Biodiversity: Science and Governance Bulletin

A Daily Report of the International Scientific Conference "Biodiversity: Science and Governance"
Published by the International Institute for Sustainable Development (IISD)

Daily Reports and Web Coverage at http://www.iisd.ca/sd/icb/
Volume 100, No. 2, Wednesday, 26 January 2005

HIGHLIGHTS OF THE INTERNATIONAL CONFERENCE "BIODIVERSITY: SCIENCE AND GOVERNANCE": TUESDAY, 25 JANUARY 2005

On Tuesday, participants to the International Conference "Biodiversity: Science and Governance" convened in Plenary throughout the day. They addressed status and trends of the world's biodiversity in the morning, and social and ecological benefits of biodiversity in the afternoon.

PLENARY

STATUS AND TRENDS OF THE WORLD'S BIODIVERSITY: Mary Arroyo, University of Chile, chaired the plenary session on status and trends of the world's biodiversity.

Georgina Mace, Zoological Society of London, presented a global audit of biodiversity status based on three assessments: the Millennium Ecosystem Assessment, the World Conservation Union – IUCN Global Species Assessment, and WWF Eco-regions. Regarding the intra-species level, she said information is sparse, data is restricted to species essential to food and agriculture, and information on populations is limited to regional scales and vertebrates. Regarding the species level, she noted that information and data are restricted to large species groups, and species diversity ranges from 5 to 30 million with only 2 million identified. She stressed that the estimated extinction rate for different species ranges from 1 to 12 million species per year, and that 12 to 52 % of species within higher taxa are threatened with extinction according to the IUCN Red List. Regarding ecosystems, she explained that habitat loss has been constant and is expected to continue. Mace further highlighted: significant gaps in knowledge, especially on certain key taxa such as invertebrates, plants, and fungi; the need to assess biodiversity trends on the basis of comparable measures over time; a paucity of studies at the genetic level; lesser knowledge of marine and freshwater habitats than of terrestrial ones; and poor understanding of the impacts of biodiversity changes on ecosystem services.

Michael Donoghue, Yale University, presented challenges in documenting and classifying biodiversity. He described the role of human population growth in habitat destruction and biota homogenization. He identified problems in estimating species numbers, including cryptic species, different populations within species and the resources allocated to researching particular taxa. He drew attention to the lack of knowledge on the number of marine species, particularly marine bacterial organisms. On the phylogenic relationship between species, he presented examples of unexpected evolutionary relationships between species. He also noted the importance of extracting data from the world's 2.6 billion specimens found in museums, and stressed that the range of species identification tools has expanded over the years but that many laboratory tools are still not accessible to developing countries. Donoghue also underscored the importance of harnessing technology and increasing human resources and capacity building for species identification. He said tools presently available could revolutionize species identification if they are accompanied by funding and political commitment.

Achim Steiner, IUCN Director-General, suggested explaining why biodiversity matters rather than focusing on extinction and still undiscovered biodiversity. Showing an increase in the Earth's land area falling under protection, he expressed satisfaction with recent successes in biodiversity conservation. He stressed the need to unify approaches and strategies and identify common objectives, noting that the ecosystem approach provides an umbrella, under which research, management and conservation can be aligned. Steiner urged increased participation of the South in conversation, and said nature should not only be subject to economic cost-benefit analyses. Commending initiatives such as the IUCN Red List and Global Species Assessment, he cautioned that the problem is less in the development of basic evidence than in convincing society to make changes. Rather than a centralized information facility, he advocated improving the interface and connectivity among different existing sources, especially in developing countries. Steiner suggested communicating that biodiversity is essential to poverty eradication and, highlighting the power of the market place, said businesses can be a solution rather than a problem.

Roundtable Chair Jose Sarukhan, National Institute of Ecology of Mexico, invited panelists to share their views on the role of researchers and amateur naturalists and whether an international center of biodiversity expertise is needed.

