

*World Conservation Congress
4–11 October 2000
Amman, Jordan*

New Directions for the 21st Century



The World Conservation Union - IUCN

*Results of the
World Conservation
Congress Interactive
Sessions*

IUCN
The World Conservation Union

New Directions for the 21st Century

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Edited by Jeffrey A. McNeely

World Conservation Congress

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IUCN – The World Conservation Union
2001

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Published by: IUCN, Gland, Switzerland and Cambridge, UK



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Citation: McNeely, J.A. (Ed) (2001). *New Directions for the 21st Century*. IUCN, Gland, Switzerland and Cambridge, UK. vi + 124 pp.

ISBN: 2-8317-0609-2

Cover design by: Reflet Artwork for Business, Switzerland

Layout by: Sadag Imprimerie, Bellegarde-sur-Valserine, France

Printed by: Sadag Imprimerie, Bellegarde-sur-Valserine, France

Available from: IUCN Publications Services Unit
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E-mail: info@books.iucn.org
<http://www.iucn.org>

A catalogue of IUCN publications is also available

The text of this book is printed on Offset Cyclus 90 gsm made from recycled paper.

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An Introduction to the Interactive Sessions

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World events, political upheavals, technological developments, and scientific breakthroughs are moving at a breathtaking pace, providing significant challenges to the conservation movement. In order to help IUCN keep up with changing conditions and important developments in the global conservation agenda, the Amman Congress Steering Committee decided that the technical elements of the 2nd World Conservation Congress should be approached in a rather different way from the workshops that had characterized the previous WCC, and earlier sessions of the IUCN General Assembly. The Amman “Interactive Sessions” were designed to enable a wide variety of individuals and institutions to participate in the preparations for the sessions through electronic and other means. The actual workshop sessions in Amman were also highly interactive, using various techniques to ensure broad input and engage all participants in fruitful dialogue. And perhaps most important, the issues being addressed remain interactive even after the sessions ended, involving web sites, internet linkages, and other ways to follow up on recommendations and to communicate the results to a broad audience.

Many important new ideas were identified and discussed in the different workshops, with specific recommendations on how IUCN can successfully address them. The 12 Interactive Sessions represented somewhat artificial divisions of topics that had numerous linkages between them, and each brought a variety of perspectives to bear on the issues being addressed. They were seen as a means of engaging IUCN members in implementing the IUCN Programme and complementing the Commission meetings held on the preceding days. The following are the main issues that were identified for action:

1. The scale at which conservation needs to be approached requires greater attention than this issue has received in the past. Different kinds of approaches may be relevant at the different scales, but a scale that requires much greater attention is the bio-regional or large-scale ecosystem level. Exciting initiatives in the Amazon, Andes, Meso-America, and Australia have demonstrated that these large-scale approaches are viable, and interesting to both governments and donors. They are relevant in both terrestrial and marine habitats, and provide a key means for implementing the Convention on Biological Diversity.
2. That said, IUCN members identified conservation in coastal and marine ecosystems as a high priority to be addressed in the coming years, with particular attention given to effective marine protected areas; land-based sources of marine pollution; sustainable fisheries; and governance. IUCN also needs to ensure that marine issues are incorporated in the work of the UN Framework

Convention on Climate Change and the UN Commission on Sustainable Development. The key issues have been sufficiently well defined; IUCN now needs to act.

3. The session on Environment and Security made it clear that IUCN has a very important role to play in linking environmental issues with fundamental concerns about national security. Case studies from various parts of the world demonstrated the links between natural resource mismanagement, social tension and disaster vulnerability. While IUCN's expertise remains in biodiversity-related fields, progress in environmental conservation will necessarily have ramifications in the security field and vice versa. As a result, IUCN needs to demonstrate how sustainable development can also enhance national security and social stability. Given the apparent increase in the environmental impact of violent conflict in many parts of the world, IUCN needs to participate in programmes to minimize the negative effects on biodiversity of conflicts, movement of human populations, and violent disruption of the ways of life of indigenous and local communities. Likewise, IUCN needs to participate in combating the growing human and economic costs of disasters through advocacy for natural resource management and conservation.
4. Forest ecosystems, both tropical and temperate, are particularly important for security issues. Globally, forests are declining in quantity and quality. Over-exploitation often leads to significant impacts on the people who live in and around the forests, undermining their livelihood security. Forests are frequently considered a national asset, with most economic benefits flowing to the treasury, or to timber concessions benefiting people living outside the forest. Thus forest management typically is not designed to provide livelihood security to local communities. When forest resources are mismanaged, the impact of natural events is often exacerbated, as with Hurricane Mitch, the floods in Bangladesh and China, and forest fires in Indonesia and Russia. Any effective approach to forest conservation will also need to address livelihood issues, and more effective management of forest ecosystems will benefit both local people and biodiversity.
5. While IUCN has had a Wetlands Programme for well over a decade, all ecosystems require water to provide goods and services. IUCN recently has become much more involved in water issues, for instance through the World Water Vision and Framework for Action, in recognition of the vital role of water in all aspects of life. The integrated management of our water resources, based on the appreciation that ecosystems are the source of all livelihoods, is necessary to balance the diverse demands for water resources. Sustainable and equitable use of water can also avoid conflicts over this important resource. It is clear that the implementation of such management requires the resolution of many social, political as well as technical issues in cooperation with all stakeholders involved. The challenge is to produce principles and tools for truly effective integrated water resources management, which in turn requires collecting further information on ecosystem functioning and requirements, supporting stakeholder participation as a means of strengthening governance and responsible decision-making, promoting restoration techniques of degraded freshwater ecosystems, exchanging "lessons learned" among users and river basin organisations, and disseminating information to communities. Important guidance will be derived from the implementation of the *IUCN Water and Nature Initiative*, a five-year programme involving 28 projects with a budget of nearly US\$40 million in 40 developing countries, which includes IUCN's most prominent global and regional partners in the field of water resources management.

6. IUCN needs to continue its strong support to the Convention on Biological Diversity (CBD) which has proven to be an extraordinarily important international agreement, providing a forum where critically important issues are being discussed. For example, in the context of its articles regarding traditional and local knowledge (especially its Articles 8j and 10c), the CBD is providing the most useful arena where issues of concern to indigenous peoples are being addressed. Biodiversity has significant linkages with cultural diversity, and the CBD is unique among international agreements in recognizing this linkage and providing opportunities for addressing the challenges arising. Ironically, at a time of growing globalization of knowledge and increasing trade liberalization, many indigenous and local communities are also using the new technologies to claim greater cultural identity. In addition, local communities are also asserting their rights to local resources, and demonstrating that they are able to manage these resource systems in sustainable ways. They provide numerous examples where local solutions have promoted biodiversity conservation, social equity, and cultural diversity, the three cornerstones of building sustainable relationships between people and resources.
7. The CBD objectives include conservation, sustainable use, and equitable distribution of benefits. Some people believe that most attention to date has been given to the conservation elements of the Convention, while the sustainable use objective may be of greatest interest to both government resource management agencies and the local communities who depend upon biological resources for their welfare. But sustainable use has proven extraordinarily difficult to convert from concept into practice, and the Interactive Session addressing this topic identified some important challenges to the CBD and IUCN members. The equitable sharing of benefits issue also is receiving insufficient attention, focusing primarily on sharing of material benefits between governments and ignoring the cultural and ethical dimensions as well as equity issues within countries. Indigenous people have been steadfast in demanding recognition of their territories, full participation in determining policies and laws affecting them, and the right to deny access to the genetic resources and traditional knowledge they control.
8. Most attention on equitable sharing has gone to economic issues, while concerns of local and global justice have been ignored. Further, the scientific focus of the CBD continues the polarization between the industrialized nations, which one speaker estimated to have 94% of the world's scientists while the developing countries contain 87% of the global population and the vast majority of biodiversity. The concept of equity also needs to incorporate accountability and liability in the loss of biodiversity; when approaches to development in tropical countries have led to the loss of biodiversity, the responsibility for the design of these approaches needs to be clearly assessed.
9. Intellectual Property Rights issues have also led to a number of new difficulties, with some countries essentially stopping any exploration for new biological resources until their intellectual property legislation is fully in place. Many developing countries are very concerned that genetic resources that have been developed by their farmers are being patented by multi-national corporations based in developed countries. For them, the equitable distribution of benefits remains more a slogan than a reality. Perversely, the CBD is hampering access to genetic resources rather than promoting access as the drafters of the Convention intended.
10. As a science-based organization dedicated to knowledge management, IUCN needs to give much greater attention to how it packages and disseminates the knowledge that its various networks generate. As environmental challenges continue to multiply, IUCN needs to improve

its ability to utilize new information technology more effectively, thereby ensuring that the best science is made available to the decision-makers who need it. Basic biological information is required, for example, by those seeking to address the problems of invasive alien species, climate change, and environmental pollution. This also involves critical assessment of the content of the knowledge IUCN wishes to share and manage. Many parts of IUCN are already working on new approaches to knowledge dissemination, such as the Environmental Law Programme, the Species Information System being developed by SSC, the World Conservation Atlas (and Temperate and Boreal Forest Conservation Atlas) and the very effective work being done by IUCN members such as the World Resources Institute and the International Institute for Sustainable Development. To improve its knowledge management, IUCN needs to develop a strategy that would help deliver our most valuable products to those who are most in need of the kinds of knowledge that IUCN develops.

11. Another major advance in Amman was the recognition that agriculture is a valid issue of concern for IUCN, especially as it relates to biodiversity. Agriculture is the land use that has had the most profound influence on the current distribution of landscapes around the world. While croplands cover only about 10% of the earth's land surface at any one time, many abandoned agricultural lands are critically important for wild biodiversity, and lands that are extensively used for grazing or forestry also support important wild biodiversity. Agriculture describes many forms of land use, and human communities in the various parts of the world have developed their own ways of mobilizing their local resources and developing sustainable relationships with their available resources. These local adaptations to locally-available resources have helped to nurture both cultural and biological diversity. But with increasing globalization, communities are no longer focusing on sustainability issues, instead giving greater attention to supplying the global market place. The trade liberalization that is accompanying current global changes can have both positive and negative impacts on local environments, but the positive impacts will come only through concerted efforts to ensure that greater attention is given to conserving traditional forms of agriculture that have proven sustainable over long periods of time.
12. Multi-national corporations are becoming more important and influential, especially because they seem to have a monopoly on the new technology-intensive forms of genetic engineering. The development of genetically modified organisms (GMOs) is a very hot topic among IUCN members, with some seeing GMOs as a way of reducing the application of polluting agricultural chemicals while others see GMOs as a fundamental threat to the biodiversity that IUCN is seeking to conserve. An important element in this debate is the Cartagena Biosafety Protocol, so it was recommended that IUCN should support capacity-building for its implementation by developing countries.
13. While several of the Interactive Sessions were focusing on local issues and concerns of indigenous peoples, the biodiversity business workshop focused on harnessing the forces of private enterprise globally in support of conserving biodiversity. If indeed biodiversity conservation is of value to society, the commercial sector should be able to play a role in managing and preserving these values. This is especially true for sectors which are closely dependent on biological resources, such as agriculture, forestry and tourism. Several NGO members of IUCN, including the Earthwatch Institute, Fauna and Flora International, Conservation International, the World Wide Fund for Nature, the International Federation of Organic Agriculture Movements, The

Nature Conservancy, and the African Wildlife Foundation, are beginning to seriously explore the positive role that profit-seeking enterprise can play in conserving biodiversity. IUCN has an important contribution to make in promoting, developing and investing in such businesses whose operations are inherently beneficial to biodiversity. In this respect IUCN can learn from the efforts of biodiversity certification schemes such as the Marine Aquarium Council, biodiversity investment schemes such as the Terra Capital Fund and the Kijani Bio Fund, and the biodiversity business policy efforts of the OECD and the World Bank Group. This session clearly showed that IUCN's efforts to develop a World Heritage Enterprise Fund is a logical approach to harnessing the private sector for biodiversity conservation. Forest PACT is another example of multi-stakeholder partnership in early stages of development by IUCN (and partners) that was discussed at the Amman Congress.

14. While IUCN remains concerned primarily with biodiversity issues, government policy-makers in many countries appear to be more concerned about climate change. But the Interactive Session on the Ecological Limits of Climate Change demonstrated that the biodiversity impacts of climate change are so important that IUCN needs to give much greater attention to linking its traditional biodiversity focus to climate change concerns as well. After all, climate change will lead to impacts on wetlands, islands, the coastal zone, forests, and mountain ecosystems in all parts of the world. While some organizations will be focusing on the slowing or prevention of climate change through reducing consumption of hydrocarbons, IUCN can also contribute to more effective adaptation to the climate changes that are likely to come. IUCN can also help to focus the climate change agenda on the impacts on biodiversity of the various measures being proposed under the Kyoto Protocol.

The Interactive Sessions built on the IUCN Mission to identify specific ways to translate philosophy into action in several key areas of particular interest to IUCN. They reconfirmed IUCN's focus on biodiversity, science, protected areas, forests, wetlands and communication, while identifying new directions in linking biodiversity with climate change, water resources, agriculture, marine issues, environmental security, and the private sector. In short, the Interactive Sessions will assist IUCN to take its Programme confidently into the 21st Century.

Interactive Session 1:

Looking at the big picture: ecosystem management in mountains, watersheds and river basins

Organizer: David Sheppard (e-mail: das@iucn.org)

Introduction

Environmental and social challenges are growing rapidly, both in extent and complexity. Issues such as climate change, extinction of species, poverty and security transcend far beyond national boundaries. A combination of innovative, forward-looking approaches need to be developed and implemented. This is particularly relevant in the case of mountains, watersheds and river basins, where individual site-specific approaches such as protected areas are unlikely to succeed on their own. The emergence of approaches such as bioregional planning and the ecosystem approach respond to these challenges.

This Interactive Session, a joint initiative of the IUCN Commission on Ecosystem Management and the World Commission on Protected Areas, highlighted a range of examples from around the world and had the following specific objectives:

- *To exchange experience on innovative ways and tools for applying the concepts of the ecosystem approach and bioregional planning;*
- *To identify key lessons and guidelines for the further application of ecosystem management strategies and bioregional planning approaches;*
- *To contribute to building new alliances for IUCN in this area; and*
- *To identify recommendations for the IUCN Programme from the Interactive Session.*

Interactive Session structure

The session was structured in five parts:

- Part 1 comprised a joint keynote presentation by Kenton Miller and Ed Maltby. This introduced the concepts and identified the key challenges for the Interactive Session to address;
- Part 2 comprised three presentations, followed by discussion, on mountain ecosystems;
- Part 3 comprised three presentations, followed by discussion, on river basins;
- Part 4 comprised five presentations, followed by discussion, on transboundary resource management and conservation; and
- Part 5 comprised a concluding panel discussion involving the chairs of all of the above parts of the Interactive Session.

All presentations focused on key challenges and opportunities for the different types of ecosystems identified. The case studies covered all regions of the world and addressed a wide range of cutting edge approaches and projects. Many of the case studies represented the state of the art in relation to ecosystem management and bioregional planning. Case studies were presented on the following areas and issues:

The ecological corridors for the Amazon: the case of the Peru-Bolivia Conservation Corridor.

The conservation of the huge Amazon biodiversity requires an ecosystem approach. This paper focused on one of the corridors in the Amazon, ranging more than 1,500km along the eastern slopes of the tropical Andes and adjacent lowland forests in Peru and Bolivia. This is a very active process, involves a wide range of partnerships and collaboration among institutions at all levels, from international to local. The process includes provision for additional protected areas, and for the enhanced protection of existing areas. The process places strong emphasis on working with all stakeholders and in linking programmes for conservation with sustainable use.

Asia's challenges: linking mountain ecosystems with water and food security. This paper reviewed issues associated with the conservation of Asia's mountains – the world's largest massif extending 8,000km. These mountains provide essential economic and ecological services to the people of Asia. The paper noted that Asian mountains have two types of stakeholders – *in-situ* users and off-site consumers. The challenge is to provide tangible benefits to the upland *in-situ* user to ensure that they do not damage the mountain ecosystem, while ensuring that environmental services are ensured for the lowland off-site consumer. The paper reviewed experience with the implementation of the Global Environment Facility (GEF) and outlined the five elements of a framework for integrated management in Asian mountains. These elements are: (a) provision of sufficient water; (b) prevention of land degradation and enhancement of food security; (c) reduction of vulnerability to climate change; (d) use of mountain tourism as a tool for poverty alleviation; and (e) focus on sustainable use of non-timber biodiversity and agrobiodiversity. These elements were illustrated by examples from Asian mountain situations.

The Alpine connection: a new context for European cooperation. The Alps are home for many Europeans and provide many benefits to European society as a whole. Cooperation exists at many levels. This paper presented the European context of trans-frontier cooperation and described cooperation in the Alps at four levels: nation-states (the Alpine Convention); regional governments (the working communities of the western, central, and eastern Alps); non-governmental organisations (the International Commission for the Protection of the Alps, CIPRA; and the World Wide Fund for Nature, WWF); and networks (the Network of Alpine Protected Areas). Each of these levels of cooperation has distinct advantages, but there are few formal linkages between the different levels of cooperation. Further detailed analysis of the strengths and weaknesses of the different levels of cooperation, and links between them, could be of great benefit for other regions.

