**, and the associated **economic, environmental and social implications** • Use of **science, engineering and technology to improve agricultural productivity** in hostile land (i.e. improved drought resistance, salt tolerance, etc.) • Supportive **infrastructure for agricultural production** including irrigation systems, markets and research • **Ecological impacts** of agriculture, pesticides and land degradation • **Impacts of climate change** and related adaptation measures including: agricultural practices, crop cycles and crop mix	• Policies affecting **food security and market stability** • Policies and factors affecting **land tenure, access to water, inputs and credit** • **Indicators and mapping systems** for national food insecurity and vulnerability and their applications in risk assessment, policy and practice, as well as the link between population dynamics, resource management and food insecurity • Policies to ensure adequate **income for farmers** through the diversification of activities	• Managing **sustainable agricultural practices in the field** (education, community participation, and local and national management strategies) • Developing **financing models for national scale programs,** including the integration of public and private partnerships • Developing comprehensive and **appropriate interventions,** which integrate local knowledge with international experience to target food production, land use, water management, and access to the domestic, national and international markets • Implementing **capacity and skill-building programs** to encourage the participation of farmers in local, regional and global markets

Appendix C cont. **MDP Learning Outcomes**

Natural Sciences

Competency Area	Intended Learning Outcomes		
	Core Knowledge	**Policy**	**Management**
Energy	• Basic concepts of **energy conversions and global energy flows** • Basic **business and market structures** of oil, natural gas, coal, and nuclear electricity including production, transportation, transmission, distribution and demand • **Renewable and non-renewable energy sources,** and their associated economic, environmental and health impacts • **Energy efficiency and conservation**	• Geopolitics of **natural resource extraction** • Policies affecting the **use and distribution of energy, and the financing of energy sources**	• Critical problem analysis and problem solving to identify appropriate, affordable, assessable, and sustainable solutions to challenges such as **power production, transportation, distribution and demand** • Analysis of **technical alternatives and cost-benefits for renewable sources of energy** including the potential for carbon-credits

Appendix C cont. **MDP Learning Outcomes**

Natural Sciences

Competency Area	Intended Learning Outcomes		
	Core Knowledge	**Policy**	**Management**
Engineering and Urban and Rural Planning	• The **impact of technology and infrastructure** on economic, environmental and socio-cultural systems • **Water supply systems** including management, treatment, sanitation and protection • Basic concepts and working models for **water storage and irrigation** • **Waste management systems** and the associated issues of treatment and land use • Basic concepts and working models for **clean air systems, telecommunications systems, uninterruptible power supply systems, and clean water and sanitation** for hospitals and clinics • **Roads and transportation systems**, including workable designs for rural roads, and their impact on economic, environmental and socio-cultural systems	• **Rural and urban planning** including an understanding of current trends of urbanization in developing countries, growth management policies, and relevant theories • Policies affecting **water supply and sanitation, irrigation, and drainage** • Policies affecting **solid waste**, hazardous waste and wastewater, and the associated economic, environmental and health impacts • Policies affecting **transportation, urban growth and rural development**	• Planning and managing **infrastructure projects** • Planning and managing **equitable distribution of essential resources** such as water • Critical problem analysis and problem solving to identify appropriate, affordable, assessable and sustainable solutions to development challenges such as **transportation, water and wastewater systems, and telecommunication systems** • **Disaster management** including preparation, post-disaster planning, and the construction of temporary facilities and basic services

Appendix C cont. **MDP Learning Outcomes**

Natural Sciences

Competency Area	Intended Learning Outcomes		
	Core Knowledge	**Policy**	**Management**
Environment, Water and Climate Science	• Fundamental principles of **evolutionary and ecological processes** • Fundamental principles and dynamics of the **ecosystem and climate science** • Physical processes of **natural disasters** and the resulting challenges to sustainable development • **Human interaction** and response to climate and ecology, with special emphasis on deforestation and desertification • **Engineering measures** designed to protect against soil erosion and deforestation, and to prevent the encroachment of designated animal sanctuaries and habitats • The impact of evolutionary and ecological processes on **conservation efforts**, **agricultural production and the management of forests and fisheries**	• Local and global **environmental protection policies**, and the use and implications of deforestation policies and anti-pollution laws • Approaches for analysis of **carbon accounting** for different land use systems • **Models used to predict climate change**, their use in risk assessment, and their applications in policy and practice	• Local and national **management of environmental protection programs** • Developing strategies to promote **protection and conservation of water resources** through coordinated efforts of governments and communities • Managing **interventions to control vectors, pests and weeds** • Management options to change **land use systems to generate carbon credits**

