Knowledge, Capacity Building, and Networks for Sustainable Development: A Review

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prepared for the

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Executive Summary

To achieve its objectives, the United Nations Office for Sustainable Development must keep itself fully updated on the current status of sustainable development knowledge, capacity building, and networks (among other topics). This report is a selective, summary scan of the current "state of the art" in each of those subjects, in a sustainable development ("SD") context, with resulting recommendations to UNOSD. The report is based on extensive desk research, correspondence with centers of knowledge and expertise, and interviews and consultations with relevant experts. The attachments provide annotated databases of capacity building programs, professional networks, and highlighted SD knowledge resources.

After presenting the report Background, a section entitled "Introduction and Main Conclusions" summarizes the general conclusions and traces the logic and the research path that led to them. Then three sections present the research findings and special recommendations in the areas of knowledge for sustainable development, capacity building, and networks. A final section gathers and categorizes the additional input and recommendations of the 30 experts consulted during the course of this research.

This report recommends that the UNOSD take the following actions (among others):

- Develop (or identify) new, specialized *tools and methods* for knowledge management in the implementation of sustainable development that are dynamic, integrated, and push-based (i.e. not passive). Several such tools and methods are highlighted in this report.

- Help national officials and other stakeholders build capacity for managing and participating in *networked governance* — processes that explicitly acknowledge the role of extra-governmental groups and institutions in the process of implementing new policy.

- Work with country-based *groups* of people rather than individual officials, and train people on effective *boundary work* — managing the interfaces between science, policy, and stakeholder groups, and building strong networks among the people in these groups.

- Help national officials in sustainable development to *adapt* to the changing professional and personal demands of their work, including the shift in knowledge management from "stock" to "flow-based" processes, and to the increasing requirement for more horizontal governance structures. Capacity building of such officials should include training in organizational and institutional change processes.

- Position UNOSD and its information portal as an *inclusive, unbiased, easy-to-follow guide* to the universe of sustainable development knowledge, networks, and capacity building. For priority users of UNOSD services such as developing country officials, UNOSD should provide a very active and responsive form of facilitated guidance.

- Perform additional, targeted *research* to gain (and share) a deeper understanding of what strategies and practices work best in these areas.

1. Background

The UN Office for Sustainable Development (UNOSD) was created in 2011 to support UN member states in the implementation of sustainable development ("SD"), in four key ways: (1) facilitating *knowledge* exchange, (2) performing *research* and policy analysis, (3) providing opportunities for *capacity* building, and (4) helping to form and nurture *networks* and partnerships. The need for UNOSD was further emphasized by the 2012 Outcome Document of the Rio+20 Conference, *The Future We Want,* which mandates the United Nations system in Paragraph 66 to support Member States with knowledge and capacity building on key issues of sustainable development (among them, the transition to a green economy). UNOSD's focus is primarily, though not exclusively, on serving the needs of developing countries.

This report is intended to support the planning and development of UNOSD in three of those four topic areas. The report provides a summary, current "state-of-the-art" briefing intended for UNOSD staff, the expert groups it plans to convene, and the stakeholders it serves. The explicit topics are sustainable development knowledge, capacity building, and networks; but along the way, the report provides additional suggestions for the UNOSD research agenda as well.

It should be noted that this report was developed during the second half of 2012, in the aftermath of Rio+20, the World Conference on Sustainable Development. Rio+20 sent a pulse of significant change into the UN System and into the sustainable development community generally. The exact shape of those changes in the long term — such as the institutional relationships within the UN, or whether the importance of certain topics in sustainable development (such as Green Economy) will rise or fall — is still impossible to predict. UNOSD began its journey at a moment of uncertainty in the SD movement that has both positive and challenging features. On the one hand, the process of developing high-level, global "Sustainable Development Goals" as agreed at Rio+20 promises to raise the stakes and the visibility of SD. On the other, at least two high level officials interviewed for this report said that the UNOSD's key challenge is to "prove that sustainable development is still relevant," because skepticism among some governments and other actors is growing.

Against this backdrop, this was report was commissioned specifically to inform a planned expert workshop at UNOSD on the topic of "Capacities and Knowledge Needs for Sustainability Transition," scheduled for early 2013. The terms of reference stipulate that the report should:

- Map-out existing resources, such as actors, toolkits, activities, and networks;
- Identify and/or update needs of Member States and policy communities, in line with the objectives of the Consultative Workshop, as stated above;
- Reveal the gaps that remain between those resources and needs.

The report itself should be considered in tandem with its attachments, especially the databases of capacity building programs, networks, and knowledge resources that were identified and analyzed in the course of this research.

2. Introduction and Main Conclusions

The main conclusions of this report can be summarized in four general statements:

- The *nature of knowledge* is changing, and with it the nature of sustainable development knowledge, driven by the accelerated production of knowledge and by rapid advances in the technologies to access it.

- This change in the nature of sustainable development knowledge has profound implications for the practice of sustainable development, and for the process of building capacity to implement it. Among other effects, the change forces a shift in emphasis from individual experts to multi-disciplinary groups, and from vertical hierarchies to horizontal networks.

- The new knowledge and capacity-building environment, combined with the emergence of *networked governance* and the increasing importance of *boundary work*, requires that governments (in an SD context) increasingly adopt the role of *facilitator*. (The italicized terms are defined below.)

- All of these developments strongly underscore the need for the UNOSD and provide suggestive guidance to the development of its knowledge sharing, capacity building, and networking activities. These recommendations are noted throughout the report and are summarized in the Executive Summary.

We now consider the basis for each of these statements in some depth.

2.1. *The nature of knowledge is changing, and with it the nature of sustainable development knowledge.*

The rise of the Internet, smart phones, tablet computers, ubiquitous inexpensive telecommunications, and many other related technologies have fundamentally changed the relationship between human beings and the knowledge they use to make decisions. Recent years have seen an outpouring of research, books, articles, websites, technical applications, and (appropriately) large-scale Internet-based dialogues on this topic. The question of how technology is changing our relationship to knowledge is controversial: many argue that this Internet-facilitated revolution is vastly expanding human capability through the power of distributed knowledge and capacity, while others argue "the Internet is making us dumber."[1] The argument is not likely to be resolved in the near term, but humanity is undeniably in the midst of a revolution that is similar, in terms of its impact on the spread of knowledge, to the invention of the printing press over five hundred years ago.

At the same time, the sheer quantity of information and knowledge available to decision makers through these multiplying and ever-more-accessible channels continues to expand exponentially. To cite just one example, a recent exhaustive study of all scientific publishing over the past century concluded tentatively that while there are different speeds of growth in

[1] Two books that capture this split in opinion are Clay Shirky's *Here Comes Everybody: The Power of Organizing without Organizations* (Penguin, 2009) and Nicholas Carr's *The Shallows: What the Internet is Doing to our Brains* (W.W. Norton, 2011).

different disciplines, "the overall growth rate for science ... has been at least 4.7% per year" since the early 1900s. At this rate, the total volume of *new* scientific knowledge being generated each year is doubling every fifteen years.[2]

The combination of these two developments is driving a change in how professional knowledge managers think about knowledge, and therefore in how sustainable development practitioners must think about knowledge. The change can be summarized in a short phrase: knowledge is changing from a *stock* to a *flow*. This concept was first introduced in 2002 by David Snowden, then director of IBM's Institute for Knowledge[3], but has become more widely embraced in recent years as the enabling technologies have continued their relentless advance. As Peter Nicholson, president of the Canadian Council of Academies, described it in an essay in 2009, "The old Encyclopedia Britannica was quintessentially a stock; Wikipedia is the paradigmatic example of flow."[4] More recently, IFAD's Knowledge Management Facilitator, Chase Palmieri described emphasized the distinction between *products* (i.e. stocks) and *processes* (flows): "With products [like newsletters, reports etc.], almost by the time they are written, the knowledge is out of date. Processes are something that are ongoing, everyday: constant learning, using the learning, then learning some more ... this is what will really enhance performance."[5]

The flow of knowledge that is relevant to sustainable development is, of course, not limited to scientific advances — though it includes many kinds of scientific advance as noted later in this report. Sustainable development knowledge also includes advances in the social sciences, economics, statecraft, communications, cultural studies, participatory governance, and many other topics. The implementation of a Green Economy initiative, for example, involves all of these and more. And while the accumulated stocks of historical knowledge remain relevant to implementing such initiatives, tracking the accelerating *flow* of knowledge — such as the latest research on wind energy, or an awareness of the proliferation of new clean cooking stoves, or the rise of alternative economic models and measurements of national progress — is now essential to national decision makers and practitioners of sustainable development.

2.2. *The change in the nature of sustainable development knowledge has profound implications for the practice of sustainable development, and for the process of building capacity to implement it.*

The implementation of sustainable development is now widely acknowledged to be a multi-actor process that plays out in a complex system, rather than a top-down, technocratic process

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[2] Peder Olesen Larsen and Markus von Ins, "The rate of growth in scientific publication and the decline in coverage provided by Science Citation Index," *Scientometrics*, 2010 September; 84(3): 575–603.

[3] David Snowden, "Complex acts of knowing: paradox and descriptive self-awareness", *Journal of Knowledge Management*, Vol. 6 Iss: 2 (2002), pp.100-111. This point was underscored verbally by several of the experts interviewed for this report, including Nils Ferrand, who put it this way: "We need to shift our understanding of knowledge itself, which we have treated as a stock — it accumulates in libraries, databases, our own minds — and start treating it like a flow.... Professionals need assistance in developing their personal knowledge management strategies and systems, both for finding the knowledge they need within that flow, and dealing with the flow of knowledge that simply comes at them (or streams by them)."

