

Chairman's Report

Conclusions and recommendations
from presentations and discussions

Norway/UN Conference on Technology transfer and capacity building

23 – 27 June 2003

Hosted by

- The Royal Norwegian Ministry of the Environment

In collaboration with

- United Nations Environment Programme (UNEP)
- The Secretariat of the Convention on biological diversity (CBD)
- The Royal Norwegian Ministry of Foreign Affairs
- The Royal Norwegian Ministry of Agriculture
- The Royal Norwegian Ministry of Fisheries
- The Royal Norwegian Ministry of Education and Research

Organised by

- Norwegian Directorate for Nature Management (DN)
- Norwegian Institute for Nature Research (NINA)
- Norwegian University for Science and Technology (NTNU)

Held at Radisson SAS Royal Garden Hotel, Trondheim, Norway

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- Norwegian Institute for Nature Research (NINA)
- Norwegian University for Science and Technology (NTNU)
- The City of Trondheim
- The Norwegian NGO forum on environment and development (FORUM) - represented by WWF Norway
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Table of contents

Conclusions and recommendations from the Norway/UN conference on Technology Transfer and Capacity Building, Trondheim, Norway, 23 – 27 June 2003	7
Background and Introduction	10
Session 1	13
Opening Session	
Chair: Børge Brende	
Session 2	14
Technology transfer and CBD in a sustainable development context	
Session Chair: Peter J. Schei	
Capacity development to strengthen biodiversity conservation and management	14
Julia Carabias	
Cultural challenges to technology transfer	14
Jeffrey A. McNeely	
Benefit sharing – a cooperative enterprise between providers and users of genetic resources	14
Brendan Tobin	
Session 3	15
Technological collaboration – who are the actors and who should define the needs?	
Session Chair: Morten Svelle	
Creating South-South synergy in biodiversity and related disciplines through the creative application of information and communications technologies	15
Derek Keats	
Technological collaboration: The challenges of including the poor	15
Margaret Kakande	
Session 4 - Panel debate	16
Can CBD-relevant technologies be a vehicle for sustainable development?	
Moderator: Rasmus Hansson	
Session 5	17
Technological transfer and capacity building – can it help alleviating poverty?	
Session Chair: Karin Gerhardt	
Poverty reduction through enhancing capabilities and ecosystem services: policy implications	17
Thierry Oliveira	
Appropriate technology transfer in natural resource management and poverty alleviation - An experience of NGO in Western India	17
Harnath Jagawat	
Arresting environmental degradation in Zambia through conservation farming.....	17
Peter Aagaard	
Session 6	18
Overcoming obstacles to technology transfer	
Session Chair: Gonzalo Castro	
Species status assessments for conservation - Enabling countries to use the IUCN Red List of Threatened Species	18
Sue Mainka	
Technology transfer and the CBD: From fallacies to realities	18
John Mugabe	
CBD, technology transfer and issues of common, but differentiated responsibilities	18
Marjorie Pyoos	
Session 7	19
Sustainable use – technologies and benefit sharing	
Session Chair: Ivar Jørgensen	
Sustainable use, technology transfer and capacity building in fisheries in Namibia since independence	19
Burger Oelofsen	
Capacity building and technology transfer: a perspective from the international forest dialogue	19
Barbara Tavora-Jainchill	
Sustainable Biodiversity Management Practices in the Hindu Kush-Himalayas	19
Eklabya Sharma	

Session 8	20
Gene technology and biosafety in a development perspective	
Session Chair: Chee Yoke Ling	
The precautionary principle: lessons to be learnt on how to relate the principle to food aid	20
Luke E. Mumba	
From reactive to pro-active biosafety: science, technology and capacity needs	20
Anne Kapuscinski	
The Norwegian Gene Technology Act: some national and international aspects	20
Jan Husby	
Session 9	21
Biodiversity, medicines and health	
Session Chair: Bente Herstad	
The role of traditional health practitioners in prevention and control of HIV/AIDS	21
Frants Staugård	
Realizing the benefits in neglected and underutilized plant species through Technology Transfer and Human Resources Development	21
Stefano Padulosi	
Session 10	22
Bioprospecting	
Session chair: Birthe Ivars	
BioDiversity, BioProspecting & BioDiscovery	22
Eric J. Mathur	
Intellectual Property Right in the context of bioprospecting and genetic resources	22
Morten Walløe-Tvedt	
Session 11 – panel debate	23
Biotechnology – rights and possibilities	
Session 12	24
Scientific collaboration – education and awareness raising	
Session chair: David Brackett	
Biodiversity conservation in Namibia: Providing incentives for sustainable use of natural resources	24
E.S. Shanyengana	
The battle to save India's wildlife	24
Valmik Thapar	
Session 13	25
Scientific collaboration – research	
Session chair: Augustin Chikuni	
Issues in the assessment, management and conservation of crop diversity on-farm	25
Devra Jarvis	
Experiences and future plans for biodiversity information exchange and technical and scientific co-operation	25
Mark Collins	
Overcoming the taxonomic impediment: the SABONET experience	25
Brian J. Huntley	
Session 14	26
The role of the private sector in technology transfer and capacity building	
Session chair: Peter Holmgren	
Role of the Private Sector in Technology Transfer and Capacity Building in Aquaculture	26
Meryl J. Williams	
The role of the private sector in capacity building for environmental and biodiversity management: lessons from Central America	26
Ana Maria Majano	
Market mechanisms as drivers of Capacity Building and Technology Transfer: synergies between Climate Change and Biodiversity	27
Jan Fehse	
Session 15 - Panel debate	27
The role of global and local businesses	
Moderator: Geir Høiby	
Session 16	28
Criteria of success for technological transfer and capacity building	
Session chair: Ragnhild Lund	

Building capacity for the adoption of science and technology: Experiences of The World Agroforestry Centre.....	28
Dennis Garrity	
INBio and the development of scientific and technological capacities for biodiversity management in Costa Rica .	28
Rodrigo Gámez	
Capacity Building To Support the Cartagena Protocol on Biosafety, the UNEP/GEF Project	29
Charles Gbedemah	
Communication capacity development for managing change for biodiversity results.....	29
Wendy Goldstein	
Session 17	29
Towards global partnerships for technology transfer and capacity building	
Session chair: Peter J. Schei	
Biodiversity, technology transfer and capacity building: A World Bank perspective	29
Jan Bojö	
UNDP/GEF experiences in technology transfer and capacity building in biodiversity.....	29
Nick Remple	
A view from the south.....	29
Vandana Shiva	
Chairman's Conclusions	30
Peter J. Schei	
Closing remarks: Where do we go from here?	30
Alfred Oteng Yeboah	
ANNEX.....	31

CONCLUSIONS AND RECOMMENDATIONS FROM THE NORWAY/UN CONFERENCE ON TECHNOLOGY TRANSFER AND CAPACITY BUILDING, TRONDHEIM, NORWAY, 23 – 27 JUNE 2003

Background

Technology transfer - from those who have it to those who need it - and capacity building - in general and to allow for the effective introduction and use of technology in particular - are topics of fundamental importance for the implementation of the Convention on biological diversity (CBD). This applies particularly to the obligations under Articles 16 - 19 addressing technology transfer, exchange of information, scientific cooperation and biotechnology, but also to other articles of the convention. Technology transfer and capacity building are also important topics in other fora, including the United Nations Environment Program (UNEP) and other UN agencies, and is repeatedly pinpointed in Agenda 21 from UNCED in Rio and the Joint Plan of Implementation from WSSD in Johannesburg.

Against this background, 228 participants (scientists, managers and policy advisers) from 89 countries, representing governmental, intergovernmental and non-governmental institutions and organizations, gathered in Trondheim on 23 – 27 June 2003, at the invitation of the Government of Norway in cooperation with UNEP.

Technology transfer and capacity building are topics shrouded in a great deal of misunderstanding and often confusion. The fourth Trondheim Conference on Biodiversity provided an opportunity for demystification and gaining insights into analytical frameworks as well as sharing of experiences and examples on good practices and measures in order to make these topics operational.

Introduction

The terms “technology transfer” and “capacity building” have for decades been perceived as very important, but also as very general and difficult to grasp and translate into practical action. There is therefore a need to demystify the concepts and to break them down into operational parts relevant to the successful implementation of the CBD, and achievement of its goals.

A broad range of topics need to be included in the definition and follow-up on this issue. It was also clear that a definition of the terms should be an important contribution for clarification. In this respect, the following

definitions are offered for further consideration, and are used throughout this report:

Conservation, sustainable use and equitable sharing of the benefits arising from biodiversity make use of a very wide range of “**technologies**”, both “hard” and “soft”. “Hard” technologies include mechanical and electronic systems such as remote sensing and monitoring equipment, storage and archiving systems, digital computer systems and genetic analysis machines. “Soft” technologies include skills, processes, standards and methods. Both hard and soft technologies depend on developing and applying an appropriate **knowledge** base.

In this context “**technology transfer**” is the transfer of systematic knowledge, skills and innovations for the development and use of products, application of processes or rendering of services.

“**capacity building**” in this context is the development of the ability in a nation’s people and institutions to understand, absorb, apply, modify, and further develop the knowledge and technologies available for the implementation of the convention and achievement of its goals.

Technology transfer also relates to knowledge, methods and technologies within the various economic sectors (i.e. agriculture, forestry and fisheries) that may be essential to achieve the objectives of the CBD.

