

Building a new Generation of Sustainable Development Practitioners: The Masters in Development Practice at the University of Florida and the Global MDP Network.

Grenville BARNES, Brian CHILD, Sheila ONZERE, Tom ANKERSEN, Walter BOWEN, Carmen Diana DEERE, Jorge HERNANDEZ, Jamie KRAFT, Mary PEOPLES-SHEPPS, Ignacio PORZECANSKI, Marianne SCHMINK, Leo VILLALON, Phil WILLIAMS - University of Florida, Gainesville, USA

Key words: sustainable development, education, practitioners, MDP at Florida, interdisciplinary

SUMMARY

Promoting a new generation of development practitioners who can respond to the diverse development challenges of the 21st century requires a bold new approach to development education. The foundation for such an approach was established through a 2007 study by an International Commission on Education for Sustainable Development Practice. In their report the ICESDP identified the need for a new type of “generalist practitioner” who had the capacity to “navigate across the intellectual and institutional silos of specialized disciplines to develop integrated policy solutions that are scientifically, politically and contextually grounded.” They recommended creating a global network of programs that integrate the natural, social, and health sciences and management in what amounts to an MBA-equivalent for development.

The MacArthur Foundation committed a total of \$12M seed funding to establish this global network and this paper describes in more detail the general philosophy behind this program as well as the network of MDP programs that is emerging. The University of Florida (UF) was one of two universities in North America to receive an MDP grant. The paper describes the proposed MDP at UF, which builds on an extremely successful and inter-disciplinary Conservation and Development Program. The UF MDP will be administered jointly through the Center for African Studies and the Center for Latin American Studies and will offer summer programs in Southern Africa and Latin America.

RESUMEN

La promoción de una nueva generación de profesionales de desarrollo que puedan responder a los desafíos de desarrollo diversas del siglo 21 requiere un enfoque nuevo y audaz a la educación para el desarrollo. El fundamento de este enfoque fue establecido a través de un estudio realizado en 2007 por una Comisión Internacional sobre la Educación para el Desarrollo Sostenible práctica. En su informe la ICESDP identificó la necesidad de un nuevo tipo de "profesional generalista", que tenía la capacidad para "navegar a través de los silos

intelectuales e institucionales de las disciplinas especializadas para desarrollar soluciones políticas integradas que son científicamente, políticamente y contextualmente fundados." En consecuencia, recomendaron la creación de una red mundial de los programas que integra las ciencias naturales, sociales, y de salud en lo que equivale a una Maestría en Administración de Negocios-para el desarrollo.

La Fundación MacArthur proporcionó un total de 12 millones de dólares de financiación inicial para desarrollar esta red mundial, y este documento se describe con más detalle la filosofía general de este programa, así como la red de los programas de MDP que está emergiendo. La Universidad de la Florida (UF) es una de las dos universidades de América del Norte para recibir una subvención de MDP. El documento describe la propuesta de MDP en UF, que se base en un gran éxito e interdisciplinario de Conservación y Desarrollo. El MDP UF será administrado conjuntamente por el Centro de Estudios Africanos y el Centro de Estudios Latinoamericanos y ofrecerá programas de verano en el sur de África y América Latina.

BACKGROUND

Finding the key to sustainable development has been a challenge ever since this concept was first advanced in the 1980s. But in the 23 years that have passed since the publication of the Bruntland Report (1987), evidence suggests that we are still a long way away from achieving this goal. Continued poverty and environmental degradation are clear indicators of this failure, given that almost 40% of the global population lives on less than US\$2 per day (World Bank 2008) and approximately 25,000 children die every day (roughly 17 per minute) due to poverty, hunger or disease (UNICEF 2007). The staggering magnitude of these figures is an appalling testimony to our past development efforts and reflects a global crisis which has far deeper implications to global sustainability and our life on earth than the global economic crisis. The minimal achievements of the latest UN Climate Change Conference in Copenhagen are a reminder of how challenging it is to reach international consensus even in the face of a potential tragedy of the global commons.

Given this evidence, one may question if we in fact have the means and motivation to promote meaningful and sustainable development at a global scale? Columbia University economist and development specialist, Jeffrey Sachs, maintains the key to ending poverty is to focus on the “poorest of the poor” and to provide them with the capacity to reach the lowest rung of “the ladder of development.”(Sachs 2005, pg. 244). This rung would mean providing access to basic services and needs, such as clean water, nourishment, shelter and sanitation to this group.

