Executive Summary Chairman's Report

Norway/UNEP Expert Conference on Biodiversity

24-28 May 1993

NORWAY/UNEP EXPERT CONFERENCE ON

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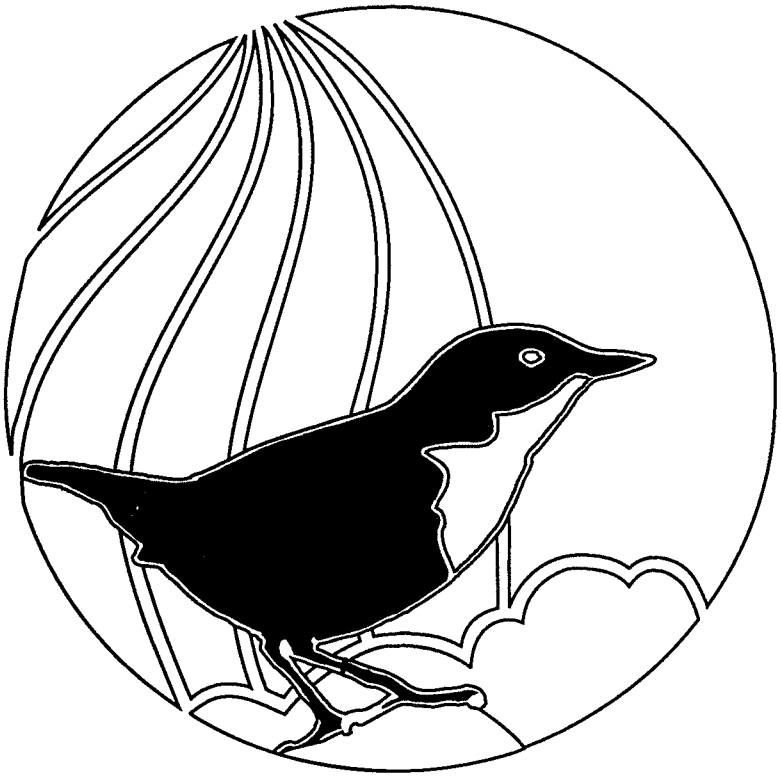

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Hosted by
the Norwegian Ministry of Environment
in collaboration with
the United Nations Environment Programme (UNEP)

Organized by
Directorate for Nature Management (DN),
Norwegian Institute for Nature Research (NINA),
and
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Trondheim, Norway

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ABSTRACT

The discussions during the first days of the Conference revealed considerable differences of opinion between the scientific community and the community of politicians and decision-makers. Several members of the scientific community expressed impatience with politicians and decision-makers, maintaining that the available knowledge about biodiversity loss is sufficient to justify a much more decisive political action. Politicians, on the other hand, felt that the considerable political challenges and the substantial efforts on their part, to promote conservation and sustainable use of biodiversity in a political environment of diverging interests, was not duly appreciated. During the formal and informal discussions at the Conference, these differences were greatly reduced, and a much improved understanding and feeling of working towards a common goal was achieved.

Other main points were:

- The issue of conservation and sustainable use of biodiversity must be kept high on the agenda of scientists and politicians alike.
- Scientists must bring their message regarding biodiversity loss across to politicians and decision-makers, not awaiting complete scientific knowledge before giving their advice.
- Scientists must relate their work more to the needs of the real world in relation to the Convention on Biological Diversity.
- Conventional science is not the only source of knowledge about biodiversity conservation and sustainable use. The traditional knowledge of indigenous peoples must be fully respected and combined with contemporary scientific knowledge.
- It is of utmost importance to improve the mechanisms for translating scientific knowledge into easily understood language and political action.
- Long-term conservation of biodiversity can only be achieved if the local communities are given adequate management responsibilities and can share the benefits from the sustainable management of biological resources.
- The lack of tools to evaluate the economic consequences of biodiversity loss is an important reason for the erosion of biodiversity.
- Sustainable management of biodiversity is a national responsibility. The problems of global and regional threats to biodiversity from e.g. climate change and atmospheric pollution must be solved through collaboration amongst countries.
- Successful management of marine biodiversity particularly depends on collaboration amongst sectors within countries as well as international collaboration.
- The new economic opportunities related to the use of biodiversity information, through e.g. biodiversity prospecting and eco-tourism, must be based on sound scientific knowledge, respect of the rights of local communities and of national sovereignty, to ensure a sustainable development of these activities.
- The development of mechanisms for transfer of technology to developing countries, as well as capacity building must be given priority, and sufficient economic resources must be made available by the industrialised countries.
- A scientific and technological advisory committee should be established as soon as possible to ensure appropriate scientific advice during the process of implementing the Convention on Biological Diversity.

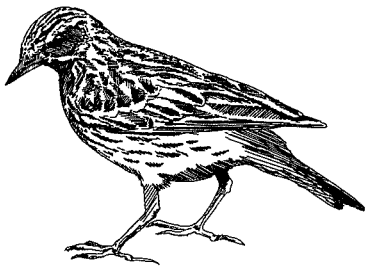
INTRODUCTION

The Norway/UNEP Expert Conference on Biodiversity was hosted by the Norwegian Ministry of Environment in collaboration with the United Nations Environment Programme (UNEP). It was held at Royal Garden Hotel, Trondheim, Norway, 24 - 28 May, 1993, as a follow-up to the signing of the Convention on Biological Diversity and as preparation for its ratification and implementation.

The Norway/UNEP Expert Conference was essentially a discussion between scientists, resource managers, bureaucrats and policy-makers from approximately 80 countries, and the proceedings form part of the basis for UNEP's preparations for the first Intergovernmental Committee (IGC) meeting of the Convention's signatories, to be held in Geneva, October 1993. The objectives of the Conference were to:

- Involve experts from a high number of countries in the follow-up process, in order to motivate for action at the local and national level.
- Establish and develop contact and collaboration between scientists and policy-makers.
- Develop cross-sectorial discussions in biodiversity research and management.
- Provide input from a wide audience to UNEP's preparatory work for the IGC meeting.

Since the adoption of the Convention on Biological Diversity at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil, June, 1992, 18 countries have ratified the Convention (as of 28 May, 1993). It is of utmost importance that the process to implement the Convention is continued during the interim period before the Convention has been ratified by 30 countries and enters into force. UNEP was urged to take responsibility for the follow-up during the interim period by the Nairobi Final Act Conference, May, 1992. UNEP's activities have included the establishment of four panels to discuss the implementation of various aspects of the Convention, and development of guidelines for biodiversity country studies and national action plans. The Norway/UNEP Expert Conference on Biodiversity was the third Conference co-sponsored by UNEP to involve representatives from a large number of countries in the discussions on the implementation of the Convention. The International Conference on Biodiversity Country Studies, in San José, Costa Rica, November, 1992, discussed the development of country studies and national action plans. The International Conference on the Convention on Biological Diversity: National Interests and Global Imperatives, in Nairobi, Kenya, January, 1993, discussed matters *inter alia* relating to access to biological resources, patents and intellectual property rights.