Experience from the Okavango Delta. The Okavango River Basin (ORB) is a major tropical wilderness wetland area that spans an area of approximately 10 million hectares from Angola through the Caprivi Strip of Namibia into the delta of Botswana and the Magkadikgadi Pans. The ORB is home to major migratory species such as elephant and buffalo, as well as the magnificent array of Africa's large mammals, and over 600 species of birds, as well as 100 fish species. The ORB's natural resources provide immense value to its indigenous communities and the region has great potential as a driver of regional economic growth. If properly developed, the benefits of the region's

economic development can accrue mostly to communities within the region. This paper reviewed the experience of Conservation International (CI) in the Okavango Delta. Until recently activities focused on four “cornerstones” of conservation actions: education and awareness; science and research; community enterprise development; and policy work. However, two overwhelming policy issues suddenly arose in the mid-1990s: the imminent construction by Namibia of a pipeline to extract water from the Okavango river, and the proliferation of Botswana’s cattle disease control fences around the delta. These unexpected developments changed the course of CI’s Okavango Program conservation work. The need to look at the bigger picture became crystal clear, particularly in relation to cross-border cooperation and the need to strengthen partnerships. This paper describes the events that made the CI field office look at the big picture in the Okavango, and details the Strategic Plan that CI has developed to promote a biological corridor as a way of achieving successful ecosystem management in the Okavango River Basin and its delta.

ECONET: development in Central European countries. The establishment of ecological networks has become one of the promising applications through which ecological principles and biodiversity and landscape conservation requirements are integrated into spatial planning procedures, watershed management and land use practices. By adopting the Pan-European Biological and Landscape Diversity Strategy in 1995, the development of national ecological networks and the Pan-European Ecological Network became the priority nature conservation strategy in Europe. The concept of ecological networks has developed as a response to fragmentation of land, and restructuring and intensification of land use. It has gained a lot of support, probably because of an intuitive feeling on its beneficial functions and effectiveness or for its flexible application. The original approach has been fine-tuned to adapt to different situations in the different European countries. This paper outlined experience with the implementation of ECONET, drawing on experiences throughout Europe.

The ecological corridor of the Andes. The Andean Range is the largest uninterrupted mountain system in the world and represents a wide diversity of biodiversity and human populations. This paper documented initiatives to conserve biodiversity and ensure sustainable development in the Andes. It introduced a conceptual framework for the Andes, based on the original concepts proposed by Dr Mario Baudoin in 1994. This aims to establish a systematic approach to the conservation of biodiversity and the sustainable use of natural resources in the Andes. It is based on full participation from countries in the region, and is based on the need to respect the unique human cultures present in the Andean range.

The Meso-american Biological Corridor. The Meso-american Biological Corridor (MBC) is a strategic programme mandated by the heads of state of the seven Central American countries and Mexico, and it is directed by the Ministers of the Environment through the Central American Integration System. It is a land-use system designed to promote a new balance between the conservation of biodiversity and sustainable socio-economic development through the intelligent use of biodiversity and other natural resources. In ecological terms, the MBC is a meta-corridor or corridor of corridors, engulfing and protecting through a broad-based land-use system both the regional and the local biodiversity structure. Its benefits, in products and services, will enrich local and national populations, and mankind as a whole. As contended here, the MBC and everything that will follow after it, is and will be an example of multi-people work. The difficult part will not be the technical work required but the fusion of the many wills and interests involved, which are, as usual, modulated by our limited human condition. Nonetheless, the opportunities offered by this strategy have such a broad potential, especially if we are to approach sustainability, that it is

impossible not to regard it as a priority. Such a challenge is an open invitation for everyone interested, to accompany us in achieving a region free from poverty and, with it and because of it, a region where biodiversity is preserved for mankind.

The Great Escarpment corridor in Australia. In October 1996 a paper titled “*Conservation Corridors and the NSW Section of the Great Escarpment of Eastern Australia*” prepared by Graeme Worboys was presented to the World Conservation Congress in Montreal Canada. This paper first introduced the concept of a continuous corridor of unfragmented natural lands along a north-south geomorphic feature, the Great Escarpment of Eastern Australia. This paper to the Amman Congress provided an update on progress with the establishment of a great escarpment corridor. Specifically, the paper: (a) described the Great Escarpment; (b) outlined the conservation history of the area; (c) described the vision behind the Great Escarpment Corridor; (d) outlined the status of the corridor and networks achieved by 2000; and (e) described further outstanding opportunities.

Transboundary natural resource management in Southern Africa. International borders are political, not ecological (or socio-cultural) boundaries. For this reason, key ecological systems and components occurring in two or more nations are often subject to a range of often opposing management and land-use practices. Unsustainable resource use on one side of the border may adversely affect resource use in neighbouring states. Similarly, this may be the case on both sides of a boundary within one nation. To ensure that future generations have sufficient access to natural resources, today’s management of water catchments, ecosystems, and migratory wildlife must become more multinational and participatory across local, national, and international levels. Sustainable natural resource planning and management must involve the ecological, cultural, political, and economic concerns of stakeholders across boundaries. This paper outlined experience with transboundary natural resource management in Southern Africa, with particular attention to initiatives which have been developed and lessons learnt from experience to date.

Ecosystem management in the Arctic. This paper outlined the importance of taking a broader view of ecosystem management in the Arctic. This region has important biodiversity and has a population of 4 million people inhabiting over 25 million km². This paper described environmental stresses to the Arctic ecosystem, including pressures associated with the overexploitation of natural resources, deposition of pollutants, and the long term impacts of climate change. Effective cooperation is essential if these issues are to be addressed, both between the countries of the Arctic and between these countries and neighbouring countries in other regions. The paper introduced the work of the Arctic Council and its associated working groups and described the Arctic Environmental Protection Strategy.

Copies of the final agenda, as well as all papers and presentations delivered at the Interactive Session, are available from David Sheppard (e-mail: das@iucn.org).

Around 300 participants attended throughout. The session was truly interactive with many substantial contributions made from the floor. The debate indicated much common ground, that many parties are now “singing from the same hymn sheet” and much that donors are listening.

The case studies referred to key aspects of ecosystem management, bioregional planning and landscape planning. For simplicity and ease of reference these are referred to below under the umbrella term of “Big Picture Approaches”.

Issues raised

1. **Protected areas are essential but we must scale up.** An underlying theme from the workshop was that protected areas by themselves are not adequate to respond to the challenges of biodiversity loss and habitat destruction. We must become more flexible and in many cases be prepared to move up scale from strictly protected areas (Cats. I–IV) to Categories V and VI, out from protected areas to buffer and transition zones, and into the farmed and productive landscape. However many consider that well-managed core protected areas should still be at the heart of Big Picture Approaches. The relative importance of these core areas is frequently growing in significance, but such areas are doomed to failure if they are not effectively linked with surrounding land-uses.
2. **Big Picture Approaches require a shared vision.** Case studies emphasized the need to build a shared vision for Big Picture Approaches. It is critical that this vision is clear, communicated effectively and translated into practical programmes which are supported by key stakeholders.
3. **The vision must be translated into action through integrated objectives and practical strategies.** Big Picture Approaches require integration of a range of objectives – ecological, environmental, social, economic, cultural – and peace and security. This will bring many benefits. In the past, these objectives have often been considered in isolation. Case studies and discussion at this Interactive Session clearly demonstrated that objectives such as environmental conservation are intimately linked with objectives such as peace and security and better linkage is essential. Strategies to implement the vision must be flexible, adaptive and informed from experience. The experience from case studies at the Interactive Session noted that there is no one blueprint or approach to Big Picture Approaches. Responses should be tailored to the unique circumstances of each country and region: there is strength in diversity and a range of approaches should be encouraged. The need for more effective linkage of objectives, coupled with practical, on-ground strategies which can operationalize these objectives, was a common theme throughout this Interactive Session.
4. **Better partnerships are essential.** The Interactive Session emphasized that successful implementation of Big Picture Approaches requires effective partnerships between all stakeholders (in and between countries). Such partnerships must be at many levels: for example, government to government, federal/state, local/municipal government, local communities, indigenous peoples, private sector, NGOs and the *in situ* and *ex situ* stakeholders. Partnership with the private sector is increasing in significance and the relative importance of this will increase as the new century progresses.
5. **These partnerships increasingly cross boundaries.** Partnerships have traditionally been between organizations within countries, but the need for partnerships across national boundaries was highlighted in many presentations to the Interactive Session. The development of a number of “partnerships across boundaries” was highlighted in the Interactive Session. Examples highlighted included: Regional agreements, such as: (a) the Alpine Convention and the EC Habitats Directive in Europe; (b) the Meso-American Biological Corridor in Central America; and (c) the Arctic Council, which brings together governments and others with an involvement in the Arctic. Informal alliances were also highlighted, such as: (a) the Okavango alliance, in Southern Africa, which brings together government, non-government and community leaders,

and others with a mutual interest in the conservation and sustainable development in the Okavango Delta; (b) the coalition of groups involved in the Peru/Bolivia/Brazil conservation corridor; and (c) the Great Escarpment Corridor initiative in Australia which covers cooperation between states in Australia.

6. **IUCN has a key role in bringing parties together.** In a number of the case studies presented at the session IUCN has acted as an umbrella to bring parties together, such as in relation to the development of the ECONET program in Central European countries. In many other cases highlighted in the Interactive Session, IUCN members, such as Conservation International, have played a key role and in many cases have served as a catalyst for bringing parties together.
7. **Ideas and language need to be simplified and better communicated.** The Interactive Session noted the importance of clarifying ideas and language. Big Picture Approaches, such as bioregional planning and ecosystem approaches, are fundamentally about the same thing. However, there is still confusion in some quarters and the message needs to be clearer. Coupled with this is the essential requirement to better communicate the concepts involved and to ensure that these messages are effectively communicated to key stakeholders in a way that makes sense.
8. **Leadership is essential.** The importance of leadership was emphasized, particularly at a political level. Where this is lacking it is virtually impossible for Big Picture Approaches to succeed. This was illustrated in the example of the Meso-American Biological Corridor where there is strong political leadership for the process and the programme. Political difficulties may be an insurmountable barrier to cooperation in many cases and this factor must be addressed. Leadership also implies a breaking down of institutional barriers; inter-agency rivalry and competition often pose major barriers to the implementation of Big Picture Approaches.
9. **Big Picture work takes time.** The Interactive Session noted that Big Picture work takes a lot of time. To prepare, and to implement, a period of upward of ten years is often required. Thus the parties involved must “stick with it”. This long time period must be allowed for in planning and implementation of Big Picture Approaches.
10. **Funding is essential and arrangements must be long-term and flexible.** The issue of time period poses a specific challenge in relation to funding Big Picture initiatives. Adequate and flexible funding arrangements are a critical key for success. This often poses a specific challenge as donor funding is often based on short time-frames. Participants noted the importance of encouraging donors to adopt longer time frames for their support for Big Picture Approaches.
11. **Don’t forget the marine environment.** The session noted that the case studies and the discussion had placed little emphasis on Big Picture Approaches at sea. The application of such approaches to the marine environment, particularly in the context of Large Marine Ecosystems, requires further examination and offers exciting opportunities (see report of Interactive Session 2).

Where we go from here

The Interactive Session noted, with appreciation, the excellent case studies and debate which took place. It agreed that IUCN should help refine Big Picture Approaches, taking into consideration

factors such as the above, and specifically that IUCN should facilitate a structured dialogue on this topic. Such a dialogue should be inclusive and involve key partners such as Conservation International and WWF. The Interactive Session noted and applauded the fact that the Session was a joint initiative between two IUCN Commissions (WCPA and CEM) but called for the involvement of other Commissions in the process, given the importance of Big Picture Approaches in addressing many of the future issues facing the world's environment. Fora for exchange of experience and information need to be further developed and debate needs to be encouraged at all levels. It was noted that several key milestones could serve as useful stepping stones for further activity and refinement of Big Picture Approaches. These include: 2002 – the Year of the Mountains; 2003 – The World Parks Congress; and 2004 – the CBD COP.

Recommendations for the IUCN Programme

The case studies and discussion resulted in general principles and observations, such as those outlined above, rather than specific recommendations for amendments or additions to the IUCN Programme. The recommendations from the Interactive Session are thus posed as general principles which should be considered in the future implementation of the programme. These include:

- The IUCN Programme should encourage the further establishment and management of protected area networks around the world; it is essential that these are better linked with Big Picture Approaches.
- Experience from Big Picture Approaches should be widely disseminated and IUCN has an important role in this.
- IUCN should continue to strive to bring members, partners and others together to encourage the wider application of Big Picture Approaches.
- IUCN should strongly encourage the work of IUCN members, such as CI and WWF, in their Big Picture work.
- IUCN should play a leading role in clarifying the language and terminology involved with Big Picture Approaches. IUCN should also play a role in the development of clear standards and indicators for Big Picture activities.
- IUCN should work with donors to encourage them to adopt more flexible, long term approaches to funding Big Picture initiatives.
- IUCN should encourage the implementation of Big Picture Approaches in the marine environment, particularly in the context of Large Marine Ecosystems.
- IUCN should ensure that key events in the next five years, such as the World Parks Congress, include specific sessions relating to Big Picture Approaches.
- IUCN should welcome the collaborative approach to this issue by WCPA and CEM but should ensure that other Commissions, relevant parts of the Secretariat, and key partners are also involved in this initiative.

The above are general recommendations, which should be incorporated within the IUCN Programme without significant financial implications. In virtually all cases these recommendations reinforce the existing elements of the programme.

ANNEX 1: AGENDA

Looking at the big picture: ecosystem management in mountains, watersheds and river basins

- 09:00–09:05 **Introduction**
Introduction to the workshop
David Sheppard, Head of IUCN Programme on Protected Areas
- 09:05–09:30 **Keynote Address**
Ecosystem Management in the 21st century
Kenton Miller, Vice President for International Conservation and Development of the World Resources Institute (WRI) and Ed Maltby, Chair, IUCN Commission on Ecosystem Management
- 09:30–11:00 **Session 1: Mountain ecosystems – opportunities and challenges**
Chair: Mingma Sherpa, WWF, Nepal
- 09:30–10:15 **Presentations**
- The ecological corridor of the Andes: lessons learnt for ecosystem management?
Jose Pedro de Oliveira Costa, National Secretary for Biodiversity and Forests, Brazil
 - Asia's challenge: linking mountain conservation with water and food security
Hemanta Mishra, GEF
 - The Alpine connection: a new context for European cooperation
Martin Price, Director, Centre for Mountain Studies, University of the Highlands and Islands, UK
- 10:15–11:00 **Panel discussion**
- 11:00–11:30 Coffee break
- 11:30–13:00 **Session 2: River basins – flow of life or shared problems?**
Chair: Dr. Jose Marcio Ayres, Senior Conservation Zoologist, Sociedade Civil Mamiaraa Universidad Federal do Parana, Brazil
- 11:30–12:15 **Presentations**
- Experience in Southern Africa: the Okavango Delta
Karen Ross, Conservation International, Botswana and Innocent Magole, Country Director, Conservation International, Botswana
 - ECONET: development in Central European countries
Kalev Sepp, Estonian Fund for Nature, Estonia

- The ecological corridor for the Amazon – is it just a dream? Example of the Peru-Bolivia corridor
Gustavo Suarez de Freitas, Director, ProNaturaleza – Fundación Peruana para la Conservación de la Naturaleza and Carlos Ponce, Conservation International, Peru

12:15–13:00 **Panel discussion**

13:00–14:30 Lunch

14:30–16:00 **Session 3: Transboundary resource management and conservation: a tool For regional cooperation, confidence building And peace-keeping efforts**
Chair: Lota Melamari, Director General of Tanzania National Parks

Presentations

- Introductory remarks on the importance of the ecosystem approach
Micieli De Biase, Coordinator of Environment, Ministry of Foreign Affairs, Italy
- The Meso-american Biological Corridor: what it brings for people, peace and conservation?
Ricardo Radulovich, Regional Director, Meso-american Biological Corridor, Guatemala
- Nature knows no boundaries: Transboundary Natural Resources Management (TBNRM) in Southern Africa
John Griffin, USAID
- The Great Escarpment of Australia
Graeme Worboys – presented by Marc Hockings
- Ecosystem management and transboundary cooperation in the Arctic Region
Jeanne Pagnan, Head, WCPA Arctic Task Force and Peter Nielsen – presented by Peter Nielsen

16:00–16:50 **Final panel**

A concluding panel discussion, involving the chairs of each session, will analyse and discuss lessons learned from the different sessions, focusing on how the IUCN Quadrennial Programme could promote and enhance these initiatives by creating the necessary capacity at regional and local levels. Particular attention will be given to define what is the role of key stakeholder groups in supporting ecosystem management and bioregional planning at different levels.

16:50–17:00 **Session 4: Summary and wrap-up**

A very brief presentation by Adrian Phillips will provide participants with a summary of the workshop.

Interactive Session 2:

Environmental health of oceans and coasts

Organizer: John Waugh (e-mail: jwaugh@iucnus.org)

Introduction

Marine issues have featured increasingly strongly in IUCN resolutions since the 1988 General Assembly in Costa Rica. At that and subsequent General Assemblies there has been watchfulness to ensure that resolutions remember and address the marine linkages and implications. As a result, many IUCN projects have addressed marine issues world-wide.

Interactive Session 2 examined the changing state of the environment of the planet's oceans and coasts, using as an organizational framework the categories identified at the strategic planning meeting conducted by IUCN in 1998 in St. Michaels, Maryland, USA: habitats and species, land-based activities impacting the marine environment, sustainable fisheries management, and effective governance.

The findings of Session 2 indicate that while at the beginning of the 1990s marine conservation issues were viewed by IUCN's membership principally as matters of localized impacts on the marine environment, requiring localized responses in the form of marine protected areas and integrated coastal zone management, it is now generally held that the cumulative impacts of human activities on the Earth's oceans and coasts make marine conservation a global issue.

Over 150 people attended the Session including members, observers and staff.

Marine, oceans and high seas biodiversity, sustainable use and conservation issues are becoming increasingly prominent in the global agenda, for example, in discussions in the context of the Commission on Sustainable Development, climate change, and sea mount biodiversity.