[4] Peter Nicholson, "Information-rich and attention-poor," *Globe and Mail*, Friday, Sep. 11 2009 <http://www.theglobeandmail.com/commentary/information-rich-and-attention-poor/article4196154/>

[5] Chase Palmieri, International Fund for Agricultural Development (IFAD), video interview, uploaded 12 July 2012, http://www.youtube.com/watch?v=KYlrKmV3S6c

of government policy-making and enforcement. The most visible example of this shift in thinking about the role of the state is the Rio+20 Outcome Document, *The Future We Want*, which refers explicitly to the role of many other sectors in successfully implementing sustainable development:

> "Sustainable development requires the meaningful involvement and active participation of regional, national and sub-national legislatures and judiciaries, and all Major Groups: women, children and youth, indigenous peoples, non-governmental organizations, local authorities, workers and trade unions, business and industry, the scientific and technological community, and farmers, as well as other stakeholders, including local communities, volunteer groups and foundations, migrants, families as well as older persons and persons with disabilities. In this regard, we agree to work more closely with Major Groups and other stakeholders and encourage their active participation, as appropriate, in processes that contribute to decision making, planning and implementation of policies and programmes for sustainable development at all levels." (*The Future We Want*, 2012, paragraph 43)

Improving the implementation of sustainable development will thus not be achieved simply by increasing the skill and capacity of a few key individuals in government. Managing flows of knowledge as complex as those described earlier, and turning those flows into actionable policies and decisions, requires building the capacities of *groups* of people who can work together across increasingly fuzzy lines of sector specialization. Sustainable development is increasingly a team sport, and capacity building for SD therefore needs to consider the development of group-based skills and collaboration processes.

As a way of highlighting this emerging international consensus on best practice, this report lifts up two relevant terms from the recent professional literature:

"Networked governance" refers to systems of governance that blend the state, private sector, and civil society in functional though usually informal ways. These networks of policy-making and implementation "combine the voluntary energy and legitimacy of the civil society sector with the financial muscle and interest of businesses and the enforcement and rule-making power and coordination and capacity-building skills of states and international organizations."[6] For example, in promoting sustainable production and consumption, policy signals from governments blend with civil society initiatives such as the Global Reporting Initiative or Carbon Disclosure Project, which create parallel, voluntary, "soft" regulatory frameworks that businesses are strongly encouraged to follow.

"Boundary work" refers to "the interface between science and policy and, more broadly, to the activities of those seeking to mediate between knowledge and action."[7] In practical terms, boundary work involves all the communication and collaboration processes that occur between those that have knowledge, and those who need knowledge — or who are perceived, by the holders of that knowledge, to need it. At the low end of interactivity, boundary work involves publishing a scientific or policy paper, and then waiting for the relevant actors to

[6] Gabriel A. Huppé, Heather Creech, and Doris Knoblauch, "The Frontiers of Networked Governance," International Institute for Sustainable Development, February 2012.
[7] William C. Clark et al., "Boundary work for sustainable development: Natural resource management at the Consultative Group on International Agricultural Research (CGIAR)," *Proceedings of the National Academy of Sciences (PNAS)*, Aug 15, 2011. This paper is highly recommended (see the bibliography).

notice it and act upon it. At the higher, more effective end, it involves sophisticated communications programs, facilitated dialogue processes, social media, and other modern tools of knowledge sharing.[8] This report argues that the UNOSD is essentially a "boundary organization," and that it is in the business of training others in effective "boundary work," mediating between the sustainable development knowledge flow in many domains and the implementation processes described by networked governance.

In sum, the vertical expert-based model of knowledge management for policy implementation is giving way to a horizontal network-based model. This changes the way government officials and other national leaders need to be trained and supported for the successful implementation of sustainable development; and it puts network development issues at center of sustainable development governance, rather than at the periphery, where they have historically tended to reside.

2.3. *The new knowledge and capacity building environment, combined with the emergence of networked governance and the increased importance of boundary work, requires that governments (in an SD context) increasingly adopt the role of facilitator.*

Governments traditionally make policy, communicate that policy's requirements, and enforce compliance. In many if not most countries, policy implementation support processes such as knowledge sharing and network formation are largely left to the "free market" of non-governmental organizations, professional and industry associations, or independent research institutes that recognize those needs and respond to them. The policy development process itself operates behind a political firewall, away from these support processes, with varying levels of consultation with experts and stakeholders, but without their legitimized participation in the policy process itself.

There are good reasons for that firewall, including minimizing the risk of corruption or undue influence from powerful interest groups. However, the challenges and complexities of sustainable development have been forcing the firewall between government and the rest of society to become more permeable, in both directions. On the one hand, stakeholder groups are knocking on government's door and requesting more of a say in the process of addressing the increasingly urgent challenges that directly affect them, and often demanding acceleration in the policy development process. On the other hand, government policy makers and officials are discovering that they need the knowledge and the active collaboration of diverse stakeholder groups if they are to have any hope of tackling ever more complex, system-wide challenges, such as climate change or demographic shifts.

All these trends are challenging government officials, in the context of sustainable development, to add the role of "facilitator" to their list of core functions.[9] In practice, this means opening the door to more active participation by stakeholders in the process of

[8] An indicator of how professional UN thinking is developing in this area is a recent, much-discussed article on the UNDP knowledge sharing site "Teamworks," which focused on the shift away from large-scale formal reports to "micro-content" in the form of blog posts, one-page fact sheets, slide presentations, Facebook pages, and other more easily digestible — and more interactive — communications channels. See: https://undp.unteamworks.org/node/285655 (requires registration).

[9] Alan AtKisson, "Facing the Crisis in Sustainable Development," keynote presentation to the European Sustainable Development Network Annual Conference, 29 June 2012; available for download at <http://www.sd-network.eu/?k=ESDN%20conferences>.

forming policy, strategizing its implementation, adapting it to changing conditions, and continuously monitoring results. Government, rather than waiting for the "free market" of non-governmental social institutions to act in entrepreneurial ways, needs to take a more active role in enabling, catalyzing, supporting, or directly convening such processes.

This new imperative for more horizontal, inclusive policy processes is challenging to many governments, whose formal structures as well as informal habits may work at cross purposes to emerging needs. To effect the changes necessary for effective implementation of sustainable development, they need clear guidance on methodology. They also need reassurance that opening the doors to more extra-governmental participation will not result in a weakening of government's fundamental monopoly on rule-making and enforcement.

Fortunately, during the past decade, researchers have explored the emergence of new governance models for SD, both in theory and in practice, using frameworks and headlines such as "adaptive policy-making" and "transition management." Importantly, Huppé et al. (op. cit.) note that these new approaches to intentional networked governance do not undermine the traditional role of government as decider. Rather they "... allow centralized governance authorities to maintain control over opening-up and closing-down of the process of strategy formation ... but aim to stimulate the influence of outside actors that may self-organize within the boundaries of the governance network."[10]

Increasingly, governments need to "stimulate the self-organization of outside actors" and the formation of these broader governance networks — which means that government officials need to learn the skills and tools for enabling and facilitating such processes.[11]

2.4 *All of these developments strongly underscore the need for the UNOSD and provide suggestive guidance to the development of its knowledge sharing, capacity building, and networking activities.*

The shift in the nature of knowledge from stock to flow, the rapidly changing competencies demanded of national leaders in managing sustainable development, and the rising importance of networked governance and boundary work as essential tools of implementation: these developments all have a profound impact on the agenda of the new UNOSD. Indeed, they underscore the need for a legitimated international center where sustainable development officials and practitioners can find guidance, tools, and support for navigating complexity. Specifically, these developments suggest that UNOSD needs to:

2.4.1. *Develop (or identify) new, specialized tools and processes for knowledge management and knowledge sharing for sustainable development.*

UNOSD needs to avoid the trap of just aggregating sustainable development knowledge as it accumulates (treating it as a stock). It needs to develop its own model of knowledge

[10] Huppé et al. in "The Frontiers of Networked Governance" (op. cit.) provide a good summary of these research threads as well as links to the original sources on topics such as Transition Management and Adaptive Policy.

[11] There are many good examples of networked or distributed governance processes available for government officials to study, in both the developing and developed world, and these have been extensively researched, most prominently by the late Nobel Prize-winning political scientist Elinor Ostrom and her work on the management of common-pool resources. An excellent entry point is Ostrom's own Nobel lecture, available here: http://www.nobelprize.org/nobel_prizes/economics/laureates/2009/ostrom-lecture.html

management as well as the tools, programs, and training courses that can actively help national decision makers to navigate their own journeys down the river of relevant knowledge. That river is continuously flowing and swelling around them in a rushing stream of scientific studies, "New Economics" concepts and models, social and cultural development insights, technology advances, collaboration process innovations, policy experiments, case studies, and more — not to mention the numerous SD-related conferences, meetings, and formal negotiating sessions that occur on a global, regional, and national level. (See next section.)

2.4.2. ***Help national officials and other stakeholders build capacity for managing and participating in networked governance processes.***

An explicit focus on networked governance will accelerate the process of finding and implementing effective solutions to the pressing problems faced by country leaders. Networked governance processes are emerging spontaneously in many situations, driven by the complex nature of SD challenges; but waiting for spontaneous emergence is not good strategy. The skills and processes that support networked governance are increasingly well recognized, and UNOSD can support countries in accelerating their development among key national officials as well as stakeholder leaders. The development of a knowledge model and related tools (as described later in this report) could significantly empower national government officials, especially, to make this shift in emphasis.

2.4.3. ***Work with country-based groups rather than individuals.***

Providing training and competence-building support to one or two sustainable development officials is not likely to be effective, given both the scale of the challenge and the shift from vertical to horizontal implementation processes. Even a highly trained individual, operating in a government highly supportive of sustainable development goals, may find her- or himself overwhelmed with information and surrounded by insurmountable implementation obstacles. Small, formal or informal *teams* of people, carefully chosen for their innate capacities to communicate well and collaborate across boundaries, can support each other with knowledge-sharing and complementary skillsets. They can act together to spread what they know and multiply their own capacity development to a larger group — thereby creating or enhancing the networks that are needed for effective SD implementation.

2.4.4. ***Train people on effective boundary work.***

Sustainable development has always involved a systemic perspective and interdisciplinary, inter-sectoral collaboration. Managing these interfaces — science-to-policy, policy-to-stakeholder, etc. — has always been and remains a challenge to effective implementation, even in the OECD countries. UNOSD can add value to existing SD processes by building the capacity of government officials and other lead actors to communicate effectively and to create a climate of reciprocal, responsive engagement through an explicit focus on boundary work. The concrete skills should include the use of practical tools such as participatory modeling, "serious games," dialogue processes; the use of whatever communication channels are most effective (currently, "social media"); and decision support processes such as decision theatres and scenario exercises.