One of the most recent global strategies to address the many dimensions of poverty is the promotion of the Millennium Development Goals (MDGs). In September, 2000, some 189 nations met and adopted the MDGs to address this challenge. These goals focused on the following objectives, with specific targets to be met by 2015:

- Halve the number of people living in extreme poverty (less than \$1 per day)
- Ensure that all children receive primary schooling
- Promote gender equality
- Reduce child mortality by two thirds
- Cut the maternal mortality rate by three quarters
- Stop and reverse the spread of HIV/AIDS
- Reduce loss of biodiversity through sustainable development
- Establish a global partnership to promote ‘good governance,’ debt relief and action programs to address needs of the least developed and most vulnerable countries (UNDP *no date*)

While some of these goals are still achievable, several appear overly ambitious given the global financial crisis, food/energy crises, and the need to address other urgent issues such as climate change (not unrelated to poverty alleviation). One problem that Sachs and his colleagues identified was the absence of qualified interdisciplinary people to lead the charge on the MDGs.

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. (ICESDP 2008, pg. i)

Promoting a new generation of development practitioners who can respond to the diverse development challenges of the 21st century requires a new approach to development education. Sachs and his colleagues at the Earth Institute (Columbia University) approached the MacArthur Foundation in 2007 for resources to form an International Commission on Education for Sustainable Development Practice (ICESDP) to analyze existing approaches to development education. The ICESDP comprised 20 world leaders in sustainable development who undertook a gap analysis of existing development programs against the background of the needs of the MDPs. They concluded that there was a need for a new type of “generalist practitioner” who had the capacity to “navigate across the intellectual and institutional silos of specialized disciplines to develop integrated policy solutions that are scientifically, politically and contextually grounded.”(ICESDP 2008) They recommended creating a global network of programs that would integrate the natural, social, and health sciences with practical management skills in a program that amounts to an MBA-equivalent for development.

The MacArthur Foundation committed \$12M in seed grant funding to create this global network with the aim of establishing approximately 10 programs across the globe that would offer a Masters in Sustainable Development Practice (MDP) based on the ICESDP integrated model. Proposals were received from all over the globe, with approximately 40 proposals from North American institutions. In June 2009 the University of Florida (Gainesville) and Emory University (Atlanta) were awarded this grant. Another 8 awards were made to the Universities of Botswana (partnered with the University of Florida), James Cook (Australia), Tsinghua (China), Cheikh Anta Diop (Senegal), Ibadan (Nigeria), The Energy and Resources Institute (India), and Trinity and University Colleges of Dublin (Ireland) (see Figure 1). The Earth Institute at Columbia University (New York) serves as the Secretariat for the network and initiated the first MDP in September, 2009.



Figure 1. Global Network of MDP Programs

A DIFFERENT APPROACH TO DEVELOPMENT

Our current development paradigm is often traced back to the Marshall Plan – designed to reconstruct western Europe following the Second World War. University of Florida political scientist and noted Africanist, Goran Hyden, traces the subsequent shifts in this paradigm from a focus on *projects ‘for the people’* (1950s- 1960s) to *programs ‘of the people’* (1960s-1970s) to *policies ‘with the people’* (1980s) and ultimately to *politics ‘by the people’* (1990s – present) (Hyden, Court and Mease 2004). Whereas development was previously viewed as a technical, apolitical process that was imposed from the outside, today it is seen more as a process that is people-centered and cognizant of power, which by definition encompasses the political realm. This idea is not new and was promoted by Chambers (1983) almost three decades earlier when he advanced the idea of “putting the last first.” He challenged development academics and practitioners to focus more on learning (about local households and communities) and less on teaching (changing communities livelihood strategies). A decade later, Lee (1993), highlighted the role of science and democracy, using a compass and gyroscope as an analogy for the role of science and democracy in navigating towards sustainable development. Science, he argued, provides the bearing or direction of the road ahead and democracy the gyroscope that balances diverse views and opinions.