Appendix C cont. **MDP Learning Outcomes**

Social Sciences

Competency Area	Intended Learning Outcomes		
	Core Knowledge	**Policy**	**Management**
Delivery Science	• Drawing upon knowledge of the successes and failures of past interventions, **ability to analyze the key determinants that may affect the successful delivery** of a specific technology or intervention	• Ability to apply understanding of relevant economic, political and logistical factors, as well as the social and cultural context in order to **design an effective strategy to "scale-up" interventions**	• Ability to **design and adjust appropriate delivery strategies** to achieve an intervention's desired outcome
Economics	• **Micro and macro economic principles** and their application within the context of developing countries • Mechanisms to promote **long-term economic growth** • **Global patterns of economic growth and development**, and the forces and mechanisms that drive trade and investment • **Patterns and mechanisms of urbanization** and their implications for labor markets, migration, productivity, environment and income • Tools and methods used to **measure poverty and growth** • **Economic models used for risk analysis and cost-benefit analysis** related to technology development, climate change, health policies, educational planning, etc.	• Key policies used to confront the economic impacts of **natural disasters and war, and to promote poverty reduction and sustainable growth** • **Models of inflation and price stabilization** and their application in the context of developing economies • **Key private and social incentives and inputs** to develop human capital and maintain income growth and their affect on household decisions in education, gender allocations, fertility, health, nutrition, land use, microenterprise development, etc.	• Developing appropriate **economic growth strategies** to combat poverty and inequality while taking into account the social, demographical, economical environmental, and political contexts in developing economies • **Development planning process** and distinct roles of government agencies and international financial institutions

Appendix C cont. **MDP Learning Outcomes**

Social Sciences

Competency Area	Intended Learning Outcomes		
	Core Knowledge	**Policy**	**Management**
Education	• Key factors that affect **access to quality formal education** and measures to ensure equitable access for marginalized and vulnerable populations • **Structure and basic components of education systems** in centralized and decentralized contexts • **Incentive systems** used to improve quality of and access to education • **Recruitment, incentives, training, and professional development strategies** to support effective teaching • Effective **emergency, non-formal, vocational, and adult education** programs, and the successes and failures of such programs in a range of contexts	• Effective **teaching techniques** for conducting classes, trainings or presentations • **System modeling skills** to project requirements for future resources and inputs, and the applied use of dynamic models to determine appropriate improvement strategies	• Providing **leadership and support to education planners** at the local and national level • Establishing and supporting **effective systems for monitoring and evaluating the quality, efficiency, and effectiveness of an education system,** incorporating data collected through coherent education management information systems (EMIS)
Politics, Anthropology and Social Studies	• Methods for **participatory planning and evaluation** • Key concepts and theories of **social dynamics**, including culture, power, and social relations within households, communities, and across societal groups • **Human rights**, with an emphasis on the rights of children, women and vulnerable populations • **International treaties, trade law, migration law and governance** • Politics of **conflict, racism and forced migration**	• **Institutional and political mapping skills** to apply in participatory planning for problem solving • **Facilitation skills** and ability to apply participatory methodologies to promote **community organization, education, and mobilization for the local management of development interventions**	• Ability **to facilitate and manage policy formulation and change** • Ability to **analyze the long- and short-term effects of development interventions** on children, women, marginalized ethnic groups, and vulnerable populations, and **implement and manage appropriate strategies to mitigate negative effects**

Appendix C cont. **MDP Learning Outcomes**

Social Sciences

Competency Area	Intended Learning Outcomes		
	Core Knowledge	**Policy**	**Management**
Statistics	• Principles and methods **of data collection, quantitative and qualitative data, sampling procedures, and data analysis** • **Normal linear models, analysis of variance, and simple and multivariate regression analysis** • **Integrative data analysis** and basic expertise in systems dynamics	• **Ability to use statistical software** to analyze normal linear models and simple and multivariate regressions	• Ability to apply logical approaches to **analyzing data for appropriate use in policy, project elaboration, monitoring and evaluation, and program management**

Appendix C cont. **MDP Learning Outcomes**

Management

Competency Area	Core Knowledge and Skills
Budget Planning, Financial Management and Commodities Management	• Key concepts of **financial management** including the elaboration of budgets, grant proposals, and corresponding activity plans • Key concepts of **commodities management** integrating lessons from real-world challenges of production management, procurement, and distribution of, for example, medical supplies • **Budget-planning processes, international financing structures, and systems of credit and microfinance** • **Procurement and logistical processes** in developing countries and resource-poor settings, and the development of effective and appropriate distribution plans
Communications and Negotiation	• **Verbal communication skills** and ability to effectively interact with partners and stakeholders from diverse cultural backgrounds • **Written communication skills** and effective proposal-writing skills • Ability to **work collaboratively with multiple stakeholders** to negotiate important decisions, policies, and programmatic strategies to achieve outcomes that positively affect development goals • Use of **critical self-reflection** to analyze attitudes, perceptions and biases, how they are formed, and how they affect choices
Geographic Information Systems (GIS)	• Basic concepts, structures and functions used in **geographic information systems (GIS)** as well as the applications of GIS in development policy and planning • Skills using **GIS software** such as ArcGIS, and the ability to interpret GIS maps • Integrating the use of **ICT and GIS to inform project design** through the use of comprehensive needs assessments, risk analyses, and dynamic monitoring and evaluation tools
Institutional and Human Resources Management	• **Leadership skills** for human resource management including the ability to mentor and inspire co-workers and subordinates • Knowledge of relevant **human resources policies and procedures** • Ability to provide **institutional leadership** guided by an ability to understand and analyze the strengths and weaknesses of an organizational structure; identify available resources and potential opportunities; and recognize internal and external challenges