2.4.5. ***Help national officials in sustainable development to adapt to these new demands, and to evolve these more horizontal policy implementation processes.***

The foregoing suggests a shift in attitude and practice for government officials that may amount to a shift in their sense of identity. Obviously there are numerous structural,

managerial, and political dimensions associated with a shift to networked governance, and changing these to create a more enabling environment is a major focus of research. But changes in structure will not happen without changes in mindset. Most government officials have been trained under an older paradigm where "knowledge is power," and where power is exercised through hierarchies. Adopting the new concepts described above may be a *personal* challenge for many of them, as the shift from strict vertical hierarchies to more horizontal networks may look like a diminishment of the traditional badges of power: privileged access to information, the honorific role of "expert," and the maintaining of social distance from those of perceived lesser rank, among others.

Embracing the more facilitative role described above — which also involves becoming an agent of change to promote and implement the necessary internal, structural adjustments — may require professional and personal coaching. SD champions within government may need support so that they can successfully change the governance systems in which they operate, while also realigning their professional and personal indicators of success.

3. Sustainable Development Knowledge: State of the Field

Managing the implementation of sustainable development at the national scale requires familiarity with the substantive content of a broad array of topics and disciplines, ranging in their diversity from climate science to economic development to human rights. It also requires knowledge of relevant processes such as policy-making, program design, and culture change. Handling a demanding mixture of *multi-disciplinary content* and *the management of multiple processes* is not unusual in most senior executive positions; but in the case of sustainable development, the demands are extreme.

This section describes the domains of knowledge that are common to most sustainable development planning and implementation processes. This mapping exercise should not be considered complete, nor is a generic mapping adequate to any specific national case. The section closes with an analysis of how officials and practitioners are coping with this complexity; what key phrases and frameworks are on the ascendency; how SD knowledge interacts with competency building and network processes; and how these dynamics affect the programmatic priorities for UNOSD.

3.1. *Confronting Sustainable Development Knowledge Domains*

There is no standardized typology of knowledge domains for sustainable development, but there are reference documents that provide a credible basis for initial mapping. The following list, newly generated for this report, is drawn from the main United Nations agreement texts for sustainable development: *Agenda 21* (1992), the *Johannesburg Plan of Implementation* (2002), and *The Future We Want* (2012). Topics mentioned in these internationally negotiated documents imply, for the sustainable development official or practitioner, a necessary familiarity with the underlying knowledge domains. These source documents are not exhaustive, however, and a policy topic mentioned within them usually includes, by inference, a vast and branching tree of additional knowledge domains. Because these knowledge domains are usually trans-disciplinary, categorization is difficult. The following list is presented in alphabetical order.

Agriculture - General
Agriculture - Research & Extension Services
Agriculture - Small Scale
Agriculture - Sustainable
Animals - Domestic Livestock
Animals - Wild
Armed Conflict
Biodiversity
Biomass Energy
Bretton Woods Institutions
Business & Industry (Role of)
Capacity Building
Chemicals - Hazardous
Chemicals - Management
Chemistry - Green
Children and Youth
Climate Change
Coastal Zone Management
Consumption Patterns
Consumption Reduction
Cooking Fuels
Corruption
Decision Making Processes
Desertification
Design - Sustainable
Development Aid / Cooperation
Disaster Management
Disaster Preparedness
Disaster Prevention
Diseases - Communicable
Diseases - Non-Communicable
Early Warning Systems
Economic Development
Economic Growth
Economic Policy
Ecosystem Services
Ecosystems - Marine
Ecosystems - Terrestrial
Education - Formal
Education - Non-formal
Education for Sustainable Development (ESD)
Employment - General
Employment - Youth
Energy - Electrification
Energy - General
Energy - Renewable
Energy Access
Energy Efficiency
Energy Technology
Environmental Impact Assessment
Ethics for Sustainable Development
Farmers
Financing Mechanisms
Fisheries Management
Fishing - Illegal
Fishing - Overfishing
Fishing - Unregulated
Food Security
Forests
Freedom
Geographic Information Systems
Global Compact
Globalization Processes
Governance
Green Economy
Greenhouse Gas Emissions
Health - Infant / Child Mortality
Health - Mental
Health - Physical
Health - Reproductive
Healthcare - Access
Hope - Inspiration of
Human Rights
Human Settlements
Human Trafficking
Hunger & Malnutrition
Illicit Drugs
Indigenous People - Rights
Indigenous People - Sustainability of
Industrial Production (Cleaner)
Information and Communication Technology (ICT)
Integrated Planning
Integrated Policy Making
Intellectual Property Rights
International Agreements
International Co-operation
International Labor Law
International Law
Land-Use Changes
Land-Use Planning
Life-Cycle Approaches
Local Authorities - Role and Support
Maritime Safety
Micro-Enterprises
Millennium Development Goals (MDGs)
Mining, Minerals & Metals
Mountain Regions
Multi-Stakeholder Approaches
Natural Resource Management
Non-Governmental Organizations
Ocean Acidification
Ocean Fertilization
Organized Crime
Organizing Social Change
Ozone Depletion
Participatory Decision-Making
Peace & Security
Polluter Pays Principle
Pollution
Population
Poverty - General
Poverty Reduction & Eradication
Procurement
Public Education
Public-Private Partnerships
Research & Development
Resilience
Respecting Diversity
Risk Assessment
Risk Reduction
Rural Development
Sanitation & Hygiene
Science for Sustainable Development
Science-Policy Interface
Scientists and Technologists - Role of
Sea Level Rise
Small Business Development
Small Island States
Stakeholder Engagement
Statistics and Indicators
Sustainability Reporting
Sustainable Development Goals (SDGs)
Systems Thinking / Inter-linkages
Technology Development & Diffusion
Technology Transfer
Terrorism
Tourism
Transparency
Transport - General
Transport - Urban
UN System
Urbanization - City Development
Urbanization - General Trends
Visioning - Practice of
Waste - Radioactive
Waste Management
Waste Minimization
Water - Access and Supply
Water - Desalination
Water - Drinking
Water - Groundwater Contamination
Water - Treatment
Watershed Management
Weather Forecasting
Well-Being
Women - Equality
Work - Unpaid
Workers and Trade Unions

An alphabetic listing may appear to contradict the integrated and dynamic approach to sustainable development knowledge recommended elsewhere in this report. However, it is important to confront the full breadth and depth of the knowledge integration challenge that is faced by SD officials and practitioners. Note that this list leaves out many additional dimensions and sub-domains related to this challenge, such as region-specific knowledge (the scales range from continent to community) and the many specific institutional roles, relationships, and legal environments through which practitioners must also navigate. It also, obviously, leaves out the many inter-connections among these knowledge domains, and the dynamic relationships between them — that is, it leaves out a systemic understanding, which most practitioners consider to be the *sine qua non* of SD work.

Finally, also missing from this list of knowledge domains is *knowledge management itself*. Learning, knowledge management, networking, institutional strengthening, and other skills and social processes now commonly acknowledged as central to the challenge of implementing sustainable development are subsumed into one category: "Capacity Building."

In the face of such a daunting list, what should one do? Fortunately, the most recent of the reference documents, *The Future We Want*, provides some useful guidance to the UNOSD (and other UN agencies). It specifically requests ("invites" is the formal word) the United Nations System to "coordinate and provide information upon request" in ways that will advance sustainable development, a green economy, and poverty eradication. The specifics of that invitation — from Paragraph 66, rephrased here in actions terms — include:

(a) performing a "match-making" role between countries and various types of support partners
(b) identifying toolboxes and/or best practices for policy implementation, at all levels
(c) showing models or good examples of policies in action
(d) promoting methodologies for the evaluation of policy impact, and
(e) cataloguing existing and emerging platforms for SD knowledge, capacity building, and networking.

These are meta-level activities that assume, correctly, that there already exist ample sources of support, tools, methods, models, good examples, knowledge platforms, capacity building programs, and networks for sustainable development. This report has surveyed hundreds of such resources. Paragraph 66, the request from the international community to the UN System, is an appropriate call for assistance specifically to provide a coordinating and mediating service between such resources and the national government officials and other stakeholders who need them. Those officials and stakeholders usually are called upon, in turn, to play a similar role between these resources and the policy-making and implementation processes of their countries.

However, these support activities also require at least a working familiarity with the substantive contents of sustainable development work. The above list of knowledge domains, together with the thousands of sub-domains that are included beneath those headline topics, compounded by the dynamic web of system interconnections among them, makes it clear that no single person could hope to master the stock of "sustainable development knowledge" in their lifetime. Moreover, research, analysis, and innovation are advancing at an accelerating pace in each of those domains. The river of knowledge keeps growing, rapidly and endlessly.

That is why the general shift in knowledge management from *stock*-based to *flow*-based strategies is so essential to sustainable development — and therefore essential to the UNOSD's knowledge management approach.

3.2. *Closing the "Know-Do" Gap*

The political obstacles to implementing SD are often considerable, but before these can be addressed, practitioners must first bridge the distance between the knowledge and understanding of SD issues and their application in policy and practice — the "know-do gap."[12] That know-do gap is often caused by common obstacles such as lack of capacity or even interest on the part of the "doers", but it is compounded by the scale and speed at which the "knowers" are producing new sustainable development knowledge.

The chief aim of supporting national sustainable development officers and leaders to develop their capacities in the area of SD knowledge is not to help them accumulate that knowledge, or even to manage it or redirect its flow: it is to *help them close the know-do gap*. UNOSD's activities in the area of SD knowledge should therefore be structured with that aim in mind. Following the example of other leading centers, such as the University of Wageningen's Center for Development Innovation (CDI), the UNOSD should integrate knowledge related to *organizational change and change management* into its knowledge base and related capacity building processes from the outset (see next section). Of course, helping individual officials to navigate these complex knowledge flows is essential. But the aim of closing the know-do gap underscores the importance of "networked governance" and "boundary work," as described earlier in this report.

3.3. *Reviewing the 2011 UNOSD Knowledge Management Strategy*

In connection with the inception and launch of UNOSD, an initial Knowledge Management Strategy for Sustainable Development ("KM4SD") was developed by Dr. Nils Ferrand. This strategy is quite comprehensive and cannot easily be summarized.[13] However, several key recommendations from that report are worth highlighting here.