Nevertheless a key characteristic of marine issues is that the biological and physical linkages are generally at scales that cross jurisdictional and professional boundaries. We need specific attention to marine issues within each of the Commissions and programmes. WCPA has a fine track record in this respect but the management of marine issues needs a broader base in addition to the protected area approach. The need for a commitment and a continuing well-resourced and coordinated programme to address the 70% of the planet covered by sea is fundamental to the credibility of IUCN as the World Conservation Union.

In some respects the coordination issue which IUCN must address is one which most governments find challenging. How do we get those responsible for fishing, marine environment, protected areas, and economic and social issues to operate an interactive and strategic programme rather than a comfortable and often competitive sectoral programme? Good fences may make good neighbours on land but fences don't work in the sea.

An example is the framing and cross linkages in these interactive workshops. Fisheries were discussed in at least three sessions. How many fisheries policies and programmes does IUCN have? How do we ensure that we are not using scarce resources in unproductive duplication or worse, direct conflict?

Land-based sources of marine pollution

Briefings were given by **Dr. Veerle Vandeweerd**, Director of the United Nations Environment Programme's Coordination Office for the Global Programme of Action for the Protection of the Marine Environment from Land Based Activities (GPA), and Mr. Tom Laughlin, Deputy Director of the Office of International Affairs, US National Oceanographic and Atmospheric Administration. Land-based sources (LBS) account for 85% of marine pollution. The sheer scale of the problem makes LBS the major threat to the marine environment, together with over-fishing, habitat destruction, and alien species. LBS constitute the greatest threat to coral reefs, seagrass beds, and other essential marine habitats, and are therefore central to the IUCN mission.

The GPA was adopted in 1995 in Washington by 108 States and the European Union. It is a source of conceptual and practical guidance that aims at preventing the degradation of the marine environment from land-based activities and the physical alteration and destruction of habitats. For every pollutant source category GPA provides a basis for action, objectives and proposed targets, lists of specific actions covering the policy lifecycle, national and regional Action Plans, identification and assessment of problems, establishment of priorities, setting of management objectives, and performance criteria.

IUCN played a central role in the negotiations, in ensuring the strong linkages to habitat destruction that make the present GPA approach an effective template for comprehensive integrated coastal zone management.

Implementation of the GPA is not happening at the pace necessary to address destruction of the marine environment. The cross-sectoral integration required for effective implementation often requires a major realignment of roles and responsibilities across all levels of society, involving changes in political, legal, and economic organization which cannot easily happen in the short term. IUCN is partnering with UNEP to assess lessons learned to date from implementation of the GPA through projects of the Global Environment Facility and the UNEP Regional Seas conventions and action plans.

One lesson is already clear: traditional national strategies and action plans will have extreme difficulty in attracting the necessary resources to address LBS. To address this problem, IUCN is working with UNEP and NOAA to transform national action plans into business plans and funding portfolios, in hopes of attracting private sector investment in the service of national policy. It won't be

known for several years whether the strategy is successful, but the structuring of national objectives in the form of public-private partnerships with appropriate policies and incentives to mobilize private financial flows, which now dwarf official development assistance, is a potent concept which has attracted strong interest from all sectors.

Because of the scale of the problem, few NGOs work on GPA implementation in any but highly localized situations. If IUCN's role in society is to incubate ideas and build capacities to address the leading causes of biodiversity loss, work on land-based sources of marine pollution is the *sine qua non* amongst priorities.

Specific recommendations to IUCN included that:

- IUCN should work with UNEP to design and implement demonstration projects which promote the roles and methods of addressing land-based sources of marine pollution;
- IUCN should give particular attention to the intergovernmental review of the GPA due in 2001;
- IUCN should review implementation of the GPA in the period 1995–2000;
- IUCN should work to identify future objectives for the GPA;
- IUCN should promote the linkages of GPA and other land-based pollution management actions with programmes on habitat protection, fisheries and coastal and coral reef management; and
- IUCN should work with regional groupings to develop community and political will to address land based sources of marine pollution; to seek resources through GEF and other donor sources; and to develop new partnerships between land and marine managers to address whole ecosystem linkages.

Habitat protection and marine protected areas

Dr Charles Ehler of the US National Ocean Service and **Dr Georgina Bustamante** of The Nature Conservancy, an international non-governmental member of IUCN, gave briefings and led discussions on strategies to protect critical habitats and ecosystems. Dr Bustamante described the assessment and ranking of Latin American and Caribbean ecoregions based on the data collected through local experts and using a transparent and replicable methodology approach to describe and review the ecosystems of the region and, on the basis of the review undertaken, to identify conservation priorities. Although any strategy for priority setting at a regional scale is bound to elicit controversy, the TNC experience has provided an important case study in the analytical tools needed to extend the global representative system of marine protected areas (a long-standing IUCN priority), through detailed work at the ecosystem scale.

The smallest geographic unit used in this assessment is the coastal system. Coastal systems were defined and delineated based on physical identity (a discrete area with distinct physical attributes), ecological integrity (each comprises a mosaic of the different habitats necessary to sustain the ecological processes of species populations and biological communities) and manageable size (10,000s of km²). For these reasons, they were deemed most suited for conservation priority identification, through analysis of threats and urgency for conservation for each coastal system (based on expert opinion).

This ecoregional framework and methodology was described as being applicable to other regions of the world where there is a need for defining conservation areas, prioritizing conservation investments, and applying conservation policy.

Dr Ehler, who is Chair of the IUCN World Commission on Protected Areas Marine Working Group, described WCPA's efforts to address management effectiveness and relevance of marine protected areas, in particular links to fisheries management. Specific recommendations for IUCN were to continue to promote the development of representative systems of marine protected areas, including, as much as practicable, organization of the work on an ecosystem basis. In addition, continued work on new, interdisciplinary approaches to habitat protection, including linkages to fisheries management, was encouraged. In order to support the work of WCPA, IUCN's Marine Programme should draw as much as possible on WCPA and promote linkages with work within the Union on ecosystem approaches to management.

Sustainable fisheries

Eskild Kirkegaard, Director of Fisheries Research at the Danish Institute of Marine Fisheries, briefed participants on unsustainability in industrial fisheries. He reviewed current findings of ecosystem approaches to fisheries management, using the North Sea fisheries case studies.

David Carter, a fisherman in northern Australia, and Eddie Hegerl, of the IUCN Commission on Ecosystem Management, presented a case study on fisheries management of the northern Australia prawn fishery. This fishery is perhaps the prime example in the world of voluntary adoption of the precautionary approach to sustainable fisheries management by a fishing industry. The briefing examined, from the NGO and fishing community perspective, the events that led to the voluntary reduction of fishing access (through closed areas) and fishing effort and fishing impact (through gear restrictions). The regional fishery management council, comprised primarily of representatives of the fishing community, but also including governmental and non-governmental participants, adopted these measures on the basis of its own analysis.

Discussion of the elements that made this process possible where many others had failed identified several critical features, including especially a strong effort to build trust between the vessel owners and operators from the private sector and the non-governmental community (aided by the presence of NGO members with in-depth understanding of the issues). The resulting dialogue aided the information flow and channelled effort constructively to practical solutions.

It was suggested that IUCN's Marine Programme should build upon this example in bringing NGOs and the fisheries community together in other parts of the world in exercises to build better understanding of issues and options to promote sustainable fisheries. In order to be effective in sustainable fisheries, IUCN's networks and staff should include strong fisheries management expertise.

General recommendations for IUCN's continued work to promote sustainable fisheries included that:

- IUCN should work with conservation NGOS, fishers and fishery managers to develop reference points or ecological sustainability performance criteria;

- IUCN should work to develop partnerships and advisory groups bringing together conservation NGOs, resource-dependent communities, and private sector groups; and
- IUCN should seek to develop natural partnerships and strong cross linkages between fisheries and Marine Protected Area management programmes and between fisheries and pollution management programmes.

Governance

A special briefing was given on the Red Sea Marine Peace Park, a major success story in the making in the conflict-torn region of the Middle East. Jordanian, Saudi, and Israeli scientists and managers are working side-by-side on protection of the coral reef resources of the Gulf of Aqaba.

It was not lost on the audience that during a particularly trying period (violence in the West Bank having erupted during the week prior to the opening of the Amman Congress, and the death toll having climbed to over 60 by the day of the Interactive Session), there was special significance in the joint presentation. That genuine collaboration could emerge and yield innovation and real conservation progress against the background of political and religious tension was a powerful object lesson in the power of science and indicated that the love of nature could provide reference points for human interaction. A catalytic IUCN role was acknowledged in the evolution of the concept of the peace park, reaffirming points made elsewhere about the role of IUCN as an “incubator” for innovation in conservation.

Clare Shine, of the IUCN Commission on Environmental Law, and **Christophe Lefebvre** of the Conservatoire du Littoral (France) presented a new publication on legal arrangements for conservation and sustainable use of the coastal zone. The report provided an example of the way that IUCN can assist coastal stakeholders by providing information resources to facilitate conservation action. Strong support was expressed for the IUCN marine publication series.

Communication tools

There was discussion on the needs to strengthen communication and coordination so that the Marine Programme can develop and build on the synergies of work in Headquarters and Regional Offices, between Commissions and Programmes and between IUCN and its partners, having particular regard to the new responsibilities which come with UN observer status.

To address coordination issues, part of the workshop was devoted to communication tools, including a case study of a vertical network developed under FAO's Support Unit for International Fisheries and Aquatic Research (SIFAR) called the oneFish Community Directory (www.onefish.org). oneFish is a Web-based knowledge management system that draws together a broad cross-section of stakeholders within the fisheries and aquatic research community. It represents a fundamental advance in devolved management information systems, responding to long sought-after information, communication and networking needs of the many agencies currently actively engaged in the complex process of promoting more responsive fisheries and aquatic resources research and development. oneFish allows users to contribute information in electronic form to specific subject areas, and to search and retrieve information, files and other linkages across the whole oneFish domain. Institutions and special interest groups will be able to use oneFish to develop discussion groups and create virtual offices.

While oneFish builds on the participatory design philosophy of Internet open content directories, the overall concept of oneFish is also a natural step forward in the development of aquatic information systems. It introduces the concept of information stored as knowledge objects, which comprise any electronic media that can be uploaded and linked to topics. Knowledge objects include books, documents, Web sites, maps, contacts, projects and any other relevant electronic media or multimedia. References to information that is not in electronic form can be added as can links to electronic information stored elsewhere.

IUCN's Marine Programme is establishing a *virtual office* within oneFish that will allow stakeholders to share and collaborate with their peers on the marine information that matters most to them (see www.onefish.org/iucn). A virtual office is a customized topic tree tailored to the specific needs, activities and specialisation of a particular organisation. Virtual offices allow individuals and organisations to manage their knowledge (e.g. projects, contacts) and share it, sometimes selectively, with others with similar interests.

Staff, IUCN networks and members participating in the *virtual office* will benefit from improved collaboration among partners and easier access to relevant information. A suite of knowledge management tools such as discussion, intuitively organized topic trees, fast searching, content rating, news and events calendars will help participants work better and maintain themselves on the cutting edge of marine information.

Access to the World Wide Web by many of the poorer developing countries is currently very limited or non-existent. There are plans to provide regular CD ROM outputs from oneFish from early 2001, as well as the additional facility of selective dissemination by e-mail. This will ensure even wider access in areas where using the Internet is not yet feasible.

General conclusions and key findings of the Interactive Session

Marine, oceans and high seas biodiversity, sustainable use and conservation issues are becoming increasingly prominent in the global agenda, for example in the context of the UN Commission on Sustainable Development and the UN Framework Convention on Climate Change.

Specific attention to marine issues is called for within each of the IUCN Commissions and Programmes.

Participants recommended that IUCN make an unequivocal commitment to address marine issues through a strong programme adequately resourced and staffed to achieve communication and coordination so that members, commissions, the central secretariat and regional offices work effectively together and with partners to achieve action to address growing problems facing marine biological diversity, marine ecosystem functions and marine resource-dependent human communities.

That IUCN should continue support for a coherent, well-resourced and coordinated programme to address the 70% of the planet covered by sea is fundamental to the credibility of IUCN as the World Conservation Union. It should assert its track record and role in the marine agenda, broker NGO and community involvement from the start of marine and coastal programmes.

IUCN should:

- continue to broker NGO and community involvement from the start of marine and coastal programmes;
- help states to address the feasibility and obligations for action flowing from their involvement with conventions relating to the marine environment;
- work to build government/NGO partnerships, including in support of the UNEP Regional Seas conventions and action plans;
- advocate and develop marine management systems to address integrated coastal management and marine protected area systems by documenting and sharing experiences and developing regional systems and guidelines;
- become involved in activities relating to management of land-based sources of marine pollution by catalyzing numbers and networking government and non-government partners; and
- help to catalyse a move from evaluation and planning to implementation of actions.

ANNEX 1: AGENDA

Environmental health of oceans and coasts

- 09:00–10:00 **The framework**
Keynote address: Environment and security in the seas
Richard Kenchington
- Introduction of the quadrennial strategy
J. Waugh and D. Tarte
- 10:00–11:00 **Briefing and consultation: protecting the marine environment from land-based impacts**
(brief presentation of the state of knowledge and experiences in implementation, followed by discussion)
Veerle Vandeweerd, Head, GPA Coordinating Unit, UNEP, and Tom Laughlin, Deputy Director, Office of International Affairs, NOAA
- 11:00–12:00 **Demonstration and design consultation: networking for the 21st century – a marine “vortal” for IUCN**
Greg Searle and Eric Sauve, WorldTree
- 12:00–14:00 Lunch
- 14:00–15:00 **Interlude: Ground truthing: The Red Sea Marine Peace Park**
(a presentation on work in the region)
- 15:00–16:00 **Protecting essential habitats: briefing and consultation**
Charles Ehler, WCPA and Georgina Bustamante, The Nature Conservancy
- 16:00–17:00 **Sustainable fisheries: briefing and consultation**
Eddie Hegerl, Commission on Ecosystem Management, David Carter, fisherman, and Eskild Kirkegaard, Director of Research, DIFRES, (Denmark)
- 17:00–18:00 **IUCN’s niche at the global level – a panel discussion**
John Tanzer, Great Barrier Reef Marine Park Authority, IUCN Marine Programme, Diane Tarte, IUCN Council, John Waugh, IUCN Coordinator
- 18:00 **Concluding remarks**
Richard Kenchington and John Waugh
- 17:30–18:30 **Press conference**

Interactive Session 3:

Environment and security: a strategic role for IUCN

Organizers: Mark Halle (e-mail: mark.halle@iprolink.ch)
Jason Switzer (e-mail: jswitzer@ictsd.ch)

Introduction

Can the steep cost of humanitarian assistance and peace-keeping be reduced through greater investment in environmental stability and management? Is attention to IUCN's mission a cost-effective way of resolving social tension and avoiding conflict?

Environmental insecurity lies simmering beneath many of today's most violent conflicts and most grievous disasters. From the burning forests in Indonesia to the violence in the Great Lakes region of Africa, the erosion or inequitable distribution of natural resources upon which livelihoods depend is a key ingredient in conflict and catastrophe. At the same time, cooperation for environmental ends can provide a basis for mutual security, as demonstrated by the growing interest in Parks for Peace and international river basin management commissions.

IUCN's interest in this emerging field is growing rapidly. The Quadrennial Programme for IUCN stresses that "putting conservation tools in the hands of people...will be the most reliable bulwark against conflict and insecurity" (p. 6). At the Amman Congress, members urged the development of a greater understanding of the environmental sources for and impacts of conflict (CGR2.PR054 Rev.1). In short, IUCN and its member organizations are moving towards consensus on two conclusions: peace is a pre-requisite for effective long-term conservation; and conservation contributes towards the maintenance of peace.

To help IUCN begin to address this issue in a comprehensive way, IISD and CEESP convened a Task Force on Environment and Security in early 2000, under the chairmanship of Ambassador Mohamed Sahnoun, special advisor to the UN Secretary General on African Affairs, and former Brundtland Commissioner. Members of the task force include leading academics, representatives of the private sector, the conservation community, as well as senior government officials. The task force assembled a series of case studies examining the linkages between environment and security, and their particular impact on conservation goals. Drawing on these cases, the task force put forward a set of conclusions for debate and consideration by the IUCN and its members in Amman, both at the Earth Forum and at the World Conservation Congress.

The Session

Structure of the workshop

Following an introduction to the task force and to the concepts emerging from environmental security research, participants were presented with a series of case studies illustrating the linkages between natural resource conservation, conflict and disaster risk. Each presentation was debated by an expert panel, then put forward to the workshop for comment. One case study traced the origins of the Rwanda genocide, and mapped the relationship between those parts of the country under the most severe environmental stress, and the places where the worst violence broke out. The relationship was direct and compelling. Another case study examined the famous Estai case, the brief and surprising armed skirmish between Canada and Spain over the turbot fishery in the Atlantic. A third looked at the link between environmental management and the impact of Hurricane Mitch, which devastated Central America in 1998. Others examined the forest fires of Indonesia, the volatile development situation in the North-West Frontier Province of Pakistan, legal tools for conservation during times of conflict, and the impact of war on biodiversity.

The workshop concluded by seeking to draw from participants an understanding of the particular roles the conservation community should play in enhancing security, and recommendations for the way forward in this field, both for IUCN and for the task force itself. These recommendations will form the basis of the final chapter of an IUCN book on Environmental Security, to be published in early 2001, as well as the work programme of the task force in the years to come.

Attendance

Between 75 and 100 people attended the Interactive Session. Attendees included funders, government ministers and agency representatives, NGO conservation experts, IUCN HQ and regional staff, Youth Reporters, and host country government officials.

Results of the Session

Mark Halle, Task Force Coordinator, began the session by explaining the history of interest in environmental security within the IUCN family, and framed the work of the task force within that field.