Appendix C cont. **MDP Learning Outcomes**

Management

Competency Area	Core Knowledge and Skills
Information Systems Design and Management	• Ability to **identify and implement appropriate systems** of monitoring and evaluation to be incorporated into the project design • Methods of **data collection and key indicators** used in monitoring and evaluation • Ability to **analyze data collected** during the monitoring and evaluation process, and recommend adjustments or adaptations to the project when appropriate • Knowledge of basic technologies used to transfer and share information, and the associated opportunities to mobilize partners from developing countries to **engage in information sharing and virtual mentorship** • **Essential computer skills** and ability to integrate information technology and decision-making tools in practice • Integrating the use of **ICTs and GIS to inform the project design** through the use of comprehensive needs assessments, risk analyses, and dynamic monitoring and evaluation tools
Project Design and Management	• Knowledge of the **theories and commonly-used processes** of project cycle management and log frame analysis (LFA) including: identification, analysis, design, implementation, and monitoring and evaluation • Ability to conduct an **in-depth analysis** of geographical, environmental, political, historical, religious, and institutional landscape of a development challenge • The appropriate selection and identification of **project indicators** in the project design • Ability to facilitate **collaborative and participatory approaches** to project design and knowledge of commonly used techniques such as SWOT analysis, stakeholder mapping, and problem and objective analysis • Ability to **collate and synthesize relevant information** into a logical and cohesive project proposal • Ability to **develop and implement effective work plans** for project staff and participants • Ability to **integrate knowledge gained from monitoring and evaluation systems** into the project design and the revision of project objectives or activities

Appendix D Example Training Module: Food Production Management

Core Knowledge		
Science	**Policy**	**Management**
• Fundamental principles and dynamics of the ecosystem • Factors affecting land degradation, soil fertility, plant growth and animal production, and forest and fisheries management • Nutrition and caloric requirements of human populations • Ecological impacts of agriculture and land degradation	• Policies affecting food security and market stability • Indicators and mapping systems for national food insecurity and vulnerability, and their applications in policy and practice • Models used to predict climate change and their applications in policy and practice	• Sustainable agricultural, forestry and fisheries management practices in the field (education, community participation, local and national management strategies) • Managing interventions to control vectors, pests and weeds, forest fires, illegal logging, and overfishing
Case Studies and Learning Activities		
• Biotechnology and the use of genetically improved seeds • Innovations in water harvesting and irrigation systems • Improved soil fertility (fertilizers, organic materials, and erosion prevention) • Case studies of dramatic food production increases in Latin America, Asia and Africa (i.e. green revolutions) • Case studies of dramatic improvements in natural forest and fisheries management, certification, and reduced carbon emissions in Latin America, Asia and Africa (i.e. oil palm industry in Malaysia) • Case study analysis and identification of appropriate interventions to increase food production for distinct climates • Critical analysis of indicators of poverty and food insecurity and vulnerability for policy formulation		

Appendix E Partner Universities In The Commission's Early Initiatives

Country	University	Potential MDP Partners	Global Classroom Partner (round 1)
BRAZIL	University São Paulo	√ (2010)	
CENTRAL ASIA (Kazakhstan, Kyrgyz Republic, Tajikistan)	University of Central Asia	√ (2010)	
CHINA	Tsinghua University	√ (2010)	√
CHINA	University of International Business and Economics	√ (2010)	√
ECUADOR	Universidad Internacional del Ecuador	√ (2010)	√
ETHIOPIA	Mekelle University	√ (2010-11)	√
FRANCE	Sciences Po	√ (2009-10)	√
GHANA	Ghana Institute of Management and Public Administration (GIMPA)	√ (2010)	
INDIA	The Energy and Resources Institute (TERI University)	√ (2009)	√
MALAYSIA	University of Malaya (w/ INTAN)	√ (2010)	√
NIGERIA	University of Ibadan	√ (2009-10)	√
SINGAPORE	National University of Singapore, Lee Kuan Yew School	√ (2010)	√
UGANDA	Makerere University	√ (2010)	
UNITED KINGDOM	Institute of Development Studies - Sussex	√ (2010)	√
UNITED STATES	Columbia University	√ (2009)	√
UNITED STATES	Cornell University	√ (2010)	
UNITED STATES	Emory University	√ (2009-10)	
UNITED STATES	Georgetown University	√ (2010)	√

Appendix F Biographies Of Commission Members

John DeGioia
President, Georgetown University
Dr. DeGioia has served as an integral member of Georgetown University's administration and faculty for over twenty-seven years. Prior to his appointment as president in 2001, Dr. DeGioia held a variety of senior administrative positions at Georgetown, including Senior Vice President responsible for university-wide operations, and Dean of Student Affairs. In 2004, he was presented with a Lifetime Achievement Award for Excellence in Academia from the Sons of Italy. Dr. DeGioia is a Professorial Lecturer in the Department of Philosophy. He earned a bachelor's degree in English from Georgetown University in 1979 and his PhD in Philosophy from the University in 1995. He has most recently taught "Ethics and Global Development," "Human Rights: A Culture in Crisis" and a seminar on "Ways of Knowing."