First, UNOSD is encouraged to develop its own model of sustainable development knowledge that is relevant to its core mission of assisting nations in the implementation of SD. Ferrand argued strongly for a model that was:

(1) ***Dynamic*** rather than static, and continuously updated, which is in line with the "knowledge as flow" metaphor introduced earlier;

(2) ***Integrated*** in the sense of drawing on all relevant knowledge domains and considering

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[12] While the challenges of translating research to action have been noted and studied for decades, the heightened focus on that challenge in the international arena is more recent. Gavin Bennett and Nasreen Jessani link the origin of this phrase "know-do gap" to a meeting of health ministers in Mexico in 2004. See *The Knowledge Translation Toolkit: Bridging the Know-Do Gap: A Resource for Researchers*, IDRC/Sage, 2011, p. 3.

[13] See "Knowledge Management Strategy for the UNOSD Portal," Nils Ferrand, UNOSD, 2011. Dr. Nils Ferrand is currently with the *Institut national de recherche en sciences et technologies pour l'environnement et l'agriculture* (IRSTEA) in France. He was on leave from the Institute while on assignment to UNOSD.

their systemic linkages in real time (rather than considering knowledge domains as separate from each other); and

(3) ***Push-based*** rather than pull-based, meaning that UNOSD should take an active guiding and facilitating role in moving relevant information and knowledge to the user, based on perceived needs, rather than passively waiting for users to seek knowledge through UNOSD databases and services.

To support this approach, Ferrand developed a draft "knowledge model" for the UNOSD — a framework for structuring SD knowledge in planning and implementation terms — composed of eight elements[14] and their interactions:

- **Actors**: The persons or organizations that need to interact with the knowledge in some way and use it to create and implement a Strategy (see below).

- **Context**: The overall socio-environmental situation within which the Actors are operating. This includes the political background, legal and normative constraints, the physical/natural conditions, etc.

- **Case**: The specific issue, problem or process for which the Actors are designing a Strategy, using Tools, following Procedures etc. within that Context (see other terms below). Cases can be of many different scales; examples could include a comprehensive national sustainable development plan, a more targeted Green Economy program, or the development of a regional climate adaptation initiative.

- **Strategy** (also known as a "Plan"): A set of Tools (actions and interventions) to be put into use, in a specified sequence, to improve the sustainability of the Case.

- **Tool:** Any possible action, option, or intervention to be included in a Strategy. Examples would include specific policies, technology deployments, social processes, communication programs, etc.

- **Procedure** (also known as a Policy Design Process): The organization of the Actors and the process steps used to design and implement the Strategy; how the Strategy is built and implemented. Procedures may, for example, be legislatively mandated processes within a national government, with well defined development, consultation, review and approval steps; or they may be voluntary processes initiated by civil society Actors.

- **Resources**: The physical, financial, social, or other immaterial requirements needed to implement a Strategy, use a Tool, etc. The implementation of a Strategy may also have feedback impacts on Resources as well.

- **Indicators:** Quantitative or qualitative values that are used to inform the Actors about the condition of a Context, Case, Tool, Strategy, etc. Indicators are the feedback mechanism back into the knowledge application process.

[14] This version of Ferrand's eight elements have been reorganized and somewhat modified from the original.

This framework can, at the very least, serve as the basis for a common, clear lexicon of terms (also known as an "ontology") for UNOSD to use in conceptualizing its work and communicating with its stakeholders. Using this architecture, Ferrand further recommended the development of several tools or aids in addition to the standard training, information, and networking services that are traditionally offered by centers like the UNOSD. Two of these recommendations are worth special mention in the context of this present report:

- **A web-based sustainable development planning and implementation system**, based the UNOSD knowledge model described above. Users would define their own Contexts, Cases, Procedures, etc., and then develop the overall Strategies and specific Tools to use in those Cases. The system would support them in finding the knowledge they need along the way, such as relevant case studies, guidebooks, or research papers. A user's activity and their expressed or inferred needs could also be monitored and — in the case of priority users, such as national sustainable development officers in developing countries — the user could be proactively assisted by UNOSD staff and guided to the information most relevant to her or him. Ferrand also developed a non-functional mock-up of how such a web-based support system might look. While the development of such a system may be currently beyond the resources available to UNOSD, the mock-up design provides a good illustration of a dynamic, integrated, pull-based system of support for UNOSD's target group.[15]

- **A global network of "SD Watchers"** who scan the scientific and professional literature on sustainable development and monitor relevant local developments (in their own languages), and then proactively submit to UNOSD those items of highest relevance and utility to the UNOSD user community. An excellent example of this kind of activity (already in existence for ten years) is the work of Japan for Sustainability, a non-governmental initiative that monitors and summarizes important sustainable development activities in Japan and publishes regular newsletters in English.[16] Such a network would serve multiple purposes in advancing the work of UNOSD, but principally it would ensure a dynamic flow of knowledge into the center.[17]

The Knowledge Management Strategy developed for UNOSD is a rich source of insights and ideas for responding to one of UNOSD's primary objectives: to help governments and stakeholders put the vast river of sustainable development knowledge to work. Its recommendations, and specifically its proposal for a web-based planning support system, should be considered carefully.

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[15] This mock-up is not included in the Knowledge Management Strategy paper cited above but is available in the slide presentations separately submitted by Dr. Ferrand and used in August 2011 pre-launch seminar of the UNOSD.

[16] See http://japanfs.org

[17] This recommendation harmonizes with the idea of a "Sustainability Transition Observatory" described in the "Concept Note on the Expert Group Meeting on Capacities and Knowledge Needs for Sustainability Transition" (UNOSD, Oct 2012). A related recommendation was offered in the Inception Report for the UNOSD, specifically a proposal to create a network of sustainable development libraries around the world, e.g., dedicated sustainable development collections in major universities, or the libraries of specialized sustainable development institutes. See Alan AtKisson, "Inception Report 2011-2012 - United Nations Office for Sustainable Development (UNOSD)," 2011, p. 17.

3.4. *The Social Dynamics of Sustainable Development Knowledge*

Sustainable development knowledge is vast. However, in recent years, researchers and practitioners have tackled and begun to tame its vastness by organizing their activities into a relatively small number of *integrative clusters* — which knowledge theorists might refer to as "discourses."[18] These clusters or discourses can be seen as strategies, pursued by communities of professionals, for the collective focusing of attention on actionable areas of work. A discourse can provide a coherent lens for the practical application of SD knowledge and tools, in a specific situation (a "Case" in the terminology introduced above), in a way that maintains the integrated nature of SD but puts boundaries around the knowledge space, limiting it to the minimum necessary level of complexity. The different discourses or clusters now in broadest use in SD also reflect the differing social, political, and academic interests and value sets of the people and organizations engaged with them, as well as their differing public identities and objectives.

It is beyond the scope of this report to catalogue all of these clusters or to analyze them in detail. The following is a selection, for illustration purposes, of four such discourses that are currently among the most visible at a global scale, followed by one "meta-discourse" that is engaged in studying the others. This analysis is one researcher's view, but it is the product of participating in a significant number of relevant conferences, meetings, and dialogues; reviewing a large number of documents and websites; talking at length with individual people working within those discourses; and other observations.

Green Economy. This is the topic or discourse that was proposed as a new, pre-eminent focus of attention for SD policy development and implementation at the Rio+20 conference. Green Economy groups together issues such as sustainable production and consumption, pollution reduction, waste management, water, biodiversity preservation (from better land use etc.), sustainable urban development and other knowledge topics related to changing national (or global, or local) economic systems and infrastructures to be more environmentally friendly and socially just. This cluster most strongly attracts practitioners from environmental ministries and NGOs, labor and employment specialists concerned with "Green Jobs," national governments with a strong commitment to carbon emissions reduction, and others who place the preservation of global ecosystems at a high level of priority. Prototypical website (The Green Economy Coalition): http://greeneconomycoalition.org/

Green Growth. While Green Growth may be seen as a subset of Green Economy, in practice the two topics attract very different groups of practitioners with somewhat divergent areas of priority. Green Growth is more engaged with knowledge domains related to industrial development, financing mechanisms, employment creation, and the government-based policy instruments that drive these. It has strong overlaps with Green Economy — for example in the area of sustainable production and Green Jobs — but attracts the engagement of different ministries (e.g. Finance), NGOs, think-tanks, and UN agencies. Green Growth also attracts more actors from business and finance than does Green Economy.
Prototypical website (Global Green Growth Institute): http://gggi.org/

Sustainability Science. Sustainability Science is an increasingly well-defined and

[18] For an excellent and readable introduction to "discourses" — the contexts within which groups of concepts are used — see David Weinberger, *Too Big to Know*, Basic Books: 2011, p. 90.

knowledge domain all its own, with specialized journals, textbooks, and associations. However, the phrase also functions as a meta-cluster for topic areas that attract (primarily) researchers and academics, and provides them an integrative platform for exploring sustainability-related topics from a trans-disciplinary perspective. Sub-clusters to be found within the discourse on Sustainability Science include Resilience Science, Global Systems Science, and Integrated Modeling among others. The focus of this discourse is on analysis, research, teaching and learning, with somewhat lighter couplings to policy processes and action programs (in contrast to Sustainability Transitions, where these couplings are much stronger, see below).
Prototypical website (Proceedings of the National Academy of Sciences, special section of the journal): http://www.pnas.org/site/misc/sustainability.shtml

Education for Sustainable Development ("ESD"). ESD is primarily identified with formal education programs and the United Nations Decade of Education for Sustainable Development (2005-2014). However, the discourse around ESD has fuzzy boundaries and often stretches to include broader processes of capacity building, at every level, from village to national government, including professional training and institutional development. ESD's topic areas can range across the entire map presented earlier, but the center of gravity for this discourse is the process of learning itself, and a philosophy of learning that emphasizes critical thinking, values, and ethics. Professional educators are obviously attracted to this discourse, but so are NGOs, consultants and trainers, human development experts, and even religious organizations.
Prototypical website (UN Decade for Education for Sustainable Development): http://desd.org

Sustainability Transitions. The phrase "Sustainability Transitions" refers here to a meta-discourse whose focus of interest is the process of large-scale change in an SD context. This discourse has deep roots in decades of social transition research generally; but it has now generated its own multiple, contemporary communities of practice for whom SD is a specific focus of attention. Academic researchers from social science disciplines are represented here, but also practitioners of various kinds, including development officials, consultants, and even community organizers (as in the Transition Towns movement). Theory and application are tightly interwoven here, for the goal of the sustainability transition work is usually described in terms of helping to accelerate change and to make change processes more effective.[19]
Prototypical website (Sustainability Transitions Research Network): http://www.transitionsnetwork.org/

There are many other such discourses operating under the general banner of sustainable development, and they are often clustered into seemingly specialized topics such as *Integrated Water Resources Management* (which includes social, environmental, and economic sub-disciplines) or *Climate Adaptation* (which involves land use, agriculture, human settlements, water, health issues, and many more). But even these specialized discourses are highly integrated clustering exercises that overlap with each other, and with the larger-scale integrative clusters similar to those noted above. All such discourses tend to develop their own story lines ("narratives") and lexicons ("ontologies") to create a shared sense of understanding and to explain why this particular way of framing the complexity of

[19] The author is indebted to François Fortier for identifying the shape and history of this cluster, and its role as a meta-discourse looking at change processes within other knowledge domains and cross-cutting SD discourses.

sustainable development is good (or even "best").