Sustainable development (SD) became a popular paradigm after the Bruntland Report (Bruntland 1987) was published. In that report SD was defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” The report was significant in that it advanced the idea that our future depended on global cooperation and was a precursor to international agreements such as the Kyoto Protocol. MIT economist Robert Solow questioned the simplistic interpretation of this definition as essentially requiring that we leave the earth to following generation in the same state as we found it (Solow 1991). He points out that this would prevent the building of any permanent structures or infrastructure and preclude the use of fossil fuels and other raw

materials that support modern life (at least in certain countries). Instead, he argues for the equitable distribution of our “productive capacity” which he sees as the ultimate source of human well-being. Solow suggests that non-renewable resources, such as oil, could be used up by the present generation as long as we develop a substitute for oil. Although his paper was written almost twenty years ago, it may resonate even more strongly today as we face issues like climate change and global warming which in a single generation have become a huge challenge to sustainability.

Over the past decade a more dynamic approach towards SD has emerged by focusing on the *resilience* of social-ecological systems (SES). Resilience “stresses the importance of assuming change and explaining stability, instead of assuming stability and explaining change.” (Folke et al., 2003, p. 352) A resilience approach recognizes that there is no single stable state in a SES, but that the system is exposed to different ‘shocks’ that challenge its fundamental identity and make it dynamic. ‘Resilient’ systems are able to absorb shocks and adapt themselves without changing their fundamental structure and function (Gunderson and Holling 2002; Cumming et al 2005). Shocks may come in the form of natural disaster (tsunamis, hurricanes), economic crises, policy changes, infrastructure development, etc. The advantage of a resilience approach is that it “embraces human and natural systems as complex entities continually adapting through cycles of change, and seeks to understand the qualities of a system that must be maintained or enhanced in order to achieve sustainability.” (Walker and Salt 2006)

It is against this background that we at the University of Florida have developed our new Masters in Development Practice (MDP).

FLORIDA MDP

The University of Florida (UF)

With approximately 50,000 students and 35,000 employees, UF is one of the largest universities in the US and is consistently ranked within the top 15 public universities in the country. In 2005 UF became the first university in the world to be designated as a "Certified Audubon Cooperative Sanctuary" for environmental and wildlife management, resource conservation, waste management, and outreach and education (University of Florida 2010). SD is therefore not only promoted through academic programs but also practiced on campus (Ankersen 2009). At the University of Florida we have generally approached SD through a strong focus on environmental science and conservation, but we have increasingly used resilience as a key analytical lens.

Building on Existing Interdisciplinary Programs

The MDP at UF builds on the well-established Tropical Conservation and Development (TCD) program. Since the mid-1980s, the TCD Program (TCD 2010a) has drawn on multiple disciplines, methods and skills to understand and address the challenges of linked social-ecological systems in the tropics (Kainer et al 2006). TCD offers an interdisciplinary certificate and concentration to students enrolled in Masters or Ph.D. programs, spanning 21

TS 2G - Future Education Models and Curricula

6/15

Barnes, Child, Onzere, Ankersen, Bowen, Deere, Hernandez, Kraft, Peoples-Shepps, Porzecanski, Schmink, Villalon, Williams

Building a new Generation of Sustainable Development Practitioners: The Masters in Development Practice at the University of Florida and the Global MDP Network

FIG Congress 2010

Facing the Challenges – Building the Capacity
Sydney, Australia, 11-16 April 2010

academic units at UF. In the late 1980s, long-term TCD field-based research and training programs were established in Latin America, which expanded to Africa after 2001. To help prepare students for the challenges of applying core competencies in real development settings, and to communicate their results to different local audiences, the program has continually developed new professional skills courses (e.g. Conservation and Development Skills; Facilitation and Communication; Conflict and Collaboration; Conservation Entrepreneurship; Conservation Policy) as well as other non-traditional structured learning activities, such as internships and practitioner experiences, student-led workshops, annual retreats and orientations, and applied summer field experiences in Latin America and Africa.

The TCD program has a broad approach to graduate education and regards it as a ‘learning and action platform,’ drawing on intellectual, personal, and collective resources to stimulate interaction and innovation. Its focus on practical skills, interdisciplinarity, innovative learning approaches, active networks with practitioners, and field programs in Latin America provides a strong foundation for the development of the new MDP. The MDP will expand the traditional focus of TCD to include the health sciences as well as additional management skills. This health component will be provided in part through a new Department of Environmental and Global Health located in the College of Public Health and Health Professions.

The UF MDP Curriculum

The UF MDP emphasizes an interdisciplinary way of thinking, and the integration of theoretical, practical and skills training. Figure 2 shows the integrated framework we have used to guide the design of the MDP curriculum.