Helene Gayle
President and CEO, CARE
Helene D. Gayle, M.D., M.P.H., became President and CEO of CARE in April 2006. Previously, she was director of HIV, TB & Reproductive Health within the Global Health Program at the Bill & Melinda Gates Foundation. Dr. Gayle is a graduate of Barnard College of Columbia University, the University of Pennsylvania and Johns Hopkins University. She was director of the National Center for HIV, STD and TB Prevention with the Centers for Disease Control and Prevention. She served in the U.S. Public Health Service for 20 years, retiring as a Rear Admiral. Dr. Gayle also worked for USAID and been a consultant to the World Health Organization, UNAIDS, UNICEF and the World Bank.

Lawrence Haddad
Director, Institute of Development Studies, University of Sussex
Formerly a Research Director and Fellow at the International Food Policy Research Institute, Dr. Haddad has conducted and led policy research at the intersection of poverty, food security and nutrition in many countries in Africa and Asia. Prior to joining IFPRI in 1990 he was a lecturer in development economics at the University of Warwick. Dr. Haddad earned his Master's in Research Economics from the University of Massachusetts and a PhD in Food Research from Stanford University. His research interests are wide-ranging and he has written on social capital, the policy process, human rights, urbanization, gender, agriculture, AIDS and social protection. His own fieldwork has been in the Philippines, India and South Africa.

Jim Kim
Chair of the Department of Social Medicine at Harvard Medical School & François Xavier Bagnoud Professor of Health and Human Rights at the Harvard School of Public Health

Dr. Kim has 20 years of experience in improving health in developing countries. He is a founding trustee and the former executive director of Partners in Health, a not-for-profit organization that supports a range of health programs in poor communities in Haiti, Peru, Russia, Rwanda and the United States. In March 2004, Dr. Kim was appointed director of the World Health Organization's HIV/AIDS department. He received his MD and PhD from Harvard University, where he currently holds appointments as the François Xavier Bagnoud Professor of Health and Human Rights at the Harvard School of Public Health and Professor of Social Medicine at Harvard Medical School. He is chief of the Division of Social Medicine and Health Inequalities at Brigham and Women's Hospital, a major Harvard teaching hospital; Director of the François Xavier Bagnoud Center for Health and Human Rights; and Chair of the Department of Social Medicine at Harvard Medical School. Dr. Kim trained dually as a physician and medical anthropologist.

Jeffrey Koplan
Vice President for Academic Health Affairs,
Emory University Woodruff Health Sciences Center

Dr. Koplan began his public health career in the early 1970's as one of the CDC's celebrated "disease detectives," more formally known as Epidemic Intelligence Service (EIS) Officers. Since then, he has worked on virtually every major public health issue, including infectious diseases such as smallpox and HIV/AIDS, environmental issues such as the Bhopal chemical disaster, and the health toll of tobacco and chronic diseases, both in the United States and around the globe. Dr. Koplan served as the Director of the Centers for Disease Control and Prevention (CDC) and Administrator of the Agency for Toxic Substances and Disease Registry. Pursuing his interest in enhancing the interactions between clinical medicine and public health, Dr. Koplan lead the Prudential Center for Health Care Research, a nationally recognized health services research organization. Dr. Koplan also served as Assistant Surgeon General and the first director of the National Center for Chronic Disease Prevention and Health Promotion at the CDC. While serving in the Public Health Service (PHS), he received the Distinguished Service Award --the corps' highest award -- as well as seven other PHS awards. He also received the Indian Health Service Director's Special Award for Excellence. Dr. Koplan is a graduate of Yale University, the Mt. Sinai School of Medicine and the Harvard School of Public Health. He is a Fellow of the American College of Physicians and was elected to membership in the Institute of Medicine.

Freddie Kwesiga
Coordinator, African Water Facility, African Development Bank

Prior to his position with the African Development Bank, Dr. Kwesiga served as Coordinator of the Sub-Saharan Africa Challenge Programme within the Forum for Agricultural Research in Africa (FARA). There he worked to add value and improve the impact of agricultural research in Africa by orienting it toward innovation systems approaches. The Programme organized 80 institutions into nine innovation taskforces that were responsible for testing and evaluating the comparative impact of innovations systems approaches in the Sub-Saharan Africa context. Before his position at FARA, Dr. Kwesiga was the principal scientist and Regional Coordinator for the International Centre for Research in Agroforestry (ICRAF)'s programs in southern Africa. Dr. Kwesiga has authored or co-authored approximately 100 research publications and is a member of the United Nations Millennium Task Force on Hunger. He received his PhD in plant physiology from the University of Edinburgh. Dr. Kwesiga is currently working as the Coordinator of the African Water Facility for the African Development bank in Tunis, Tunisia.