- **Cost-effectiveness:** If there is a solid link between environmental degradation and social tension, then environmental management is a means for preventing or at least mitigating disasters and redirecting the dramatic outlay of funding that peace-keeping requires towards more productive investment in development.
- **Security is relevant to conservation:** The task force has focused on those aspects of security that are of greatest interest to the IUCN family. "Human security" is too broad to be meaningful, while greening the military or seeking to adapt their resources for environmental ends poses several problems.

Richard Matthew, Director of the Global Environmental Change and Human Security Project at the University of California, Irvine, summarized the lessons learned over 20 years of research in the field of environment and security.

Conclusions so far: Environmental change can have serious social impacts, including violent conflict especially in the developing world where the majority are dependent on direct exploitation of natural resources for their livelihoods. As environmental degradation appears to be accelerating, and its impacts increasingly felt among the poorest, it is of central importance to improve natural resource management tools such that they enhance the environmental foundations of livelihood security.

Way forward for IUCN: The Union should use its convening capability to bring academics, practitioners, and policymakers together to discuss the issues. IUCN has the unique capacity to translate environmental security theory into a tool for establishing conservation priorities and designing more robust management structures.

Charles Barber, Senior Forest Policy Advisor to WRI, mapped out the sources of environmental insecurity in Indonesia's forests, and their impact on conservation efforts there.

Flashpoint: Forestlands, considered 75% of the country's land mass, have become the battleground in escalating conflicts between communities, industry, ethnic groups and government, as political instability and insecurity undermine management efforts. In fact, political change, including the removal of a repressive regime can be detrimental to conservation in some cases.

Equitable peace needed: Conservation is nearly impossible while the sources of insecurity (including corruption, perverse institutional structures, unprotected civil rights and flawed population resettlement policies) are not addressed.

James Gasana, formerly Minister of Environment and also Minister of Defence in the pre-coup Rwanda government, navigated the complex web of interacting issues that led to genocide in the Great Lakes region in 1994. Some of the key messages emerging from this session were:

Interacting sources of scarcity (population growth, imbalance in land distribution, steady degradation of topsoil) were deepened by destruction wreaked by mass refugee movements and fuelled by years of political conflict.

The exclusion of one group from political power and access to resources by another undermines conservation efforts and sets the stage for further conflict. IUCN should work with parties to develop equitable bases for resource protection, utilization and benefit sharing.

Richard Matthew introduced the complex sources of environmental insecurity in the volatile North-West Frontier Province of Pakistan.

NWFP's 19 million inhabitants are suffering from inadequate access to fresh water, arable land, pasture and forests. Pressures from rapid population growth (2.8% per annum), and nearly two million refugees from the war in neighbouring Afghanistan are overwhelming infrastructure, polluting the major waterways, rapidly depleting forest cover (nearly 90% deforestation in 200 years) and undermining the resource bases for livelihood in the regions.

Scenario Building: IUCN should help countries and regions systematically map out the interacting sources of environmental insecurity through scenarios, and bring the results to the attention of policy-makers.

Jason Switzer of IISD presented the fisheries dispute between Canada and Spain, over access to and preservation of turbot in the Northwestern Atlantic Ocean.

Special interest groups can harness national pride to bring countries into conflict over a resource, even when the countries are not economically dependent on the results in question.

Conflict can sometimes lead to strengthened institutions for conflict prevention and resolution.

Pascal Girot of the University of Costa Rica illustrated the links between environmental management and disaster vulnerability in Central America, through the experience of Hurricane Mitch.

Environmental degradation and poverty are strongly linked to disaster vulnerability.

Conservation can be prioritized in terms of the contribution it can make to protect and buffer societies from disasters. Priorities include: forests and watersheds upstream of major cities, wetlands and mangroves for flood protection. Further study is needed to identify activities with the greatest positive impact on disaster vulnerability mitigation.

Judy Oglethorpe, Director of the Biodiversity Support Program, proposed roles for IUCN and its members in mitigating the impacts of armed conflict on biodiversity.

Peril and opportunity: IUCN must carefully avoid legitimizing traditional security institutions. It can, however, use the concept to mobilize new actors and funds in service of conservation, and in order to enhance the effectiveness of conservation projects by designing them for contingency.

IUCN should integrate environmental security into its programmes and act as a global clearinghouse and broker on these issues. It is well-positioned to play an important role in this field.

Impacts of conflict on biodiversity: The chart below shows the direct and indirect impacts on biodiversity of three sources of conflict:

	Direct	Indirect
Habitat destruction	Intentional defoliation	Clearing due to refugee movements
Resource overexploitation		Depletion for subsistence or to finance conflict
Pollution	Intentional damage - oil spills	Concentration on heavy metals from weaponry in water supplies

Richard Tarasofsky, Senior Legal Fellow at Ecologic Environmental Research, presented the international legal instruments that have evolved to balance actions taken during conflict with protection of the environment.

The goal of these instruments is to establish a set of clear rules and institutions that create an appropriate balance between legitimate actions taken during armed conflict and protection of the environment. Today there is a patchwork of ambiguous roles, with some bright spots, including the arms control treaties (e.g. chemical and biological weapons, land mines, etc.) the International Criminal Court, and the UN Compensation Commission.

There needs to be a credible threat of accountability for crimes against the environment or against humanity, through the international criminal court or other similar mechanism.

IUCN should continue to develop its initiative to create rules to protect especially important sites during armed conflict.

Session conclusions

Environmental security is both a powerful rhetorical device and a useful analytical tool, though the tool as yet has not been developed for practical application at the field level. The most significant aspects of the environmental security perspective as it relates to conservation are:

Linkages between conservation and security		
Degradation/scarcity of natural resource	→	Conflict
Incompatible resource use	→	Conflict
Conflict	→	Undermining of conservation efforts
Conservation	→	Basis for cooperation
Environmental degradation	→	Vulnerability to disaster

Participants agreed that while IUCN has done much to integrate environmental security into its programmes and activities, much more could be done, and in a more coherent way. As a next step, IUCN should:

- Convene an international conference on environment and security in 2001 at which it:
 - collects the lessons learned by its members in their field work,
 - builds awareness and action at the regional level,
 - engages with the military and private sector,
 - identifies the areas of action most relevant to its various programmes and activities,
 - conveys results to policy-makers;
- Build support for an international fund for environmental security projects;
- Advocate more openly for peace and control of weapons of mass destruction;
- Incorporate contingency planning into conservation programme design;
- Work with Communications to better inform the IUCN and broader constituencies of the relevance of this issue to their goals;
- Convey the urgency of this issue to partner organizations such as UNEP, the World Bank and member governments;

- Develop indicators and early warning systems;
- Assess and monitor the impacts of war.

The Task Force was given a strong mandate to continue its work along several axes:

- Move from theory to actionable tools;
- Seek to understand the role of the private sector and of macroeconomic forces in undermining environmental security;
- Identify traditional mechanisms for resource-based conflict resolution;
- Research the link between conservation and disaster vulnerability mitigation in greater detail;
- Help integrate security into IUCN's broader work programme.

Environmental security holds out the promise of strengthening the link between protecting the environment and reaping social benefits. It can 'raise the stakes' for environmental conservation and mobilize new actors in support of that end. It can provide a point of cooperation between actors who might otherwise be opposed. Moreover it can enhance conservation effectiveness by allowing:

- Better prioritization of conservation activities;
- Design of projects to handle contingencies such as disaster and war.

ANNEX 1: AGENDA

Environment and security: a strategic role for IUCN

Chairperson: *Mark Halle*, European Representative, IISD

Rapporteur: *Jason Switzer*, IISD

Panel: *Pascal Girot*, Department of Geography, University of Costa Rica
Richard Matthew, Director of the Global Environmental Change and Human Security Project at University of California, Irvine
James Gasana, consultant and former Minister of Environment and Minister of Defence, Rwanda
Ambassador Mohamed Sahnoun, Special Adviser to Kofi Annan, and former member of Brundtland Commission (WCED)
Jeffrey McNeely, Chief Scientist, IUCN Secretariat

09:00–10:00 **Session 1: Introduction**

Presentation: purpose and outline of activities
Mark Halle

The relationship between environment and security
Richard Matthew

10:00–10:20 **Panel discussion**

10:20–10:40 **Session 2: Incompatible resource use, livelihood insecurity and conflict**

Interlinking crises: Pakistan Northwest Frontier
Richard Matthew

Forest resources: fires in Indonesian forests
Chip Barber

10:40–11:00 **Panel discussion**

11:00–11:30 **Session 3: Environmental stress, livelihood insecurity and conflict**

Land distribution and refugees in the African Great Lakes Region
James Gasana

Turbot war: the fisheries dispute between Canada and Spain
Beth De Sombre, *Colby College* and *Dr Sam Barkin*, *University of Florida* –
presented by Jason Switzer

11:30–11:50 **Panel discussion**

11:50–12:00	Summary of morning’s discussion <i>Mark Halle</i>
12:00–14:00	Lunch
14:00–14:40	Session 4: Benefits of conservation for security from natural disasters Opening of the session <i>Mark Halle</i> Hurricane Mitch and environmental vulnerability <i>Pascal Girot</i> Panel discussion
14:40–15:30	Mitigating impacts of conflict on biodiversity NGO roles in conflict <i>Judy Oglethorpe</i> Legal regimes for ensuring conservation in times of conflict <i>Richard Tarasofsky</i> Panel discussion
15:30–16:00	Coffee break
16:00–17:00	Defining IUCN’s role in environment and security
17:30	Press conference

ANNEX II

Collaborating institutions and commissions

IUCN Regional Office for Central America, IUCN Pakistan, IUCN Regional Office for Southern Africa, IUCN Canada

Commission on Environmental Law

Biodiversity Support Program

World Resources Institute

UN/Economic Commission for Europe

International Institute for Sustainable Development

Swiss Development Cooperation

Swedish International Development Agency

Interactive Session 4:

Forests for life: forest ecospace, biodiversity and environmental security

Organizers: William Jackson (e-mail: wjj@iucn.org)
David Hinchley (e-mail: dgh@iucn.org)
Simon Rietbergen (e-mail: spr@iucn.org)
Dagmar Timmer (e-mail: dat@iucn.org)

Introduction

Forests continue to be lost and degraded at an unacceptable rate, and these losses are having severe impacts on the livelihoods of forest-dependent people and on the world's longer-term environmental security. This is a major obstacle to achieving IUCN's vision of a just world that values and conserves nature. Forests have long been an area of particular focus for the IUCN secretariat and scientific commissions (working in close collaboration with numerous members and partners).

The Interactive Session considered links between livelihood security and forests, using disasters as a discussion framework. Unusually for a conservation meeting, livelihood issues were identified as a key component of conservation strategies by participants, who considered the dangers and opportunities associated with the global forest crisis and discussed practical steps open to IUCN members, Commissions, Programmes and partners. Drawing on case studies, speakers stressed the limited success of 'one size fits all' solutions, given the diversity and complexity of the socio-economic and ecological settings in which forest degradation occurs.

Forest loss and declining forest quality

Despite promising signs in some parts of the world, forests continue to be under very considerable stress, with continued loss of forest area in many parts of the world and declining forest quality in numerous regions. In the past 15 years alone, the world has lost an area of forest twice the size of South Africa – 200 million hectares – to other land uses such as farms and pasture or large-scale plantations of oil palm, rubber and other cash crops.

The quality of the remaining forests is also declining in many places. Even where the forest area is stable or increasing, there are often rapid changes in its character. Forests around the world are tending to become younger and less diverse, with stands often comprised of the same size, age or species of tree. This makes them less hospitable to biodiversity and not as able to withstand disturbances from fire, wind and insects. Natural forests are being replaced by plantations or by intensively

managed forests. A tree plantation can be as different from a natural forest as a football pitch is from a wildflower meadow. That said, plantations have been established which respect the local mix of species or are in other ways better for the environment and biodiversity.

World-wide, 80% of original forest cover has been cleared, fragmented or otherwise degraded. In some key areas for biodiversity the figures are much worse. In the Atlantic rainforests of Brazil, the West African rainforests, Madagascar, and Sumatra, much less than 10% of the original forest cover is left. The effects are evident: we are currently undergoing the most rapid rate of species extinction in the history of the planet.

Livelihood implications

This Session looked at the implications of these changes for livelihoods of people around the world. It explored how many so-called “natural” disasters such as forest fires are really caused or aggravated by human beings, and how the mismanagement of forest resources increases the vulnerability of all people, in particular those who depend on forests for their subsistence – between 400 million and one billion people world-wide. Conversely it provided examples of how well-managed forest ecosystems are a cornerstone of secure human livelihoods in many parts of the world, as well as a safe haven for biodiversity.

All subsequent quotes are taken from the presentations made at the Interactive Session.

The holistic approach of current sustainable livelihood initiatives recognizes the vulnerability of the poor to resource degradation and promotes sustainable resource management as a critical element for sustainable improvement in the livelihoods of the poor.

Katherine Warner

The papers presented promoted discussion on the links between forests and livelihoods and on tools, methods and approaches for effectively managing forests to meet socio-economic and conservation objectives.

Forests provide us with an enormous wealth of plants and animals as well as services that are vital to human societies – both physical resources and less tangible benefits. Some of these are fairly obvious such as timber for building and wood fuel, a wealth of foods, oils and medicines. Others are more difficult to measure but similarly important, such as the recreational benefits derived from having access to forests and the spiritual importance that some forests have for individuals and to particular religions. Forests also touch on the deepest levels of cultural and emotional experience in humans and have inspired artists, philosophers and travellers for centuries.

Hundreds of millions of people around the world depend on forests, directly or indirectly. Some depend on forest products for livelihoods; some use forest products as a means of ensuring food security; others engage in forest enterprises in order to raise livelihoods above subsistence level.

It is important to remember that forest-based income is a major contributor to livelihoods for some rural people in much of the world, regardless of interventions aimed specifically at linking such income to conservation objectives. In some cases forest-based income is of fundamental importance. In India, many tribal people, in particular, have traditionally gained their major sources of cash income from collecting and selling forest products. In Vietnam, collection and sale of medicinal plants from forests is an established source of cash income.

Robert Fisher

Discussion highlighted the need to look more closely at complex and interdependent relationships between forests and humans – sometimes supportive, such as with community management of resources, and sometimes conflictual. For example, a case study in Nyangui Forest, Zimbabwe, of a long running conflict over reserve boundaries highlighted the importance of negotiating roles and responsibilities of stakeholders to overcome threats to human and environmental security. In this case, negotiating long-term access rights and management responsibilities of stakeholders is more important than adjusting contested boundaries.

Hence the case study underscores not only the material struggles over the forest boundary (i.e., the issue of access) but also the symbolic struggles with respect to the people's culture, tradition and rights... The key lesson emerging from this case study is that the solution to contested landscapes or boundaries is not to erase such boundaries or to redefine them, but rather to force the parties on each side of the boundary to define their appropriate relationships. By using the boundary as a focal point that brings together rather than divides, the state forest authority and the community could have focused on the meaning of the boundary and negotiated a relationship based on clearly defined responsibilities and accountability.

Yemi Katerere

Positive examples of community management examined included the role of non-timber forest products in meeting the food and development needs of communities living near the Huacamayos Forest in Ecuador (where 212 plant species and 141 kinds of animal products are eaten).

...The fact tourists and other people make evident their praise for these foods by paying for them, has provided feedback for local self-esteem, and traditional foods increasingly recover their prestige. As a result, some NTFPs have begun to be processed (jelly-making with some seasonal fruits from the forest), cultivated outside the forest (wild asparagus, white cacao, edible and medicinal mushrooms) or domesticated (cachama or pacu, a native Amazonian fish). In this way, they will serve as a reliable dietary complement, preventing excessive pressures on the forest ecosystem's carrying capacity, and providing a permanent basis for food supply to local ecotourism projects and, potentially, to external markets.

Xavier Izko

Throughout the world there are many such examples of communities regulating forest use in order to sustain long-term benefits, leading to improvements in forest condition. In many places, the participation of communities is becoming a central feature of forest management.

There are lingering 'myths' concerning poverty and the environment that also hinder trust in community management. One of the myths is that the poor are too poor to invest in the environment. Yet numerous experiences demonstrate that when incentives are favourable, even the poor can mobilize enormous resources, particularly labour.

Katherine Warner

However, a review of the role of community forestry in generating income for improved livelihoods in Asia found that while local communities are often expected to take responsibility for management, there is seldom a corresponding shift in decision-making power or capacity-building.

...It is not surprising that often communities are hesitant about assuming responsibilities (and providing resources) without some guarantee of benefits (as they define benefits) for doing so. Participation is elicited only within a pre-determined framework while the agenda itself is not open for discussion. Rather than being involved in the design and implementation of the initiative, they are blamed for 'not being enthusiastic...about whatever they are offered.' Benefit-sharing arrangements are externally determined, without villagers being asked if 'they in fact want to harvest their timber, and how they would like the proceeds' distributed.

Katherine Warner

Especially regarding resources such as timber that can provide significant levels of income, experience has shown that most Government forestry programmes yield few opportunities for significant local income generation. The opportunities are restricted and can be characterised as 'little trees for little people'.

So far I have been discussing income generation from forests as if it was only concerned with non-timber forest products, or NTFPs (implicitly assuming that ecotourism is an NTFP). The income-generating potential for local communities of timber has not been mentioned. This is, or should be, surprising, as timber is a major source of commercial forest income. The omission highlights an important point: commercial harvesting of timber is rarely seen as being relevant to local people. (In Asia and Africa) there has been some discussion about 'big trees for little people', but 'big trees' are usually assumed to be a resource for the state (managed through Forest Departments) and concessionaires.

Robert Fisher

It was suggested that more work is needed in this area before the positive impacts of community forestry on income can be convincingly demonstrated.