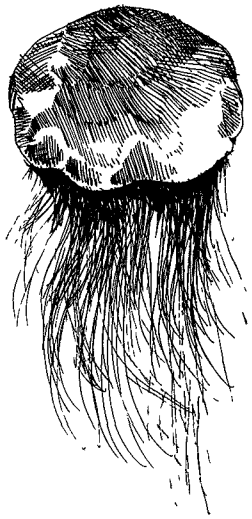


The themes discussed at the Norway/UNEP Expert Conference on Biodiversity included:

- Ecosystem functions of biodiversity.
- Loss and conservation of biodiversity.
- Marine biodiversity.
- Biodiversity inventory and monitoring.
- Sustainable use of forest biodiversity.
- Sociocultural aspects of biodiversity.
- The economic aspects of biodiversity conservation and use.
- From scientific knowledge to political action.

The themes were covered through 22 lectures followed by plenary discussions, four panel discussions, and four ad hoc working groups. The UNEP panel reports on priorities for science and management (Panel 1), economic implications of biodiversity conservation and use (Panel 2), and handling of biotechnologically modified living organisms (Panel 4), were also presented.

This document presents the executive summary of the lectures, discussions and presentations at the Conference. The text is based on main points from the lectures, minutes taken by the rapporteurs, and discussions in the editorial group. The summary does not necessarily represent a consensus among participants.



OPENING SESSION

Chair: **Thorbjørn Berntsen,** Minister of Environment Norway

Introductory speeches were given by Ms. Gro Harlem Brundtland, Prime Minister of Norway; Ms. Elizabeth Dowdeswell, Executive Director of UNEP; Mr. Olof Johansson, Minister of Environment, Sweden; Mr. Marvin Wiseth, Mayor of Trondheim; and Mr. Vicente Sanchez, Chilean Ambassador to Kenya and UNEP.

Keynote session: BIODIVERSITY AND HUMAN EXISTENCE

Chair: **Peter Johan Schei,** Norway

Keynote lecturers and panel participants: **Madhav Gadgil, Per Ariansen, Norman Myers, David W. Pearce, Vertistine A.B. Mbaya.** Moderator: **Ketil Gravir**

Complexity is a prominent feature of the biodiversity crises, compared to other recent environmental crises. The loss of biodiversity concerns almost all human activities and all parts of society. The conservation or erosion of global biodiversity is by far the most far-reaching responsibility that is taken by any generation. Scientists have an obligation to communicate the crisis and should more actively involve themselves in the aspects of biodiversity of most consequence to society, not conducting their activities in a social vacuum. The urgency of the crisis calls for scientists to speak up even if they lack full scientific knowledge.

The relationship between humans in different societies and their dependence on biological diversity vary among communities. The relationships may be divided into three categories:

- Ecosystem people are members of societies which are closely dependent on local biodiversity for their survival and foodsecurity.
- Biosphere people are those who rely on a market for their food supply. The market may be local; or it may be world wide, meaning that those people draw on the entire biosphere for their day to day life.
- Ecological refugees are people who are forced to move due to radical ecological changes, e.g. people displaced due to hydroelectric power plant development, soil erosion, environmental poisoning, etc.

Conservation of natural ecosystems can best be achieved by a combination of motivating local people to manage local ecosystems, and transferring substantial power of resource management to the local communities. Developed countries should also offer better terms of trade for e.g. tropical forest products. The rights of people who are owners or custodians of the biological diversity should be recognised and the value of these rights and resources must be promoted.

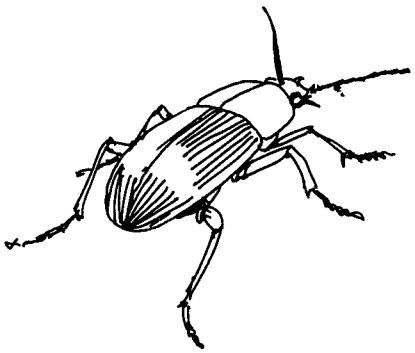
The poor are not poor so much as disempowered. In the formulation of an alternative approach to solving the problems of the poor, indigenous people seek to achieve solutions for internal as well as external problems according to their own criteria and way of thinking. Sharing of knowledge is central in this process as opposed to trading of "things". Economic, social, political and scientific programs should focus on the gradual regeneration of natural resources.

The present consumer lifestyles (mainly in the north), particularly the levels of consumption, have detrimental effects on biological diversity. The Rio Conference clearly stated that a change in lifestyle in the rich countries is needed. However, arguments focusing on lifestyle changes only may not easily be accepted by a majority of people in the rich countries. To achieve a change in consumption patterns and levels, an approach focusing on the quality of lifestyles may be productive.

Among the most important causes behind biodiversity loss are competition for space between humans and other species, and systematic flaws in economic systems, both relating to natural resources policies and to global and local markets. The loss of biological diversity can be delayed through the active use of economic tools attacking the fundamental causes of this loss. The use of economic tools may prove that conservation of biodiversity is valuable to the society in general, although such conservation will involve increased costs for some groups in society. Governments must adjust local markets and the international community must develop mutually beneficial trade.

We cannot expect that people have moral obligations towards species per se. Humans may however, decide to institute a "one way ethic" towards animals and entire species. The attitude of protecting and caring not only for species but also ecosystems follows from various religions, for example the Christian Stewardship concept. Furthermore, the fear that we are tampering with the very foundation of human existence certainly involves an ethical obligation.

Conclusion: Keeping the biodiversity issue on the agenda
It is imperative that conservation and sustainable use of biological diversity are kept high on the agenda, avoiding that the Convention on Biological Diversity becomes a "dust-collector". There is a general agreement that a multitude of actions should be undertaken immediately. Scientists and the scientific community have an important role to play in bringing the message to politicians and decision makers, not awaiting full scientific knowledge of every aspect of biodiversity. The fundamental importance of biodiversity and ecosystems for the future survival of humankind, calls for immediate action to protect and sustainably use biological diversity.



Session 3

BIODIVERSITY AND ECOSYSTEM FUNCTIONS

Chair: **Jameson H. Seyani**, Malawi

Harold Mooney: Biodiversity Components in a Changing World
It is important to consider ecosystem processes when discussing the conservation of biodiversity. Core issues regarding the ecosystem function of biodiversity in the ongoing international SCOPE (Scientific Committee on Problems of the Environment) research project are:

- How does biodiversity contribute to ecosystem processes?
- How is system stability and resilience affected by species diversity and how will global change affect these processes?

Preliminary work has led to the following conclusions:

- Concentration on the loss of species diversity can be misleading, since there are both enrichment and pauperisation of species in tropical and temperate ecosystems.
- Biological systems are dynamic and yet the Convention on Biological Diversity tends to give a static view of the world, subject only to land use changes with negative impacts on biological diversity. The effects of the change in CO_2 in the atmosphere (as a greenhouse gas and fertiliser) should also be considered.
- Short term experiments and observations can be highly misleading since the variables of ecosystem function are highly time and space dependent.