These strategies for coping with, or making sense of, the complexity of SD knowledge also overlap with this report's two other focus topics: capacity building and networks. Most of these knowledge discourses happen within networks, often formally constructed. For example, the discourse on the "green economy" has been developed, explored, and championed by a network called the Green Economy Coalition (website above) that includes UN agencies, NGOs and think-tanks. Green Growth is promoted by several formal networks, among them the network of governments, consultancies, and UN actors participating in the Global Green Growth Institute (GGGI, website above). Sustainability Science has, as noted, its own networks as well as sub-networks, such as the Resilience Alliance (on resilience science in a sustainability context) or the Balaton Group (on system dynamics and sustainability). Both of these latter networks also overlap into Sustainability Transition as well, with specific groups of individuals often acting as bridge figures who ferry news and knowledge advances between them.

These networks, in turn, often develop their own capacity building programs (as in the case of the GGGI), or serve as knowledge resources to other formal programs (as the Balaton Group does with LEAD International, a large international capacity building program).

In sum, the challenge of managing knowledge for sustainable development is intimately bound up with the process of creating and sustaining networks, and with the process of sharing that knowledge through capacity building.

3.5. *Recommendations*

Many of the general recommendations offered in Section 2 are knowledge-related, but here are several additional recommendations to UNOSD that are more specific to the topic of knowledge for sustainable development and based on the above analysis. These recommendations can also be seen as relevant to the task of developing the UNOSD knowledge portal on the Internet.[20]

3.5.1. *Provide users with unbiased guidance on the substance of SD knowledge generally and on SD knowledge clusters specifically.*

The clusters or discourses identified above are not value-free and tend to attract different interest groups. The UNOSD, in working with a wide diversity of countries, needs to establish itself as an "honest broker," not favoring one discourse over another. For example, it should not perceived as leaning more to "Green Economy" than to "Green Growth," or as being a champion of "resilience thinking" but ignoring "system dynamics." It should provide clear, unbiased guidance on all the most serious frameworks for engaging with SD's complexity, and on how these discourses fit into an overall strategy and plan for national transition.

[20] Note that in Section 6 there are additional recommendations on both additional knowledge content topics and on how UNOSD should related to new, technical tools for managing and interacting with knowledge.

3.5.2. ***Actively assist member states in translating the accrued practical knowledge on sustainability transitions to their own specific goals and situations.*** The meta-discourse on sustainability transitions described above can be applicable to any other SD discourse, or to national implementation processes. UNOSD can act as a translator between this (largely) academic and analytical discourse and the needs of UNOSD's principal target group, developing country officials. Regardless of which cluster or clusters those countries choose to embrace, UNOSD can, through its capacity building programs and knowledge portal, support officials in identifying the tools and resources they need to make the transition they seek.

3.5.3. ***Translate complexity into simpler, more practical terms.***
Many knowledge domains in sustainable development, and several of the leading discourses, tend to create formal or informal "communities of practice" (see next section). These communities, in turn, often tend to use complex concepts, analyses, and language, which become barriers to entry for newcomers. As a "boundary organization," UNOSD needs to act as a translator between these communities and the national leaders who must put the ideas to work. To make things simpler does not mean making them simplistic: it means finding effective ways to present and explain complexity, and to engage UNOSD's users in a process of exploration. Good communications practice on the part of UNOSD will help government officials and others grasp and use SD concepts in appropriate, practical ways — concepts that might otherwise seem impenetrable to them.

3.5.4. ***Further develop the UNOSD knowledge model into a useful and practical tool.***
The model first proposed by Ferrand (and slightly modified here) holds promise as a methodology for helping national-level SD decision makers grapple with challenging tasks. Whether or not it is used to structure a web-based planning system, the model can help the UNOSD to structure its own, internal knowledge management work, and thereby better serve its target audience with clear guidance about what kinds of knowledge are most useful to them, in what contexts.

3.5.4. ***Get UNOSD users involved in UNOSD's knowledge processes.***
Ilan Chabay, an expert in systems modeling and learning for sustainability, noted in an interview for UNOSD that developing countries will be better able to use knowledge if they are also *involved in the process* of capturing it and communicating it. He recommends making UNOSD's knowledge management development process into a "mutual learning opportunity," so that it does not become a top-down exercise. This can be done in a synergistic fashion with UNOSD's network development activities, and the development of UNOSD's knowledge products and services can provide one of the principal tasks around which a core of engaged officials and stakeholders can interact on a regular basis. Getting them involved will create buy-in and will follow the general best-practice advice on network development by keeping it focused on a mutual, meaningful task that produces beneficial results.

4. Capacity Building for Sustainable Development

In preparation for this report, a review was conducted of existing capacity building programs that focus on sustainable development and closely related concepts, such as the clusters identified in the previous section. A distinction here is made between capacity building and formal education: schools and universities obviously build the capacities of their students, and "Education for Sustainable Development" is a major cluster or discourse in the field, with its own dedicated institutions and a UN "Decade" initiative. This report focuses more on the process of building capacity in working professionals, such as government officials, business managers, or civil society leaders, including the processes of institutional strengthening and process development that are part of the modern capacity building approach.

The phrase "capacity building" incorporates within it other terms such as "training," "professional development," and "professional education." It may also, depending on the user, include broader processes such as "community development," the improvement of institutional arrangements, and the strengthening of accountability mechanisms, as well as general educational activity. The more common general phrase used in development circles is "capacity development," but to avoid repetition and confusion (capacity *development,* sustainable *development*, etc.), this report follows United Nations convention and uses "capacity building" to refer to all these activities.[21]

Capacity building is such a central activity in the process of sustainable development that it receives special treatment (its own sub-headline) in the Outcome Document of Rio+20, *The Future We Want*, as part of the section on Implementation:

> We emphasize the need for enhanced capacity building for sustainable development and, in this regard, we call for strengthening technical and scientific cooperation including North- South, South-South and triangular cooperation. We reiterate the importance of human resource development, including training, exchange of experiences and expertise, knowledge transfer and technical assistance for capacity-building, which involves strengthening institutional capacity, including planning, management and monitoring capacities. (*The Future We Want*, 2012, Paragraph 277)

Drawing boundaries around what constitutes capacity building is challenging, but for the purpose of this report, we surveyed formal capacity building programs presented by institutions that explicitly frame and promote training and educational offerings in the context of sustainable development. We included closely related terms such as green economy. We looked primarily at offerings in English (which appear to represent the bulk of higher-profile offerings in an international context), but we included a few programs where German, French, or Spanish is the principal language. For the complete, annotated list, see Attachment 2.

[21] For a general definition of "capacity development", see the online journal *Capacity.org*: http://www.capacity.org/capacity/opencms/en/topics/introduction-to-cd/index.html. UNDP also links capacity development to "drivers of change" and offers a useful explanation of this at <http://www.undp.org/content/undp/en/home/ourwork/capacitybuilding/drivers_of_change/>

Note that not all the programs we reviewed incorporate, in their actual offerings, the wider definition of capacity building described above. Many appear limited to professional training courses aimed at individuals — though of course, some of these training courses are also schooling and supporting their participants in that wider process of capacity building that includes institutional and process development. Determining the exact extent to which these programs include broader institutional processes, including transition processes, was beyond the scope of this report; but it appears that most programs are evolving in the direction of that broader conception of capacity building.

4.1. *The SD Capacity Building Landscape*

Formal capacity building and professional training programs related to sustainable development are offered by a diverse range of institutions, including agencies of the United Nations (UNEP, UNITAR, UNIDO, World Bank, etc.); national government programs in development cooperation (Germany's GIZ, Sweden's SIDA, the UK's DFID); universities (sometimes in alliance with their governments); and independent non-governmental organizations. The types of offerings range from post-graduate degree programs of one to two years, to training seminars lasting a few days or weeks, to online courses that can be completed in a few hours. Topics on offer are as diverse as the knowledge domains mapped in the previous section.

Characterizing this extreme variety presents its own challenges, but the following analysis attempts to describe these current offerings in general terms, based on a desk analysis of the 55 capacity building programs we identified and reviewed, and on a limited number of interviews and informal conversations with service providers.

Relevance to UNOSD's mission. We rated all the programs reviewed in terms of their *relevance* to UNOSD, using a simple (and subjective) "Low", "Medium", or "High" scoring system. "High relevance" means that a capacity building program closely mirrors UNOSD's terms of reference by being focused on the broader "big picture" of sustainable development (rather than a single issue or cluster of issues); offering in-depth training opportunities to national or international decision-makers; and serving a global or highly international audience. Of the 55 programs reviewed, only 10 appear to meet these criteria. Of those, only one was based in Asia (linked to UNU in Tokyo). Note that "Low" still means "Relevant": *all* the programs included here are considered important enough for UNOSD to be aware of them. "Lower relevance" (21 entries) might include programs with a few sustainable development aspects, for example, or offering knowledge and skills of significant importance to integrated SD, but not focused on SD *per se.* For example, there are many programs focused on traditional development, without a sustainability dimension. In the Medium category (24 entries) are to be found, by way of illustration, programs such as those offered by ICLEI or the UN Center for Regional Development, which have a similarly broad approach to sustainable development as UNOSD, but which are targeted specifically to local or sub-national officials.