Mismanagement of forest resources aggravates 'natural' disasters

Disasters highlight the stresses that forest ecosystems (and the people who depend upon them) are under.

Hurricanes

Hurricane Mitch killed 18,000 people, displaced almost 2 million, left 300,000 homeless, and caused US\$6 billion damage, including huge infrastructure losses.

The immediate reaction to a humanitarian tragedy such as Hurricane Mitch is one of disbelief. How could a disaster of such proportion impact directly in a few days a tenth of all Central Americans, paralyze entire countries like Honduras, and beckon one of the largest humanitarian responses from the entire world in Central American history? How vulnerable is Central America to severe weather systems, such as depressions, storms and hurricanes? Furthermore, what is the relation between environmental degradation and the compounded vulnerability of impoverished societies recovering from decades of war and civil strife?

Pascal Girot

The ability of many catchments to cope with the hurricane was decreased by deforestation, degradation and changes in lowland drainage. In contrast, upland areas with remaining natural forest cover were far less affected. Vulnerability to extreme climatic events is increased due to forest and forest quality loss stemming from environmental mismanagement.

While landslides and mudflows hit hardest in hilly areas farmed by smallholders, floods were most prevalent in the lowlands and floodplains where most of the large-scale farming takes place. A recent study involving some 2,000 farmers in Guatemala, Honduras, and Nicaragua, and doing field tests in a number of sites found that farmers that practised soil conservation reported less damage as a result of Hurricane Mitch.

Pascal Girot

Floods

On the other side of the world, the Bay of Bengal is exposed to cyclones that create storm surges of 5–7m in height, threatening lives and property. The mangrove forests of Bangladesh help to diffuse these storm surges, however they are threatened by encroachment, over-exploitation and increased salinity from reduced water flows. When the mangrove forests in Bangladesh are cleared, the country is left increasingly vulnerable to flooding and loss of good agricultural land when hit by cyclones.

An estimate by the Southwest Area Water Resources Management Project shows that the absence of the Sunderban (mangrove forests) would dictate the need of building 2,200km of cyclone/flood embankments... The opportunity cost of the protective function of the Sunderbans in these terms would be about US\$460 million.

Mahfuz Ullah and Ainun Nishat

Fires

The 1997 fires in Indonesia resulted in an estimated 20–70 million people suffering health problems due to smoke haze, and hospitalization of some 40,000 people. Estimated economic losses were around US\$9 billion. Uncontrolled wildfires around the world have similar impacts to this – and they often disproportionately hurt the poorer segments of society.

In the long term, indigenous peoples in the region (of Khabarovsk Krai territory in Russia), who make up a sizeable proportion of the Khabarovsk population, may be the most severely affected by forest fires. They are dependent on hunting and fishing for their livelihoods and, as a result of the habitat destruction, may have suffered the most direct and possibly severe impact... Some 3 million hectares of forest in Russia are contaminated with long-lived radio-nuclides, mainly concentrated in three pockets in southwestern Europe (from Chernobyl), the Urals (from the defence industry) and the Altai (from nuclear testing). Forest fires in these contaminated areas can re-mobilize these radio-nuclides.

Victor Teplyakov, Andrew Deutz, Andrey Filipchuk and Danielle Cantin

Conservation impacts can also be severe: the Khabarovsk Krai fires threatened protected areas, Ramsar sites and critical habitats.

The fires (of Khabarovsk Krai) directly affected critical habitat of several endangered species listed under the IUCN Red Data Book, protected under CITES, and listed in the Russian Red Data Book (of Endangered Species). These include the endangered Siberian tiger and Amur leopard, as well as their main prey species, the wild boar. The Former State Committee of the Russian Federation for Environment Protection has also expressed concern over the potential impacts on bird population resulting from forced early migration, as well as multiple stresses on aquatic ecosystems, which could adversely affect invertebrate species as well as commercial fish species such as salmon and sturgeon.

Victor Teplyakov, *et al.*

Natural fire regimes can help maintain forest ecosystems. Recently, however, the frequency and intensity of forest fires has increased dramatically as a result of human action causing devastation in countries around the world: the United States, Sub-Saharan Africa, the Mediterranean and Indonesia to name but a few. World-wide, 14 million hectares of forests were affected by fires in 1997 and 1998, with a similar trend continuing.

Early in 1999, parts of the Brazilian Amazon, and forests in China were alight. For the tropics, it was only the beginning of the dry season yet areas of South East Asia had already burnt. In October, one of the world's greatest areas of biodiversity – Manu National Park – in the Peruvian Amazon caught fire too... These have occurred during a period when global weather patterns were forecast to be relatively wet but is also at a time when the frequency and intensity of El Niño could be increasing, which means the world faces warmer, more extreme weather and more forest fires.

Jean-Paul Jeanrenaud and William Jackson

As many such damaging wildfires are caused by humans – either deliberately or accidentally, an improved understanding of the underlying causes and motivations of people lighting the fires is required. Underlying causes of fires include perverse economic and social incentives, land and resource conflicts, climate change, and greed and corruption.

Given that 85% of forest fires in Russia are anthropogenic, fire management policy in Russia should focus more upstream on understanding and combating the underlying causes of forest fires in Russia, rather than exclusively on the downstream issues of actually fighting fires... (Currently Russia invests less than 5% of the available funds for fire management on prevention. The major expenditures are for fire suppression...) Much greater capacity will have to be developed and deployed to understand and influence how different stakeholders use and abuse fire, particularly newly emerging groups of forest users; what kind of economic and policy incentives and disincentives exist or can be developed for sound fire management; and how information systems can be strengthened to enhance fire prevention and management.

Victor Teplyakov, *et al.*

Presenters examined these issues and looked towards more effective ways of managing forest fire in the future. Strong arguments were made for a rethink of the conventional response to forest fires, which over-emphasizes fire suppression and often ignores the underlying causes of human-induced forest fires. The need for prevention and preparedness was emphasized.

Finding management approaches for balancing environmental and livelihood needs

Building further on the complex interaction between forests and people, and recognizing that most of the world's forests are outside protected areas, it is imperative to find management approaches that allow environmental and livelihood needs to coexist.

There is some concern in forestry that initiatives that focus on poverty alleviation or sustainable livelihoods will encourage deforestation and forest degradation. However, sustainability of the natural resource base is a critical concern (and basis) for sustainable livelihoods.

Katherine Warner

The use of non-timber forest products for food-supply purposes continues to be an incentive against deforestation.

Xavier Izko

The Interactive Session thus also looked at tools, methods and approaches for linking policy and practice – and involving all stakeholders in forest management. This was explored from several angles, ranging from discussion of legal mechanisms for applying sustainable forest policies in practice, to an analysis of the ways in which the World Bank's forestry and non-forestry sector policies interact with natural disasters.

Presenters emphasized that our expectations from forests are high. We now count on forests to be managed not simply for timber but for multiple objectives, involving multiple stakeholders. Forests are supposed to provide benefits for conservation, production and services, as well as economic benefits to rural communities.

Policy-makers are increasingly called upon to consider the value of forests as ecosystems, as homes to unique biological, biochemical and genetic resources, and as part of the basic biophysical system that maintains the climatic range and atmospheric

chemistry that is essential to continued life on this planet. At the same time, forests and forest products continue to be a valuable commercial commodity and to play in some instances an important role in national economies.

Ben Boer and Tomme Young

It should be noted that all of the multiple objectives of forest management are valid. While there may be disagreement over how much forest is to be managed for which objective, there is general agreement that forests should provide a range of products and services.

Katherine Warner

This has made the task of forest management increasingly complex, while the resources at the disposal of state forest departments have decreased with budget cuts and down-sizing in recent decades.

In some cases, the processes of developing and implementing natural resources management plans are too complex, costly and slow to engage the full range of stakeholders such as the private sector, communities and small NGOs (i.e. no truly multi-stakeholder processes). Examples include the processes of preparing national monitoring reports under the Climate Change convention and national forest programmes (NFPs). Whilst these processes are supposed to be multi-stakeholder, their implementation is long and complex which makes it difficult to engage everyone fully and maintain their interest and participation throughout the process when the outcome will be yet another plan. The net result is that many key stakeholders, such as local communities, who do not have the resources to maintain their presence in the dialogue and planning process, lose out or are not given the same importance as larger well-financed interest groups. Instead they are consulted occasionally and become mere sources of information for planners rather than active participants.

Peter Gondo

In response to the failure of forest management strategies in many parts of the world, community-based management approaches have been developed and promoted. While these have met with varied levels of success in terms of both forest conservation and livelihood impacts, more work is needed to realize the full benefits of these approaches and learn lessons provided by experience to date.

Community-based regimes are still in the process of being developed. Community-based management cannot accomplish in a few years what State management could not accomplish in a hundred. While this may appear to be an obvious point, calls are currently being made to assess the success of community-based management after a relatively brief period of implementation. Assessments are needed, but they should be conducted with a view of community-based management as 'work in progress', that is, adapting and evolving, and attempt to identify what supports (and undermines) good, multiple-objective forest management. Measures of success should reflect the multiple objectives of forest management and not only assess the status of the forest, but also the incentives (tenure, benefits) for good management and the impact of community-based management on the poor and most vulnerable.

Katherine Warner

A key principle to negotiating and reaching agreement on access to resources inside the forest boundary has to be local responsibility, accountability and respect for both parties. Where there is no local accountability, there can be no real participation in decision-making regarding the forest resources and the benefits arising from their management.

Yemi Katerere

In the international forest policy arena, there has been slow progress with an apparent overemphasis on the debate and not on the purpose of the debate. Policies and laws are often not ratified or implemented at the national to local level. Participants stressed the need to build a culture of success, building on the positive action that is taking place on the ground. This would go some way to address the existing gap between policy intent and on-the-ground implementation.

During the last ten years, the global forestry community has been engaged in a policy dialogue aimed at coming up with agreed strategies and mechanisms for implementing sustainable forest management... Collectively these agreements represent the most comprehensive international consensus on priority areas of concern and proposed action towards the sustainable management and conservation of all types of forests... Unfortunately despite the international focus and attention placed on forests, real action on the ground to improve the management and conservation of forests has been far from satisfactory. The reasons for this are numerous, complex and inter-linked, and vary from region to region and country to country. Some of the factors affecting developing countries, especially in Africa, include complex planning and implementation processes associated with international programmes, limited funding and inadequate capacity, uncoordinated planning processes under different frameworks, lack of obligations and commitments of stakeholders other than government and inadequate incentives for local communities and the private sector.

Peter Gondo

The Russian forest sector has been experiencing severe management problems that threaten socio-economic stability and the ecological integrity of the forests. The legacy of centralised planning policies, the recent transition to a market economy and the ensuing economic and political turmoil have diminished Russia's management capacity. These problems are further compounded by insufficient public access to information and by the lack of mechanisms for public participation in decision-making. These issues are severe impediments to the conservation and sustainable development of Russia's forests, and they urgently need to be addressed.

Victor Teplyakov *et al.*

Cross-sectoral interactions

Broader cross-sectoral interactions were also examined, with examples showing that policies and practices in other sectors such as mining, urban development or structural adjustment can have major impacts on forests – often more so than forest policies.

Non-forest sector policies influence the state of the world's forests and the increasing risk of disasters, more than forestry policy. The World Bank's non-forest sector investments have the potential to greatly affect forests and forest-dependent people. Impacts

can result from projects in sectors such as agriculture, transport, energy, and mining as well as in the framework of macroeconomic adjustment lending. In many cases these impacts have been both more extensive, and more adverse than was anticipated.

Jürgen Blaser

The policies of multilateral institutions provide one avenue for addressing this threat to forest conservation and rural livelihood concerns. The World Bank influences the state of the world's forests. The Bank's greatest impact results not from their forestry loans, but from non-forest sector loans for structural adjustment, transportation, hydropower, mining, transmigration, and agriculture.

One example is the Barranquilla–Soplaviento Road in Colombia. The road choked off the water flow to the Ciénaga Grande de Santa María and destroyed some 30,000ha of mangrove forests, impacting the lives of 200,000 poor people who relied on these resources for a living.

Jürgen Blaser

The World Bank is currently refining safeguard policies and developing forest sector strategies to ensure that Bank-supported activities evaluate the kind and extent of impact they may have on forests, and integrate appropriate ameliorative or off-setting measures. These policies and strategies will emphasize poverty reduction, containment of threats to critical forest ecosystems, and will also focus on climate change conditions and measures to mitigate and prevent natural disasters.

Jürgen Blaser

Fiscal and trade policies call for agreements that can potentially have adverse, unforeseen consequences on forests. For example, International Monetary Fund (IMF) promotion of the deregulation of oil-palm investments in Indonesia may have accelerated forest clearance, and been one factor in the devastating fires there. Thus natural resource stability (and sustainable livelihood) precautions need to be incorporated into macro-economic adjustment frameworks and other major agreements with bilateral and multilateral donors.

Implications for IUCN and future directions

Following the presentation of papers, a plenary discussion was held on the key questions of: how do we better engage multiple stakeholders? What is the potential and actual role for IUCN members, Commissions and Secretariat on the Session themes? And how do we move to action?

IUCN was encouraged to address the issues raised during the Session in the following ways:

- rigorously test the assumption that supporting income generation from forests can contribute to conservation and poverty alleviation;
- emphasise and support negotiations on tenure and full implementation of community forestry programmes;
- focus on the direct and underlying causes of deforestation and loss in forest quality, as well as how these influence and are impacted by 'natural' disasters;

- explore ways to work at the watershed/landscape scale to better address highland-lowland interactions;
- emphasise and build on effective action on the ground, and mobilise the full range of stakeholders from the local to the global level;
- work cross-sectorally, especially with IUCN's Commissions and members;
- develop partnerships with key players who can have an influence, such as the World Bank;
- gather and disseminate information where it is lacking and avoid studying issues that are already well known.

It was recognized that the Union has already been working on many of these specific questions, and is committed to continuing its efforts to address the underlying causes of forest loss and degradation. One concrete manifestation of this commitment is IUCN's involvement in ForestPACT, a mechanism to promote multi-stakeholder partnerships for forest conservation. ForestPACT facilitates commitment and concerted action at all levels, from governments and international agencies to private enterprise and individual consumers and citizens.

Many developing countries are faced with serious challenges such as small or poorly developed forest sectors, weak institutions, inadequate policy and legal frameworks, lack of financial resources, heavy debt burdens and poverty. Thirty-two African countries are among the 'Heavily Indebted Poor Countries' (FAO, 1999, ECA, 1998). Thus for the majority of these countries lack of resources and limited capacity are the major constraints they face in trying to sustainably manage their forest and woodland resources. There is need for innovative approaches for mobilising in-country resources from government, private sector, civil society and local communities for implementation of sustainable forest management. The partnerships envisaged under the ForestPACT initiative provide an opportunity to meet or at least contribute to meeting some of these needs at national and community levels through mobilising resources and leveraging financial support.

Peter Gondo

The participants welcomed IUCN's renewed commitment to reversing forest loss and degradation through its joint Forests for Life Strategy with WWF. The Forests for Life vision is based on the principles of ecological integrity, human well-being and the landscape approach and challenges many different stakeholders to become involved in defining and implementing sustainable forest management (see below). Over the past five years literally hundreds of groups have been working to put the Forests for Life principles into practice around the world.

The Session concluded that well-managed forest ecosystems are a cornerstone of secure human livelihoods, as well as a safe haven for biodiversity. David Cassells, chair of IUCN's Forest Conservation Advisory Group, captured the spirit of many contributions with his final remarks at the Session:

To safeguard the future of forests and the people who depend on them for their livelihoods will require a complete paradigm shift in the way we think about forests. I'm confident that IUCN can continue to play a leadership role in facilitating change not only in people's thinking, but also in the way we treat forest ecosystems in practice.

David Cassells

ANNEX 1: AGENDA

Forests for life: forest ecospace, biodiversity and environmental security

- 09:00–10:45 **Session 1: Livelihood security and forests**
Facilitated by David Cassells, Chair of IUCN's Forest Conservation Advisory Group and Director General of IWOKRAMA International Centre for Rain Forest Conservation and Development (Guyana)
- Introduction to the workshop
David Cassells
- Sustainable development and non-timber products in the Huacamayos Forest (Upper Napo, Ecuador, South America)
Xavier Izko (Intercooperation), Coordinator of the PROBONA Project (Ecuador)
- The contested boundaries between state and communal land in Zimbabwe: the case of Nyangui Forest
Yemi Katerere, Regional Director of IUCN-ROSA (Zimbabwe)
- Poverty alleviation and forests: experiences from Asia
Robert J. Fisher, Head of Programme Development at the Regional Community Forestry Training Centre and member of CEESP – Commission on Environmental Economics and Social Policy (Thailand)
- 10:45–12:00 **Session 2: 'Natural' disasters?**
Facilitated by Alberto Salas, Coordinator of Forest Conservation and Protected Areas, IUCN-ORMA (Costa Rica)
- Introduction
Alberto Salas
- Case study: structural vulnerability, environmental degradation and risk abatement through landscape management and community forestry in Central America (Hurricane Mitch)
Pascal Girot, Vice-Chair for Meso-America (CEESP), and University of Costa Rica (Costa Rica)
- Natural disasters, forests and environmental security: flooding and tidal surge in Bangladesh
Mahfuz Ullah from the Centre for Sustainable Development (Bangladesh) and Ainun Nishat, Country Representative, IUCN Bangladesh Country Office (Bangladesh) – presented by Mahfuz Ullah
- IUCN and WWF's work on forest fire prevention
Jean-Paul Jeanrenaud, Coordinator of WWF's Forests for Life Programme (Switzerland) and William J. Jackson, Coordinator of IUCN's Forest Conservation Programme (Switzerland) – presented by Nigel Dudley, IUCN/WWF

Economic transition and forest fires in Russia

Victor Teplyakov, IUCN Office for the Commonwealth of Independent States (Russia), Andrey N. Filipchuk, All Russian Research and Information Center for Forest Resources (Russia), Andrew M. Deutz and Danielle Cantin, Temperate and Boreal Forest Programme (Canada) – presented by Victor Teplyakov

12:00–14:00 Lunch

14:00–15:30 **Session 3: Linking policy and practice: tools, methods and approaches**

Facilitated by William Jackson, Coordinator of IUCN's Forest Conservation Programme (Switzerland)

The World Bank: ways in which forest and non-forest sector policies link to natural disasters

Jürgen Blaser, ESSD – Environmentally and Socially Sustainable Development Network, The World Bank (USA)

Involving communities in forest management

Katherine Warner, Community Forestry Unit, Food and Agricultural Organization (Italy)

Legal mechanisms for linking sustainable forest policy and practice

Ben Boer, Australian Centre for Environmental Law, University of Sydney, and Deputy Chair of IUCN's Environmental Law Commission (Australia) and Tomme Young, IUCN's Environmental Law Centre (Germany)

ForestPACT: a southern perspective

Peter Gondo, SAFIRE (Southern Alliance for Indigenous Resources) and a founding member of ForestPACT (Zimbabwe)

15:30–17:00 **Session 4: Move to action**

Facilitated by David Cassells

Panel discussion

Summary and wrap-up

David Cassells

17:30–18:30 **Press conference**

All papers and other materials from the forests workshop are available from:
<http://www.iucn.org/themes/fcp> in the section about the Amman Congress.