Phyllis Coley: Plantanimal Interactions

To preserve biodiversity, the interactions between plants and animals must be protected. Plant-animal interactions increase diversity in several ways:
Keystone species relationships Keystone species play a vital role in the ecosystem, one upon which many other species depend. Examples are fig wasps and jaguars. Many birds and mammals depend on fig fruits which are pollinated by tiny wasps. Jaguars regulate the number of seed-eating mammals which in turn affects the relative abundance of small and large -seeded trees.
Diverse assemblages of species A complex assemblage of species acting in concert can also increase biodiversity. An example is soil decomposers which regulate the circulation of nutrients in the ecosystem, allowing high plant diversity and productivity in poor soils.
Speciation Plant/animal interactions can hasten the creation of new species. An example is longdistance dispersal of fruits to new areas. The widely separated plant populations will diverge until they are two distinct species.

Knowledge from research on plant/animal interactions has practical implications for biodiversity prospecting and genetic engineering. For example, plants that resist insects and diseases may have genes or chemicals useful in agriculture and medicine.

To preserve the plant/animal interactions which are essential to biodiversity, we must:

- preserve large areas (for keystone species and diverse assemblages of species)
- preserve a variety of habitats
- preserve corridors for migration of species
- include buffer zones of multiple use around preserves

Discussion
It was pointed out that two issues of great importance for developing countries are particularly related to this session's theme. These are soil conservation and biodiversity prospecting. The importance of nitrogen enrichment in certain northern countries (by car exhaust fumes) was stressed. The notion of "keystone" species was questioned, often we simply do not know enough about the interactions of most species.

Session 4

MARINE BIODIVERSITY

Chair: **Jameson H. Seyani,** Malawi

Ray H.J. Beverton: Biodiversity and Sustainable Harvesting of Fish Resources: the Barents Sea Experience in Context

Recommendations for sustainable use of marine fish stocks:

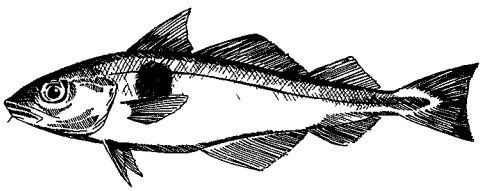
1. For stocks that can be considered as composed mainly of a single species, the relationships between harvesting rate and natural mortality rate can work as a directing principle for harvest levels. This means that the harvest level must not exceed the amplitude of natural fluctuations. The size of natural fluctuations must be known.
2. There is today a lack of knowledge for the development of criteria for harvest levels for stocks belonging to very complex ecosystems; and for ecosystems with a small number of economically important and strongly linked species, for example the food chain from the Barents Sea.

Elliott Norse: Global Marine Biological Diversity: A Strategy for Building Conservation into Decision Making

Main points from the report published by the Center for Marine Conservation (in collaboration with IUCN, WWF, UNEP and the World Bank):

1. Marine biological diversity - genetic, species, and ecosystem - is comparable to terrestrial biological diversity in magnitude. It is vital for humankind as a source of products and ecosystem services, and it is threatened.
2. The major threats to marine biological diversity - overexploitation, physical alteration, pollution, introduction of alien species and global atmospheric change - are the same ones that are reducing biodiversity on land.
3. Institutions are poorly configured for protecting, studying, and sustainably using marine biological diversity because marine processes generally occur at a much larger scale than those on land, and commonly transcend nations' borders. Hence, international cooperation is essential in marine conservation.
4. Piecemeal management of single sectors, such as fisheries, oil transportation, and coastal development, is not effective in maintaining marine biodiversity. Integrated area management is an effective alternative.
5. The goal of conserving marine biodiversity is to maintain the integrity of the sea, both the living components and the processes that connect them.

Discussion
The main point, stressed by several participants, is the urgent need for international collaboration on conservation and sustainable use of marine ecosystems.



Session 5

LOSS AND CONSERVATION OF BIODIVERSITY

Chair: **Georgy A. Zavarzin,** Russia

Nils Ryman: Genetic Effects of Harvesting and Supporting Natural Populations

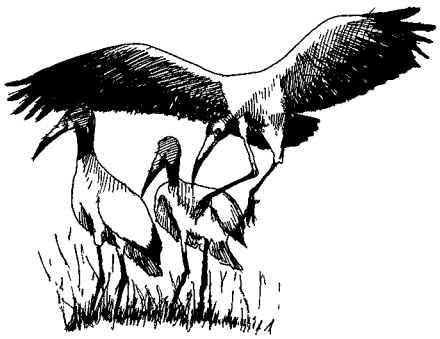
The heightened consciousness regarding the need to protect biodiversity has insufficiently related to concerns about conservation of genetic diversity within species, particularly when considering species where population sizes are large enough to permit harvesting.

Harvesting and supporting natural populations may threaten intraspecific genetic variability in three distinct ways. First, local populations may become extinct either from excess harvesting or from introduction of diseases or displacement by other species or populations following the release of individuals aimed at supporting the natural population. Second, loss of genetic variability within a population may occur through intentional or unintentional selective harvest of individuals or populations, or through declining population size and consequent inbreeding. Third, losses of genes and gene complexes that characterise populations may occur through hybridisations resulting from a variety of human activities, including undertakings that are aimed at enhancing weak populations.

For some threats the cause-effect mechanisms are obvious, but for others they are not. There are also a number of situations where regulations intended to minimise the potentially negative effects of harvesting or supporting a population are in direct conflict with the goal of conserving the genetic characteristics of the population. There is an urgent need to properly identify this latter group of threats, particularly as they relate to current practices for management.

Particularly serious are the problems encountered when managing economically important species such as fishes and forest trees, because the management programs are typically carried out on a very large scale. Contrary to the potential perils associated with high technology DNA engineering and the release, or escape, of transgenic organisms, these genetic manipulations attract very little attention.

Peggy Fiedler: Fragmented Populations



Fragmentation is a diverse, complex, process that operates at different temporal and spatial levels. Not only number of species but also composition of ecosystems and abundance and diversity within species are important features to be recognised in the study of fragmentation. The following subjects should be given priority in future research on fragmented populations:

- Demography of naturally and anthropogenically fragmented populations.
- Fragmentation in aquatic systems.
- Experimental approaches to understanding demographic responses to fragmentation.
- When and where do corridors work to ameliorate the effects of habitat fragmentation?
- What is the general congruence between the theory behind the dynamics of nature preserves and habitat fragmentation?
- Adaptive management of parks, preserves and habitat fragments.

David Wood and Jillian Lenné: Dynamic Management of Domesticated Biodiversity by Farming Communities

A major challenge for tropical agriculture in the future will be to increase food production without irreversibly damaging the environment. Biodiversity has been selected and used by farmers for millennia to harness the productive potential of a wide range of terrestrial ecosystems to meet human needs. Past crops and diversification of varieties, as well as the dissemination of diversity between farmers at all levels, is of fundamental importance in maintaining this cultivated diversity. Multiple cropping and mixtures of varieties in traditional farming is of crucial importance to conservation of crop diversity, which is related to risk aversion, dietary diversity, and economic factors of marketing and labour. Such traditional farming systems should be preserved in parallel with the development of high-yielding agricultural production systems.