Technology transfer and capacity building as defined above may contribute significantly to all three objectives of the convention and to the maintenance of the biological foundation on which sustainable development can be built. The focus should be on how technology transfer and capacity building can contribute to implementation of relevant obligations in the convention, achievement of the 2010 biodiversity goal and to sustaining progress on relevant UN Millennium Development Goals.

Strategic Considerations

The meeting identified several challenges that need to be overcome in order to enable a better understanding and use of available and potential opportunities and benefits deriving from technology transfer and capacity building, including:

- Insufficiently receptive social and economic conditions to allow successful technology transfer and capacity building;
- Inadequacy of information on available technologies;
- Uncertainty with respect to terms under which technology transfer could and should be undertaken;

- Lack of appropriate regulatory, financial and institutional frameworks at the local, national, regional and international levels.

Achieving improved and better-targeted technology transfer and capacity building, will require developing concrete targets and improved synergies between biodiversity and development policies, with obligations and needs under other conventions, and between sectors at the national level.

Based on the definitions presented above, it was agreed that different needs that are identified will require different technologies and be used by different users. Examples could include “simple” technologies aimed at alleviating poverty, and more advanced technologies for adding value to biological resources as compared to highly “advanced” technology such as that related to biotechnology, biosafety, access and benefit sharing (ABS), and remote sensing for inventory and monitoring.

Technology transfer and capacity building related to biotechnology may include partnerships in science and technology related to research and development and on building national capacities to design and implement appropriate national legal and policy frameworks for handling all aspects of biotechnology and biosafety. Establishing regional training centres on biosafety may also be an option. Many biotechnology techniques are available in the public domain and can be obtained through training programmes and information searches, while other biotechnologies are on offer, often from corporations that provide entire packages and discourage their modification and adaptation to local conditions – the latter usually seen as a prerequisite for successful technology transfer.

Focus was also put on the importance of using a preventative, “safety first” approach that incorporates knowledge and technologies regarding preventative risk assessment and safety design and management for biotechnology and other biodiversity aspects. Such an approach also requires in-depth training in biosafety science and technology, and is an example of practical exemplification of the precautionary approach.

Transferring or acquiring technologies relevant for the conservation of biological diversity requires appropriate economic incentives. Such technologies are not necessarily available on the market, and usually also need to be developed and refined locally.

The considerable technological resources of the private sector should be engaged more actively to contribute to implementation of the CBD, and improved communication with and involvement of the private sector is therefore essential.

As an operational principle, the Parties to the CBD and bodies and entities established by the Parties should engage in technology transfer and capacity building in co-operation and in partnerships with other organizations, intergovernmental, governmental, non-governmental, and with the private sector. This could include existing organisations like the UN Food and Agriculture Organisation (FAO), UNDP, the Consultative Group for International Agricultural Research (CGIAR), and networks (including the CBD Clearing House Mechanism (CHM)) and co-operation with other multilateral agreements.

Science and scientific knowledge should be a key element in decision making processes and implementation solutions, but some areas may need to improve the credibility of scientific advice in the relationship between science and society, as illustrated for example in the debate on genetically modified organisms (GMOs). This debate can be constructively addressed by establishing biosafety standards for the safety design, assessment, verification and monitoring of GMOs.

Biosafety considerations regarding GMO experiments should be applied globally to ensure that GMOs will not cause a threat to human health and biodiversity, guided by international legislation regulating the release of GMOs.

Members of society should be empowered to make informed choices through education and training. This requires an enhanced enabling environment for easy technology and information access to strengthen individual capacities of stakeholders. It was noted that non-governmental organisations could play an important role in this regard.

Operational aspects

The conference identified three key areas for further analysis and work, and where operational measures should be identified, tested and evaluated.

The first of these is related to **technology needs**, where thorough assessments should be carried out for the identification of relevant needs and of where and how to find possible solutions. Such assessments should be country driven, primarily by the receiving country, and should be based on the obligations in the CBD and other needs relevant to conservation and sustainable use of biodiversity. However owners /holders of technology also have an obligation to identify what knowledge experience that may be useful for others, and to make their assessments available to a wider community. Here a more proactive use of the Clearing House Mechanism (CHM) of the CBD could play an important role. The assessment process should involve relevant stakeholders such as the private sector, the research community and non-governmental organisations.

The second area relates to **capacity building needs**, where assessments can identify relevant needs and where and how to find possible solutions. Such assessments should include needs related to information and communication, public awareness, networks and partnerships, safety science and management including risk assessments (for biotechnology and biodiversity in general), education and research, and inventory and monitoring. The role of the private sector would also be essential here.

A more proactive approach is necessary from users as well as holders of relevant technology if such assessments are to succeed, and adequate information structures should be developed suited to various requirements.

Such assessments related to technology and capacity building needs should be made transparent and involve all relevant stakeholders as far as possible. Assessments should also aim at stimulating increased interest in biodiversity-relevant issues from a wider audience, such as improving the understanding of the fundamental role of biodiversity in sustainable development and the provision of ecosystem services. Necessary focus should be put on the economic value of these resources and services, as key economic interests and the private sector will be expected to adapt to the risks and opportunities related to these values. Greater public and political awareness could increase the demand and supply for science and technology relevant to the CBD.

Last, the **enabling environment** is crucial for the successful technology transfer and capacity building. Improving the enabling environment is a wide area that needs further discussion, but where important elements were identified. There are needs to promote and in some cases revise legal frameworks, to foster and strengthen their implementation, and to develop workable law-enforcement (compliance) mechanisms that foster responsible transfer and clarify the rights and responsibilities involved. Particularly related to important areas such as bioprospecting, biotechnology, access and benefit sharing and property rights issues. Other important aspects related to an enabling environment, include establishing national institutions related to the conservation of biodiversity and sustainable use of biological resources, the development of mechanisms for co-ordination and oversight of biodiversity-related or biodiversity-affecting technology transfer within a country or region, establishing suitable mechanisms and standards for participation of relevant stakeholders, developing appropriate incentives both economic and others (both in the receiving country and in the country of the transferor), and establishing mechanisms for monitoring and evaluating the state of biodiversity. Legislative and institutional developments that may enable technology transfer could also include adequate protections both for those sharing data, and for those using shared data. There is also a need to facili-

tate institutional synergies and policy integration, and to analyse and catalyse solutions for national and regional and global conflicts. The need to build the necessary institutional framework at various levels for continued work on technology transfer and capacity building was stressed.

Concluding remark

The Conference participants agreed that the discussions and presentations had been fruitful and that the output of the meeting could serve as a significant contribution to the preparations of the ninth meeting of the Subsidiary Body on Scientific, Technological and Technical Advice (SBSTTA9).

It was also requested that its outputs be made available to SBSTTA9 and to other fora that work on technology transfer and capacity building relevant to the CBD and other related international instruments and processes.

BACKGROUND AND INTRODUCTION

The Trondheim Conferences on biodiversity

The conference was the fourth in the series of the Trondheim Conferences on Biodiversity, which started in May 1993. The Trondheim Conferences focus on the multidimensional nature of the implementation of the Convention on biological diversity (CBD). There is a need to establish the best possible scientific basis for this implementation, taking into account that the conservation and sustainable use of biodiversity and fair and equitable sharing of benefits derived from it, constitute the very foundation for sustainable development.

The Conference series aims to establish and develop contact and collaboration between scientists and policy makers from all Parties to the CBD. Its major goal is to enhance the cross- and multi-sectoral dialogue on biodiversity research and management, and to contribute to a solid basis for policy and management decisions needed to implement the Convention on Biological Diversity.

The Conference in May 1993 provided input that was highly instrumental to the first Intergovernmental Committee meeting of the signatories to the CBD in September that year. The theme of the second Conference in July 1996 was scientific and management problems related to alien invasive species. The Conference provided useful input to the discussions at the second SBSTTA meeting in September 1996, and to the development of the Global Invasive Species Program (GISP). In June 1997, the organizers of the Trondheim Conferences hosted a workshop on biodiversity in freshwaters, to provide scientific input to the third SBSTTA meeting in September 1997. The Conference in 1999 on the Ecosystem Approach for Sustainable Use of Biological Diversity provided useful input to the discussions at the fifth SBSTTA meeting in 1999, and to later work on the ecosystem approach and on the sustainable use of biological resources under the CBD and in other fora.

Organisation of the conference

The Norway/UN Conference on technology transfer and capacity building was hosted by the Norwegian Ministry of the Environment on behalf of the Norwegian Government, in collaboration with the United Nations Environment Programme (UNEP) and the CBD Secretariat.

The sponsoring and funding of the conference was a joint venture between the Norwegian Ministry of the Environment, the Ministry of Foreign Affairs, the Ministry of Agriculture, the Ministry of Fisheries and the Ministry of Education and Research. This included significant travel support from the Ministry of Foreign Affairs, enabling the funding of one delegate from each devel-

oping country Party to the CBD. Significant in kind contributions have also been provided by the City of Trondheim.

The **International Advisory Committee** of the Conference had participation and contributions from the following relevant international bodies: Convention on Biological Diversity Secretariat (CBD), Global Environment Facility (GEF), Third World Network (TWN), United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), United Nations Food and Agriculture Organization (FAO) and the World Conservation Union (IUCN).