Fulfilling the MDP requirements within a 54 credit Master’s requires considerable innovation in combining disciplinary training, skills, field work, and program performance management:

- *Ten foundational courses* provide disciplinary competency. The faculty driving this process will emphasize inter-disciplinary approach, which will be reinforced through retreats each semester.
- Students take *four elective courses* in a selected specialization (which they can use to get an additional certificate) or in a broader, discretionary manner.
- A weekly seminar on *Sustainable Development Practice* (replaced in year 2 by a field assessment process and capstone course) will provide students with an opportunity to plan and lead discussions about development.
- *Skills training* includes communication and leadership skills, and (based around the field experience) participatory planning, implementation, monitoring and reporting skills.

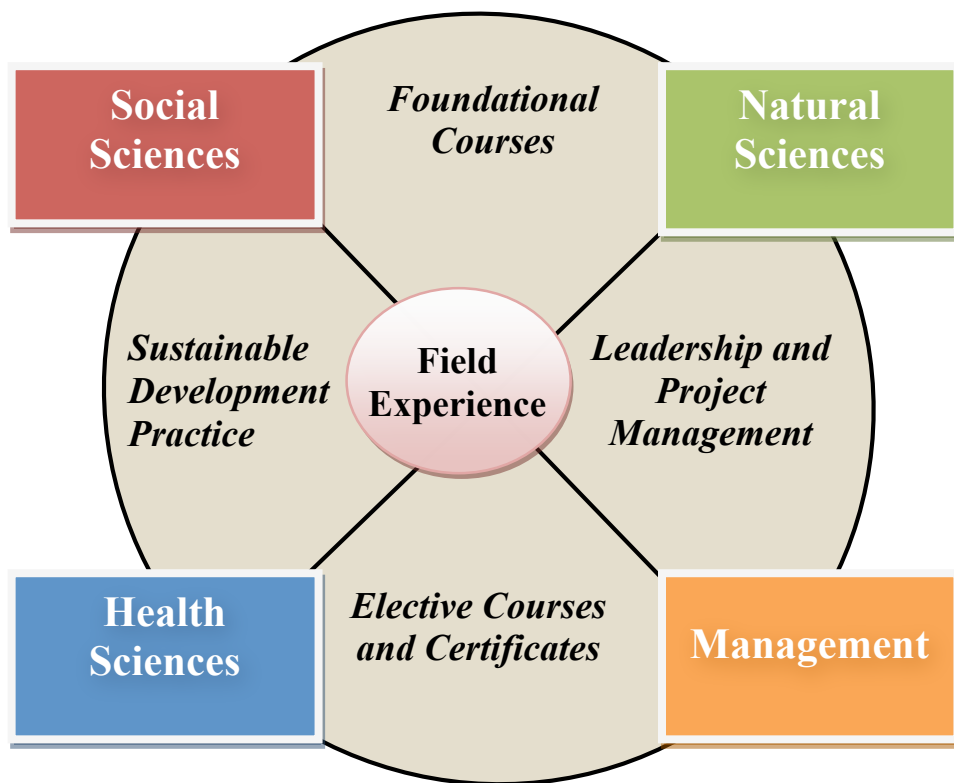


Figure 2. Integrated Framework of the Florida MDP Curriculum

- Professional development is centered on an intense *field experience* that requires a tangible product.
- The MDP is structured to teach management skills and the curriculum will be managed like a development project - students will be ‘contracted’ in with a ‘job description’ and defined metrics to track competencies. Students and the program tracking, including individual and participatory evaluations, provides experiential learning in *performance management*.

The full curriculum is laid out in Table 1 below.

We have defined certain competencies in the four major pillars (social, natural, and health sciences, integrated skills and SD practice) to guide the development of the MDP curriculum. An example of the social science competencies is shown below in Table 2.

Summer Program

Effective training of development professionals requires active experiential learning within a real world context. This will be achieved with a summer field requirements (6 credits), but

will also be an integral part of the sustainable development practice seminars where students will use field experience in comparative case studies and analyses back on campus. The student requirements will be structured through a “contract” that will mimic typical contractual requirements of development professionals. The contract will define the scope of work, specific deliverables, timetable and budget, and evaluation criteria. To accommodate the diversity in student interests we will offer MDP students several options for field training:

- Faculty-led group development interventions in Botswana (in collaboration with UB).
- Development internships in Latin America
- Summer internships with NGOs, government agencies, development agencies that meet the competency requirements of the MDP.
- A “Practicum” option modeled on the TCD Program that provides course credit for supervised individual or group professional activities outside the classroom (TCD 2010b).