Interactive Session 5:

Ecospaces and a global culture of sustainability

Organizer: Eduardo Fernandez (e-mail: efernandez@iucn.org)

Introduction

This Session dealt with the implications of creating a global culture of sustainability. The dynamics and impacts of globalization were analysed to appraise the equity and non-equity established through global markets while critical analyses presented the possibility to construct innovative cross-cultural strategies which could contribute towards sustainable use of natural resources globally.

Addressing the cultural dimensions of globalization, follows IUCN's commitment to harness the expertise of academics to generate analytical schemes to interpret ongoing historical processes that affect bio-cultural resource use. Within the framework of IUCN's Programme, the session contributed to debates about management of ecosystems, incentives for conservation of biodiversity and sustainable use of natural resources, equitable sharing of costs and benefits, communication and information systems, and accountable management and leadership of the Union.

***Claude Auroi** introduced the processes by which sustainable use is linked to ethical principles and social processes, for the conservation of local resources and the equitable distribution of benefits. He reviewed the significance of the 5th Conference of Parties of the CBD and contemporary international debates relating to the themes of access, benefit-sharing and equity of biodiversity. Recognizing that the concept of "ecosystem" is endorsed in the CBD and in COP5 to include humankind as part of ecosystems and as integral components of these, Auroi recognized that the concept of sustainable use, in turn, allots humans a special responsibility in their behaviour towards other processes of the ecosystems and among cultures themselves.*

"Sustainable use" is defined in Article 2 of the CBD as the "use of the components in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations". This should imply the coexistence of a utilitarian component and an ethical approach which reflect that ultimately the concepts of both sustainable development and sustainable use are socially constructed and historically contextualized as part of a collective social representation having both scientific, and religious and ethical components. Thus to generate a global culture of sustainable use, it is necessary to solve the difficulties of communicating incommensurate value systems, philosophies, sciences and religions which predicate different explanations of humanity's functions within

nature. A profound cross-cultural dialogue is needed to solve this predicament and this dialogue may be advanced through sustainable use programmes.

The need to contextualize ethical dilemmas among social groups having rights and participatory capacities regarding sustainable uses of natural resources and the contradictions between the issues of gender equity or of equity of indigenous peoples and local communities in relation to sectors such as those of the scientific-commercial constituency, are factors in the complexity of the issues of sustainable use at stake. The concept of equity in the CBD and COP5 has only been applied in relation to the equitable sharing of benefits of material resources, while the knowledge and culture components and their ethical contexts were ignored. The priority of community wellbeing over wealth acquisition should be redefined to redress the decision-making imbalances where wealth owners have dominated over communities and such redefinitions are necessary to achieve cultures intent on sustainable resource use globally.

Since Rio 92, not enough progress has been made regarding peoples' rights to participate in in-situ conservation and benefit-sharing as expressed in Article 8j, while only this year with COP5 has an Ad hoc Open-ended Working Group been established to develop a Work Programme for the implementation of Article 8j and related provisions of the CBD. The International Indigenous Forum on Biodiversity has reiterated that indigenous priorities are the recognition of their territories, declaration of a moratorium on bioprospecting, demands for full participation in development policies and biodiversity laws affecting them, recognition of their right to deny access to genetic resources and traditional knowledge, recognition of rights to equitable and fair benefit-sharing where access was agreed by indigenous peoples, and the need for increased financial support for indigenous participation and capacity on the right of prior informed consent in the use of traditional knowledge. The Draft Declaration on the Rights of Indigenous People is still pending because it is hindered by issues such as the fear that sovereignty of the state may be affected by indigenous claims to their territories and resources.

Growing threats to "human security" include wars, conflicts and emergency situations involving armed actors, refugees, and security issues which are devastating the bio-cultural resources, while factors such as industrialization, poverty, over-population, over-hunting, over-grazing and unsustainable agriculture are increasingly having negative impacts on sustainable use of biological resources. Reflections on these emergency and security issues should be a key part of environmental and development agendas and should advance the concerns expressed in COP5 regarding the "harmful effects of war and poverty on the conservation and sustainable use of biological diversity". Auroi suggested that IUCN and SUI accord these issues central consideration given the wide scope of wars, conflicts, and natural and cultural disasters which severely affect resource use.

The Interactive Session dealt with the following topics:

- Segment I: Sustainable fishing: is selectivity the answer?*
- Segment II: Sustainable use and ethics in the context of the CBD*
- Segment III: Who are the CBD stakeholders? Science and traditional knowledge*
- Segment IV: Equity and sustainable use in the CBD from international aims to national reality*

Segment I: Sustainable fisheries

Eskild Kirkegaard, Danish Institute for Fisheries Research and member of the IUCN/SSC European Sustainable Use Specialist Group (ESUSG) Fisheries Working Group, gave an overview of the state of the marine fisheries resources and of the fisheries management. According to FAO about 25% of marine fish stocks are over-fished, globally we have an over-capacity in the fishing fleet of about 30-40%, and about 25% of the total catch is discarded. Discards are generally considered to be a waste of resources and may have a negative impact on conservation of fish stocks and charismatic or endangered species. Although there are many examples of fisheries that are managed in accordance with the FAO Code of Conduct for Responsible Fisheries, the general picture is that management has failed to maintain fish stocks within safe biological limits and to optimise the yield.

When evaluating the biological impact of fisheries, he distinguished between impact on the resources and impact on the ecosystem. The main areas of concern with respect to resources are over-fishing, by-catch and discards and the changes in genetic diversity and integrity caused by the selective nature of fisheries. With respect to impact on the ecosystem the areas of concern are discards, by-catch of fish, seabirds and marine mammals, change of fish community structures, physical disturbance caused by the contact of fishing gear with the seabed, and food availability for top predators.

Improving the selectivity of fisheries (e.g. by closing areas or seasons, by changing fishing performance or by changing gear design) is often proposed as a general tool to minimise the negative impact of fisheries. Making fisheries more selective may reduce by-catches and discards but may create other problems. The question was raised of what is preferable: selective fishing, or fishing removing all components of the ecosystem proportionally to their productivity?

Sarah Fowler, Co-chair IUCN/SSC Shark Specialist Group, gave an overview of the state of the shark stock and concluded that several shark species are over-fished and threatened. Although over-capacity resulting in over-fishing is the main problem, improving the selectivity may be an efficient way of reducing the catch of sharks and thereby the pressure from fisheries.

John Cooper, Coordinator BirdLife Seabird Conservation Programme, used the by-catch of albatross species in the long-line fisheries as an example of non-sustainable by-catch requiring immediate action to safeguard most albatross species. Albatrosses have a low productivity and even small by-catches may be a threat. The long-line fisheries are good examples of fisheries where improved selectivity may solve or reduce the by-catch of seabirds. Methods to avoid by-catch of seabirds already exist.

Takanori Ohashi, from the Japan Fisheries Agency, warned against using selectivity as the main management tool in relation to sustainability. He argued that making fisheries selective may create trophically unbalanced ecosystems.

Segment II: Sustainable use and ethics

Tariq Banuri, chair of IUCN's Commission on Environmental, Economic and Social Policy (CEESP), presented an overview of the synergies between the CBD goals and those of IUCN. The ethical controversies related to a global culture of sustainability were illuminated through references to the

perspectives of the sociology of knowledge and alternative approaches to justice, and by contrasting the transcendental and contextualist approaches. An analysis of the CBD's recent developments of wording revealed that terms such as stewardship were being replaced by economisms and approaches such as "protection" are made into concepts referring to "liberalization", revealing dynamics, of expropriatory and exclusionary strategies.

The term "equity" initially appears in the CBD in relation to the use of indigenous and traditional knowledge when other sectors need to access these and hence the term equity is misplaced from its proper context. Debates as to what is or is not a global resource, a public domain, or a private or communal resource are not clear in the CBD nor in other international instruments such as the Kyoto Climate Change Protocol, and other conventions which increasingly define resources in terms of economic efficiency while silencing other voices and values.

The relations between local justice and global justice are analyzed in reference to theoretical frameworks to explore issues such as the freedom-for or freedom-from dynamics and their relations to ethics and morality to present the contradictions between definitions of justice or truth. Analyzing the recent transformations of rights-based arguments into liability-based arguments in biodiversity-related issues of the CBD, and the growing trend towards a "shallow ecology" that displaces other environmental and cultural and ethical standpoints, Banuri indicated that this reflects the reality of the growing ratio of asymmetry between rich and poor sectors of humanity where over-consumers negatively affect the bio-cultural heritages. If a culture of sustainability is to be achieved, radical critiques and ruptures in the present relations between knowledge, power and production, would generate an alternative ethic based on justice and equity in contrast to the prevailing system where violence, inequity, and poverty predominate in the contemporary world. Understanding justice as not only a means of legitimizing action but as a means of creating society, the present struggles over bio-cultural systems allows for more conscious and responsible definitions of sustainable resource use, and of justice and ethics itself. Paraphrasing Heraclitus, Banuri concluded: "There is only one true struggle. Justice is the Strength."

Riccardo Simoncini, coordinator of the IUCN/SSC ESUSG Agriculture Working Group, responded by contrasting the anthropocentric (human-centred) paradigm where environmental responsibility is derived from human moral interests, with the eco-centric paradigm based on Aldo Leopold's land ethic regulating human conduct towards the environment. Nowadays Technocentrism dominates, where techno-scientific progress is an end in itself. He asked, "What are the moral agents and objects and who is to value what are ethical issues, for example with biotechnological products such as GMOs?" The incommensurability between different worldviews and value systems may hamper agreements about trade-offs and achievement of basic principles. Given that the anthropocentric paradigm reigns in contemporary market-based economies, individual self-interest predominates based only on short-term horizons and calculations to the detriment of sustainable resource use. Since definitions of biodiversity conservation are related to equity across generations in the CBD or in the Kyoto Protocol, while the Cartagena Protocol on Biosafety recognizes the "precautionary principle", it is possible that a paradigm shift is underway. To understand the processes, SUI should consider how predominant paradigms shape the development of sciences and their political and practical applications regarding resource use; realize the validity of both expert knowledge and the knowledge of those affected by valuation and policy decisions; and seek an holistic approach that considers a scientific, monetary or interdisciplinary perspective to value and use biodiversity and serves to reassemble the meaning of life and sustainability itself.

Segment III: Who are the CBD Stakeholders?

Science and traditional knowledge

Joseph Matowanyika, from FAO in Zimbabwe, explained that the value and role of communities with regard to indigenous or traditional knowledge is a key issue in national, regional and international environmental law. But, as the Crucible II Group stated recently, the terms indigenous and traditional knowledge and other terms such as biodiversity are ultimately political. Who decides who attains what and where, for example regarding genetic resources, or how benefits derived from the use will be shared equitably, or what is knowledge, all involve struggles among interest groups. The problem can be approached through analysis of stakeholders within their ideological and political contexts, and in international Conventions such as the CBD. A dominant ideological premise in many international Conventions is the difference between indigenous knowledge and Western or “conventional” science. Giving examples of seed selection and traditional agricultural experimentation, Matowanyika indicated similarities and contrasts between indigenous traditional science-making processes and Western sciences. The sustainable use of resources is a long-term concern linked to community wellbeing by many traditional societies, while western sciences relate to commercial processes dominated by short-term profit-driven dynamics. The developments in western intellectual property rights law and the protection of techno-scientific innovations are made in spite of growing conflicts between traditional communities and the private interests of post-industrial corporations. It is not the local private interests, but those of all humanity, which should guide the policies and laws on socio-ecological sustainability for the world.

As key stakeholders, local communities and indigenous peoples should be truly involved in sustained participatory dynamics with processes that involve social participation as much as concerns of ecosystem maintenance. In Africa, over 90% of the population are indigenous peoples and local communities, as defined in the CBD and in Article 8j specifically. These local stakeholders are the owners of their traditional knowledge and the conservators of genetic resources and biodiversity, though to date international and national laws are too slow to recognize these rights, or to convert them into practical programmes. The intermediaries between indigenous and traditional peoples and the policy-making organs have been divided. Some protect the rights of international corporations while others the rights of indigenous peoples and local communities, and a minority seek other alternatives, such as regional, sub-regional, national or local interests. The debates are far from resolving the problem.

Among the various international agreements, the CBD is central in promoting the defence of bio-cultural diversity and in indicating the protection of indigenous and non-indigenous resource rights and sustainable resource use, providing security to different segments of humanity. Calling for a new interdisciplinary dynamic and a new global ethic that value the heritage of indigenous and traditional knowledge systems along with those of western knowledge bases, Matowanyika concluded that SUI is a valuable bridge in such an endeavour to provide insights, experience and to establish guiding principles for sustainable resource use.

Elizabeth Reichel responded by reiterating the need to consider indigenous peoples and local communities as key stakeholders as indicated in the CBD. Article 8j should be considered in relation to the fact that 94% of the world’s scientists and technicians are in the developed nations (mainly seven countries) while 6% are in the developing countries (87% of the global population). Knowledge

Society should be defined to include indigenous knowledge systems and specifically indigenous sciences. Because similar processes exist in both western conventional science and in indigenous traditional systems, indigenous science exists as much as the science-making capacity in all cultures, and this allows for a cross-cultural dialogue regarding scientifically-based notions such as sustainable resource use and conservation. A global charter or a SUI task force should consider the application of all sciences towards sustainable resource use, based on equity, respect and communication intent on achieving long-term use of bio-cultural resources. This will enable indigenous peoples and communities to participate in the research and development processes to enhance sustainable resource use. Without losing their own cultural identities, indigenous peoples and local communities should be able to sustain or transform their cultural norms, territories and resources while maintaining the dynamics of their cosmologies and worldviews which harness lessons for sustainability. Heeding this knowledge may guarantee humanity not only sustainable resource use but also a sustained life and humanity.

Ashish Banerjee emphasized the importance of discussing the topic of indigenous and traditional knowledge and of sciences in relation not only to the CBD but in relation to the dynamics of cultural identity. Using examples from India of multiple knowledge systems where science, religion, art, music and rituals are deployed to collectively mobilize certain social dynamics that affect resource use and conservation for sustainable resource use and life itself, he indicated how ongoing cultural processes allow for both *ex situ* and *in situ* resource use.

Segment IV: Equity and sustainable use in the CBD – from international aims to national reality

Chris van Dam from the University of Salta, Argentina, introduced his paper by indicating that the CBD and Rio 92 initially led people to believe that a panacea was now available to finally solve the problems of underdeveloped countries. A biodiversity-rich South and a North that required those resources and would pay for these would allow sustainable use and conservation of biodiversity. But, upon a careful textual analysis that revealed the significance of the CBD, he found that strategic word games, for example, in the highlighting of intergenerational equity but not of present socio-cultural inequity, or in the subordination of biodiversity conservation to its use, are allowing developed countries to control access to the key biological and cultural resources. Only a critical revision and deactivation of the terms used so far can allow relevant advances of the CBD, specifically to achieve equity and equitable benefit-sharing.

Nation states are identified in the COP and in national legislation as owning genetic resources while genetic resources and indigenous knowledge are defined as being in the public domain. The large number of definitions of sustainable development, the blurriness of the CBD's wording and the amplitude of its reach have allowed for contradictory uses, either subordinating environmental dynamics to economic priorities, or the opposite, but in both models, the issues of equity appear as secondary. The rhetoric obfuscates the fact of the prevailing contradictory cultural and socio-economic goals among peoples, while poverty and inequity accrues world-wide. The example of the rhetoric of protected areas is a further case in point, as indigenous peoples are allowed to occupy the areas only if their activities are judged compatible with specific forms of resource conservation and use. If equity and benefit-sharing are to be achieved as expressed in the CBD, the problems of resources existing across ecosystems and cultural groups, the issues of genetic and not

ecosystem values of biodiversity resources, and the price and property distortions affecting resources once transformed by capital, techno-scientific and market dynamics are among the many areas of the CBD that must be urgently revised.

The CBD concept of equity should also be revised to consider that it is not only a process of benefit-sharing and access to resources, but also a process of accountability and liabilities incurred in the loss of biodiversity due to socio-environmental externalities proper to development processes. Thus, environmental and socio-economic justice are involved as power is held differently over strategic resources in processes that generate a growing gap of inequity among humans and advance ecocidal processes. If an environmental debt is owed by developed countries to developing countries, this debt is also retrospective, but such accountability is not envisioned in prevailing economic dynamics as the long-term calculations of resource values have not been formalized. This, and the ecological footprint which allows the accountability of resources used by dominating development models and consumer patterns, require a redefinition of the long-term accountability to achieve truly sustainable use.