Lee Yee Cheong
President ASEAN Academy of Engineering and Technology/Chairperson Governing Board, UNESCO International Science, Technology and Innovation Centre for South-South Cooperation

Dato' Ir Lee Yee Cheong studied in the University of Adelaide, South Australia, on a Colombo Plan scholarship and graduated with the degree of BE (Electrical) with first class honors in 1961. He was Managing Director of Ewbank Preece (Far East) Ltd. in Hong Kong and Director of Ewbank Preece joint-venture companies in Australia, Singapore, Brunei, Indonesia and Thailand. He retired from professional practice in 2002. Currently, he is a director of UMW Holdings Berhad, the Malaysian parent company of UMW-Toyota Motor Corporation. He is a commissioner of the Energy Commission of Malaysia and was an Advisor to Malaysia's Minister of Science, Technology and Innovation from 2006-2007. He is the Chairperson of the governing board of the UNESCO International Science, Technology and Innovation Centre for South-South Cooperation in Kuala Lumpur. In Malaysia, Lee was at various times President of the Institution of Engineers, Member of the Board of Engineers, Member of the Board of Architects, Chairman and currently Honorary President of Commonwealth Engineers Council and President of the ASEAN Federation of Engineering Organizations. He was the President from 2003-2005 of the World Federation of Engineering Organizations (WFEO), the first Asian to be elected to global engineering leadership. He led WFEO to the World Summit for Sustainable Development in Johannesburg in 2002 with continuing involvement in every annual UN Commission for Sustainable Development meeting in New York until 2005. He was the Co-chair of Task Force "Science, Technology and Innovation" of the UN Millennium Project from 2002-2005 and co-lead author of its Report "Innovation: Applying Knowledge in Development" published in January 2005. Dato 'Ir Lee is a Senior Fellow and former Vice President of the Academy of Sciences Malaysia

(ASM). He was a founding member of the Board of the Inter-Academy Council of World Science Academies (2001-2005), and a member of the Academic Council of the World Economic Forum. He is the Secretary General of the Federation of Asian Scientific Academies and Associations, the Founder President of the ASEAN Academy of Engineering and Technology, a Foreign Fellow of the Australian Academy of Technological Sciences and Engineering and a Corresponding Member of the Pan-American Academy of Engineering. He is an Honorary Fellow of the Institution of Electrical Engineers (UK), the Institution of Civil Engineers (UK), the Institution of Engineers (Australia) and the Institution of Engineers (Mauritius). Dato' Ir Lee was conferred the Malaysian state awards of DPMP and KMN for services to engineering. He was conferred the Honorary Officer of the Order of Australia.

Livingstone Luboobi
Vice Chancellor, Makerere University

Livingstone S. Luboobi is Vice-Chancellor of Makerere University in Uganda. He graduated from Makerere's College of East Africa and has remained at Makerere since except for several periods of overseas study. He is an Applied Mathematician specializing in Biomathematics with emphasis on Mathematical Epidemiology. He has served as Head of the Mathematics Department and Dean of the Faculty of Science at Makerere. He has co-authored articles such as "An HIV/AIDS Model with Variable Force of Infection and its Application to the Epidemic in Uganda" and "Modelling the effect of treatment and mosquito control on malaria transmission."

John W. McArthur (Co-chair)
CEO & Executive Director, Millennium Promise

John McArthur is the Chief Executive Officer and Executive Director of Millennium Promise and Research Associate at the Earth Institute at Columbia University. He also teaches at Columbia's School of International and Public Affairs. Previously, he served as Policy Director at the Earth Institute and co-director of the Millennium Villages project. Mr. McArthur also served as Deputy Director and Manager of the UN Millennium Project. In this capacity he coordinated a global network of nearly 300 experts who served on ten thematic Task Forces and he was lead editor of the Project's final report to the Secretary-General, *Investing in Development: A Practical Plan to Achieve the Millennium Development Goals*. Prior to that Mr. McArthur was a Research Fellow at the Center for International Development at Harvard University, where he coauthored the World Economic Forum's *Global Competitiveness Report*. He has an MPhil in Economics from Oxford University, which he attended as a Rhodes Scholar; a Master's in Public Policy from Harvard University's John F. Kennedy School of Government; and a Bachelor of Arts (Honours) from the University of British Columbia.