Discussion
There is a relationship between fragmentation of habitats and human agricultural activities, e.g. in the form of shifting cultivation. It may be questioned if the environmental change that occurs in areas of shifting cultivation necessarily means a loss of biodiversity. Shifting cultivation means a change in biodiversity which could mean a loss of biodiversity on a small scale but not necessarily on a large scale.

The difficulty of promoting only traditional farming was stressed. Increasing populations must be fed. Therefore, an active support of only traditional farming to promote in situ on farm conservation of genetic diversity may not be feasible. Development of a high-yielding agriculture together with support of some traditional farming to conserve the genetic diversity necessary to uphold highly productive agriculture can be envisaged.

Session 6

PRESENTATION OF THE UNEP PANEL 4 REPORT

Chair: **Georgy A. Zavarzin,** Russia

Veit Koester: The Need for a and Modalities of a Protocol setting out Appropriate Procedures of the safe Transfer, Handling and Use of any Living Modified Organism resulting from Biotechnology

There is no unanimity in Panel 4 over the question of whether or not the strengthened international cooperation on this subject should take the form of a legally binding protocol. However, all the Panel members felt that the political decision on the need for such a protocol should be made by the Conference of the Parties. A majority of the Panel members agreed to recommend that there be a protocol, because the nature of biotechnology itself necessitates a precautionary approach. In the report, the majority of the Panel has outlined the scope and modalities of a possible protocol. The minority maintained that the need for a protocol can only be determined after further analysis of a range of issues.

Discussion
It was pointed out that without in some way transforming the obligations of the contracting parties into obligations for the private sector, the Convention will not be effective in the field of biotechnology.

Session 7

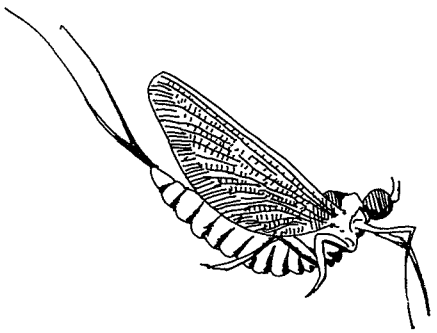
INVENTORIES AND MONITORING

Chair: **Robin Pellew,** UK

Daniel H. Janzen: Taxonomy: Universal and Essential InfraStructure for Deve lopment of Tropical Wildland Biodiversity

The more traditional forms of agriculture in tropical countries are close to its limit if it is to remain sustainable. However, taxonomy and thereby a better knowledge of species, how they interact and their possible useful applications, have great potential. Eliminating much of the present taxonomic chaos and ignorance can be done at very low costs. Education and training at all levels are crucial.

Costa Rica was highlighted as a country with good experience in local communities' participation in the inventory and monitoring process of biodiversity, whereby the local communities have been directly involved in the development of more sustainable and prosperous utilisation of biological resources. The Costa Rica example indicates that economic values and commercial use of biological resources are important incentives for governments to conserve biodiversity.



Eduardo Fuentes: The Need to Establish a Global Biodiversity Monitoring Network

There is a need to develop a systematic approach to evaluate trends in the world's biota; i.e. to have a global biodiversity monitoring network that will act as a warning system capable of informing the parties about global, regional and local trends in biodiversity of populations, species and landscapes. The network should be capable of detecting undesired trends beyond "normal" fluctuations in populations, species and landscapes, and

it should have the capacity to convey this information to interested parties, such as governments, scientists and NGOs.

The network should be part of a larger environmental warning system to get a better understanding of the causes of changes in biodiversity. Scientists and policy makers at all levels should be involved in the creation of the network. The balance between top down and bottomup initiatives and control is important. The network should start small, with core sites, core taxa and core variables. From there the network should expand in a stepwise fashion.

Discussion
There is a serious lack of taxonomists and other scientists in many countries, particularly in the developing world. It was argued that industry may be likely to invest in taxonomy once the commercial benefits of improved taxonomy have been made obvious for them.

Session 8

TOWARDS SUSTAINABLE USE OF FOREST BIODIVERSITY

Chair: **Robin Pellew,** UK

Madhav Gadgil: Tropical Forestry and Conservation of Biodiversity

Tropical forests are one of the ecosystems with the richest diversity of living organisms. The wealth of biological resources has for centuries been exploited in a sustainable manner by the indigenous ecosystem people. Instead of conserving the biological resources by patronising the ecosystem people they should be empowered to control and profit from the current and emerging uses of tropical forest resources. Outsiders, the biosphere people, who obtain the profits of commercial utilisation of the biological resources have little concern for sustainable use since they have the option of shifting the exploitation to other localities as well as finding substitutes through technological advances. The development of biotechnology adds to this negative trend: Once the genetic resources are located and collected they can be kept in *ex situ* conditions with no incentives to conserve the biological resources *in situ*. The best chance of long term conservation of the biodiversity of tropical forests lies in enhancing the security of control of the ecosystem people of the third world over their immediate environments. Environmental refugees should be helped to re-establish themselves as ecosystem people with secure livelihoods. The Convention on Biological Diversity does not give adequate recognition to or protection of the needs of ecosystem people.

Jukka S. Salo: Boreal Forestry and Conservation of Biodiversity

More than half of the world's remaining forest cover is found in temperate and boreal regions. Nevertheless the tropical forests have dominated the discussions on biodiversity issues. The forestry practices in the boreal forests have important implications to the maintenance of biodiversity. However, the most important factors concerning biodiversity maintenance are land use and land ownership issues. While state ownership dominates Russia and Canada, forests in Scandinavia are mostly privately owned, resulting in a very fragmented forest cover. The fragmented pattern has, together with forest practices, implied a decline in species populations and even extinctions of many species in the forests. The lessons learned from the different forestry practices and forest ownership in regard to biodiversity should be carefully examined in the case of forming a new Russian forest policy.

Discussion

It is of utmost importance that FAO and TFAP (Tropical Forest Action Plan) give adequate emphasis to biodiversity conservation. If not, there will be a need for a Forest Protocol under the Convention to promote sustainable use of forests.

Session 9

SOCIOCULTURAL ASPECTS AND LOCAL COMMUNITIES

Chair: **Setijati D. Sastapradja,** Indonesia

Tewolde B.G. Egziabher: Modernisation, Science and Technology, and the Perturbations of Traditional Systems of Conservation of Biological Diversity

It is a truism that science springs from our interactions with Nature. Several types of reductionism in biology are recognised and described. Both *ex situ* and *in situ* conservation practices are forms of reductionism, which may give a false sense of security that something is being effectively done to conserve biological diversity. We should not be deluded by the idea that science knows all, but accept the fact that ancient traditional resource use systems may present solutions for today's and tomorrow's problems. The following considerations are important for the implementation of the Convention:

- Industrialised countries should base their research and development on a broader resource base, including traditional knowledge, and reduce their population and resource consumption;
- Developing countries should legislate against the patenting of organisms; give patent rights to rural communities; reorient and strengthen their research and development; j diciously industrialise agriculture; and reduce population growth.