Peter Bridgewater, Secretary-General of the Ramsar Convention on Wetlands, called for focusing on the role of biodiversity in providing ecosystem services, also addressing cold- and wetspots in the biodiversity range, and improved synergies for scientific advice. He stressed the need for adaptive management and a precautionary approach.

Thomas Lovejoy, President of the Heinz Centre, noted the need to identify ways to show linkages between biodiversity and other issues, including assessing nature's response to climate change.

Catherine Day, European Commission (EC) Director-General for the Environment, focused on the needs of policy makers, highlighting the need for more science, better measuring tools, and policy-relevant indicators. She said challenges include integrating biodiversity into other policies and convincing policy makers that biodiversity conservation measures, including establishing protected areas, are an investment for the future.

Bertrand Tramier, Executive Director of the Total Corporate Foundation, stressed the need to better understand links between

The *Biodiversity: Science and Governance Bulletin* is a publication of the International Institute for Sustainable Development (IISD) <info@iisd.ca>, publishers of the *Earth Negotiations Bulletin* ©. This issue was written and edited by Changbo Bai, Nienke Beintema, Bo-Alex Fredvik, and Charlotte Salpin. The Digital Editor is David Fernau. The editor is Stas Burgiel, Ph.D. <stas@iisd.org>. The Director of IISD Reporting Services is Langston James "Kimo" Goree VI <kimo@iisd.org>. Funding for coverage of this meeting has been provided by the French Ministry of National Education, Higher Education and Research. Funding for translation of the *Bulletin* into French has been provided by the International Organization of the Francophonie (IOF) and the French Ministry of Foreign Affairs. IISD can be contacted at 161 Portage Avenue East, 6th Floor, Winnipeg, Manitoba R3B 0Y4, Canada; tel: +1-204-958-7700; fax: +1-204-958-7710. The opinions expressed in the *Bulletin* are those of the authors and do not necessarily reflect the views of IISD. Excerpts from the *Bulletin* may be used in other publications with appropriate academic citation. Electronic versions of the *Bulletin* are sent to e-mail distribution lists (ASCII and PDF format) and can be found on the Linkages WWW-server at <http://www.iisd.ca/>. For information on the *Bulletin*, including requests to provide reporting services, contact the Director of IISD Reporting Services at <kimo@iisd.org>, +1-646-536-7556 or 212 East 47th St. #21F, New York, NY 10017, USA. The *Bulletin* Team at SDICB can be contacted by e-mail at <charlotte@iisd.org>.

business and biodiversity conservation, and highlighted Total's activities regarding biodiversity, including the creation of a Foundation for biodiversity and the sea.

Mace, supported by Lovejoy, said protected areas are not the only answer to biodiversity loss, and humans need to learn how to live with nature in a sustainable way. She encouraged scientists to collaborate on large-scale projects in order to achieve the 2010 target.

In the ensuing discussion, participants noted the need for: open dialogues between business, governments, international organizations and scientists with regard to the use of certified timber; increased support from governments to local communities to use biodiversity sustainably; benefit sharing; partnerships between North and South for scientific research and training; and interdisciplinary approaches.

SOCIAL AND ECOLOGICAL BENEFITS OF BIODIVERSITY: Jacques Weber, Director of the French Institute for Biodiversity, chaired the plenary session on social and ecological benefits of biodiversity.

David Tilman, University of Minnesota, presented research on the relationship between ecosystems services and biodiversity. He gave a historical overview of early ecological theories, which associated higher productivity with areas of higher biodiversity. He also presented results from research in the past decade confirming these earlier theories and demonstrating that biodiversity loss leads to a decrease in: plant productivity; efficiency of plant resource utilization; ecosystem stability and predictability; and carbon sequestration. Tilman also presented research showing that biodiversity loss can lead to increased risks of invasion by exotic species. He said ecosystem services include productivity, water quality, ecosystem stability and protection from alien invasive species. Noting that the true value of ecosystem services is often overlooked, he stressed that wise environmental policy should maximize both the quantity and quality of these services to society. In the ensuing discussion, participants called for increasing eco-farming in agricultural policy and identifying viable alternatives for people that use lands rich in biodiversity for farming in developing countries.