Goolam Mohamedbhai
Secretary-General, Association of African Universities

Goolam Mohamedbhai is the Secretary-General of African Universities, and formerly served as the President of the International Association of Universities and formerly Vice Chancellor of the University of Mauritius. He is currently Chair of the Regional Scientific Committee for Africa of the UNESCO Forum on Higher Education, Research and Knowledge and has chaired several university associations, including the Association of Commonwealth Universities (2003-2004), the University Mobility in the Indian Ocean Rim (2001-2004) and the University of the Indian Ocean (1998-2005). He obtained his Bachelor's and Doctorate degrees in Civil Engineering from the University of Manchester, UK, and did postdoctoral research at the University of California, Berkeley, under a Fulbright-Hays award. Prof. Mohamedbhai is the recipient of many awards including Honorary Doctorates from the Institute of Business Management, Karachi, Pakistan and Mykolas Romeris University, Lithuania, in 2006. He also received the Grand Officer of the Star and Key of the Indian Ocean National Award from the President of Mauritius in recognition of his distinguished services in the field of higher education. Beginning August 1, 2008, Prof. Mohamedbhai took on a new role as Secretary General of the Association of African Universities, based in Accra, Ghana.

Milena Novy-Marx
Program Officer, Human Rights and International Justice,
MacArthur Foundation

Milena Novy-Marx joined the MacArthur Foundation in 2003 after having spent several years as an economic and management consultant in the private sector, where she worked on issues of business strategy, antitrust and competition policy. Prior to her work as a consultant, Novy-Marx served as Economist at the World Bank in Bangkok, Thailand, managing a program on privatization of state-owned enterprises and regulation of services such as energy and telecommunications. She also worked for the Institute for East-West Studies in Prague on reform of social policy in former Communist countries. Novy-Marx received her MPA and PhD in Economics and Development from the Woodrow Wilson School of Public and International Affairs at Princeton University.

Rajendra K. Pachauri
Chairman, Intergovernmental Panel on Climate Change
Vice Chancellor, The Energy and Resources Institute

After working in India as a manager for Diesel Locomotive Works, Dr Pachauri pursued his graduate studies at North Carolina State University where he earned an MS in Industrial Engineering, a PhD in Industrial Engineering and a PhD in Economics. In addition, he served as Assistant Professor and Visiting Faculty Member in the Department of Economics and Business. On his return to India, he joined the Administrative Staff College of India, Hyderabad, as Member Senior Faculty and went on to become Director of the Consulting and Applied Research Division. He

assumed his current responsibilities as the head of The Energy Research Institute (TERI) in 1981, first as Director and since 2001 as Director-General. TERI does original work and provides professional support in the areas of energy, environment, forestry, biotechnology and the conservation of natural resources to government departments, institutions and corporate organizations worldwide. Dr Pachauri has been elected as Chairman of the Intergovernmental Panel on Climate Change (IPCC), established by the World Meteorological Organization and United Nations Environment Programme in 1988. He has been active in several international forums dealing with the subject of climate change and its policy dimensions. To acknowledge his immense contribution to the field of environment, in 2001 he was awarded the Padma Bhushan, one of India's highest civilian awards. In 2007, Dr. Pachauri accepted the Nobel Peace Prize on behalf of the IPCC.

Alice Pell
Vice Provost for International Relations, Cornell University

A cum laude graduate of Radcliffe College with an AB in Architectural Science, Alice Pell wrote her undergraduate thesis while teaching English, History, Development Studies and Geography in Botswana with the Peace Corps. Upon her return to the United States, she enrolled at Harvard University and earned a Master's degree in International Education. After teaching and running a farm in Vermont, she took undergraduate science courses at the University of Vermont where she earned an MS and a PhD in animal science. As Director of the Cornell International Institute for Food, Agriculture and Development, Dr. Pell has been working with a team of economists, soil scientists and rural sociologists to develop a dynamic bio-economic model of smallholder crop-livestock systems. Dr. Pell has also been involved in the West Africa Water Initiative (Mali, Niger and Ghana) that includes an interdisciplinary approach to improving water quality and the efficiency with which water is used. This project represents a novel collaboration between NGOs, foundations, industrial trade associations, universities and a service club.

Jeffrey D. Sachs (Co-chair)
Director of the Earth Institute and Quetelet Professor of Sustainable Development, Columbia University

Prior to his arrival at Columbia University in July 2002, Jeffrey Sachs spent over twenty years at Harvard University, most recently as Director of the Center for International Development and Galen L. Stone Professor of International Trade. He received his BA, summa cum laude, from Harvard College in 1976, and his MA and PhD from Harvard University in 1978 and 1980 respectively. He is one of the leading voices for combining economic development with environmental sustainability, and as Director of the Earth Institute leads large-scale efforts to promote the mitigation of human-induced climate change. Sachs has been an advisor to the IMF, the World Bank, the OECD, the World Health Organization and the UNDP, among other international agencies. During 2000-2001, he was Chairman of the Commission on Macroeconomics and Health of the World Health Organization,

and from September 1999 through March 2000 he served as a member of the International Financial Institutions Advisory Commission established by the U.S. Congress. From 2002 to 2006, he was Director of the UN Millennium Project. He has served as Special Advisor to United Nations Secretary-General on the Millennium Development Goals since February 2002. Dr. Sachs is also President and Co-Founder of Millennium Promise Alliance, a non-profit organization aimed at ending extreme global poverty.