Botswana Field Program

In collaboration with the University of Botswana, and mentored by UF/UB faculty, students will work with key ministries, the private sector, and local communities to identify SD indicators. This may include, for example, (i) working with the Ministry of Wildlife and Tourism to develop a tourism sector analysis and provide policy recommendations, (ii) working with local communities to develop village development plans, and (iii) working across national and local scales to improve resource governance. Tourism is the primary economy in many parts of Botswana, and requires an understanding of economic policy and infrastructure planning, health and service delivery, district and town planning, community conservation, etc.

The field program is designed to develop professionals who are both socialized and trained to address development problems at multiple levels. Students will learn how to interact with government officials, NGOs and donors in the capital city (Gaborone), but will also work with district councils, communities and the private sector in a more hands-on manner. They will learn how to develop appropriate relationships, to negotiate priorities with stakeholders, and to collect, manage and analyze macro-level data and policy about the sector/region. We have on-going relationships in the wildlife-tourism sector and will leverage this to train students in the many contemporary issues in sector planning, infrastructure, property rights, distributional equity, community development, biodiversity conservation and climate change. Because this is more than an academic exercise, we anticipate having the opportunity to work actively with stakeholders to assess the sector, develop policy, and implement priorities. By going back every year we will be able to study and track development practices and trends longitudinally.

Our existing research program in Botswana, comprising more than 30 graduate students and young African professionals and professors from six African and US universities, has already crossed the boundary from academic research to development practice, and uses participatory

TS 2G - Future Education Models and Curricula

9/15

Barnes, Child, Onzere, Ankersen, Bowen, Deere, Hernandez, Kraft, Peoples-Shepps, Porzecanski, Schmink, Villalon, Williams

Building a new Generation of Sustainable Development Practitioners: The Masters in Development Practice at the University of Florida and the Global MDP Network

FIG Congress 2010

Facing the Challenges – Building the Capacity

Sydney, Australia, 11-16 April 2010

action research to address the priorities of local partners. For instance, we are developing visual management information systems to track the performance of governance at community level, and are promoting cross-cultural learning and capacity-building by teaming our students (half of whom are from Africa and Latin America) with Young African Professionals from government agencies, universities, NGOs and local communities.

Table 1. UF Masters in Sustainable Development Practice (MDP) Curriculum

Orientation (1 week): <i>Familiarize students with this curriculum, its philosophy, its sequence and its academic tools; Cohort-building activities; Introduce performance management system related to competency training.</i>				
	Social Sciences	Natural/ Biological Sciences	Health Sciences	Integrated Skills and SD Practice
Semester One (Fall) 12 Credits	LAS 6938 Development Theory and Practice	LAS 6XXX Ecology and Development	PHC 6XXX Health and Development I	LAS 6291 Communication and Leadership Skills
Semester Two (Spring) 12 Credits	LAS 6XXX Foundations of Economic Analysis for Sust. Dev.* OR LAS 6XXX Economics of Sustainable Development	LAS 6XXX Natural Resource Management and Innovation Systems	PHC 6XXX Health and Development II	GEO/FOR 6XXX Sustainable Development Practice Seminar/Workshop*
Evaluation (Year 1): <i>Evaluate individual performance (competencies, skills, group participation and leadership), and throughout the educational process; Participatory evaluation of overall program (facilitated retreat)</i>				
Semester Three (Summer) 6 Credits	Field Study or Internships in Africa, or Latin America: Includes field skills, project design and evaluation; field project Assessment, Analysis, Write-up, and Presentation (through individual advisor).			
Semester Four (Fall) 12 Credits	Two Elective Courses (6 credits)		Global Classroom	Sustainable Development Team Project
Semester Five (Spring) 12 Credits	Two Elective Courses (6 credits)			Development Administration and Resource Governance
Final Evaluation (Year 2): <i>Evaluate of individual performance (competencies, skills, group participation and leadership); Participatory evaluation of overall program (facilitated retreat)</i>				

* includes project management/logical framework workshop

TS 2G - Future Education Models and Curricula

10/15

Barnes, Child, Onzere, Ankersen, Bowen, Deere, Hernandez, Kraft, Peoples-Shepps, Porzecanski, Schmink, Villalon, Williams