Calestous Juma: Towards Biodiplomacy: New Regimes in Genetic Resources and International Relations

A summary was given of the main results of the ACTS meeting in January 1993 on "National interests and global imperatives". Elements include the relationships between the Convention provisions and trade agreements such as the GATT, the "loopholes" in the Convention as regards non Contracting Parties or Parties which would fail to implement the Convention. The negotiations of the Convention gave perhaps too much emphasis to the contentious issue of patents which led to a climate of mistrust: can one now explore the possibilities of cooperation in good faith and try instead to move ahead, for example with national biodiversity strategies, both within and outside the Convention?

Mark Sagoff: Creation, Culture and Ecology

A summary was given of the historical and philosophical origins of modern ecological thinking and its paradigms, starting with the different viewpoints of Plato and Aristotle and how contemporary ecologists have used their schools of thought in shaping their own attitudes towards Nature. Today we see two different perceptions of biological diversity according to whether the perspective is an ecosystem-based study of processes, or a study of minute particulars, i.e. individual organisms. These perspectives also influences our values which are at the base of our emotive relations with Nature. Scientifically, both per-

spectives give us strong reasons to value biodiversity. In addition, the ethical and spiritual values of biological diversity, as presented in the Preamble of the Convention, must be recognised as powerful forces underpinning much action for the conservation of biological diversity.

Discussion
Class (caste) and gender issues are important in the use and conservation of biological diversity. It is imperative that all Parties to the Convention apply the principles of human rights, including the emancipation of women, without in the process disrupting the delicate balance by which a given society can promote the sustainable use and conservation of biological diversity. This requires a country-specific approach.

The social, cultural, ethical and spiritual aspects of biological diversity need further thought and discussion by the Contracting Parties.

SESSION 10

PRESENTATION OF THE UNEP PANEL 1 REPORT

Chair: **Setijati D. Sastapradja,** Indonesia

Peter Johan Schei: Priorities for Action for Conservation and Sustainable use of Biological Diversity and Agenda for Scientific and Technological Research

Panel 1 was asked by UNEP to consider priorities for action for the conservation and sustainable use of biological diversity and to propose an agenda for scientific and technological research. Its discussions could also contribute to the process of developing national strategies, plans or programmes called for in the Convention. The report of Panel 1 contains four detailed tables which provide guidance on the implementation of articles 6 - 14 and 17-18, which are of particular relevance to conservation and sustainable use of biological diversity. Panel 1 recommends:

- Establish as soon as possible an interim Scientific and Technological Advisory Committee on Biological Diversity, STAC.
- Establish interim working groups under the IGC, especially in the agriculture, forestry and fisheries sectors.
- Give funding priority through the multilateral financial mechanism under the Convention to projects which are integrated parts of national biodiversity strategies plans or programmes.
- Establish an intergovernmental group to develop criteria for priority setting for global action in the conservation and sustainable use of biodiversity.

Panel discussion
Panel participants: **Tewolde B.G. Egziabher, Peggy Fiedler, Barbara Kirsop, Vertistine A.B. Mbaya, Michel Pimbert, Peter Johan Schei.**
Moderator: **Daniel H. Janzen**

The main conclusions of the panel discussion were:
- Scientists need to come out of their isolation and relate their work to the real world needs in relation to the Convention.
- Scientists need to communicate their research findings better to policy makers, who in turn should provide adequate support for their work.
- Some areas of science which are crucial to the work of the Convention are needing urgent support, e.g. taxonomy, microbiology, conservation biology in the developing countries, monitoring of ecological processes.
- Local communities harbour a wealth of biodiversity knowledge of great use.
- The scientific community must help the developing countries to build up their own scientific capacity.

Sessions 11

NEW PERSPECTIVES ON COMMERCIAL USE OF BIODIVERSITY

Chair: **Elisa Barahona**, Spain

Walter Reid, Daniel H. Janzen, David Downes, Calestous Juma: Presentation of the World Resources Institute Report on Biodiversity Prospecting

This report gives guidelines about what the Governments must take into consideration for their national legislation on biodiversity. We have heard about the potential economic value of biodiversity in some of the new industries, like pharmaceuticals. More specifically related to the Convention is the way to regulate the access to resources and get useful information about what should be required in the cooperation with other countries.

Discussion

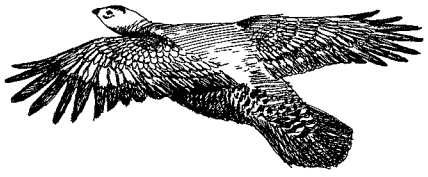
A major problem of legal agreements in this sector is the inequality of the parties. The procedures outlined in the WRI report may nevertheless provide an improvement in biodiversity prospecting. By establishing the national sovereignty over biological resources, the Convention has strengthened the position of the developing countries in these matters.

The international community may not become a major source of funding of capacity building, despite oral commitments in the Rio Conference. Capacity building will largely remain the responsibility of each country. There may be possible provisions e.g. in a continuation of the GEF structure to fund capacity building in developing countries.

Rodrigo Gámez: Wild Biodiversity as Resource for Intellectual and Economic Development: INBio's Pilot Project in Costa Rica

Costa Rica's approach for conservation of biodiversity, including the organisation of conservation areas and the establishment of INBio, has brought the conservation and sustainable use of wild biodiversity of that country a large step forward. The ideas are probably applicable to other similar countries, but the practical solutions depend on the special characteristics of each country. It is emphasised that to save biodiversity, it must be well known and used, and thus given a value, economically, culturally, intellectually, etc.

Discussion



In the process towards conservation and sustainable use, participation by local people is essential. Countries also have to develop relevant legislation on biodiversity. Costa Rica is in the process of developing modern legislation, particularly about regulating biodiversity utilisation. However, the work of INBio caused an explosion of interest into this matter, and other, also private, companies have now started up with formal arrangements with the Government for bioprospecting. INBio is only one of the relevant NGOs in this field, although INBio is so far the only organisation with the precise functions as described.

Session 12

SOCIO-ECONOMIC VALUE OF BIODIVERSITY

Chair: **Elisa Barahona**, Spain

Richard Tapper: Tourism: is it a Non-consumptive Use?

Tourism is not a non-consumptive use of biodiversity. Ecotourism is not something completely different from other forms of tourism. Therefore, from the point of view of the Convention, we can point out these main conclusions:

- The need of performing environmental impact assessments (EIA) in the context of national plans, applied to biodiversity.
- The importance of applying Integrated Rural Development, that is to say to share benefits and incentives to the local communities.
- National and local authorities must gain control over the development and activities of tourism, especially via the planning system.