Diversity of service providers. No one sector dominates the provision of these capacity-building services, which are spread relatively evenly among agencies of the United Nations, other multilateral organizations, national government-sponsored programs, academic institutions, and non-governmental organizations (see Figure 1).

Focus on government and civil society. We identified seven key target groups based on a review of program websites: (1) National-level policy makers; (2) Civil servants & local government officials; (3) professionals in international agencies & NGOs, (4) sustainability professionals working as consultants, trainers, advisors etc.; (5) people from academic or research institutions; (6) university students; and (7) people working in business and the private sector. Nearly all programs surveyed offer course options that are appropriate to more than one target group, but most appear to target their offerings to a mixture of government officials, civil servants, and civil society leaders. National policy makers are served by less than half of the programs on offer. Sustainability professionals (e.g. consultants or people seeking general leadership and management skills in the field) are served by slightly more than half, as are the professionals in international agencies and NGOs. Note that the business sector, which is not often targeted by these programs, is also served by a large number of private sector training companies and consultancies with more specialized business competencies; these targeted private-sector training firms were not a strong focus for this initial scan of the capacity building programs on offer. (See Figure 2.)

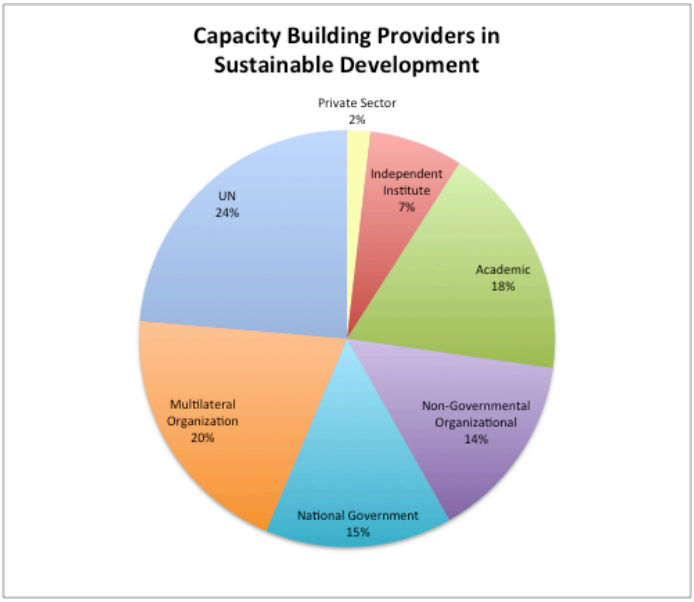

Figure 1. Distribution of providers by sector

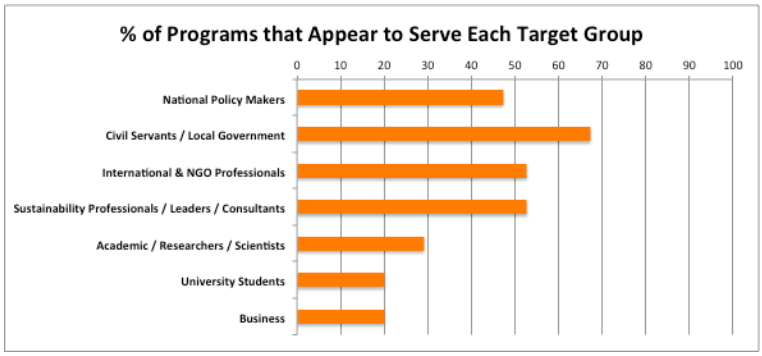

Figure 2. Distribution of providers by target group coverage

Global rather than regional.
More than half of these programs appear to recruit participants from anywhere in the world, mixing developed and developing countries for example. Another one-fifth focuses on developing countries, without any regional designation. Combined, these two categories account for nearly three-quarters of the programs on offer. The remaining programs in this survey have a more specific regional focus, e.g. on South Asia or Latin America. Only one program appeared to have Africa as its special focus, but Africa is solidly included in the programs labeled "Global" or "Developing Countries." (See Figure 3.)

Differing standards of competency. Some programs have defined a formal set of competencies (knowledge and skills) that practitioners of sustainable development should have. These competency maps are linked to program course offerings, with some offering formal certification once the participant has taken all the required classes and/or demonstrated acquisition of the competencies. However, this research did not identify any

current effort to define a set of competencies that is common to all such programs. The situation might be compared to an international group of universities where the standards for degree programs are not harmonized, which forces the students to figure out what the correspondences are, negotiate between institutions for recognition of their other training experiences, and explain to employers the meaning and value of their certification (if they have received one).

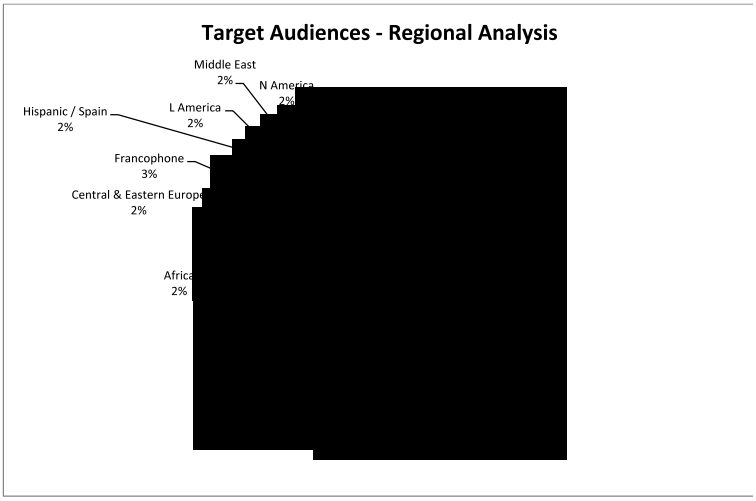

Figure 3. Distribution of providers by target region

Competitive marketplace. These service providers are often in competition for participants from the same overall body of sustainable development officials and other professionals. Most funding comes from development aid, and in aid-funded programs, demand appears to outstrip supply: programs can afford to be selective about which applicants they accept, and shrinking development aid budgets are likely to exacerbate this trend. The competition for resources also includes a competition for people's time: the quality and value of a training program must be worth the investment involved in traveling abroad and being away from one's core work functions. (Note that the programs listed in Attachment 2 can also be seen as competitors to UNOSD, as it begins to offer formal capacity building programs, particularly those programs in the "High Relevance" category.)

A diversity of tools and methods. Some programs offer courses in generic skills such as "report writing" or "increasing your impact," but many, if not most, appear to use defined tools and methods for exploring and implementing sustainable development. The strong tendency among these programs is to offer "home-grown" tools and methods, often with their own brand names and logos, rather than adopting existing tools. Large programs such as GIZ's "Capacity Works," to cite one example, have their own extensive, highly developed toolkits; they run special training courses and certify staff and consultants in their use and application.[22]

No overall coordinating body. While there are some networks that provide links among some of these capacity building programs in various ways (as noted in the previous section on Knowledge), we found no evidence of any overall network, formal or informal, that specifically links, catalogs, or coordinates communication among capacity building programs for sustainable development. This is one of the gaps that UNOSD is intended to fill, and this review of the field underscores the need for this function.

4.2. *Recommendations*

Based on this analysis and our consultations with experts in the field, this report recommends the following:

[22] Even when the use of specific tools and methods is mandated in a development aid system, as is Capacity Works (a management toolkit for development programs) in the context of GIZ, diffusion and adoption of such standardized tools and methods is uneven at best (as one interviewee reported).

4.2.1. *Conduct a larger, more formal survey of SD capacity building programs.*

While every effort was made to find and analyze a large representative sample of programs, this report is not comprehensive, particularly with regard to programs in other languages. Using this report as a starting point, UNOSD could commission of study of such programs that provided (1) a more thorough understanding of what is available and what the gaps are, (2) more characterization of the content of those programs and what certifications they offer, (3) some empirical data on the effectiveness of these programs (e.g. through participant or graduate surveys), and (4) the basis for a more expanded portal service (see next item).

4.2.2. *Map those programs on the UNOSD portal.*

"Map" means building a literal map, showing the location of these programs, but it also means developing a searchable catalog so that users can quickly locate a program that meets their needs. The categories and tagging strategies could identify programs that are allied with key clusters and discourses as described earlier, describe the toolkits used in general terms, and offer advice about which programs are most appropriate to which type of professional. Such a portal does not appear to exist at this time.

4.2.3. *Build a super-network of capacity building programs for SD.*

There are many kinds of networks, and this recommendation proposes the "lighter" variety: a UNOSD-edited list of programs (which would appear on the portal), and a moderated broadcast channel for spreading information among them. The UNOSD list could include other networks, such as UNDP's Teamworks, that are not specifically SD-related — and potentially encourage them, either actively or passively, to orient their programming in an ever more sustainable direction. Note that this recommendation does *not* include the idea of defining shared standards of competency or certification, though if demand for such activity emerged, UNOSD could consider hosting an international process. (The UN should not get into the business of setting competency standards, but it could provide a hosting platform for such multi-stakeholder dialogues to occur.)

4.2.4. *Design UNOSD's own capacity building programs with transition and change in mind.*

In this context, "transition" and "change" have slightly different meanings, with "transition" referring to the over-arching process of political, institutional, and social transformation, and "change" referring to the specific management challenge of initiating and successfully implementing organizational-level changes. Both are critically important, and the success of the former is often entirely dependent on the skills and capacities of those attempting to do the latter. Interviewed for this report, the Deputy Director of Wageningen's Center for Development Innovation, Wouter Hijweege, said that "the new UN office [needs] to find a balance in addressing the skill development of individuals with more organizational change and institutional level challenges, as these need to complement each other." Other experts confirmed this view, noting that change management skills are often skipped over or considered of minor importance, when in practice, such skills are critical to the success of implementation.

5. Networks for Sustainable Development

"Networks" are defined here are formally constituted organizations or programs whose purpose is to link diverse practitioners or organizations together via communications channels, as well as through physical meetings, and to spread knowledge and information among the network members. Networks of this kind in the field of sustainable development are also referred to as "communities of practice" and "knowledge sharing programs," among other terms.