Building a new Generation of Sustainable Development Practitioners: The Masters in Development Practice at the University of Florida and the Global MDP Network

FIG Congress 2010

Facing the Challenges – Building the Capacity

Sydney, Australia, 11-16 April 2010

Table 2. Competencies and Learning Outcomes in the Social Sciences

Competency	Learning Outcomes/Skills
1. Critical perspectives on development theories and concepts, and their practical applications at different scales	<ul style="list-style-type: none"> • Understand and critique alternative theories and concepts of development and their implications for practical design and implementation
2. Integrated analysis of markets and institutions, policy and governance, social organization, culture and values, and environmental sustainability to address development problems in a specific historical context	<ul style="list-style-type: none"> • Understand the differential patterns of national development and issues of persistent inequality within a historical and political economy perspective; • Understand the relationships between economic growth, resource sustainability, and livelihood strategies, and their implications for poverty reduction; • Understand the diversity and complexity of social, political and cultural contexts, and the role of institutions and social norms
3. Methodological tools (quantitative and qualitative) to address the distribution of and changes in development costs and benefits among social groups at different scales and in different ecological contexts	<ul style="list-style-type: none"> • Apply the principles of economics, both in households and firms; • Examine the consequences of market imperfections and failures for livelihood systems and environmental sustainability • Apply social survey and interview tools and stakeholder analysis to address distributional issues in development • Apply participatory methods to engage different stakeholders
4. Management tools to design and implement policies, institutions, and social innovation at diverse scales in complex social-ecological systems	<ul style="list-style-type: none"> • Apply planning tools including adaptive management, pluralistic and participatory approaches to sustainable development at diverse scales

After gaining a national and district-level perspective, students will be encouraged to work with rural communities on community-based natural-resource management (CBNRM) programs. This is rural development in a microcosm - introducing new systems of property rights, valorizing environmental goods and services, bringing environmental services into the market economy, and establishing local accountable democratic management, as well as supporting this with policy, extension, research and capacity-building at multiple levels.

Over a period of two months, students will be trained and mentored through all stages of the process including: (i) relationship building; (ii) participatory problem analysis; (iii) data management and analysis; (iv) data feedback using visualization techniques; (v) options

analysis and decision-making; and (vi) production of plans, reports, charts, posters etc. Field training will be alternated with classroom discussion, introspection and reading.

Elective Courses and Certificates

In their second year, there is space for MDP students to take elective courses that will lead to a graduate certificate in one of a dozen existing fields of specialization. The most applicable certificates include:

- African Studies
- Latin American Studies
- Tropical Conservation and Development
- Environmental Health
- Epidemiology
- Public Health Management and Policy
- Urban Planning and Sustainability
- Gender and Development
- Interdisciplinary Concentration in Geographic Information Systems
- Climate and Climate Change

Students who complete the requirements for a certificate receive a formal certificate and this qualification is added to their transcript.

PROGRAM ADMINISTRATION

The MDP Program is administered jointly through the Center for African Studies and the Center for Latin American Studies, both leading Title VI Centers (funded by the US Department of Education). Through these Centers the MDP draws on faculty from across campus and the MDP offices are housed in the Center for African Studies which is located in the same building as the Center for Latin African Studies. The MDP Program is co-directed by two faculty with the assistance of a program assistant. Most of the decisionmaking and program development is done through a steering committee made up of representatives from 9 departments and 7 colleges (see Figure 3). We are in the process of hiring two new professors, one in health and development (already advertised) and a second in development administration (to begin in Fall 2011).

GLOBAL LINKAGES

The UF MDP described in this paper is part of a global network of programs with a secretariat located at Columbia University's Earth Institute. In addition, Columbia will offer its own MDP and an on-line "Global Classroom" course on sustainable development for students worldwide. This course was offered this past fall (Sept to Dec, 2009) as part of Columbia's MDP curriculum. The goal of the global network is to develop an open-source repository for teaching materials that can be shared across the network. As other MDP curricula get underway, additional sharing of resources may occur through shared or jointly taught courses,

TS 2G - Future Education Models and Curricula

12/15

Barnes, Child, Onzere, Ankersen, Bowen, Deere, Hernandez, Kraft, Peoples-Shepps, Porzecanski, Schmink, Villalon, Williams

Building a new Generation of Sustainable Development Practitioners: The Masters in Development Practice at the University of Florida and the Global MDP Network

FIG Congress 2010

Facing the Challenges – Building the Capacity
Sydney, Australia, 11-16 April 2010

faculty exchanges, as well as through shared summer programs. Through such an arrangement, the summer program offered by the University of Botswana in collaboration with the University of Florida could be attended by students at the other MDP programs.