Paul R. Samson
Director General of Policy Development and Analysis, Canadian International Development Agency, Strategic Policy and Performance Branch

Previously Director of CIDA`s Environment Division, Paul Samson has held several senior positions with the Government of Canada at the Privy Council Office, Environment Canada and Natural Resources Canada. Earlier in his career, he worked for Mikhail Gorbachev at Green Cross International and with several United Nations organizations in Geneva. Following his undergraduate work at the University of British Columbia, he completed a diplôme d'études supérieures and PhD in international relations at the Université de Genève. He was a post-doctoral fellow and research associate at the Belfer Centre for Science and International Affairs, Kennedy School of Government, Harvard University. He has also been a fellow with PN Labs, Battelle Institute in Washington D.C. and at the Peace Research Institute in Oslo. He has authored several publications relating to global issues. He co-edited the The Biosphere and Noosphere Reader: Global Environment, Society and Change (Routledge, 1999). A native of Vancouver Island, British Columbia, Paul lives in Ottawa with his wife and children.

Lawrence Tubiana
Director, Institute for Sustainable Development and International Relations (IDDRI)

Laurence Tubiana is the head of the Institute for Sustainable Development and International Relations (IDDRI) in France. Prior to launching IDDRI in 2001, Dr. Tubiana served as Environmental Consultant to former Prime Minister Lionel Jospin and was responsible for the Mission for Sustainable Development where she led French delegations through several negotiations of environmental agreements. She was a member of the Council of Economic Analysis and served as director of research and director of the International Economy Laboratory at the National Institute of Agronomical Research. Dr. Tubiana has represented French NGOs on the international level and served as consultant for various international organizations, including the European Commission, The World Bank and the United Nations Conference on Commerce. She was also a member of the scientific council of the Institute for Research and Development. Dr. Tubiana holds a diploma from the Institute of Political Studies in Paris and a PhD in economics from the University of Paris. Dr. Tubiana was associate professor at the Ecole Nationale Supérieure

Agronomique de Montpellier and Inspector-General for Agriculture. She is now the Director of the Chaire Développement Durable de Sciences Po, a member of the CCICED (China Council for International Cooperation on Environment and Development) and on the boards of IFPRI (International Food Policy Institute) and CIRAD.

Ann Veneman
Executive Director, UNICEF

Former U.S. Secretary of Agriculture, Ann Veneman has provided integral leadership in the area of agriculture and trade policy, and much of her career has been focused on child nutrition, public health and alleviating hunger, including new approaches to help fight malnutrition around the world. She joined the United States Department of Agriculture's (USDA) Foreign Agricultural Service in 1986, serving as Associate Administrator until 1989. During this time she helped negotiate the Uruguay round talks for the General Agreement on Tariffs and Trade (GATT). She subsequently served as Deputy Undersecretary of Agriculture for International Affairs and Commodity Programs, and later as the USDA's Deputy Secretary, the Department's second highest position. While at the USDA, Veneman directed programs that included school meals, nutrition assistance and nutrition education, foreign food aid and development assistance both at home and abroad. In 1995, Veneman was appointed Secretary of the California Department of Food and Agriculture. She holds a Bachelor's degree in Political Science from the University of California, Davis, a Master's degree in Public Policy from the University of California, Berkeley, and a JD degree from the University of California, Hastings College of Law. As the current Executive Director of UNICEF, Veneman is committed to achieving the Millennium Development Goals by implementing aggressive interventions aimed to improve the health, survival and well-being of impoverished children.

Virgilio Viana
Director General, Amazonas Sustainability Foundation (FAS)

An expert in Forestry and Sustainable Development, Virgílio Viana received his Forestry degree from University of São Paulo/ESALQ, a PhD in Evolutionary Biology from Harvard University and did post doctoral work on Sustainable Development at University of Florida. He is Professor of Forest Sciences at the University of Agriculture, Luiz Queiroz (on leave) and several of his students have become leading professionals in Brazil and abroad. Viana coordinated the Brazilian consultative process that led to the establishment of Forest Stewardship Council (FSC) in 1993. He was the founder and President of IMAFLORA, the first forest certifier based in Latin America. He also participated in the process of structuring a number of institutions such as the Center for International Research (CIFOR), and the Brazilian Biodiversity Fund (FUNBIO). He was President of the Brazilian Society of Ethnoecology (SBEE), President of São Paulo Forester's Association (APAEF) and Vice President of the Association Brazilian State Secretaries of Environment, among several other positions. He has served as a consultant to institutions such

as the World Bank, GTZ, IIED, CIFOR, WWF and Greenpeace. In 2003 he became the first Secretary of Environment and Sustainable Development for the State of Amazonas, Brazil, which had the mission of coordinating the state's sustainable development program, the Green Free Trade Zone. This program has been able to develop a new conceptual framework for the Amazon having achieved international recognition, including an independent evaluation carried out by CEPAL. Results in the 2003-2006 period include reduction of deforestation by 51%, average annual economic growth of 9%, increase in protected areas network by 135% and significant results in income generation, sustainable natural resource management, regional development, poverty eradication, sanitation, education and infrastructure development in Amazonas. In 2008, Dr. Viana transitioned to a new role as Director General of the Amazonas Sustainability Foundation (FAS), an organization charged with the challenge of implementing the Bolsa Floresta Program as well as providing the institutional framework to market environmental services of Amazona's forests.