Discussion
There is an urgency in considering the whole ecotourism concept. As it works today, it may be predatory or even destructive. It is vital to set up awareness schemes for tourists ("Tourist's code of conduct"). Initiatives to this end are already started by WWF and others. Ecotourism must be a part of e.g. National Action Plans, it must be truly sustainable, and the money it generates must adequately be channelled back to the management of the areas, to the people responsible for the areas, and to the landowners. However, ecotourism issues are clearly linked to the Convention, as it often constitutes one of the main financial assets from the biodiversity in many developing countries.

Karl-Göran Mäler: The Socio-economic Value of Biodiversity

Economic analysis is necessary to define processes which have an impact on biodiversity, and to identify appropriate action. There are two main utilitarian reasons for preserving biodiversity: a) it is the basis for human welfare; b) there is a high probability that unknown useful diversity is being lost. A basic reason why biodiversity is lost is that the role of ecosystems as an input to economic activity is neglected. Economics can contribute by assisting Governments in creating the correct incentive structure which will reflect the contributions of biodiversity to socioeconomic activity. To achieve this, intervention by society is necessary.

Discussion
There are obvious dangers in linking economics directly to biodiversity, as e.g. many ecologically, socially and politically important aspects of biodiversity cannot be measured in economic terms. However, more aspects than presently are applied must be taken into account in valuating natural ecosystems. The value of biodiversity is often excluded from actual incentive and policy systems. The decisionmakers must be shown, in monetary terms, the value of biodiversity; otherwise they will not attach any substantial value to it. Social profitability must take into account both the actual and the option value of biodiversity. The only way to stop destruction of ecosystems may be to show the decision makers that it is more profitable, economically, to preserve the ecosystem than to convert it into alternative uses.

Session 13

PRESENTATION OF THE UNEP PANEL 2 REPORT

Chair: **Eivin Røskaft,** Norway

Ulf Svensson: Evaluation of Potential Economic Implications of Conservation of Biological Diversity and its Sustainable Use and Evaluation of Biological and Genetic Resources

There is a need to create a better understanding of the values of biodiversity including the values of sustainable agriculture, forestry, fisheries and biotechnological industry. The Convention on Biological Diversity provides a framework for this. A precondition for the creation of better valuation tools is a better understanding of biodiversity loss. As the biodiversity lies mainly inside the socioeconomic system, a multidisciplinary approach is essential.

Panel discussion
Panel participants: **Rodrigo Gámez, Calestous Juma, Jillian Lenné, Erkki Puttonen, Ulf Svensson.**
Moderator: **Diane Osgood**
One half of the world market economy and 85-90% of the market economy of developing countries relate to biodiversity and components hereof. The strongest force for conserving biodiversity is that it provides ecological services of value to human society. In accordance with the Convention, sharing of the benefits of genetic resources should be on mutually agreed terms. It was suggested that such terms at least for genetic resources in agriculture could be agreed on a multilateral basis within the framework of a multilatral agreement since every country depends upon many others for genetic resources.

Session 14

FROM SCIENCE TO ACTION

Chair: **Wayne Fletcher,** Australia

Vandana Shiva: Cultivating Biodiversity: From Reports to Action

There is an obligate relationship between biological diversity and biological production. To conserve biodiversity, we need: 1) A shift in the way of thought to encourage diversity and multiplicity instead of monocultures; 2) A shift from viewing conservation as separate from production, to seeing conservation as part of production. The duality between conservation and production, ecology and economics, and wild and cultivated biodiversity is artificial. Cultivating biodiversity stresses that biodiversity conservation is a challenge for changing production systems. For cultures directly using the wild and cultivated biodiversity it is obvious that conservation of biodiversity is an integral part of the production process. The neem tree *(Azadirachta indica)*, native to India, is used as an example of the huge conflicts of interest between local communities and international commercial companies regarding use of a plant species.

Olav Høgetveit: Communicating through the Media

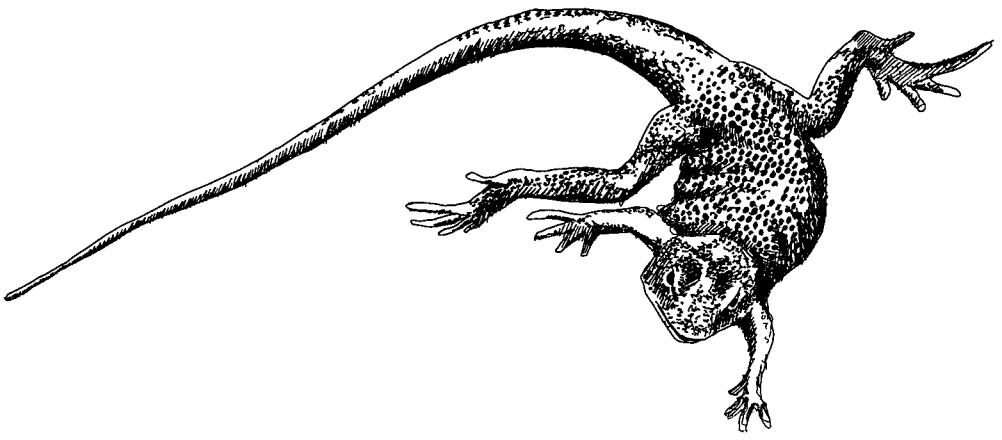
The links of communication are: scientific research - information - knowledge - understanding - action. Research on public interest in information from the media shows that people want to learn something from the media. However, we must take care not to simplify scientific results so that we end up with false conclusions. Experience shows that it is easier to popularise results from natural sciences than social sciences. It is a problem that an increasing proportion of scientific results is commercial, i.e. they are no longer available to the public. A golden rule for communication is that there must be mutual trust between scientist and journalist, and mutual responsibilities to avoid misinterpretations.

Jeffrey McNeely: From Science to Action: What is the Role of Non-governmental Organisations?

NGOs have a crucial role to play in implementing the Convention on Biological Diversity. Article 23 (5) enables them to participate in the Conference of parties as observers. But it is perhaps more important that NGOs can serve as productive partners with national governments especially in applying science to action. NGOs can carry out important research, implement projects to conserve biodiversity and use it sustainably, promote a diversity of approaches to biodiversity issues, and ensure that information about biodiversity is broadly disseminated to the public.

Peter Jutro: What Kind of Information do Decision Makers Need?

Progress in protecting biodiversity and ensuring sustainability is dependent in part upon our understanding of nature. Much of that knowledge can be provided by the scientific community. But the scientific community must be motivated to organise their research to respond to societal needs. A model of a managed, structured, iterative dialogue between policymakers from all sectors and all levels of society, and scientists was presented. The model can be applied in any country to provide a context-sensitive research agenda, responsive at any countries needs.



Panel discussion
Panel participants: **Olav Høgetveit, Peter Jutro, Jeffrey McNeely, Vandana Shiva.**
Moderator: **Karl Baadsvik**
Some traditional knowledge may be like sacred secrets. To make it public may not be favourable to the local community. The important thing is to be aware of how local communities have maintained local biodiversity. The knowledge and the biodiversity may be best left as "local commons".

The biodiversity crisis is an immensely complicated problem, which makes it more difficult to communicate to the public than e.g. the Global Climate Change. The challenge for science is to communicate the existing knowledge so that it can lead to action. At the same time, science cannot give answers to questions dealing with cultural, moral and ethical values.