Preparations for the conference were supervised by a **Conference Steering Committee**, which had representatives from the following relevant authorities and institutions in Norway: Norwegian Agency for Development Cooperation (NORAD), Norwegian Directorate for Nature Management (DN), Norwegian Institute for Nature Research (NINA), Norwegian University for Science and Technology (NTNU), City of Trondheim, Norwegian NGO forum on environment and development (FORUM) - represented by WWF Norway, Ministry of Agriculture (LD), Ministry of Education and Research (UFD), Ministry of Fisheries (FID), Ministry of Foreign Affairs (JD) and the Ministry of the Environment (MD). The chairman of the committee was Peter Johan Schei from DN.

The program was developed by a **Conference Program Committee**, with the following members who all provided valuable input to the program: Gabriella Bianchi, The Norwegian Institute for Marine Research (HI), Ole Kristian Fauchald, University of Oslo (UiO), Bente Herstad, Centre for Development and the Environment/University of Oslo (SUM), Svein Erik Hårklau, World Wildlife Fund (WWF) Norway, Alf Morten Jerve, The Christian Michelsen Institute (CMI), Ivar Jørgensen, Centre for International Environment and Development Studies/Agricultural University of Norway (Noragric), Ragnhild Lund, Norwegian University for Science and Technology (NTNU), Svein Aage Mehli, Norwegian Directorate for Nature Management (DN), Knut Opsal, Norwegian Agency for Development Cooperation (NORAD) and Odd Terje Sandlund, Norwegian Institute for Nature Research (NINA) The chairman of the committee was Odd Terje Sandlund.

The Norwegian Directorate for Nature Management (DN) was responsible for organizing the conference, which was done in cooperation with the Norwegian Institute for Nature Research (NINA) and the Norwegian University for Science and Technology (NTNU), all based in Trondheim.

Conference focus and program

Since the adoption of the Convention on Biological Diversity (CBD), it has become increasingly clear that a successful worldwide implementation of the Convention

is greatly dependent on and promoted by active cooperation between parties regarding transfer of relevant technologies and knowledge, and of the necessary capacity building to apply such technology and knowledge. This includes both transfer of technology and knowledge among Parties, active collaboration to develop competence and capacity, and the recognition, inclusion and application of traditional knowledge relating to biodiversity conservation and sustainable use.

Technology transfer and capacity building will be a main subject for the 7th Conference of the Parties (COP) of the CBD, to be held in Malaysia in 2004. The Norway/UN Conference on Technology Transfer and Capacity Building aims to provide input to the discussions at the 9th meeting of the CBD's Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), in November 2003, which will provide important input to COP-7. The discussions at the Conference will also support the collaborative work of UNEP and other agencies with developing countries regarding capacity building and technology transfer, relating both to biodiversity and natural resources management in general.

The theme of the Conference this year relates to a number of Articles in the CBD, in particular Articles 16-19, dealing with technology transfer, exchange of information, scientific cooperation, and biotechnology.

Obviously, the concepts of technology transfer and capacity building touches on almost all aspects of implementing the Convention. Moreover, these issues are central to most sectors of international development collaboration.

The CBD has established a Clearing House Mechanism (CHM) to facilitate exchange of information and knowledge among Parties to the Convention and other stakeholders. One issue up for discussion will be how to improve the present arrangements for technology transfer and capacity-building in order to promote the implementation of the CBD. Are there additional mechanisms at the international and national level that can be applied to increase the efficiency of this co-operative work? The Conference lectures will present a number of case studies and lessons learned.

Among experts, institutions and organisations present at the Conference, there is extensive experience related to technology transfer and capacity building. The Conference will hear a number of case studies, and solicit opinions on best practices. The discussion will focus, i.a., on issues such as criteria for success, lessons learned, and possible new approaches. Discussions in a forum where scientists, managers and policy makers meet may significantly promote knowledge and understanding of how technology transfer and externally acquired knowledge may be adapted to and adopted by a country's own political, socio-cultural and ecologi-

cal structures and processes. The role of traditional knowledge in this process will be an essential aspect.

This Conference is the 4th Trondheim Conference on Biodiversity, and maintains the overriding goal of providing a forum for cross-sectoral and multidisciplinary dialogue between scientists and policy makers on issues related to the implementation of the CBD.

Against this background, the Norwegian Minister of Environment invited all members of the United Nations, as well as relevant UN agencies, all national focal points for the Convention of Biological Diversity, and a number of international and non-governmental organisations in the field of environment and development.

The objectives of the Conference were:

- to contribute to a sound scientific knowledge of issues related to technology transfer and capacity building.
- to show examples and to contribute to the development of principles and practical use related to technology transfer and capacity building.
- to provide a forum for cross- and multi-disciplinary dialogue between scientists and policy makers on research and management issues related to practical use
- to contribute to ongoing deliberations in the CBD as well as in other international and national fora relevant to implementation of the convention.

The program included one opening session, fifteen thematic sessions, three panel debates and one final session on follow-up of the conference. The themes were primarily covered by oral presentations, but also by active participation from panelists and the audience.

The social program was also an important part of the conference, and this included two receptions (cordially hosted by the Ministry of the Environment at the Sverresborg Museum and by the City of Trondheim at the Archbishop's Palace), organ recital at the Trondheim Cathedral, boat trips on the wooden ship *Pauline*, tram rides to Lian and a "conference pub".

Outputs from the conference

This document presents the report of the Conference Chairman, Peter Johan Schei, containing his conclusions and recommendations from the presentations and discussions at the Conference.

The text is based on main points from the lectures and the following discussions and the panel debate, minutes taken by session rapporteurs, and discussions with the "friends of the chair". Friends of the chair were David Brackett (Canada), Mark Collins (UNEP/WCMC), Maria Luisa Del Rio (Peru), Brian John Huntley (South Africa), Jeffrey McNeely (IUCN), Nicola Notaro (European Union), Alfred Oteng Yeboah (Ghana), Jan Ple-

snik (Czech Republic), Christian Prip (Denmark) and Markus Lehmann of the CBD Secretariat.

In most cases abstracts and/or presentations have been available. Valuable input was also received from participants through a simple questionnaire asking for general points, cf. also Annex I of this report.

The report does not necessarily represent a consensus among the participants.

In addition to this report, ordinary proceedings from the Conference will be produced and published.

This Chairman's Report and the Conference Proceedings will be distributed to all the participants as well as to relevant international fora working on issues related to technology transfer and capacity building, in particular those working with the Convention on Biological Diversity. The output of the conference will *inter alia* be submitted as information papers to the ninth meeting of the CBD's Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA9).

It should also be mentioned that the Earth Negotiations Bulletin (ENB) will publish a summary from the conference, to be made available on the Internet at <http://www.iisd.ca/linkages/sd/sdtro/>. ENB has also been helpful in providing updated draft material that has been highly valuable for the work on this report. Question and comments from the presentations could be found here.

SESSION 1

Opening Session

Chair: **Børge Brende**

Following an artistic presentation, opening statements were delivered by:

- Børge Brende, Minister of the environment
- Liv Sandven, City of Trondheim
- Shafqat Kakakhel, UNEP
- Hamdallah Zedan, Executive Secretary of CBD
- Frank Pinto, UNDP

In his opening statement, **Børge Brende**, Norwegian Minister of the environment, pointed out that biodiversity is the very foundation of human existence, but that we by our current actions are squandering this biological capital at an alarming rate. He underlined the importance of the precautionary principle and the use of the best and most up-to-date knowledge. Referring to the three objectives of the convention, he said that transfer of technology and knowledge between parties is necessary. The minister also stated that while technology transfer and capacity building has been discussed for at least 40 years, there is still a gap between fine words and concrete action. CBD and other international treaties need to follow up on this, in order to contribute to alleviating poverty and supporting sustainable development. He also called for an intergovernmental strategic plan for technology transfer and capacity building within the UN system. Brende also pointed out that he would follow this up in his period as chairman of the Commission on sustainable development (CSD).

The Deputy Mayor of Trondheim, **Liv Sandven**, welcomed participants to Trondheim and gave some background about the city. On behalf of the Mayor she also wished the participants prosperous discussions.

Shafqat Kakakhel, Assistant Executive Director of UNEP, thanked Norway for organizing the Conference, noting the role of the Trondheim conferences on biodiversity for providing valuable input to the CBD, UNEP and other relevant processes. He also informed about some of UNEP's efforts to assist the CBD, including work on biosafety, development of legal frameworks, capacity building on access and benefit sharing. Kakakhel also referred to the work of the World Conservation Monitoring Centre (WCMC) and UNEP's partnerships such as the International Coral Reef Action Network and the Great Apes Survival Project.

Hamdallah Zedan, Executive Secretary of the Convention on biological diversity, said technology transfer is essential for meeting all three of the CBD objectives and for meeting several key CBD articles. He outlined the following challenges related to technology development, transfer and co-operation: lack of adequate information on available technologies, lack of established terms under which transfer could be made, lack of appropriate regulatory, financial and institutional

frameworks, lack of capacity to absorb imported technology at the national level and fear or failure to manage associated with new technologies, limited market access and incentive for developing countries to invest in technological innovations, lack of international technological allegiances or partnerships beneficial to biodiversity-rich developing countries, strong regimes for the protection of intellectual property, need to reform policies on technology that were developed in the pre-globalization age and lack of knowledge-based institutions. Zedan also pointed out several important aspects related to technologies for achieving the objectives of the convention.