Andrew Dobson, Princeton University, addressed the relationship between biodiversity and human health. He stated that many pathogens only threaten people when their natural environment has been disturbed, and argued that low-tech solutions to diseases are often the most effective. Stressing the importance of underlying ecological knowledge, he described interactions between pathogens, people's immune systems, drug resistance, population density, livestock density, biodiversity and climate. Dobson noted that alien species often become invasive because they lack the parasites that infest them in their natural range, and that alien species can introduce parasites that threaten native species. He stated that eliminating pathogens from natural systems, as has been done for agricultural purposes in certain locations, greatly influences an ecosystem's functioning. He stressed that biodiversity is an important disease buffer, particularly against vector-transmitted diseases such as malaria, since vectors tend to turn to humans when biodiversity is low. He concluded that describing food webs and ecosystems in mathematical terms constitutes the major scientific challenge for the 21st century.

Charles Perrings, University of York, presented on economics and the value of biodiversity and ecosystem services. He said the anthropocentric value of biodiversity and ecosystems derives from the value of the goods and services they provide, which includes direct-use values, indirect-use values, and non-use or passive values. He observed that biodiversity supports ecosystem functioning and processes, which, in turn, support the production of marketed goods and services. He said that, in economic terms, biodiversity is equivalent to a portfolio of assets, and that conservation efforts should be designed according to the mean and covariance yield of the portfolio. Perrings said economics should be incorporated into conservation efforts and plans, and suggested identifying areas where ecosystem services are becoming scarce in order to target conservation efforts in those areas.

Christian Körner, University of Basel, spoke on climate change and biodiversity, with a focus on non-living plant species and carbon dioxide (CO_2) variations. Regarding indirect CO_2 effects on biodiversity through climate change, he presented findings of research on climate change in cold climates and mountain ecosystems, noting that microclimate differences can exceed by five times the scenarios of the Intergovernmental Panel on Climate Change. Körner said effects of global warming include: net changes in species frequency; the climate becoming dryer in certain parts of the globe; loss of taxa through drought; and forest loss due to increased fires. Regarding direct CO_2 effects on biodiversity, he described responses in specific taxa of flora and fauna. He noted a shift in the focus of climate-related research from carbon sequestration to the effects on biodiversity.

Roundtable Chair Harold Mooney, Stanford University and Millennium Ecosystem Assessment, said a new approach is needed to assess potential benefits of ecosystems, and suggested using failures in biodiversity conservation to prode scientists rather than the public into action.

Madeleine Tchuente, Minister for Scientific Research and Education of Cameroon, described Cameroon's rich ecosystem diversity, and highlighted conservation initiatives and partnerships in the Congo Basin.

Regarding globalization and biodiversity, Perrings said the main problem is the failure of international markets to deal with biodiversity loss, and suggested including scientific advice on potentially adverse environmental impacts of trade liberalization in the work of the World Trade Organization.

Laurent Piermont, President of the French Société Forestière de la Caisse des Dépôts, elaborated on experiences regarding biodiversity funding through market mechanisms. He highlighted the importance of low-cost ecological engineering and rationalizing conservation objectives.

Pierre Jacquet, Executive Director of the French Development Agency Group, said changes to social and political behaviors are key to biodiversity conservation, noting the need to reconcile various stakeholders' interests and conduct more biodiversity-related economic and social analyses.

Pierre Valette, EC Research Directorate-General, stressed the need for social and economic assessments of biodiversity loss, with a focus on research that would help to establish thresholds for sustainability.

During the ensuing discussion, addressing traditional use of herbal medicines in Cameroon, Tchuente said institutes are conducting research on plants for health purposes. Regarding costs and benefits of biodiversity, Perrings said benefits for the public should not be compromised by private gains. One participant appealed to scientists in the biodiversity field to reach out to the public through stronger education and better communication.