In considering formal networks for SD, it is important to recognize that there exist many networks *within* organizational boundaries that do not show up in such a scan because they are not self-identified as "networks." We do have one self-identified, intra-organizational network in this review — connected to the World Bank, and linking together people across its many departments and divisions — but this exception underscores the rule. Within organizations, especially global organizations, people use intranets, email, staff meetings, and other tools to do exactly what self-declared "networks" do between and among people and organizations that are not otherwise formally related to each other. This report did not attempt to survey this type of intra-organizational activity, which is often invisible externally yet is highly relevant to the topic of this report.

Networks are created for a number of different purposes. Knowledge sharing is perhaps the most common reason to form a network for SD, but it is hardly the only possibility. Network theorist and practitioner Steven Waddell identifies six separate "desired outcomes," or purposes for networks[23]:

1. Accelerating the spread of knowledge
2. Realizing benefits of scale (i.e., creating a larger if looser entity out many smaller ones)
3. Innovating
4. Enhancing coherence (e.g., aligning activities in an effort to achieve a common goal)
5. Improving coordination (e.g., to reduce conflicts or to develop common standards)
6. Integrating resources, knowledge, and skills (i.e., bringing people and organizations together to create synergies and improve effectiveness in a joint effort)

Of the 70 networks we reviewed for this report, most seem to be "Category 1" networks in Waddell's typology. A smaller number — mostly of the Academic or Research variety — are focused on innovation or on integrating skillsets (Sustainability Transition networks often fall into this category). Fewer in number are goal-oriented networks attempting to achieve a collectively shared outcome of some kind, though these do exist (the Green Economy Coalition is an example). In general terms, sustainable development networks tend to be "looser" rather than "tighter."

[23] Steven Waddell, *Global Action Networks: Creating Our Future Together*, Palgrave McMillan, 2010, p. 22 (cited with permission of the author). See <http://networkingaction.net>.

As with competency building programs, we scored the SD networks identified by our survey according to their apparent relevance to the mission of UNOSD. "High relevance" in this instance describes a network that links people and/or organizations together under the broad umbrella of sustainable development, on a global or highly international scale. They may be topical networks (e.g. a network on sustainable tourism); but within those topics, they embrace a comprehensive vision of sustainable development, are highly active, and seek to empower their members to be more effective in their work. "Lower relevance" networks are weaker, or less active, or more distant from overarching sustainable development concerns (while still being relevant and worth noticing).

We identified 17 networks of High Relevance to UNOSD, and 33 of Medium Relevance — that is, there appeared to be a somewhat higher density of relevant networks as compared to capacity building programs. At the time this report was being completed, new networks were still appearing regularly on our horizon as well. The following analysis of the SD Network landscape should therefore be taken as provisional and subject to change as information continues to be gathered. For the complete annotated list, see Attachment 3.

5.1. *Analysis of the SD Network Landscape*

A predominantly global focus. While some networks are region- or even country-specific, the great majority of them are global in their reach. Many are tied to specific international conferences or associations with global memberships. Based on a cursory scan of available information, it appears that regional networking needs are often met within these global networks, as sub-networks or themes of discussion in online fora. This may partly account for the distribution we see in this data. (See Fig. 4)

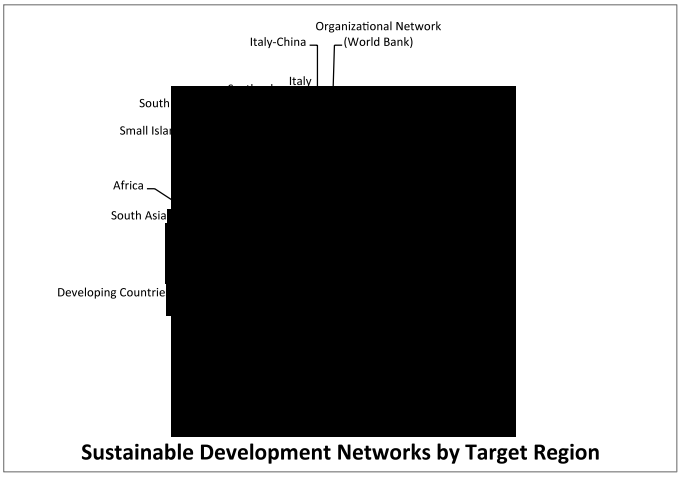

Figure 4. Distribution of SD networks by regions served

A wide diversity of sectoral focus areas. It is somewhat surprising to note the wide distribution in terms of sectoral (and topical) focus: one might expect larger clusters around e.g. climate change or urban sustainability issues. Generalist categories do predominate ("Academic/Research," "Development"). It is in the nature of networks generally to be inclusive, so a network classified as focused on "Energy" will undoubtedly have cross-connections to "Climate Change," "Academic/Research," etc. This classification should not be seen as rigid, but rather as indicative of the diversity in the SD network landscape. (See Fig. 5)

Divergent vitality and lifespan. We noticed during this survey that a number of networks had "died" but left their websites behind, looking as though it were still active (at least one "SD network corpse" was over ten years old). Some other networks, judging from their public postings, had long periods of inactivity followed occasional bursts of communication. It is difficult to analyze the vitality of SD networks generally, or characterize their lifespans,

except to say that they are highly variable and usually dependent on the consistent moderating presence of a few individuals. Only one network in this database is more than 30 years old (the Balaton Group); only a few are 20 or more, usually dating to the launch of Agenda 21 (e.g. ICLEI, the Earth Charter Initiative, LEAD International). Most networks are much younger than that, and many appear to have lifespans of just two to three years. Waddell notes that networks rarely break up in conflict; they "just sort of die away and stop being relevant to people's needs."[24] SD networks, in particular, seem to follow this pattern.

Focus of SD Networks

Sector or Topical Cluster	#
Academic/Research	9
Development	8
Education	7
Multilateral Institutions	6
Energy	5
NGO	5
Development Finance	4
Government	4
General (All Sectors)	4
Urban/Community	3
Business	3
Climate Change	2
Government & Business	2
Tourism	2
Trade	1
Civil Society	1
Information Technology (IT)	1
Science	1
Trade	1
Total	**70**

Figure 5. Number of SD networks serving each sector or topical cluster

Non-transparent governance. Given the very uneven nature of their vitality and lifespans, it would be useful to know more about how these networks are governed, so that UNOSD users might have greater chances of success in developing or maintaining networks in their home countries. Waddell, in an interview conducted for this report, notes that successful network governance is often counterintuitive, especially from a governmental or large institutional perspective. "A big challenge for governmental people is that they want to create [network governance] structures with a degree of definitiveness that actually creates problems," he notes. Networks are more likely to succeed when they first "focus on meaningful work ... and on building an atmosphere of mutual trust. Let the structures evolve out of how you actually work together." He further advises getting clear first on the shared outcomes and mutual benefits the network aims to produce for all its members, and to be explicit about these expectations in written form. The history of the longer-lived network noted above fit that prescription perfectly; but little to no similar governance information is transparently available on the majority of networks included in this survey.[25]

5.2. *Recommendations*

5.2.1. *Perform a more in-depth analysis of selected SD networks.*

As with capacity building, the mission of UNOSD is likely to be well served by taking a more detailed look at selected SD networks, perhaps through a commissioned academic study. That study could include an analysis of their goals, governance, knowledge content, and impact (on members as well as on the world) to extract lessons learned, develop case studies, and create guides for good practice.

5.2.1. *Establish UNOSD's portal as a "network of networks."*

As with capacity building, there appears to be no current aggregator site for finding and linking up with existing, SD-relevant networks. UNOSD can use the findings of this report as a starting point and easily begin to fill this role. This will immediately establish UNOSD as an indispensable part of the SD networks universe and potentially provide multipliers for

[24] Personal communication, 7 Nov 2012.

[25] The author has personally interacted with (and in two instances directed) several of the longer-lived networks as well as with numerous younger ones; this observation is based on that personal experience.

UNOSD's own outreach efforts.

5.2.1. ***Use existing knowledge to design UNOSD's own network(s) for success.***
The findings from this report and the key resources already identified provide ample guidance for how UNOSD can and should pursue the process of building its own knowledge sharing and practice networks. Specifically, UNOSD should (1) focus on defining shared outcomes and benefits in clear terms; (2) mix live meetings with virtual network activity (virtual activity alone is not seen as effective); and (3) ensure that there is active, sustained facilitation in any network it creates, so that those benefits are realized. This will establish a virtuous cycle: participation-creates-value-creates-more participation.

6. Expert Consultations: Summary of Additional Input

In the course of producing this report, we interviewed or otherwise consulted with over 30 sustainable development experts whose work closely intersects with issues of knowledge, capacity building, and networks. Many of their insights have been integrated into the main body of the report. Here we provide a selection of their other views and suggestions that did not fit within the confines of the main body of the report, or that were not explicitly included in the main recommendations. These inputs are organized by category, with key words and phrases emphasized in **bold** for easy reference.

6.1. *General Reflections on Knowledge and Sustainable Development*

- "UNOSD should define a **competency framework** that specifies the relevant knowledge and skillbase of the practitioners it aims to serve." The definition of that framework should be done in a participatory manner, working with representatives of the target audience, and in comparison (or contrast) to other knowledge and learning challenges.

- There is a need for **prioritization among the relevant knowledge domains**: "UNOSD needs to be able to know, what areas of knowledge are most important for this person, in this context?" Another expert put it this way: "I want to know what people need to know, in order to act in a sustainable way."

- Many experts noted the importance of understanding and **not duplicating the role of other UN agencies** — especially UNESCO, and the UNU Regional Centers of Expertise. Surveying the state of capacity building on a regular basis, looking across the UN system but also beyond it, could be a useful function for UNOSD.

- The target audience for UNOSD's work should, if possible, also **include UN staff, in alignment with the One UN philosophy**. UN staff are perceived as also needing to improve, continuously, their understanding of SD knowledge if they are to interact effectively with country actors.

- **Success stories and successful role models** are usually the most powerful way of conferring knowledge in a convincing way. [Note: The Asian Development Bank has done recent work on using storytelling to support knowledge sharing for development. See: http://www.adb.org/features/ahead-curve-long-reach-short-tales]

6.2. *Critical Needs*

- There is a **gap in capacity for strategic foresight** on the part of most countries. In part, the gap is institutional, and it is not limited to developing countries: even the U.S. has closed its Office of Technology Assessment. But the gap is also in the capacity for individual policy makers to fully grasp and weigh the consequences of actions, or to project current conditions into the future.