In his opening statement to the Conference, **Frank Bruno**, GEF executive co-ordinator of UNDP, pointed out that the last three years have witnessed some major shifts in society's perceptions of the role of biodiversity. He also underlined the role of the Trondheim Conferences on Biodiversity in contributing to the global biodiversity agenda. Bruno said that the conference is an opportunity to address lessons learned and practices that enable biodiversity concern to be incorporated into poverty alleviation and development efforts. He also presented some of UNDP's significant efforts related to biodiversity and development.

SESSION 2

Technology transfer and CBD in a sustainable development context

Session Chair: **Peter J. Schei**

Capacity development to strengthen biodiversity conservation and management

Julia Carabias

Chair Scientific and Technical Advisory Panel (STAP) of the GEF / Universidad Nacional Autonoma de Mexico, Mexico

The presentation started by outlining some general concerns regarding biodiversity, including biodiversity still being a marginal issue for governments and most of society, biodiversity conservation and development generally not being understood by decision makers or the general public, and last but not least, that despite efforts, trends show increased environmental deterioration and poverty. Main problems that the conservation *in situ* objective of the CBD is far behind with respect to others, the lack of quantitative targets and timing, no synergies between biodiversity and development policies and with other conventions and weak commitment on behalf of countries.

Against the background of the challenges of the 21st century she then presented some opportunities offered by global changes: new and extended technology, expanding access to information and communication, and consolidation and expansion of democratization processes.

The kinds of capacities are needed to apply adaptive management to deal effectively with current and future threats and to capitalize opportunities was discussed. These included raising awareness at the political level and with the public, strengthening the institutional framework, promotion of regional planning instruments, increased decentralization and stakeholder involvement, inclusion of science in decision making and mechanisms for monitoring and evaluation of biodiversity.

The work of CONABIO was presented. This is an inter-ministerial commission created in 1992 with a mission to promote and coordinate actions towards knowledge and sustainable use of Mexico's biological richness and to obtain, organize, analyze and spread information about this richness.

Cultural challenges to technology transfer

Jeffrey A. McNeely

IUCN - The World Conservation Union, Switzerland

Introducing important concepts related to society and culture and to the notion of progress. Various factors affecting acceptance of new technologies, including relative economic advantage, social value and prestige, compatibility with vested interests and the ease with which advantages can be observed. The question

whether technology transfer does help the poor, as it may also enhance wealthy elites and attract the wealthy and powerful by increasing the value of resources.

Several examples illustrates that development of technology is not always predictable, making it necessary all the time to look for risks and opportunities. Showing biotechnology as an issue where culture is also an important aspect, referring to criticisms as well as potential benefits of genetically modified organisms (GMOs) for biodiversity, noting that countries and cultures have different ways of dealing with risk. Against this background he introduced steps that can aid culturally sensitive transfer of GMO technology.

Five conclusions related to cultural challenges to technology transfer:

- New technologies are needed for conservation and sustainable use, but these must be culturally appropriate to the setting.
- Societies should be encouraged to develop the capacity to determine which technologies are most relevant to them, and how to adapt them to their needs.
- Technology transfer requires understanding of local cultures and needs, and full participation of local people.
- Given the expense of implementing the Biosafety Protocol, countries should pool their expertise and set up regional centres.
- Give indigenous and local peoples control over how traditional knowledge important for conservation and sustainable use will be transferred to modern societies.

Benefit sharing – a cooperative enterprise between providers and users of genetic resources

Brendan Tobin

United Nations University / Institute of Advanced Studies, Japan

Key international obligations related to technology transfer and international governance on access and benefit sharing are provided through the CBD and from the World summit on sustainable development (WSSD). For the CBD Articles 15, 16 and 19 are of particular importance, in addition to its Bonn guidelines on ABS. It was shown how we are going towards more shared responsibilities and examples of user measures that are being developed.

In terms of technology, insights were given regarding legal obligations of user countries, review of measures taken to promote technology transfer in user countries, constraints for negotiating equitable technology transfer, intellectual property rights (IPR) and technology transfer and possible user measures.

The need to demystify intellectual property was also stressed, raising issues for example on IPR and inno-

vation, the public domain and IPR and technology transfer.

Issues related to international negotiations were also drawn up, for example on technology transfer for conservation and sustainable use and development assistance, linking access to genetic resources to access to technologies, facilitated access to genetic resources in return for technology transfer and questions of compatibility with the World Trade Organisation (WTO). Possible elements in an international regime on access and benefit sharing were also presented.

SESSION 3

Technological collaboration – who are the actors and who should define the needs?

Session Chair: **Morten Svelle**

Creating South-South synergy in biodiversity and related disciplines through the creative application of information and communications technologies

Derek Keats

University of Western Cape, South Africa

The presentation gave examples of technological collaboration, actors involved and lessons learned from his base in South-Africa. Biodiversity informatics is a relatively new discipline that brings advanced computational techniques to biodiversity data. Several levels of biodiversity informatics can be defined, and the user interface to data, tools and techniques are the website.

There are many initiatives, the largest – and also the newest is AVOIR (African virtual open initiatives and resources).

Some characteristics of this technological collaboration are their voluntary Nature and lack of strict command lines. The activity of a “Champion” might be important for success. Good communication is a key-element for success in virtual teams, and the presence of a communication plan based on a structures openness model might secure the success of a project as it is crucial for everyone involves to understand processes and expectations, end agree to it from the beginning of a project.

Keats underlined that scarcity of bandwidth is a limiting factor for most of the African partners.

Technological collaboration: The challenges of including the poor

Margaret Kakande

Ministry of Finance, Planning and Economic Development, Uganda

The poor are not a homogenous group! and in most countries the poor are engaged in small scale agriculture. It is therefore critical to increase agricultural productivity.

A wide choice of technologies must exist to match the needs, as neither poor peoples nor their challenges are homogenous.

Some reasons for under-utilisation of existing technologies are poor dissemination and adoption (lack of resources to produce, lack of information about, inadequate skill to electively use).

After going through the challenges of involving the poor in technological development, Kakande gave the following recommendations:

- Ensuring public development and provision of technology
- Encourage participation of the poor in the development of technology by decentralizing research
- Encouraging the multi-national technology developers to have a component for social accountability in addition to maximizing profits. This would entail making a contribution to the development of pro-poor technology. In addition having indicators of performance include contribution to poverty reduction in the world
- Promote structural and cultural change within the technology development organizations. This would include changing attitudes, values, missions, goals, strategies, systems, and skills particularly of the front-line staff.

SESSION 4 - PANEL DEBATE

Can CBD-relevant technologies be a vehicle for sustainable development?

Moderator: **Rasmus Hansson**

World Wildlife Fund - Norway

Participants in the panel debate were the speakers during sessions 2 and 3 (see details above): Julia Carabias, Jeffrey A. McNeely, Brendan Tobin, Derek Keats and Margaret Kakande.

The panel debate, where the audience participated actively, brought up some key issues in relation to technology transfer and capacity building in general, as well as some specific and more political issues that have arisen more recently.

A massive technology transfer and capacity building is currently taking place and covering most sectors in society. An important question raised by the moderator is whether one should focus on technologies and competence that will promote the implementation of the CBD, or whether one should pay equal attention to, or even focus more on, other technologies that indirectly affect biodiversity and CBD follow-up in a negative way. The panelists and the audience did not conclude on this issue.

The moderator also questioned some of the effects of recent donor alignment to the global Millennium Development Goals (MDG) and national Poverty Reduction Strategy Papers (PRSP). He said the MDGs do not mention biodiversity specifically and that PRSPs reflect little or none of biodiversity's value neither for economic development nor for the poor people's livelihoods. The panelists and audience participants seemed to conclude that when biodiversity is treated as a sector interest it remains a marginal interest among most key decision-makers. The prioritizing during the PRSP processes in most or all cases ends with other sectors being prioritized above biodiversity. A key challenge, several participants mentioned, is therefore to clearly document and communicate the value of biodiversity for other sectors and the economy (agriculture, forestry, fisheries, water supply and sanitation etc) and for livelihoods of the poor.

The panel debate briefly touched upon issues like financing of technology transfer and capacity building, the developing countries' expectations in this respect from 1992 when CBD was agreed upon, environmentally harmful subsidies, local and indigenous knowledge as well as coordination between various international conventions.

SESSION 5

Technological transfer and capacity building – can it help alleviating poverty?

Session Chair: **Karin Gerhardt**

Poverty reduction through enhancing capabilities and ecosystem services: policy implications

Thierry Oliveira

UNEP, Kenya

A UNEP initiative on poverty reduction and ecosystem services, emphasise the importance of the capability approach that puts people at the centre of development. Capability approach governs the links between poverty and ecosystem services, which includes regulation, provisioning and enriching cultural value of ecosystems.

Technology can be an instrument of change that contributes towards capabilities by providing social opportunities, economic facilities, transparency guarantees, participative freedom and ecological security. Technology development and transfer should be a social process, needs to be ecosystem friendly and should be suited to the poor.

It is essential to create partnerships between public and private sectors. A mix of traditional knowledge and new technology should be encouraged to fit social, cultural, political and ecological conditions. A mechanism to protect the property rights of the technologies should be established. Capacity building support at the local level should be provided; and there needs to be an increase in awareness on the issue.