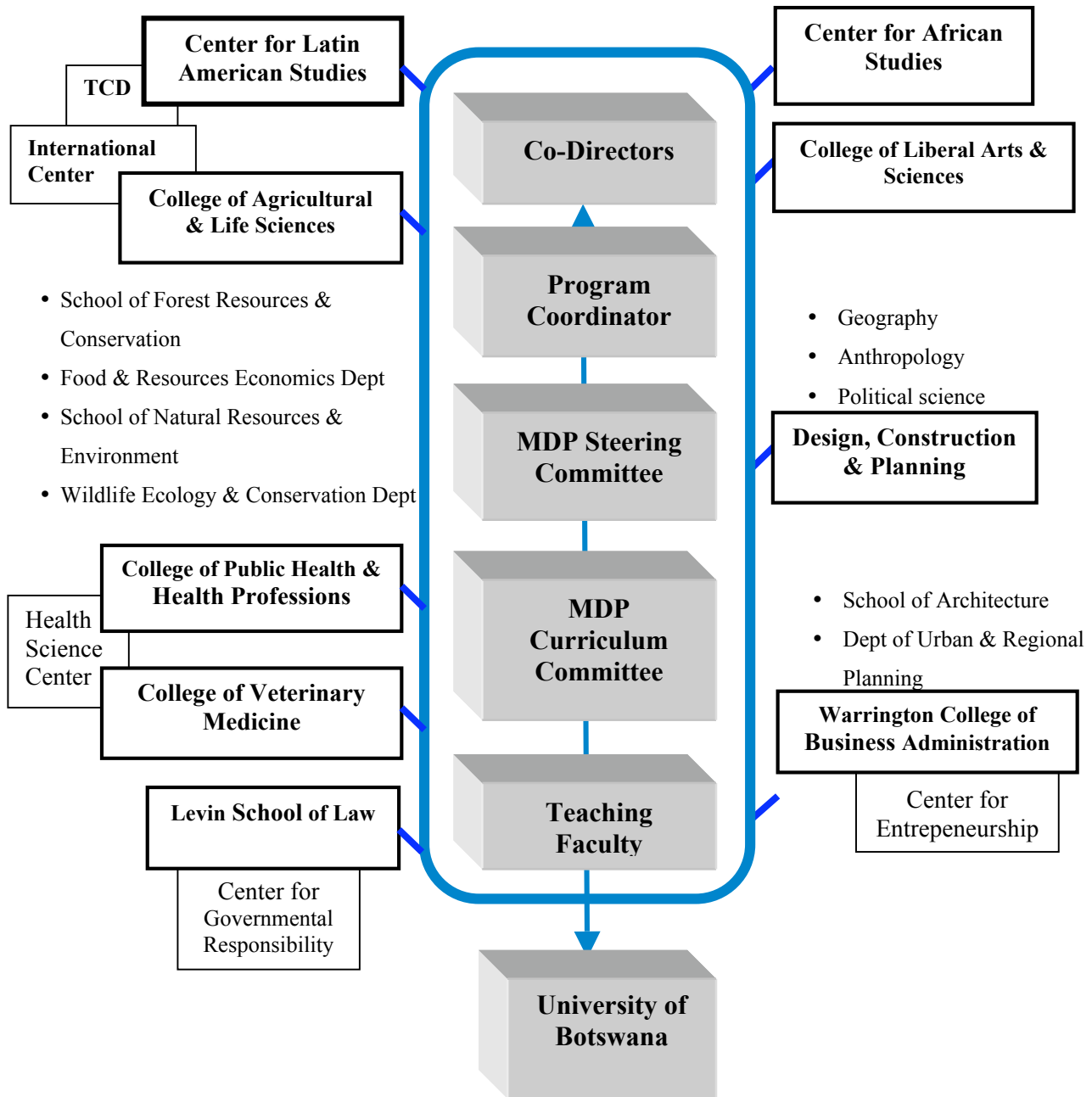


Figure 3. MDP Administrative Structure and Cross-Disciplinary Linkages

ACKNOWLEDGEMENTS

We would like to acknowledge the significant support given by the John D. And Catherine T. MacArthur Foundation and the following offices at the University of Florida: President's Office, Provost's Office and Office of Research.