Whether international instruments such as the CBD should continue to be revised or if other instruments must be created to allow relevant analyses of the real issues pertaining to sustainable use, van Dam argued that in any of these processes the indigenous peoples, ethnic groups and local communities should be considered parties of the COP and CBD debates on biodiversity. The urgency to create innovative intellectual property rights and resource right regimes that defend indigenous and traditional communities, and the defence of traditional and non-traditional knowledge rights of indigenous peoples are among the other urgent tasks which will involve the generation of new international conventions where justice, sustainable resource use, and equity are to be basic premises for the sustainable future of humanity.

In responding, **Claudine Ramiarison** from GEF Madagascar, suggested that the multiple phrases of the CBD regarding the value of biodiversity and its uses and conservation have been redefining the responsibility of humanity in its environmental and bio-social functions. However, the fact that indigenous peoples tend to use and conserve resources better when managing their traditional territories through the application of traditional rights systems signals a contradiction with development models that tend to be predatory or short-sighted. National programmes that involve all stakeholders and that implicate the local communities in biodiversity use and conservation strategies, promote a better level of wellbeing and quality of life to all its peoples. Decentralized dynamics where local groups are empowered to conserve and rationally use biodiversity can only be harnessed with effective participation, responsibility, valorization and utilization of traditional knowledge and for this equity and sustainable development should be endorsed in national programmes. In turn, the CBD should be developed to face the fact of increasing poverty and ecocide in Africa and in many Southern countries. All international instruments that allow sustainable resource use should be incorporated in national plans which involve also the local and regional levels to include all the relevant populations. However, since the issues of equity, as defined in the CBD, imply the contractual and monetary aspects, in Madagascar there are still many problems in the creation of contracts and compensatory practices. For example, the negotiations regarding medicinal plants involves different cultural, juridical, political, commercial and industrial property systems which imply the need to develop new instruments and processes to negotiate their sustainable use. The terms of bioprospecting on local medicinal systems have yet to be developed in Madagascar, but these must occur simultaneously with transformations of national and international legislation dealing with equity in intellectual property regimes.

Discussion

Marshall Murphree summarized some of the key issues raised in this Session, such as topics of equity, sustainable use of bio-cultural resources, analyses of the CBD, indigenous knowledge systems and sciences, stakeholder involvement, and local and global dynamics. He noted the importance of intercultural and interdisciplinary meetings such as these, highlighting the prominence of new topics being discussed in the Interactive Sessions which may develop innovative agendas, such as the Democratization of Science to enhance sustainable resource use and conservation world-wide.

Conclusions and recommendations

IUCN should use its Marine Programme and Commissions to promote conservation and sustainable use of living marine resources. In doing this it is not enough to focus on the impact at a species level. The effect on the ecosystem has to be taken into account. However, the ecosystem effects of fishing are not very well understood and research in this area should be given high priority. IUCN should recognise that there is no general answer to the by-catch issue and it is vital to include all stakeholders at all levels in finding solutions and implementing them.

IUCN, and SUI in particular, should compile lessons learned from using the concept of “ecosystem”.

Among the stakeholders and parties involved in CBD decision-making processes, the indigenous and local communities must be considered along with other representatives.

The presence and impact of indigenous and Western scientists must be enhanced to promote sustainable resource use globally.

Access and benefit-sharing processes must be redefined in the CBD to involve these beyond criteria of economic valuation or economic efficiency.

The relationship between biodiversity use and conservation, and political and policy considerations should be studied carefully when considering the overall objective of sustainable use.

In the CBD, certain concepts need to be revised: the concept of equity should be expanded beyond its monetary valuation; the concept of knowledge and science should be expanded to cross-cultural global dimensions; the concept of ethics should be expanded beyond monetary or utilitarian terms; the concept of stakeholder should be extended to include all relevant stakeholders in sustainable use of resources; and the concept of international and national normativity should be coordinated more efficiently when these promote equitable sustainable resource use and sustainable development at the local, regional, national, international and global level.

Considerations of war and conflict in many regions of the world should be made by IUCN and SUI to undertake specific programmes in these areas and to minimize negative impacts of conflicts, relocation of populations, armed actors, and other calamities, upon the bio-cultural bases.

SUI should establish a task force to prepare a Global Charter of Indigenous and Western Sciences for Sustainable Resource Use, geared towards the true democratization of science and technologies for sustainable biodiversity conservation and use.

Given that 94% of the world's formal scientists and technologists are in the developed countries and only 6% are in the developing countries, the value of indigenous and traditional knowledge systems must be redefined in SUI programmes to add new dimensions to the dynamics of the Knowledge Society of this century.

Studies of the relations between religion, science, environment and their relation to knowledge systems and cultural dynamics should be applied to programmes in sustainable use of natural resources given the permanence of these systems in local and global dynamics regarding resource use or conservation.

Indigenous peoples and local communities must participate more fully in the decision-making processes pertaining to their bio-cultural resources and as parties in the COP of the CBD. Their contribution to the rising global cultures must be heeded not only for their holistic and non-dualistic division of nature-society, but for their sciences, humanities, arts, worldviews and cosmologies that assign responsibility to all humans in the short, medium and long term for sustainable use of resources.

ANNEX 1: AGENDA

Ecospaces and a global culture of sustainability

- 09:00–09:10 **Opening**
Eduardo Fernandez
- Welcome**
Prof. Marshall Murphree
- 09:10–09:40 **Overview Paper**
Claude Auroi, Institut universitaire d'études du développement (IUED), Geneva
- 09:40–10:00 **Segment I: Sustainable fishing: is selectivity the answer?**
- Keynote paper
Eskild Kirkegaard, Research Director, Danish Fisheries Institute, member of IUCN/SSC ESUSG Fisheries Working Group
- 10:00–10:15 *Panellists: Takanori Ohashi, Programme Co-ordinator, International Affairs Division, Japan Fisheries Agency; Carlos Mazal, Executive Director, Oldepesca, Peru; John Cooper, Co-ordinator, Seabird Conservation Programme, BirdLife South Africa; Sarah Fowler, Co-Chair, IUCN/SSC Shark Specialist Group, UK*
- 10:15–11:00 **Discussion and summing-up**
Facilitator: Robin Sharp, Chair, IUCN/SSC ESUSG
- 11:00–11:20 **Segment II: Sustainable use and ethics in the context of CBD**
- Keynote Paper
Tariq Banuri, Chair, IUCN CEESP
- Respondent: *Riccardo Simoncini, University of Florence, Co-ordinator, IUCN/SSC ESUSG Agriculture Working Group*
- 11:20–11:35 **Discussion**
Facilitator: Luis Guillermo Baptiste, Chair, IUCN/SSC Andean Sustainable Use Specialist Group
- 11:35–12:00 **Summary morning session**
Claude Auroi
- 12:00–14:00 Lunch
- 14:00–14:20 **Segment III: Who are the CBD stakeholders? Science and traditional knowledge**

	<p>Keynote Paper <i>Joseph Matowanyika, FAO, Zimbabwe</i></p>
14:20–14:40	<p><i>Respondent: Elizabeth Reichel, Universidad Nacional de Colombia, Bogota</i></p>
14:40–15:15	<p>Discussion <i>Facilitator: Ashish Banerjee, Chair, IUCN/SSC South Asia Sustainable Use Specialist Group</i></p>
15:15–15:35	<p>Segment IV: Equity and sustainable use in the CBD. From international aims to national reality</p>
	<p>Keynote Paper <i>Chris van Dam, Universidad de Salta, Argentina</i></p>
15:35–15:55	<p><i>Respondent: Claudine Ramiarison, GEF, Madagascar, Chair, IUCN/SSC West Indian Ocean Sustainable Use Specialist Group</i></p>
15:55–16:15	<p>Discussion <i>Facilitator: Marshall Murphree</i></p>
16:15–16:45	<p>Conclusions and recommendations <i>Claude Auroi</i></p>
16:45–17:00	<p>Closing remarks <i>Marshall Murphree</i></p>
17:30–18:30	<p>Press conference</p>

Interactive Session 6:

Making waves – strategies for averting the world water crisis

Organizers: Jean-Yves Pirot (e-mail: jyp@iucn.org)
Ger Bergkamp (e-mail: gjb@iucn.org)
Elroy Bos (e-mail: elb@iucn.org)

Introduction

Water resources around the world are at crisis levels. Due to their misuse and over-consumption by mankind, these resources – and the freshwater species and natural ecosystems upon which they depend – are being depleted rapidly. In the last century alone, more than 50% of wetland resources in the developed world have disappeared. The 2000 IUCN Red List of Threatened Species signals an extremely serious deterioration of river-dwelling species. For instance, 30% of freshwater fish species are currently threatened and estimates indicate that over 800 other freshwater species are at risk of extinction. A solution seems nowhere near as water abstractions are projected to increase by almost 40% world-wide by 2025. As a result, the development of many societies is threatened, and the benefits that could be gained from the sustainable use of freshwater biodiversity looks even more uncertain than anticipated in the recent past.

The degradation of freshwater biodiversity, and of many terrestrial and coastal ecosystems in general, due to the over-abstraction of water resources, has not been adequately recognised. Yet without these ecosystems, there would be no water resources. Ecosystems require water in order to preserve the intrinsic values that enable them to provide goods and services to humankind. If humanity continues to misuse and destroy water resources and their ecosystems, major social and economic losses will result. Severely degraded rivers, lakes and groundwater reserves will lead to increasingly serious social and political conflicts, especially in times of heightened water scarcity.

This Interactive Session addressed the world water crisis in three separate sittings, addressing policy, technical and programmatic issues. More than 150 participants attended.

The latest on the water front: New policies and guidelines

Chair: Delmar Blasco, Secretary General, Ramsar Convention on Wetlands, Switzerland
Speakers: Bert Diphooorn, Department for International Cooperation – DGIS, the Netherlands
Khalid Mohtadullah, Global Water Partnership, Sweden

Jamie Skinner, World Commission on Dams, South Africa
Nick Davidson, Ramsar Convention Bureau, Switzerland
Ger Bergkamp, IUCN, Switzerland

The gravity of the freshwater crisis has provided the impetus for a number of global and regional efforts, including the World Water Vision and Framework for Action. This Vision was prepared by over 20,000 experts for discussion at the 2nd World Water Forum (The Hague, 17–22 March, 2000). The specific contribution of IUCN to the World Water Vision, the *Vision for Water and Nature*, was produced by the IUCN secretariat in consultation with a large number of experts from IUCN Commissions, members and partners. It has played a prominent role in ensuring integration of environmental considerations into the World Water Vision and, subsequently, the Ministerial Declaration on Water Security in the 21st Century (“The Hague Declaration”) as adopted in March 2000.

The global Vision and ensuing Framework for Action, as developed by the World Water Commission, the Global Water Partnership and IUCN, will provide guidance to many organisations in the development and implementation of a range of new initiatives relating to water resources conservation and management. With these documents on the table, it is now time for IUCN and its members to clarify their involvement in the Framework for Action and other activities that may evolve out of the Vision exercise.

A second important development, critical for freshwater conservation in the coming decades, will be the development and future operation of large dams. A new framework for decision-making, currently under preparation by the World Commission on Dams, will aim at minimizing the adverse effect of large dams on ecosystems and biodiversity (note: the report was launched on 16 November, 2000). The question is how the IUCN membership may implement these guidelines, when and where appropriate.

The following four sets of recommended actions for improved water management and conservation were discussed during the Session: the first, by the Ramsar Convention on Wetlands (adopted at its COP7, San José, May 1999); the second, by the 2nd World Water Forum and Ministerial Conference (The Hague, March 2000); the third, by the World Commission on Dams (forthcoming); and the fourth, consisting of the work programme of the Global Water Partnership (GWP) which aims at implementing the Framework for Action attached to the Global World Water Vision. These recommendations, guidelines and work programme, which generally address the need to apply integrated water resource management (IWRM) within entire river basins, provide the basis for action by IUCN members in the years to come. Finally, the IUCN Water and Nature Initiative, which builds on all policy discussions that took place in the past two years, was presented.

Outcome: Moving from policy to action

During this Session we heard of the latest and most important event (the 2nd World Water Forum) in relation to finding solutions to avert the world water crisis. Participants were briefed on the process for producing and adopting the World Water Vision in The Hague, and were reminded that during this event, H.M. Queen Noor, Patron of IUCN, presented the Vision for Water and Nature as prepared by IUCN.

The key outcomes of the 2nd World Water Forum were:

- heated discussions about the privatization of water resources and the respective role of the private sector and governments in water allocations;
- a large discrepancy between the visions proposed by the authors of the Vision of Water for Food and Rural Development and those responsible for the Vision for Water and Nature; and
- the urgent need to move from Vision to action at the regional and local levels, supported by the Global Water Partnership, the donor community, IUCN and many of its members.

We heard that the Global Water Partnership, represented by its Executive Secretary, will focus on the implementation of Integrated Water Resources Management at the regional level, in cooperation with governments, the private sector and all stakeholders. Special emphasis will be on good governance, working out practical principles for Integrated Water Resources Management (IWRM), identifying needs and setting up demonstration activities in support of IWRM, and building alliances among all stakeholders.

In 1997, in an attempt to implement several IUCN resolutions addressing the environmental and social costs of infrastructure development, IUCN and the World Bank facilitated the creation of the World Commission on Dams. This is a concrete example of how stakeholders (government, affected people, private sector and donors) can interact to develop new public policies for dam planning, development, and management. Based on ten detailed case studies, a survey of 125 dams in 56 countries, 17 thematic reviews from 125 authors in 34 countries, and four regional meetings with 1,500 experts, the Commission is preparing its report for launching mid-November by former President of South Africa, Nelson Mandela. It establishes criteria and guidelines that will lead to development outcomes that are economically viable and socially as well as environmentally acceptable.

This also holds true for the Resolution (VII.18) and Guidelines for integrating wetland conservation and wise use into river basin management, and for Resolution VII.19 on international cooperation, adopted in 1999 by the Parties to the Convention on Wetlands (Ramsar, 1971). Under the CBD and Ramsar Joint Work Plan, these documents provide the framework under which Parties to both conventions will implement a River Basin Initiative on integrating wetlands, biological diversity and river basin management. This Initiative seeks to establish a knowledge-sharing network to exchange experiences and good practices on integrated river basin management, through about 30 case studies in 20 countries during the initial project phase.

Finally, the IUCN Water and Nature Initiative was launched. This Initiative is a five-year programme of 28 projects with a budget of approximately US\$ 39 million, in about forty countries in the poorest areas of Latin America, Africa and Asia. It builds upon the *Water and Nature – Vision and Framework for Action*, which was discussed and approved at the 2nd World Water Forum. The IUCN Initiative will involve IUCN members and partners, to bring together the experience needed to find practical solutions to uncoordinated and, therefore, unsustainable use of water resources. Since water resources form the very basis of human life on earth, the Initiative will also demonstrate the clear linkage that exists between improved ecosystem management, sustainable development and poverty alleviation. Immediately after the Session, a press conference to launch the IUCN Water and Nature Initiative was convened, during which the Netherlands Government expressed an interest in becoming a leading partner.

One hot issue to debate: How much water do our wetlands need?

Chair: Sir Martin Holdgate, former Director General of IUCN (1987-1993)
Speakers: Grethel Aguilar, Commission on Environmental Law, Costa Rica
Honourable Minister Jacob Nkate, Ministry of Land and Housing, Botswana
Mike Acreman, Centre for Ecology and Hydrology, UK
Jorge Jimenez, Commission on Ecosystem Management, Costa Rica
Geoffrey Howard, IUCN EARO, Kenya

Underlying many of the discussions on policy and practice is the important issue of the water requirements of freshwater ecosystems. The requirements of rivers are defined by the necessity to maintain their essential functions, and the goods and services they provide to societies, as well as their non-utilitarian qualities. There is a need for clear procedures to describe how appropriate allocations can be made to maintain environmental flows. Although much scientific information on river flows still needs to be collected, the definition of these water requirements can only be resolved with full participation of scientists and all concerned users within each river basin. Both the methods for assessing environmental flows, and the political and social issues involved in deciding on water allocations, were discussed during this Session.

Outcome: Bringing together science, government and civil society to meet the challenge

Session 2 addressed a critical issue: how much water has to be allocated to rivers and associated wetland habitats to maintain their essential functions and the goods and services they provide to human societies? A keynote presentation was made by Mike Acreman in which he stressed that a number of methods are available for setting river flows to meet environmental, recreational and energy needs, from those used by engineers to those that bring together social, economic and ecological aspects. While sophisticated methods are available to determine the relationship between river flow and habitat characteristics, the range of results obtained with various methodologies cannot answer the critical questions conclusively. There is no universal “silver bullet technique”, as key political, social and economic choices remain to be made, which require further tools for decision-making and the involvement of all stakeholders. Inevitably, it will fall on decision-makers and civil society to decide how much ecological change they are prepared to accept in a given freshwater ecosystem.

Honourable Minister Nkate presented a case study of the largest freshwater wetland in Africa, the Okavango delta in Botswana, which is also the largest designated site (68,640km²) on the Ramsar List of Wetlands of International Importance. We heard about the threats, ranging from the competing interests of agriculture, tourism, nature conservation, the resettlement issue in post-war Angola, unplanned abstractions, pollution, to land degradation, both *in situ* and in the entire basin. Clearly, there is a need for a management plan that would cover the entire Okavango basin and guarantee the Okavango delta a proper allocation of water for the future.