On policy implications, they should not be limited to economic dimensions; emphasis should be on distribution and on the autonomy of individuals.

Appropriate technology transfer in natural resource management and poverty alleviation - An experience of NGO in Western India

Harnath Jagawat

NM Sadguru Water and Development Foundation
Gujarat, India

Presenting a NGO experience regarding technology transfer in natural resource management and poverty alleviation in Western India. These NGO's programmes introduced appropriate environmental friendly technologies for developing land and water resources. The benefits of micro watershed development, lift irrigation schemes, small-scale surface water harvesting structures, innovative approaches to drinking water wells, joint forest management, and hi-tech drip irrigation systems were presented with several examples.

The role of village institutions is central in the success of the programmes. Focus on community ownership and the role of women. Training and capacity building is

an important part of the programmes. Good relation with governmental institutions is also of importance.

The lesson from this model is that the technology and approach are replicable in vast areas in India, with potential, to transform the poor regions and lives of millions of poor.

Arresting environmental degradation in Zambia through conservation farming

Peter Aagaard

ZNFU – Conservation Farming Unit

Lusaka, Zambia

According to the Food and Agricultural Organisation (FAO) of the United Nations, Zambia now suffers the 4th highest per capita deforestation in the world. Conventional farming systems as practised by the majority of 800,000 small-scale farmers in Zambia are a major contributor to this statistic

Conservation farming (CF) is introduced as an alternative to conventional farming with aim to reduce damage to the environment. The fundamentals of CF are:

- Residue retention
- Reduced tillage
- Rainwater harvesting
- Permanent planting positions
- Precise seeding and targeted nutrient application
- Sequential tasking
- Rotations

CF based systems enable sedentary agriculture. Even on relatively fragile soils farmers can remain where they are in perpetuity. The social and environmental benefits are extremely significant. CF can increase productivity, reduce poverty and reverse environmental degradation. It can also help small farmers in countries far from Zambia.

SESSION 6

Overcoming obstacles to technology transfer

Session Chair: **Gonzalo Castro**

Species status assessments for conservation - Enabling countries to use the IUCN Red List of Threatened Species

Sue Mainka

IUCN – The World Conservation Union
Gland, Switzerland

The IUCN Red List of Threatened Species is a global assessment of the status of species risk to extinction. The IUCN Red List System was first conceived in the early 1960s by Sir Peter Scott and after 40 years of evolution has become the standard for species listing and conservation assessment efforts.

As of mid-2003, 29 Red List training workshops have been held in 20 countries, involving participants from more than 50 countries. Reviewing results from the workshops, IUCN has identified the following issues that challenge our outreach in the future.

- Language barriers
- Communicating scientific complexity
- Use and abuse for political reasons
- Resources for longer term implementation

To respond to these challenges, IUCN has developed training tools and a long-term strategy addressing the issues of scientific complexity and language. Successful biodiversity conservation and sustainable development will require an understanding of what we have and how it is doing. Putting the power of the IUCN Red List into the hands of those making decisions will make a better outcome for us all.

Technology transfer and the CBD: From fallacies to realities

John Mugabe

New Partnership for Africa's Development (NEPAD)
Pretoria, South Africa

Defining technology transfer as a non-linear process of transferring and ensuring the assimilation of know-how, which takes place through social and economic interactions. Technology transfer is uncertain and involves learning by both source and recipient. The main modes of technology transfer are: turnkey projects; foreign direct investment; training of scientists and technicians; provision of software components, such as manuals; purchase and supply of hardware.

The nature of CBD relevant technologies is defined as:

- Science/knowledge intensive
- Ecology sensitive e.g. biotechnology and genomics
- Those for sustainable use goal of CBD are in very limited supply

- Subject to legal protection as part of intellectual property of corporate actors and some public institutions

Several institutions could be effective for technology transfer: knowledge centres, (universities, etc); innovation hubs, both private and public; private companies; network and alliances of universities and private companies; and bilateral S&T agreements and protocols. Addressing the CBD programme of work, there is a need for: good practical cases of technology transfer arrangements to build confidence and reduce costs; institutional building that includes networks of CBD-specific innovation hubs; integrating CBD considerations in bilateral technical cooperation agreements; and a need for an information base on a range of CBD relevant technologies.

CBD, technology transfer and issues of common, but differentiated responsibilities

Marjorie Pyoos

Department of Science and Technology, Pretoria, South Africa

The technology profile of countries serves as a status indicator at the global level of wealth creation capabilities, the capacity to deal swiftly and quite effectively with the outbreak of infectious diseases, natural disasters and even political turmoil. The less technologically advanced a nation is the more vulnerable its people and their economy.

The presentation focuses on the following areas:

- Science, Technology and Biodiversity: Issues and applications
- Understanding Technology Transfer
- Common but differentiated responsibilities: National context
- Common but differentiated responsibilities: Global context
- Experience of South Africa

The issues regarding national perspectives on common but differentiated responsibility where presented focusing on:

- governments
- industry
- society
- researchers

For global issues of common but differentiated responsibilities focused on:

- developing countries
- multilateral agencies
- developed countries

SESSION 7

Sustainable use – technologies and benefit sharing

Session Chair: **Ivar Jørgensen**

Sustainable use, technology transfer and capacity building in fisheries in Namibia since independence

Burger Oelofsen

Ministry of Fisheries and Marine Resources, Namibia

Successful management of fish stocks is based on successful management of people. Conflicts between stakeholders must either be avoided or resolved. Management of resources by different stakeholders has to be transparent and based on trust. To achieve this, industry must be satisfied that quality research data are gathered, captured accurately, and analysed and used in an unbiased and responsible way.

Fish resources in Namibia belong to the people and the fishing industry is seen as acting as agents of the people with benefits from the industry going directly back into local communities. Future fish stock management in Namibia is based on national plans of action, management plans, fixed long-term fishery rights, and individual quotas. Despite the relative success of single stock management, in the future an ecosystem management approach will be welcomed.

Capacity building and technology transfer: a perspective from the international forest dialogue

Barbara Tavora-Jainchill

United Nations Forum on Forests, New York, USA

Technology transfer is inseparable from capacity building and that both depend on international cooperation and appropriate financial assistance. The UN Forum on Forests, through its Plan of Action and Programme of Work, and the Collaborative Partnership on Forests, address transfer of environmentally sound technologies and capacity building for sustainable forest management.

Technology transfer-related proposals for action can be categorised in six clusters: Assessing technological requirements; enhancing cooperation and financing; facilitating capacity building within national forest programmes, including supporting institutions, indigenous people, local communities and forest owners; supporting developing countries to increase downstream and community-based processing; promoting dissemination and sharing of technologies to end-users; and strengthening education and training for women in community development programmes.

Sustainable Biodiversity Management Practices in the Hindu Kush-Himalayas

Eklabya Sharma

International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal

The Hindu Kush-Himalayan ecosystem as a region that sustains 150 million people in eight countries, this is one of the world's major biodiversity centres. Environmental services provided by the ecosystem's natural assets are the basis for the physical security of the people, and ensure the sustainability of their production systems in the future.

On criteria for successfully addressing landscape transboundary issues, i.e., the need to apply participatory biodiversity management in protected areas; restore and increase the connectivity between protected areas; more conservation attention and efforts to focus on species that operate across political boundaries; address transboundary issues such as grazing and poaching; and adopt policies and incentives conducive to participatory biodiversity conservation.

On criteria for successful community biodiversity management at the country level, i.e., there is a need to take appropriate national policy and legal measures; build on local knowledge and customary practices relevant to conservation; incorporate strong local leadership; support continuous capacity building of all stakeholders; undertake constant monitoring and evaluation; and develop local indicators.

SESSION 8

Gene technology and biosafety in a development perspective

Session Chair: **Chee Yoke Ling**

The precautionary principle: lessons to be learnt on how to relate the principle to food aid

Luke E. Mumba

School of Natural Sciences, University of Zambia

Confronted with a strong international lobby against genetically modified (GM) foods, many African countries are unsure about investing in gene technology, importing grain or accepting relief food from countries producing GM crops. Few African countries will reject GM food when faced with a food crisis, and cited Kenya, Swaziland and Lesotho as countries that have all accepted GM food aid. Zambia, however, has rejected such aid despite growing threats of starvation. Rejection of such aid he said was based on food and feed safety concerns, environmental concerns, loss of traditional markets, and lack of biosafety legislation.

The effective application of the precautionary principle in decision-making is likely to be further realized as a countries' range of technological options widens. To realize such options, it is called for: encouraging technology transfer from developed to developing countries; helping build capacity (human resource and infrastructure) in biotech; and developing partnerships with locals to allow for genuine benefit sharing and acceptance of technology by the local communities. Countries should not ignore technologies that can provide part of the solution to food security crisis in Africa, but that the precautionary principle should take into account technological opportunities to address immediate malnutrition and human health problems.

From reactive to pro-active biosafety: science, technology and capacity needs

Anne Kapuscinski

Dept. of Fisheries, Wildlife and Conservation Biology, University of Minnesota, USA

The current reactive approach to biosafety as the approach in which: risk assessment and management is carried out at the late stages of the development of a living modified organism (LMO); field trials often do not include ecological testing; and, if export is envisaged, the effect of an LMO with other ecosystems is seldom tested. Proposing a pro-active approach, which prioritizes safety, and includes: a safety criteria setting stage; risk reduction planning; bioconfinement; safety tests at the breeding programme stage; ecological tests at the field trial stage; and follow up monitoring.