Session 15

CONCLUDING SESSION

Chair: **Peter Johan Schei,** Norway

Arthur Campeau: The process of ratification

More than 160 states have now signed the Convention, and the next step is to ratify. The Convention is a landmark agreement as much of our economy is based on biodiversity. The Convention is as important for sustainable use as for conservation. The Convention text is a compromise as well as a framework agreement.

Most articles in the Convention are flexible enough to be beneficial for all Governments. The Convention also provides for flexible tools to tackle up-coming problems. Besides, country-driven implementations of the Convention cannot impose unwanted rules to other countries. The text has no intention of providing the last word, however, and two Panels have proposed to work out protocols to the Convention. Protocols will be based on the agreed text of the Convention and will not be in contradiction to this. Furthermore, future protocols are not linked to signing or ratifying the Convention now.

Reuben Olembo: Preparing for the IGC

As of May 28, 1993, 18 states had officially ratified the Convention. Three international conferences have been preparing for the IGC meeting. Switzerland has offered to host an interim Secretariat in Geneva. The first meeting in Switzerland will probably take place October 11-15, 1993. The IGC meeting will be open to all states, including those not being UN members. The meeting will also be open for all interested observer organisations, and these must write to UNEP to show interest and explain why they are relevant for the Convention. A last selection will be decided by UNEP in Nairobi. Official documents to the IGC meeting will be decided by the Executive Director of UNEP, and other material will not be discussed officially at the meeting, but possibly be treated as information.

The Convention is meant to contribute to a participatory and inclusive process. UNEP therefore relies on the good will of rich countries to fund poorer countries, and is making a plea for more resources to be given to UNEP in this respect.

Vicente Sanchez: Conference output and executive summary

A summary of the week's lectures, discussions, papers and Panel reports was given, with stress on points of consensus, agreements and progress. The Conference has not been a political negotiating meeting, and therefore, formal Governmental statements will not be issued. The dialogue between science/research on one hand and decision-makers, politicians, Governments on the other hand is difficult, but this communication process has started. The better we understand the complexity of the issue, the better is our position to understand constraints of the process. However, the complexity does not make our task more comfortable, nor does the apparent disagreement between scientists. The process may be compared with a medical doctor's approach: First decide a diagnosis and then describe a solution to the diagnosed problems.

Thorbjørn Berntsen: Concluding statements

The discussions during this Conference, and the comprehensive documentation which has been submitted to it, provide an important scientific diagnosis for those of us who are to take political decisions. The Conference itself, as well as the three panel reports which have been presented here, provide us with important directions for the further work in following up this Convention. We must speed up our work on several fronts in order to reach the main objective for us all: protection and sustainable use of life's diversity. I am glad to be able to tell you that Norway is ratifying the Convention on Biodiversity in a few days. It is my hope that 30 countries have ratified within the end of this year.

The work which you have put into the Conference will provide very valuable contributions to the meeting of the IGC in October. Some of you will perhaps feel that the steps we manage are small in relation to the enormous challenges we face. But the important thing is that the steps we take go in the right direction, and that some of the small steps can lead to significant results over time. In spite of everything, I am more optimistic about the situation than only a few years ago.

NORWAY/UNEP EXPERT CONFERENCE ON BIODIVERSITY

Conference programme

Monday, 24 May, 1993

Opening session
Chair: **Thorbjørn Berntsen,** Host of the Conference, Minister of Environment, Norway

Gro Harlem Brundtland, Prime Minister of Norway
Elisabeth Dowdeswell, Executive Director of UNEP
Olof Johansson, Minister of Environment, Sweden
Marvin Wiseth, Mayor of Trondheim
Vicente Sanchez, Chilean Ambassador to Kenya

Lunch

Keynote session: BIODIVERSITY AND HUMAN EXISTENCE
Chair: **Peter Johan Schei,** Norway, Chairman of the Conference

Introductory lectures and round-table discussion.
Moderator: **Ketil Gravir,** Norway

Introductions:

The Significance of Biodiversity for the Ecosystems and Human Existence.	Madhav Gadgil, India
Ethics and Biodiversity Conservation.	Per Ariansen, Norway
Communicating the Biodiversity Crisis.	Norman Myers, UK
Biodiversity and Local Involvement in Third World Countries.	Vertistine A.B. Mbaya, Kenya
The Economy-Biodiversity Interface.	David W. Pearce, UK

Round-table discussion

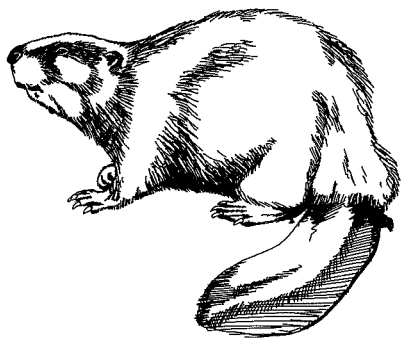
Concert, Nidarosdomen
Reception hosted by the Norwegian Government, in the Archbishop's Mansion (Erkebispegården)

Tuesday, 25 May, 1993

Session 3 Ecosystem Functions
Chair: **Jameson H. Seyani,** Malawi

Biodiversity and Ecosystems Functions.	Harold Mooney, USA
Plant-animal Interactions.	Phyllis Coley, USA

Discussion



Session 4 Marine Biodiversity
Chair: **Jameson H. Seyani,** Malawi

Biodiversity and Sustainable Harvesting of Fish Resources; the Barents Sea Experience in Context.	Ray J.H. Beverton, UK
Global Marine Biological Diversity: A Strategy for Building Conservation into Decision Making.	Elliot Norse, USA

Discussion

Lunch.

Session 5 Loss and Conservation of Biodiversity
Chair: **Georgy A. Zavarzin, Russia**

Genetic Effects of Harvesting and Supporting Natural Populations.	Nils Ryman, Sweden
Fragmented Populations.	Peggy Fiedler, USA
Dynamic Management of Domesticated Biodiversity by Farming Communities.	David Wood and Jill Lenné, UK

Discussion

Session 6 Handling of Technologically Modified Organisms
Chair: **Georgy A. Zavarzin,** Russia