- **Making investments** in capacity building itself, and in the professionals who do capacity building, is currently under-prioritized. Most nations have a need either to scale-up that function, or to have a good partnership strategy in order to meet emerging and growing needs.

- Given the level of need, it is important to focus on **"train-the-trainer" level programs** that spread the capacities.

- It is critical to **support the *process* of planning and decision-making**, the "how-to" of implementing SD. In part, this means looking backward and capturing the tacit knowledge and reflective learning — "We did this, it didn't work, so we tried that, and it did work" — and in part it means providing tools and support to make planning and decision-making for SD more effective right now.

6.3. *Topics of Special Interest*

- Identifying **tools for understanding and responding to the inherent complexity of SD** was a central topic for many experts. It linked to a general and fundamental need to understand SD in systemic terms — i.e., in terms of the connections among issues, the driving forces, and the chains of cause and effect that amplify problems or support the spread of solutions.

- Linked to the issue of managing complexity is the need to develop understanding and capacity around **decentralized and participatory governance techniques**, including participatory budgeting.

6.4. *Technical Issues in Knowledge and Data Management*

- As a knowledge center, UNOSD needs to be fully versed on current/emerging topics such as the **semantic web, open data, cloud computing, and "linked open data clouds"** (where every piece of data has its own permanent URL).

- **New knowledge/data management tools** such as dbpedia.org could be useful in helping UNOSD to build customized interfaces into crowd-sourced knowledge flows such as Wikipedia.

- UNOSD should also **track developments at cutting edge research institutions** such as the MIT Center for Collective Intelligence (http://cci.mit.edu/). Familiarity with the advances at centers of this kind was seen by one experts as critical to the credibility of UNOSD: "If you're not there [that is, engaged with these technical discourses],

you're not a thought leader."

6.5. *Additional Miscellaneous Recommendations*

- UNOSD is recommended to add the topic of **justice systems for sustainability** to its list of core topics, and to consider the work of the World Future Council, which has done research on the emergence of new "ombudsman" functions in national governments that focus on environment, sustainable development, and the wellbeing of future generations. See: http://futurejustice.org

- One of the "flows" of knowledge that has special importance in SD is knowledge of **incentive and sanction systems** (carrots and sticks) that can steer the behavior of social and economic systems, as well as individual choices, in more sustainable directions. UNOSD could also look into the recent use of so-called "nudge" techniques, which link behavioral science to policy-making and implementation, and consider teaching these techniques to policy makers to promote sustainable development.

- UNOSD should help countries build **the social capital and cultural dimension** of knowledge and capacity development. One needs to build a cadre of knowledgeable and capable people in an organization who can have a continuous sense of rapport.

- UNOSD could consider "investing in a number of **high quality simulation projects**" that could function as learning laboratories for making policy decisions in a time of increasing uncertainty. These simulations could help policy makers find "no regrets" action steps that improved sustainability and resilience, e.g., in the fact of climate change.

- Training programs at UNOSD should be done with **mixed country groups using carefully structured and facilitated dialogue processes**, so that everyone is free to speak, everyone listens, and a "group narrative" is built up during the course of a training session. "Set clear ground rules," said one expert, "so that the *de facto* censorship is removed from these meetings."

Attachment 1

List of Experts Consulted

Consultations varied in form and included formal hour-long interviews, group discussions, short informal conversations, and email exchanges.

Jose Arribas, International Coordinator, Eco-Union, Barcelona, Spain
Ilan Chabay, Senior Fellow, Institute for Advanced Sustainability Studies
Alexander Chikanov, President, Rostock Group, Russia
Robert Costanza, Editor-in-Chief, Solutions Journal
Shyamasree Dasgupta, Jadaypur University, India
Prof. Bert de Vries, Utrecht University, The Netherlands
Nils Ferrand, Senior Researcher, IRSTEA, France
Kimo Goree, Director, IISD Reporting Services
Jamila Haider, PhD Candidate, Stockholm Resilience Center, Sweden
Axel Klimek, CEO, ISIS Academy and consultant to development organizations, Germany
Noeleen Heyzer, Executive Secretary of United Nations Economic and Social Commission for Asia and the Pacific
Wouter Leen Hijweege, Deputy Director, Centre for Development Innovation, Wageningen University, The Netherlands
Prof. John Holmberg, Vice-Rector for Sustainable Development, Chalmers University, Sweden; UNESCO Chair
Phonchan ("Newey") Kraiwatnutsom, Coordinator, Ashoka, Thailand
Ashok Khosla, Director, Development Alternatives; immediate Past President, IUCN; immediate Past President, Club of Rome
Cuauhtémoc Leon, Senior Advisor and Consultant, Centro de Especialistas en Gestion Ambiental, Mexico
Prof. Diana Mangalagiu, Smith School, Oxford University, UK
Nora Mzavanadze, Central European University, Hungary
Gillian Martin Mehers, Bright Green Learning / LEAD International, Switzerland
Adam Pawloff, Center for Global Change and Sustainability, University of National Resources and Applied Life Sciences, Austria
Prof. Laszlo Pinter, Central European University, Hungary
Prof. Vala Ragnarsdottir, University of Iceland, former Dean, School of Engineering and Natural Sciences
Prof. John Richardson, American University USA / University of Singapore
Prof. Chirapol Sintunawa, Mahidol University, Thailand
Hugo Lucas, Director of Policy Advisory Services and Capacity Building (PACB), IRENA
Prof. Kevin Noone, Stockholm University and Director, Swedish Secretariat for Environmental Earth System Science
Aromar Revi, Director, Indian Institute of Human Settlements (IIHS)
Beth Sawin, Co-Director, ClimateInteractive.org
Prof. J. David Tabará, Autonomous University of Barcelona, Spain
Prof. Natalia Tarasova, Director, Center for Sustainable Development, Mendeleev University, Moscow; UNESCO Chair in Green Chemistry
Steven Waddell, Founder, Networking Action, author, Global Action Networks
Stephanie Weis-Gerhardt, Consultant/Advisor on Sustainable Development, Germany
Janos Zlinsky, Head of Strategy & Research, Regional Environmental Centre, Hungary

Attachment 2

Mapping UNOSD's Priority Areas of Engagement: A Preliminary Analysis

The following chart indicates areas where UNOSD might consider concentrating its work. This is a preliminary representation that requires considerable reflection and discussion; hence it was not included in the main body of this report.

In this matrix, dark colored squares indicate proposed core focus areas. Light colored squares indicate secondary focus areas. White indicates areas where UNOSD is not likely to be engaged. All terms are explained below, and explanations are offered for the different levels of prioritization recommended in the chart.

	Scientific	Technical	Socio-Political	Procedural
Knowledge Creation				
Knowledge Inventory				
Knowledge Translation				
Capacity Building				
Policy Facilitation				

The four categories across the top represent a development pathway from original scientific research and insight (including social science); to technical applications such as new technologies or economic mechanisms; to socio-political implementation strategies such as laws, consultation processes, or cultural change programs; to procedural matters pertaining to the details of implementation in institutional environments (i.e. bureaucratic systems).

Knowledge Creation refers to original research or innovation. UNOSD is not likely to be engaged in original scientific research or technical innovation. However, its research is very likely to produce new knowledge in the socio-political strategy arena. Creation of new knowledge on implementation at the level of institutional detail will no doubt spin-off from this research, but procedural innovation *per se* should not be a primary priority.

Knowledge Inventory refers to scanning, capturing, and cataloguing relevant knowledge. UNOSD needs to maintain a substantive familiarity with scientific and technical advances in sustainable development, but it can largely rely on secondary, or occasionally tertiary (e.g. reliable journalistic), sources for much of this information. Given the enormity of the knowledge flow, UNOSD's own inventory activities must be highly selective. UNOSD

should concentrate its inventory efforts on maintaining very up-to-date information on socio-political strategies for the adoption and implementation of sustainable development, and on procedural advances for integrating SD into the institutional life of (largely national) governments.

Knowledge Translation refers to communication and presentation activities that effectively translate and transfer high-priority knowledge into formats, channels, and forums that are meaningful for UNOSD's target audiences. In practice this involves the creation of knowledge products (websites, training curricula, executive briefings) and processes (seminars, dialogues, micro-content feeds). Knowledge translation is a high priority activity for UNOSD: it needs to make the flow of *highly relevant* scientific, technical, and socio-political knowledge accessible and useful to lead actors in developing countries. Procedural matters are slightly less prioritized here because these generally require less translation to be meaningful to an audience of largely government-based professionals.

Capacity Building refers to activities such as trainings, simulations, institutional assessments, and individual coaching sessions designed to increase the ability of lead actors to comprehend, select, and use high priority knowledge in the process of implementing sustainable development. UNOSD's efforts here must stretch across the whole science-to-procedure spectrum: for example, it may need to help officials to understand climate science, new energy technologies and policies, the politics and economics of promoting those new energy technologies and policies in a national government, and procedures for implementing those changes in a trans-departmental context. UNOSD should nevertheless concentrate its efforts on the socio-political and procedural end of this knowledge chain. Deeper capacity formation on the science and technical level is best left to other institutions and programs.

Policy Facilitation refers to active engagement by UNOSD, at a national or multi-national government level, in supporting the process of making decisions and implementing them. UNOSD must necessarily be selective in engaging at this level, for capacity reasons of its own. When it does engage, however, it needs to "cover the spectrum" while concentrating its efforts on helping countries grapple with the technical choices (which are often complex); and then it needs to help with the social and political process of adoption and adaptation. Procedural matters can largely be left to the countries themselves, but UNOSD should not step fully back, since procedural issues can sometimes be a deciding factor in the success or failure of a sustainable development policy initiative.

It is recommended that this chart and the accompanying recommendations be taken as a starting point for a strategic discussion within UNOSD focused on where, and how, to concentrate its knowledge and capacity building efforts to greatest effect.

Attachment 3

Database of Capacity Building Programs

Attachment 4

Database of Networks

Attachment 5

A Selection of Additional Sources and Resources

These Attachments are separately appended in spreadsheet format.