Biosafety science and human capacity must be strengthened through: country and region specific biosafety information, including support tools for decision; on the ground biosafety research programmes by sci-

entists from developed and developing countries; biosafety training, including professional training programmes; and confinement and monitoring methods. The pro-active approach needs to be incorporated in capacity building and training, and recommended developing, *inter alia*: certification programmes for professionals; preventative safety design for Limos; better safety testing methods; and standards for safety criteria.

The Norwegian Gene Technology Act: some national and international aspects

Jan Husby

Directorate for Nature Management, Norway

Presenting an overview on Norway's Gene Technology Act, which aims to ensure that production and use of GMOs takes place in an ethical and socially justifiable way, in accordance with the principle of sustainable development and without detrimental effects on health and the environment. The aim of the Act is also based on environmental and health risk assessment linked with socially justification and ethical assessments, and that the evaluation of each application for the introduction of GM products is based on risk of negative effects on the environment and health, in accordance with the precautionary principle sustainable development.

On control and distribution of GMOs, International co-operation between authorities at regional and global level is necessary to detect, identify, and control import and export of GMOs. On technology transfer and capacity building, the importance of UNEP/GEF projects; implementation of and training in the use and exchange of information under the Biosafety Clearinghouse Mechanism (BCM); and training in data and information processing.

SESSION 9

Biodiversity, medicines and health

Session Chair: **Bente Herstad**

The role of traditional health practitioners in prevention and control of HIV/AIDS

Frants Staugård

The Ipelegeng Foundation, Sweden

Introducing the role of traditional health practitioners in preventing and controlling HIV/AIDS. Highlighting the lack of financial resources and adequate health infrastructure in some countries for a successful synergistic approach based on vaccine development, equal access to treatment, and primary prevention, the results of a study that showed that cross-sectoral prevention, including ethno-botanical research, is more cost-effective than the development of highly active anti-retroviral treatments (HAART) alone. Herbal remedies were proven to play a significant role in treating opportunistic infections, and further the need for action-oriented research, including: access to traditional technologies and knowledge; and assessment of the role of traditional health practitioners, the quality of home-based and bush hospital care, and the clinical effectiveness of herbal remedies.

Concluding that indigenous knowledge and herbal remedies are a feasible alternative, and underscoring the need to protect and promote traditional knowledge, conserve biodiversity of medicinal plants, and promote ethno-botanical and phyto-chemical studies.

Realizing the benefits in neglected and underutilized plant species through Technology Transfer and Human Resources Development

Stefano Padulosi

International Plant Genetic Resources Institute, Aleppo, Syria

Presentation on realizing the benefits in neglected and underutilized plant species through technology transfer and human resources development. Common features of neglected and underutilized species include: little attention by national policies and R&D; poor documentation; non-existing/poorly organized marketing; characterized by non-existent/fragile seed supply systems; cultivated and utilized relying on indigenous knowledge. In order to enhance the contribution of such neglected species to food security, IPGRI was focusing on gathering and sharing information; priority setting; promoting production, use and marketing; maintaining genetic resource base and biodiversity; strengthening partnerships and capacities; improving public awareness.

On enhancing neglected and underutilized species through technology transfer it is of importance forging effective partnerships among all stakeholders; the transfer of innovation is a dynamic process and adoption requires time; efforts at national level is needed to

link various sectors. A critical aspect is empowering local communities through simple and inexpensive technologies that allow for a more effective cultivation and improved post-harvest methods, marketing, commercialization and use strategies.

SESSION 10

Bioprospecting

Session chair: **Birthe Ivars**

BioDiversity, BioProspecting & BioDiscovery

Eric J. Mathur

Diversa Corporation, San Diego, USA

Presenting Diversa's bioprospecting activities, noting that bioprospecting should result in biodiversity protection and bolster economic and conservation goals. Unlike bioprospecting, biopiracy is unauthorised and illegal, and outlined the requirements for bioprospecting, including: legal rights to access genetic resources; PIC of landowners; rights to patent and commercialize; absence of competition with partners; protection from transfer of sensitive technologies; absence of exclusivity requirements; and no use of indigenous knowledge. There are minimal impacts on the environment, noting a one-time sampling strategy, the absence of exploitation of natural resources, and reproduction in laboratories.

An equitable benefit-sharing through monetary and non-monetary benefits, including annual access fees, royalties, technology transfer, and capacity building. Capacity building includes in country field and laboratory training and research support. Diversa has bioprospecting activities in Costa Rica, Kenya, the US, Russia and Iceland, and products created from recovered resources was presented.

Intellectual Property Right in the context of bioprospecting and genetic resources

Morten Walløe-Tvedt

The Fridtjof Nansen Institute, Norway

Intellectual property right law was seen in the context of bioprospecting and genetic resources, and took the perspective of international patent law and not from the CBD point of view. It was noted that the Norwegian government has proposed amendments to the Patent Law by requiring that information on the country of origin, or in cases where this is not known, the providing country, is disclosed in patent applications. On disclosure of origin several positive aspects can be noted, which included no need for altering existing international regimes. However, there are several challenges, including the need for investigation and burden of proof that information is incorrect or that the information is given incorrectly on purpose.

On pre-condition for being granted a patent, it can be a defensive tool to prevent patents from being granted, it can be used as a legal basis for challenging a patent, and a tool for developing countries that have well-functioning access legislation to ensure compliance. However, that this might require: a re-opening of the Trade-related Intellectual Property Rights (TRIPs)

agreement; access legislation in all developing countries; and an international survey authority.

SESSION 11 – PANEL DEBATE

Biotechnology – rights and possibilities

Moderator: **Kristin Rosendal**

The Fridtjof Nansen Institute

Panel 1 - on GMOs and risk analysis

The question was raised whether a common set of criteria for risk assessments for genetically modified organisms (GMOs) could be used for example in Africa or other regions.

The debate showed that there is no "one size fit all" model mainly due to differences in ecosystems, different socio-economic preconditions and social differences. A GMO can be perfectly safe in one ecosystem while the same GMO can have adverse effects in other ecosystems, in particular in areas of origin of wild relative species. There is therefore a need for country and region specific GMO risk assessments where the ecosystems are similar. A Safety First approach is needed from the earliest stage design throughout research to post-approval monitoring of GMOs.

There are also large variations in risk perceptions amongst countries. It was pointed out that also cost-benefit analyses are needed in order to assess potential benefits from the products. GMOs may have the same effects on ecosystems as invasive alien species.

Efforts are needed to build up capacity in developing countries so that they can implement the Cartagena Protocol on Biosafety effectively. In the future there is also a need to develop risk assessments that cover a broader spectre of products than today.

Panel 2 - on access and benefit-sharing and intellectual property rights

It was pointed out that today over 50 countries have developed or are in the process of developing national legislation on access and benefit-sharing. Some developing countries have imposed strict regulations on access to their genetic resources. The question was raised whether this may hamper research and technology transfer. On the other hand, the patent system has to be developed in order to be supportive of the CBD objective of fair and equitable sharing of benefits arising out from the use of genetic resources.

There is a need to empower local communities to document traditional knowledge. If this knowledge is lost we do not know how to utilize the resources.

It was stated that patents are granted for application/process of genes, not on the gene itself and that a patent is worthless before there is a tradable product. On the other hand, patenting of living organisms such as micro-organisms which are isolated in laboratories

was criticised since this is more a discovery than an invention.

Several measures could be taken to control access to genetic resources and benefit-sharing. Measures such as incorporating questions on biological material in customs forms before entry into a new country is one possibility. Another possibility is to include information on benefit-sharing terms in applications for intellectual property rights.

SESSION 12

Scientific collaboration – education and awareness raising

Session chair: **David Brackett**

Biodiversity conservation in Namibia: Providing incentives for sustainable use of natural resources

E.S. Shanyengana

Aqua Quest Solutions (PTY) Ltd., Namibia

Effective biodiversity conservation requires that activities and products adding value to biodiversity conservation are investigated, that we build on local technology and human capital, and that we establish fair and equitable access and benefit-sharing mechanisms.

Giving an historical background for the present situation in Namibia with loss of traditional knowledge on biodiversity and how to cope with drought situations, loss of the sense of ownership to local resources, increased pressure on limited natural resources, and overall land degradation, he went on to describe ways of restoring an effective regime of sustainability. Important elements here would include legislation, education and research towards effective environmental protection, adopting land tenure and natural resources user rights, introduction of community-based natural resource management and awareness programmes, and to build on traditional knowledge linked to the many unique adaptations found in the country, including the exploitation and application of the role of modern biotechnology.

The battle to save India's wildlife

Valmik Thapar

India

Focus was on the challenges in conservation and sustainable development facing India. With a population of 1.1 billion people, India has also nearly 50% of the world population of tigers and large populations of wild elephants and rhinoceros. Thapar gave an overview of the impact of the cultural history of India on the natural history, mentioning poaching and illegal logging and mining as serious threats to the biodiversity.