Presentation of the UNEP-Panel 4 Report.	Veit Koester, Denmark

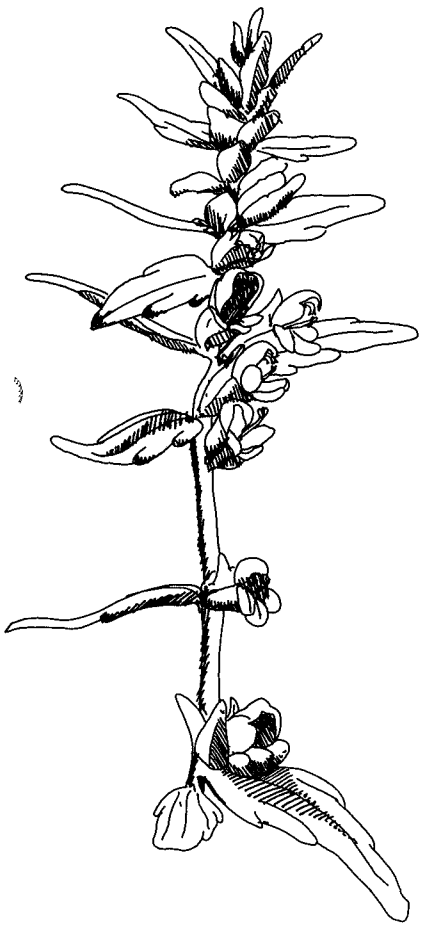
Discussion

Conference outputs.	Peter Johan Schei, Norway

Informal working groups

Wednesday, 26 May, 1993

Session 7 Inventories and Monitoring
Chair: **Robin Pellew,** UK



Taxonomy: Universal and Essential Infrastructure for Development of Tropical Wildland Biodiversity.	Daniel H. Janzen, USA
The Need to Establish a Global Biodiversity Monitoring Network.	Eduardo Fuentes, Chile

Discussion

Session 8 Towards Sustainable Use of Forest Biodiversity
Chair: **Robin Pellew,** UK

Tropical Forestry and Conservation of Biodiversity.	Madhav Gadgil, India
Boreal Forestry and Conservation of Biodiversity.	Jukka S. Salo, Finland

Discussion

Lunch

Session 9 Sociocultural Aspects and Local Communities
Chair: **Setijati D. Sastapradja,** Indonesia

Modernization, Science and Technology, and the Perturbation of Traditional Systems of Conservation of Biological Diversity.	Tewolde B.G. Egziabher, Ethiopia
Towards Biodiplomacy: New Regimes in Genetic Resources and International Relations.	Calestous Juma, Kenya
Socio-Cultural Values of Biodiversity.	Mark Sagoff, USA

Discussion

Session 10 Priorities for Science and Management
Chair: **Setijati D. Sastapradja,** Indonesia

Presentation of the UNEP-Panel 1 Report	Peter Johan Schei, Norway
Panel discussion. Moderator:	Daniel H. Janzen, USA
Panel participants:	Tewolde B. G. Egziabher, Ethiopia Peggy Fiedler, USA Barbara Kirsop, Biodiversity Information Network Vertistine A.B. Mbaya, Kenya Michel Pimbert, WWF Peter Johan Schei, Norway

Informal working groups

Thursday, 27 May, 1993

Session 11 New Perspectives on Commercial Use of Biodiversity
Chair: **Elisa Barahona,** Spain

Presentation of the WRI-report on Biodiversity Prospecting.	Walter Reid, Daniel H. Janzen, David Downes, USA; Calestous Juma, Kenya.
Wild Biodiversity as Resource for Intellectual and Economic Development: INBio's Pilot Project in Costa Rica.	Rodrigo Gámez, Costa Rica

Discussion

Session 12 Socio-economic Value of Biodiversity
Chair: **Elisa Barahona,** Spain

Ecotourism: Is It a Non-Consumptive Use?	Richard Tapper, WWF
The Socio-Economic Value of Biodiversity.	Karl-Göran Mäler, Sweden

Discussion

Lunch

Session 13 Economic Aspects of Biodiversity and Biotechnology
Chair: **Eivin Røskaft,** Norway

Presentation of the UNEP-Panel 2 Report.	Ulf Svensson, Sweden
Panel discussion. Moderator:	Diane Osgood, UNEP
Panel participants:	Rodrigo Gámez, Costa Rica Calestous Juma, Kenya Jill Lenné, UK Erkki Puttonen, Sandoz Pharma Ulf Svensson, Sweden

Open for informal working groups

Reception hosted by the Municipality of Trondheim, Ringve Museum

Friday, 28 May, 1993

Session 14: From Science to Action
Chair: **Wayne Fletcher, Australia**

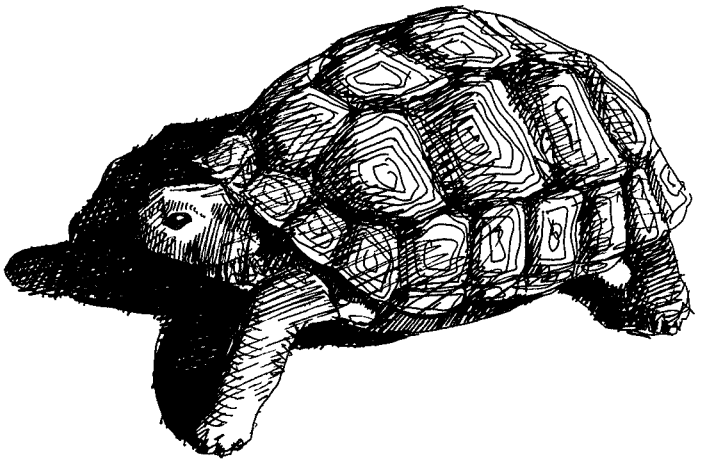
From Science and Reports to Practical Action: Challenges and Options.	Vandana Shiva, India
Communicating Through the Media.	Olav Høgetveit, Norway
What is the Role of NGOs?	Jeffrey McNeely, IUCN
What Kind of Information do Decision Makers Need?	Peter Jutro, USA
Panel discussion: How can Scientific Knowledge be Communicated? Moderator:	Karl Baadsvik, Norway
Panel Participants:	Olav Høgetveit, Norway Peter Jutro, USA Jeff McNeely, IUCN Vandana Shiva, India

Lunch

Session 15: Concluding session
Chair: **Peter Johan Schei,** Norway

The Process of Ratification.	Arthur Campeau, Ambassador, Canada
Preparing for the IGC.	Reuben Olembo, Assistant Executive Director, UNEP
Conference output and Executive Summary.	Vincente Sanchez, Chilean Ambassador to Kenya
Concluding statements.	Thorbjørn Berntsen, Minister of Environment, Norway

End of Conference



Background documents

(made available to the Conference)

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UNEP 1993b. Expert panels established to follow-up on the Convention on Biological Diversity. Report of Panel II: Evaluation of potential economic implications of conservation of biological diversity and its sustainable use and evaluation of biological and genetic resources. UNEP/Bio. Div./ Panels/Inf. 2, 30 pp. UNEP, Nairobi, Kenya.

UNEP 1993c. Expert panels established to follow-up on the Convention on Biological Diversity. Technology transfer and financial issues: Issues and options from Panel III. UNEP/Bio. Div./ Panels/Inf. 3, 12 pp. UNEP, Nairobi, Kenya.

UNEP 1993d. Expert panels established to follow-up on the Convention on Biological Diversity. Report of Panel IV: Consideration of the need for and modalities of a protocol setting out appropriate procedures including, in particular, advance informed agreement in the field of the safe transfer, handling and use of any living modified organism resulting from biotechnology that may have adverse effect on the conservation and sustainable use of biological diversity. UNEP/Bio. Div./ Panels/Inf. 2, 30 pp. UNEP, Nairobi, Kenya.

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