Xiao Geng
Director, Brookings-Tsinghua Center, Tsinghua University

Xiao Geng obtained his BS degree in Management Sciences from the University of Science and Technology of China in 1985. In the same year, he became the first graduate student from the mainland China to enroll in the economics department at the University of California at Los Angeles. After UCLA, Dr. Xiao joined the newly established Socialist Economies Reform Unit at the World Bank and worked closely with the Bank's leading economists Lawrence Summers, Alan Gelb, I.J. Singh and Andrew Sheng on China's economic reform. With valuable policy research experiences at the World Bank, Dr. Xiao moved to the University of Hong Kong in 1992, joining the School of Economics to pursue his interest in studying and helping China. In 1996, following a sabbatical visit to Harvard, Xiao was appointed as a Faculty Associate at Harvard Institute for International Development, working with HIID's leading development economists Jeffrey Sachs, Dwight Perkins and Wing Thye Woo. From winter 2000 to summer 2003, Dr. Xiao was seconded to the Securities and Futures Commission of Hong Kong as Adviser and Head of Research, contributing to the Commission's major policy research on the development and regulation of the securities markets in Hong Kong and the mainland China. Dr. Xiao is one of the founders and the Deputy Director of the Institute for China and Global Development, a newly established cross-faculty research and training platform at the University of Hong Kong. He is also a member of the Asian Economic Panel, a regular policy research forum being held twice a year in U.S. and Asia and led by Jeffrey Sachs of the Earth Institute at Columbia University and other prominent economists in Asia.

Ernesto Zedillo

Director, Yale Center for the Study of Globalization

Born in Mexico City, Ernesto Zedillo graduated from the School of Economics at the National Polytechnic Institute and earned a PhD in Economics at Yale. Over the course of nine years, he held several positions at the Central Bank of Mexico, including Deputy Manager of Economic Research, General Director of the trust fund for the renegotiation of private firms' external debts, and finally, Deputy Director. He served in the national government from 1987 to 1993 as Undersecretary of the Budget, Secretary of the Budget and Economic Planning and Secretary of Education. In 1994 he was elected President of Mexico. For the next six years he led his country into the new millennium with an unflinching devotion to economic reform and a strong commitment to democratic values. He pulled the nation out of a financial crisis right at the start of his term and the result was that under his leadership, Mexico experienced its highest five-year period of GDP growth in recent history. At the same time, social programs were allocated an increasing proportion of the federal budget each year, reaching their highest historical share in 2000. Since leaving office in 2000, Ernesto Zedillo has remained a leading voice on globalization, especially its impact on relations between developed and developing nations. He served as Chairman of the United Nations High Level Panel on Financing for Development in 2001. He currently serves as Co-Coordinator of the Task Force on Trade for the UN Millennium Project. Along with Canadian Prime Minister Paul Martin, he Co-Chaired the Commission on the Private Sector and Development, and he is also Co-Chairman of the International Task Force on Global Public Goods. He recently was elected to Chair the Global Development Network, a network of research and policy institutes that address problems of national and regional development.

Commission Members

John DeGioia	President, Georgetown University
Helene Gayle	President & CEO, CARE
Lawrence Haddad*	Director, Institute of Development Studies, Sussex
Jim Kim	François-Xavier Bagnoud Professor of Health & Human Rights, & Professor of Medicine & Social Medicine, Harvard School of Public Health
Jeffrey Koplan*	Vice President for Academic Health Affairs, Woodruff Health Sciences Center, Emory University
Freddie Kwesiga*	Coordinator, African Water Facility, African Development Bank
Lee Yee Cheong	President, ASEAN Academy of Engineering and Technology
Livingstone Luboobi	Vice-Chancellor, Makerere University
John W. McArthur (Co-chair)	CEO & Executive Director, Millennium Promise
Goolam Mohamedbhai	Secretary-General, Association of African Universities
Milena Novy-Marx	Program Officer, MacArthur Foundation
R.K. Pachauri*	Chairman, Intergovernmental Panel on Climate Change
Alice Pell	Vice Provost for International Relations, Cornell University
Paul R. Samson	Director General of Policy and Development Analysis, CIDA
Jeffrey D. Sachs (Co-chair)	Director, Earth Institute at Columbia University
Laurence Tubiana	Director, Institute of Sustainable Development and International Relations
Ann Veneman	Executive Director, UNICEF
Virgilio Viana*	Director General, Amazonas Sustainability Foundation, Brazil
Xiao Geng*	Director, Brookings-Tsinghua Center, Tsinghua University
Ernesto Zedillo	Director, Yale Center for the Study of Globalization

* Regional Coordinator