To keep India as a mega-diverse country for the future, this will require the skill of advocacy both in the political and the legal arena. Of particular importance is the involvement of local communities in conservation initiatives through field training. The most immediate needs include the reforming and restructuring of existing institutions to deal with capacity building and through this process harness the expertise of interdisciplinary sectors towards biodiversity conservation.

John Herity, Environment Canada, briefly mentioned the importance of local community involvement, noting that the success of biodiversity conservation depends on national and regional governments allowing local communities to take control of their resources. He high-

lighted the work of the Equator Initiative which is designed to reduce poverty through the conservation and sustainable use of biodiversity by fostering, supporting and strengthening community partnerships, and pointed to its website for more information: <http://www.equatorinitiative.org/>.

SESSION 13

Scientific collaboration – research

Session chair: **Augustin Chikuni**

Issues in the assessment, management and conservation of crop diversity on-farm

Devra Jarvis

International Plant Genetic Resources Institute, Italy

Farmers have always shaped the genetic diversity in their crops directly, through selection, and indirectly, through management of biotic and abiotic components, thereby developing and maintaining useful genetic diversity within local agro-ecosystems. There is a need to measure the extent and distribution of germplasm traditionally used by farmers, to obtain an understanding of the processes used to maintain this germplasm, to identify the key people responsible for maintaining the germplasm, and to comprehend what factors influence these people to maintain diversity.

Reports from studies made in seven different countries were seen as a contribution to understand adaptive advantages and limitations of local resources for their use in sustainable agriculture. The information collected is used to enhance the benefits of local crop diversity to farmers through improving the material, improving the management and improving the access, and to build institutional frameworks and representative partnerships of researchers and farming communities. Suggestions on key focus areas for the CBD work programme in technology transfer and capacity building was also given.

Experiences and future plans for biodiversity information exchange and technical and scientific cooperation

Mark Collins

UNEP World Conservation Monitoring Centre, Cambridge, UK

Various past experiences and future strategies form the basis for efforts to facilitate exchange of information and to promote technical and scientific cooperation undertaken by the World Conservation Monitoring Centre. These initiatives relates to the 2010 target for achieving a significant reduction in the rate of loss of biodiversity, the Global Strategy for Plant Conservation, the Millennium Development Goals, and the Clearing House Mechanism. Particularly emphasising the urgent need for identification and adoption of indicators in light of the 2010 target.

Cross-sectoral information linkages, e.g. to agriculture, forestry, fisheries and other natural resources sectors, are essential if the wider significance of biodiversity goals and services is to be widely understood and appreciated. Capacity building programmes for information systems now could be put in place, and that centres of excellence have a central role in building a

global biodiversity communications and knowledge system.

Overcoming the taxonomic impediment: the SABONET experience

Brian J. Huntley

National Botanical Institute, Cape Town, South Africa

The lessons learned linked to the Southern African Botanical Diversity Network, started in 1993 and involving 10 countries in Southern Africa. Through this programme more than 150 botanists, horticulturists and conservation biologists have been trained, 17 herbaria have been fully equipped and their collections consolidated, over 500 000 specimens have been electronically databased, and national and regional checklists and red data lists have been prepared.

The SABONET experience may be seen as an excellent example of a regional south-south technology transfer and capacity building exercise. Capacity building is an ongoing process; the long-term success of the project will rely on continued south-south as well as north-south collaboration.

SESSION 14

The role of the private sector in technology transfer and capacity building

Session chair: **Peter Holmgren**

Role of the Private Sector in Technology Transfer and Capacity Building in Aquaculture

Meryl J. Williams

Worldfish Center, Penang, Malaysia

High population growth and the increase in fish demand may soon reach overexploitation levels of fish resources. This trend has led to a transition from hunting to farming fish. Current aquaculture deals with a high diversity of species (>350 species farmed worldwide) and farming systems.

Fish farming should rely on production that is environmentally (i.e. use of omnivore and herbivore species) and socially acceptable. The private sector has a role in economic development and a duty regarding investments and technology transfer. To be successful, technology transfer should:

1. Increase markedly throughput of society.
2. maintain formal organisations of society as much as possible
3. benefit a wide range of people
4. allow natural resource base to remain resilient against environmental fluctuations.

Current trends indicate some overlap in roles and convergence of interests among the different private sectors, i.e. non-profit agencies, for profit agencies dealing with social welfare and for profit general.

There are many opportunities for the private sector but they are highly dependent on situation, interest and incentives. There is a need to think very broadly about roles of private sector.

The World Fish Centre has engaged in a series of RD and TT programmes where the private sector has had a major role. Lessons learnt are:

1. Patient public sector investment was needed to establish good technologies to transfer.
2. Innovative institution models have to be developed to suit local needs.
3. Private sector interests have to be carefully negotiated.
4. Private sector investment is essential for industry success.
5. Programmes should promote innovation and rural entrepreneurship.
6. For profit general sector could tap from unserved markets of the poor.

The role of the private sector in capacity building for environmental and biodiversity management: lessons from Central America

Ana Maria Majano

INCAE, Costa Rica

For economic decision-makers in Central America, biodiversity is still a marginal issue and its contribution for development poorly understood. In Central America, the investment of private companies has been due to:

1. A response of traditional economic activities to environmental regulations or certification requirements.
2. Corporate social responsibility supported by GO, or NGO environmental programs.
3. New business opportunities arising from sustainable use of natural resources.

There are currently more investments on environmental management than ever before, i.e. waste management, emissions control, and reforestation. This trend is mainly due:

1. New environmental institutional regulations in the past 10 years.
2. International agreements and trends in international markets.
3. More sophisticated domestic consumers.

But there is still not enough to evidence a change in general production patterns.

There are ubiquitous examples of private investment but there is still a lack of a general pattern. Challenges are:

1. Companies attitudes towards the revenue value of biodiversity.
2. Insufficient linkages between environmental and other sector policies.
3. Inflexibility and /or inconsistency of environmental regulations.
4. Rigidities in the financial sector.
5. Limited technical support to promote a vision of sustainability and competitiveness.

Trends in private sector development in Central America through 3 examples:

(i) In El Salvador, corporate and individual donations have supported protected area management, in later years there has been a change in strategy from single short-term donations to medium-term (5-yr) contracts. (ii) A second example is the organisation of farmers' cooperatives engaging in the revival of local dye production (production of indigo) following the recovery of international demand for natural dyes. (iii) In Costa Rica, tourist attractions are based on natural resources and the country has created a brand name destination for nature tourism. The private sector has in the past 10 years engaged significantly on local added values and in small and medium infrastructure projects and development in rural areas.

Market mechanisms as drivers of Capacity Building and Technology Transfer: synergies between Climate Change and Biodiversity

Jan Fehse

EcoSecurities Ltd., Oxford, UK

There is a potential for the market to act as a driver to capacity building and technology transfer. To success the actors must be made aware of the existence and potential value of biodiversity and economic incentives must be in place.

As a development of the Kyoto Protocol in 1997, when industrialised countries committed to reduce the emission of greenhouse gases, there is a market for environmental levies in relation to carbon sequestration, but there is no market for biodiversity goods. There is a potential to establish synergy between biodiversity and climate change, i.e. Kyoto Protocol and CBD, and to attach biodiversity added-value to carbon sequestration levies (carbon-plus credit). There is a need to develop criteria and standards that could make 'carbon-plus credits' with biodiversity benefits easily identifiable. Also, to the creation of legal instruments that internationally acknowledges the biodiversity benefits of climate mitigation activities.

Currently, and due to active lobbying from forestry sector, carbon sequestration levies can be applied for forest plantations. To achieve synergies with CBD, it is necessary that sustainable forest management and forest conservation projects become eligible. There should also be a shift to promote small-scale community forestry project with high biodiversity and social benefits in contrast to monoculture plantations.

SESSION 15 - PANEL DEBATE

The role of global and local businesses

Moderator: **Geir Høiby**

Confederation of Norwegian Business and Industry

Carbon market and synergies between CDM and CBD.

Many potentially interesting projects are not eligible.

Ana María Majano. Disappointment that forest conservation has not included in the CDM. There are also problems in private sector in understanding how the CDM works. But people are understanding and more profiting. A 'gourmet carbon certificate', would be a way of attaching and added value for biodiversity or other services. There is a need to find a market for these certificates.

Jan Fehse. EU has been concerned about the CDM levies directed to forestry. There will be likely changes after 2012 when the countries need to show that they have reduced emissions. Sustainable forest management and protection should be put forward instead of forestry.

The importance of this discussion is to bring about the potential of synergies between international environmental agreements. Carbon market could help biodiversity conservation with added value to carbon certificates. Costs that are related to creation and design of CDM project and get the certificate are high.

Public – Italy. Italy is funding 3 pilot projects to CDM reforestation / aforestation on degraded land according to the definition of the Convention of Desertification as a means to promote synergies with CDM. There is a need to come up with a list of environmental goods that could be added to the CDM market.

Ana María Majano: Important to produce a list of environmental goods and services. Currently, goods largely determined by industrialised countries (emissions, environmental waste, etc), but there is not a market for the goods that developing countries can provide. Biodiversity is one of these goods.

Jan Fehse. Rather than focusing on whether CDM is good or bad, use it as an opportunity of making good land use.

Companies and banks that have financed large projects, go over to financing small projects.