REFERENCES

- Ankersen, T. (2009). The Role of Sustainability as an Organizing Principle in Higher Education and at the University of Florida. Final Report of 2008/2009 Provost's Faculty Fellow in Sustainability, University of Florida, Gainesville, FL
<http://snre.ufl.edu/pubsevents/files/AnkersonSustainabilityReport4-Jun-09.pdf>
- Bruntland, G (ed) (1987). Our Common Future: The World Commission on Environment and Development, Oxford University Press, Oxford, U.K.
- Chambers, R. (1983). Rural Development: Putting the Last First. Longman Scientific and Technical, Essex, England.
- Cumming, G., Barnes, G., Binford, M., Holt, R., Perz, S., Schmink, M., Sieving, K., Southworth, J., Stickler, C., Van Holt, T. (2005). An exploratory framework for the empirical measurement of resilience. *Ecosystems* 8 (8), 975–987.
- Folke, C., Colding, J., Berkes, F., 2003. Building resilience and adaptive capacity in social–ecological systems. In: Berkes, F., Colding, J., Folke, C. (Eds.), *Navigating Social–Ecological Systems*. Cambridge University Press, Cambridge, UK, pp.352–387.
- Gunderson, L. and C. Holling, eds. (2002). *Panarchy: Understanding Transformations in Human and Natural Systems*. Island Press, Washington, D.C.
- Hyden, G., J. Court and K. Mease. (2004). Making Sense of Governance: Empirical Evidence from Sixteen Developing Countries." Lynne Rienner Publishers, Boulder, CO
- ICESDP (2008). Final Report, International Commission on Education for Sustainable Development Practice. http://mdp.ei.columbia.edu/sitefiles/file/Final_Report_2008.pdf
- Kainer, K., M. Schmink, H. Covert, J. Stepp, E. Bruna, J. Dain, S. Espinosa, and S. Humphries. (2006). A Graduate Education Framework for Tropical Conservation and Development. *Conservation Biology* 20: 1: 3-13.
- Lee, K. (1993). *Compass and Gyroscope: Integrating Science and Politics for the Environment*. Island Press, Washington, D.C.
- Sachs, J. (2005). *The End of Poverty*. Penguin Books, New York, NY
- Solow, R. (1991). Sustainability: An Economist's Perspective. Paper presented at the Marine Policy Center, Woods Hole Institute, MA
- TCD Program (2010a). Tropical Conservation and Development Program, University of Florida, Gainesville. <http://www.latam.ufl.edu/TCD/index.stm>
- TCD Program (2010b). TCD Practitioner Experience. University of Florida, Gainesville. <http://www.latam.ufl.edu/tcd/practitioner.stm>
- UNICEF (2007). <http://www.globalissues.org/article/715/today-over-25000-childrloridaen-died-around-the-world>

UNDP (2007). 2007 Human Development Report (HDR), United Nations Development Program. <http://hdr.undp.org/en/reports/global/hdr2007-2008/>
UNDP (no date) Millenium Development Goals <http://www.undp.org/mdg/goal8.shtml>
University of Florida (2010). UF Facts. <http://www.ufl.edu/facts/>
Walker, B. and D. Salt (2004). Resilience Thinking: Sustaining Ecosystems and People in a Changing World
World Bank (2008). World Bank Development Indicators – 2008. Washington, D.C.

BIOGRAPHICAL NOTES

Grenville Barnes

Grenville Barnes received his early education at the University of Natal and completed his PhD at the University of Wisconsin, Madison in 1988. His work has dealt with technical, institutional, legal and policy issues associated with cadastral surveying and property information systems in developing countries. He has worked as a researcher, consultant or educator in over twenty countries, primarily in Latin America, the Caribbean and Southern Africa. Grenville has published in a wide variety of professional journals in the US, Canada, South Africa, India, and Brazil. He currently serves as the Co-Director of the Masters in Sustainable Development Practice (MDP) Program at the University of Florida.

CONTACTS

Professor Grenville Barnes, Ph.D
Geomatics Program
School of Forest Resources and Conservation
Co-Director
Masters in Sustainable Development Practice Program
University of Florida
Gainesville
FL 32605
Email gbarnes@ufl.edu
Website: <http://www.sfrc.ufl.edu/faculty/barnes/>