Meryl Williams. To include CDM for conservation of marine biodiversity by using ocean carbon sinks, some of the options are ecologically very risky, management of marine resources present huge challenges. There is no really idea about what ecological consequences fertilisation of the ocean can bring about. There are also complex issues going on between aquaculture and fisheries that present problems.

Capacity building.

It is important to create knowledge of the issues, to allow internal (institutional) discussions and to put forward national issues in an international arena. Finally, it is important to create institutional capacity to implement whatever is decided.

SESSION 16

Criteria of success for technological transfer and capacity building

Session chair: **Ragnhild Lund**

Building capacity for the adoption of science and technology: Experiences of The World Agroforestry Centre

Dennis Garrity

World Agroforestry Centre (ICRAF)

Nairobi, Kenya

True capacity resides inside institutions or societies. An institution is said to have the right capacity when it operates within a recognized and enabling policy environment; has a good strategy and attendant programs of work; controls resources (facilities and financial) and has the expertise needed (knowledge, skills and attitudes) to mobilize its capacity. Therefore, capacity building can only be successful when all these factors are taken into consideration.

ICRAF's strategy for building capacity is anchored on four principles: Demand driven, serving as mentors/facilitators, long-term engagement and sustainability is included

In this presentation, we illustrate the frontiers of our capacity building efforts, namely agroforestry research, education and development. We discuss some aspects of knowledge management, particularly mechanisms that allow knowledge generated in our work to flow in all directions, now and in the future. Some recommendations are made particularly for the fields of agriculture and natural resources management.

INBio and the development of scientific and technological capacities for biodiversity management in Costa Rica

Rodrigo Gámez

Instituto Nacional de Biodiversidad

Heredia, Costa Rica

INBio has since 1989 made significant contributions to the management of the biodiversity of Costa Rica. INBio offers important lessons relevant to the success of similar initiatives in other countries.

INBio's main accomplishments include areas like:

- Establishment of a national biodiversity strategy and a national biodiversity law.
- Alliance with the National System of Conservation Areas
- Development as a solid scientific institution
- Biodiversity inventories (collection housing nearly 3 mill. specimens and 20000 species).
- Pioneering use of modern ICT's.
- A bioprospecting initiative
- Methodologies to share biodiversity knowledge and information

INBio and Costa Rica illustrate, with limitations, what may be accomplished when: 1. A serious and formal long term, knowledge intensive process is implemented for the purpose of building capacity at the three mentioned levels; 2. Key basic conditions pre-exist, and significant intellectual and financial international support is provided.

Capacity Building to Support the Cartagena Protocol on Biosafety, the UNEP/GEF Project

Charles Gbedemah

Division of UNEP/GEF Co-ordination, UNEP
Nairobi, Kenya

Drawing up the process from the Agenda 21 to the adoption of the Cartagena Protocol on Biosafety. This led to the GEF Initial Strategy on Biosafety which main objectives are to: assist countries in establishment of national frameworks; promote information sharing and collaboration; promote collaboration with organizations to assist capacity-building.

Presenting UNEP-GEF Project on Development of National Biosafety Frameworks. Key elements here are: Policy on biosafety; legal/regulatory system; risk assessment procedures; mechanisms for monitoring and inspections; systems to provide information to stakeholders and for public participation.

Finally lining up the execution of developing a National Biosafety Framework, including institutional execution and project execution. The Project execution was separated in four phases: Starting up the project; gathering information; consultation and analysis; drafting the framework.

Communication capacity development for managing change for biodiversity results

Wendy Goldstein

IUCN, Gland, Switzerland

To support change – communication is an important instrument. The IUCN Commission on Education and Communication (CEC) has carried out several surveys on these issues. The outcome of these emphasizes the lack of understanding, other public concerns and focuses. There is need for Biodiversity priorities, national methods, solutions for conflicting interests by others.

IUCN-CEC has carried out capacity development projects in South America, Asia and Central Europe. Here several measures and approaches were used.

Capacity development recommendations are: focus on priorities; tailor made tools; developing means and solutions; “tact knowledge” needed. The communication gap between experts and the public (also several decision-makers) has to be overcome. Communication is a tool for change.

SESSION 17

Towards global partnerships for technology transfer and capacity building

Session chair: **Peter J. Schei**

Biodiversity, technology transfer and capacity building:
A World Bank perspective

Jan Bojö

Environment Department, World Bank, Washington, USA

From a World Bank perspective, technology transfer and capacity building, as related to biodiversity, cuts across many sectors including environmental management, education, science and technology, information technology, private sector development, and public management.

Focusing on a few important examples in this broad context, the article reviews World Bank supported and (partially) funded activities to develop technologies and build capacity in the context of (i) biodiversity conservation projects; (ii) the Consultative Group of International Agricultural Research (CGIAR); (iii) the Millennium Ecosystem Assessment; (iv) the Critical Ecosystems Partnership Fund; and (v) several Forest Partnerships.

As for future perspectives, three themes are highlighted:

- the revolution in biotechnology
- payment for ecological services
- international connectivity

UNDP/GEF experiences in technology transfer and capacity building in biodiversity

Nick Remple

UNDP/GEF, Bratislava, Slovakia

Presenting UNDP experiences in capacity development. Noting that UNDP has primary responsibility for developing capacity within the UN system, UNDP is working in over 120 countries at national and local levels. Highlighting small grants to local communities, the Biodiversity Planning Support Programme and the Equator Initiative to exchange learning experience and for the self-assessment of capacity needs to meet CBD obligations. Capacity development is a dynamic, endogenous, strategic, participatory and locally owned and driven process, and the need for a holistic, integrated and ‘reflection-action’ approach was stressed. Noting that work is required at the societal, institutional and individual levels.

A view from the south

Vandana Shiva

Research Foundation for Science, Technology and Ecology, New Delhi, India

Focusing on the South’s perspective on technology transfer and capacity building. Expressing a strong opposition to GM crops, noting the need to assess and

compare alternatives. Highlighting the problem of bio-privacy and attempts to patent traditional knowledge, citing the case of US companies that patented traditional knowledge associated with India's Neem tree and Basmati rice. The TRIPs Agreement can prevent illegal technology transfer, but the agreement needs to be reviewed to take into consideration CBD obligations. The need for further independent studies and assessments on biotechnology was stressed.

Responding to a question on South-South partnerships, Shiva stressed the need for stronger networks and global partnerships. On South-North transfer, she said there needs to be real benefit sharing, not benefit taking.

Chairman's Conclusions

Peter J. Schei

The preliminary conclusions from the meeting were presented, where Schei highlighted the broad spectrum of technologies to be transferred; the need for adaptation to socio-economic, cultural and religious circumstances; and the need for reciprocity and to abandon the donor-receiver model. Strategic recommendations from the meeting will include elements on developing and integrating technologies with relevant sectors; involving all stakeholders; promoting horizontal cooperation; and addressing technologies related to information, data management, education, public awareness raising, biotechnology and biosafety, access and benefit sharing, and new products and value-adding processes. Operational aspects requiring further work relate to: assessing technology and capacity building needs, including training in international negotiations and understanding trade-related issues. Schei also emphasised the importance of an enabling environment, where a level playing field is created and where negotiations take place on more equal terms.

Schei also welcomed comments and inputs to the Chairman's conclusions and recommendations received from the participants and underlined that these would be included in the final version of the report.

Closing remarks: Where do we go from here?

Alfred Oteng Yeboah

CSIR, Ghana

Mr. Yeboah, who will be Chairman of SBSTTA-9, stressed technology transfer and capacity building as crucial for implementing the CBD. Highlighting how technology transfer and capacity building are integrated in the CBD, its various thematic programmes of work and cross-cutting issues, and stressing the importance of the Conference's outcomes as an input to SBSTTA-9 and COP-7 discussions.

He also underlined the importance of input to SBSTTA, referring also to the fact that no expert group meeting had been set up for technology transfer and capacity

building. Yeboah therefore welcomed the valuable output from the Trondheim conference, underlining also how he had found it to be a true and real open-ended meeting.

He hoped that SBSTTA9 would be equally open-ended, and that the meeting could produce valuable recommendations for COP7, where policy makers would make the final recommendations.

In concluding, he thanked the government of Norway and UNEP for hosting the conference and thanked everybody for their work and their contributions.

ANNEX

To improve the output of the conference, the Chairman on 26 June handed out a questionnaire asking for immediate answers to some key issues raised at the conference.

This questionnaire was handed out to all the participants and asked the following questions:

- What are the most important lessons for you and/or your country/organisation arising from this meeting?
- What is/are the most important technology¹ need[s] for your country/organisation?
- What is/are the most important capacity building need[s] for your country/ organisation?
- What is the most important technology or capacity building option that your country/ organisation could offer to meet the 2010 biodiversity goal (on significant reduction in the loss of biodiversity)?

Respondents were also to indicate from which region and type of organisation they came, i.e. Africa, Asia, CEE, GRULAC, WEOG, EU, JUSSCANZ, IGO, NGO or Other.

Response to the questionnaire was good and quick, and around 70 forms were received.

There was unfortunately not room to analyse and accommodate systematically the views expressed in the questionnaires. However, the replies were reviewed by the Chairman and some Friends of the Chair, and have thus contributed to the Chairman's conclusions presented on 27 June and as reflected at page 8.

Furthermore, a copy of the questionnaires has been submitted to the CBD-secretariat for their consideration.

¹ Technology – provide definition to include both "hard" and "soft" technology.