Key to achieving this are:

- the collection and analysis of data on the hydrology and the exploitation of the delta by the communities and other water and resource users;

- an effective OKACOM (the Okavango River Basin Commission), which brings together states in the wider basin, to ensure cooperation on shared resources and conflict resolution, using new or adapted legislation and agreements;
- a dialogue with users through a structured process, to discuss issues of common interest in relation to e.g. present and future water use and management, clarification of rules for resource utilisation, ecosystems *versus* human needs, and to interact with interdisciplinary teams of experts; and
- political will and support from outside partners (like scientific institutions, donor agencies, etc.) to implement the future management plan for the delta, working under the umbrella of the National Wetlands Policy undertaken as part of Botswana's commitment to implement the Convention on Wetlands.

Developing IUCN's freshwater work with your help

Chair: Khalid Mohtadullah, Executive Secretary, Global Water Partnership, Sweden
 Speakers: Marlou Tomkinson Church, The Nature Conservancy, USA
 Elena Lombardo, Fundación Natura, Panama
 Elias Salameh, University of Jordan
 Juan Héctor Díaz, Panama Canal Authority, Panama
 Jamie Skinner, World Commission on Dams, South Africa

The implementation of integrated water resources management and conservation is a key aspect of IUCN's work on freshwater ecosystems. At the regional level (e.g. Meso-America, South East Asia, the Mediterranean), a number of new IUCN initiatives are being formulated to support the implementation of sustainable water management practices. These will build on the local experiences of IUCN members and partners in the field of sustainable management of land and water resources. Documenting and supporting the development of the new IUCN Water and Nature Initiative will also be an important part of IUCN's work in the future. Session 6 specifically examined the Middle East and a case study from Panama to highlight issues of greatest relevance to the new IUCN Quadrennial Programme on wetlands and water resources.

Outcome: Ensuring environmental, economic and social security

The Session started with a discussion of water resources management in the Middle East. Professor Salameh of the University of Jordan discussed the scarcity of water resources in the region and the competing uses due to urbanization and upgraded living standards, immigration, industrial development, and expanding irrigation. Severe competition is increasingly leading to shortages and conflicts as river flows decline and the remaining water becomes polluted. The decline in water quality, due to pollution and salinization, will soon become a greater problem than the limited quantity. However, this issue may provide an avenue for integrating environmental aspects into centralized water management agencies.

In the panel discussion, several references were made to water losses (which can reach 50%) due to leaking pipes and bad maintenance of municipal delivery systems, which means that too often new dams and reservoirs are built at higher cost than simply fixing the existing water delivery

networks. The need for integrated river and drainage basin management in the Middle East and the wider Mediterranean was stressed. This approach is needed to move beyond decades of misuse of freshwater ecosystems, through favouring non-infrastructural solutions and placing more emphasis on the sustainability of water development programmes.

Important guidance coming out of the Session includes:

- water projects of all kinds should be based on sound economic and environmental assessments, including transboundary impact assessments;
- national and regional policies should strive for a fair allocation of water between countries through a dialogue involving relevant countries and, if necessary, international institutions as mediators;
- planning through the development of modern master plans that address both surface and ground-water resources should be improved;
- legislation and control of pollution through various mechanisms should be upgraded, meaning that regulations issued at the central level should be improved through local participation and public involvement;
- data gathering should be improved and its results made available to all stakeholders; however, serious progress will only be made through effective regional cooperation, despite political issues arising from sharing the scarce water resource among competing nations.

The final part of the Session was devoted to a discussion on the development programme of the Panama Canal Authority (PCA – recently transferred from the USA to Panama). The Panama Canal is the backbone of the economy of this country. The Director of PCA provided an overview of the issues involved and the collaborative effort of government agencies, NGOs and civil society to openly address these. Greater volumes of water are needed for shipping, supplying potable water, and addressing El Niño droughts. Options to increase the amount of water available for the transfer of ships from the Atlantic to the Pacific, and vice versa, have been developed: dredging the channel, saving water and developing reservoirs and new sluices with “synchrolifts” are examples of the options under discussion. A presentation by Fundación Natura indicated that the proposed developments of infrastructure will overlap with the Meso-american Biological Corridor, which harbours a wide range of diverse land forms, ecosystems and communities that are very sensitive to development pressure.

To address these issues, PCA aims at establishing a sustainable development strategy for the conservation of the Panama Canal watershed and the wider area currently under its jurisdiction. It is committed to cooperate with all stakeholders, including the broadest range of conservation-minded institutions, to agree on adequate development and conservation options. To this end, it will develop a major poverty alleviation programme backed by conservation activities, financed through the Ecological Trust Fund of Fundación Natura, which currently amounts to US\$30 million.

The panel and the audience reacted by debating how to engage stakeholders in catchment management. Key points emerging from this discussion included:

- good governance calls for transparency and removing mistrust which starts with discussions on subjects of common interest;

- effective participation means producing legislation that supports the establishment and functioning of institutions, such as foundations, specially devoted to providing a framework for dialogue between users;
- effective partnership means having sufficient information, based on the results of long-term scientific research, which is relayed to the communities through education and communication campaigns; and
- positive examples in river basin management should be disseminated to river basin authorities around the world, to form a compendium of principles, tools and practice for integrated catchment management.

To sum up, Session 6 exemplified the fact that the sustainable and equitable use of water resources provides the basis, at local, national and regional levels, for environmental, social and economic security. As so eloquently expressed by Her Majesty Queen Noor during the Opening Ceremony, “a security that is essential for bringing and maintaining peace”.

Recommendations

In response to the most recent policy events and calls for action, participants in the Interactive Session recommended that the IUCN secretariat in close collaboration with IUCN members and IUCN Commissions:

- actively engages in a dialogue with other Vision proponents, particularly those of the Vision of Water for Food and Rural Development;
- forcefully moves from policy to action, especially (but not exclusively) with the Global Water Partnership, which has already produced a revised Framework for Action incorporating the results of the 2nd World Water Forum. Cooperation with the GWP should take place primarily at the regional level, through the Technical Advisory Committees (TACs) responsible for bringing about a change in the way IWRM is implemented; (note: IUCN is already actively involved in the TACs for Southern African and Central America, and cooperation is being sought with the Mediterranean and South and Southeast Asia TACs);
- disseminates and assists in the deliberations on and, where appropriate, implementation of the guidelines of the World Commission on Dams, including the participation in the WCD Forum – a stakeholder forum that will discuss further actions regarding the outcome of WCD’s work in February 2001;
- supports implementation of the guidelines on river basin management as adopted by the Convention on Wetlands, under the Joint Ramsar/CBD Work Plan, and seeks ways to assist the further development of the River Basin Initiative approved by CBD COP5 in May 2000; and, above all,
- further develops and implements the IUCN Water and Nature Initiative at the regional, national and local levels in cooperation with IUCN members, IUCN Commissions, relevant environmental counterparts, and partners with a keen interest in water resources management.

In relation to integrated water resources management, and as guidance for the IUCN programme, participants agreed that:

- in the end, allocation of water to ecosystems and to people is a social and economic issue and thus becomes, primarily, a political choice;
- the need to develop technical methods for water allocation, with results that are more directly applicable by decision-makers, will remain. In turn, this implies that IUCN should support institutions (especially those from developing countries) that are responsible for collecting data and delivering analysis on water flows and environmental flow requirements. Clearly, data gathering and improved information dissemination emerged as an essential prerequisite for good governance and effective participation in water resources and river basin management;
- the enforcement of existing legislation or the development of new, “user-friendly” laws and agreements, whether national or international, is equally important to maintain water flows in freshwater ecosystems. Moreover, effective legislation for integrated water resources management should support the establishment and operation of institutions responsible for management decisions at the river basin level;
- support to river basin institutions should be strengthened, to ensure that these foster cooperation and conflict resolution in environmentally-sound basin management, through clear processes and effective dialogue on issues of common interest to all users; and
- to reach consensus on water development and conservation issues, dialogue among users should be the rule rather than the exception. Agreements and decisions approved with the participation of stakeholders should be relayed to the wider public through education and communication programmes.

Overall, the Interactive Session dealt with strategies to avert the world water crisis and provided many substantial recommendations to guide implementation of the IUCN Wetlands and Water Resources Programme in 2001–2004. At the policy and broader technical level, IUCN will facilitate implementation of integrated water resources management, through generating, documenting and disseminating principles and tools. In turn, this will require that IUCN develops a larger series of wetlands and water resources projects to demonstrate improved practices, whether this is in relation to gathering information on ecosystem functioning and requirements, to stakeholder participation as a means of strengthening governance and responsible decision-making, restoration techniques of degraded freshwater ecosystems, to exchanging “lessons learned” among users and river basin organisations, or disseminating information to communities. Important guidance will be derived from the implementation of the IUCN Water and Nature Initiative, which includes IUCN’s most prominent global and regional partners in the field of water resources management.

ANNEX 1: AGENDA

Making waves – strategies for averting the world water crisis

Session 1: The latest on the water front

Chairperson: Delmar Blasco, Secretary General, Ramsar Convention Bureau

Rapporteur: Chris Morry, IUCN, Canada

09:00–09:05 **Opening of the session**

Delmar Blasco

09:05–09:50 **Presentations**

The 2nd World Water Forum (March 2000, The Hague): recommendations and future course of action

Bert Diphooorn, Ministry of Development Co-operation, The Netherlands

Averting the water crisis: from the Framework for Action to implementation on the ground

Khalid Mohtadullah, Executive Secretary of the Global Water Partnership

Guidelines for dams: strategy for dissemination and implementation

Jamie Skinner, World Commission on Dams, South Africa

From wetlands to river basin management: Ramsar guidelines on integrated river basin management

Nick Davidson, Ramsar Convention Bureau, Switzerland

IUCN's strategy to address the water crisis

Ger Bergkamp, IUCN, Switzerland

09:50–10:00 **Questions and answers**

10:00–10:15 Coffee/tea break

Session 2: How much water do our wetlands and rivers need?

Chairperson: Sir Martin Holdgate, former Director General of IUCN, UK

Rapporteurs: Rocio Cordoba, IUCN, Mesoamerica; Ruud Jansen, IUCN, Botswana

10:15–10:20 **Opening of the session**

Sir Martin Holdgate

10:20–10:40 **Presentations**

Maintaining and restoring river flows: current knowledge and future challenges

Mike Acreman, Centre for Ecology and Hydrology, UK

Challenges and issues in the Okavango Delta
H.E. Min. Jacob Nkate, Minister of Land and Housing, Botswana

- 10:40–12:00 **Panel discussion**
H.E. Min. Jacob Nkate, Ministry of Land and Housing, Botswana; Mike Acreman, CEH, UK; Geoffrey Howard, IUCN, EARO; Grethel Aguilar, IUCN Commission on Environmental Law; Jorge Jimenez, IUCN Commission on Ecosystem Management
- 12:00–14:00 Lunch break
- Session 3: Developing IUCN’s freshwater work with your help**
Chairperson: Khalid Mohtadullah, Executive Secretary, GWP
Rapporteur: Hans Friederich, IUCN Asia Regional Office
- 14:00–14:10 **Opening of the session**
Khalid Mohtadullah
- 14:10–14:30 **Water issues in the Middle East**
Prof. Elias Salameh, University of Jordan
- 14:30–15:15 **Panel discussion**
Jamie Skinner, WCD; Marlou Tomkinson Church, TNC; Elias Salameh, University of Jordan; Juan Héctor Díaz, PCA; Elena Lombarda, Fundación Natura
- 15:15–15:30 Coffee/tea break
- 15:30–15:50 **Sustainable management for the Panama Canal catchment**
Juan Héctor Díaz, Panama Canal Authority and Elena Lombarda, Fundación Natura, Panama
- 15:50–16:50 **Panel discussion**
- 16:50–17:00 **Closing session: a brief presentation of the workshop results and recommendations for the IUCN Programme**
Jean-Yves Pirot, IUCN Wetlands and Water Resources Programme

Interactive Session 7:

Mobilizing knowledge for biodiversity

Organizer: Wendy Goldstein (e-mail: wjg@iucn.org)

Introduction

This session addressed the issue of how IUCN can become more effective in getting the right knowledge to the right people at the right time. Knowledge plays a key role in IUCN's core competence and as a service to its members and Commissions. IUCN is able to draw conservation knowledge from its vast networks, process it and make use of its networks in dissemination.

The IUCN Programme features "Knowledge" as part of its strategy for all the Key Result Areas involving generating, processing and disseminating knowledge. This process is fundamental to IUCN's other strategic lines which are "empowering" society and influencing "governance" so that individuals, systems and institutions support conservation. In addition, the IUCN Programme has a Key Result Area in "Information and Communication Systems" to build an infrastructure to support the gathering, processing, storing and dissemination of knowledge: knowledge management.

Knowledge is fundamental to how IUCN works as a body of conservation organizations. Being even more effective is imperative as species threatened with extinction grow more numerous and ecosystems are degraded so that services to species, people and their economies decline.

In a world where some have too much information, akin to drinking from a fire hose, and in fact a lack of timely and relevant access, others are at risk of being increasingly disadvantaged by poor access to know-how. We also need to consider what is the content of knowledge to be shared or managed. That content has two aspects: the "what" of conservation; and the "how" of conservation.

The Session

The meeting played on the fact that it was held in a basketball stadium, at the Sports City in Amman, and followed the Sydney Olympics. We took the idea of "the basketball dream team" and started our meeting with the presenters running on with a basketball. It was suggested that we want an IUCN dream team in knowledge management to fight the loss of biodiversity and loss of economic and social values of communities dependent on local resources. The ball, knowledge, has to be passed quickly and accurately to score our goals. The better the team works together, the more we will score. The session explored:

- the context for knowledge management and the recommendations of the IUCN external review on knowledge management; and the challenge to manage IUCN's diversity for maximum benefit;
- what is being done in knowledge management by four of the IUCN Commissions to organize species and environmental law information; to provide a knowledge service to protected areas staff; and lessons learned in knowledge management in the Commission on Education and Communication;
- heard examples of how IUCN members and partners are managing knowledge for their constituencies;
- learned about trends in corporations and businesses in managing knowledge for their clients and in being competitive;
- discussed what type of organizations we had to become and what type of competencies were required to meet the challenges of the modern world;
- proposed a model for an organizing framework – a virtual university;
- discussed in groups some of the key issues that had emerged, the model and what steps could be undertaken by IUCN in the Programme. A video report of the session was prepared for a report back to the Congress.

IUCN and knowledge management: the background

Bart Romijn, IUCN external review team, presented an inspiring vision for our work – IUCN the 21st Century first Olympic Champion on Knowledge and Learning! Imagine IUCN:

- as an open, evaluative, reflective but action-directed organization;
- as an organization which rewards experimenting, action-based learning and sharing;
- mastering the application of new media for mobilization of knowledge and leverage;
- website has been re-designed to become renowned as the world's foremost interactive hub on conservation;
- has become an attractive partner for the media and for the private sector because of its ability to generate and disseminate high quality knowledge.

Then a just world that values and conserves nature might become within reach.

IUCN principally is a knowledge organization. Knowledge is its most valuable capital. This knowledge is diverse and dispersed. The member organizations, the Commissions, the Secretariat, and their respective networks, are huge knowledge sinks, and sources.

IUCN'S knowledge management examples

Javier Beltrán presented the initiative of the IUCN World Commission on Protected Areas and the UNEP–World Conservation Monitoring Centre programme to develop networks of Protected Areas Resource Centres (PARC). The objectives of PARC are to support protected area managers worldwide through the development of an integrated programme that:

- improves availability of information resources;
- delivers information services;
- increases networking between protected area professionals; and
- provides access to opportunities for training in information management and use.

Full and equitable access to information resources, services and tools is a major factor limiting the effectiveness of protected area managers worldwide. PARC is a strategic programme to provide needed information to protected areas policy-makers and decision-makers on the ground. The system will be set up to support collaborative exchange of information within the protected areas community and the larger sustainable development community.

Protected Areas are the core of any effective strategy to sustain the health of the planet and to maintain its landscapes and biological diversity. Since the World Parks Congress in Caracas in 1992, increased attention in the international community has been focused on the information factor within the overall equation for protected area management. Building on resources and services that are already in place, PARC seeks to develop a comprehensive system for optimizing the existing, and for the provision of new, information resources and services together with support for networking and requisite training.

Koh Kheng Lian, Director of Asia Pacific Centre for Environmental Law (APCEL) and IUCN Commission on Environmental Law (CEL) Vice-Chair for Eastern Asia, shared the experience of APCEL on gathering, processing, storing and disseminating information for environmental law. The Centre was established in February 1996 by the Faculty of Law of the University of Singapore on the initiative of IUCN CEL and in collaboration with UNEP. The objectives include:

- serving as a regional training centre for the teaching of environmental law;
- serving as a regional centre for research; including multi-disciplinary research on international, regional and national environmental law and policy;
- establishing and developing a collection of materials on environmental law and policy and maintaining an electronic database;
- promoting the exchange of information on international, regional and national law and policy;
- publishing studies, reports and course materials on international, regional and national law and policy.

With support from IUCN, UNEP and APCEL have established a database for environmental law comprising international and regional instruments, and national legislation from the ASEAN member states in the region. This is available on the Internet as well as in the Law Library, National University of Singapore. The database also serves as a regional centre for IUCN Environmental Law Information System (ELIS), as well as a resource centre for UNEP's NETTLAP programmes. It can be accessed at <http://sunsite.nus.sg/apcel>

Nattley Williams from the IUCN Environmental Law Centre in Bonn described briefly about the IUCN Environmental Law Programme's initiative to provide users with comprehensive, authoritative and up-to-date information on environmental law. This information service, or ECOLEX, is a joint project developed through partnership by IUCN and UNEP, with the support of the Government of the Netherlands.

Through this user-friendly service, users can search and retrieve information on which conventions a country such as Jordan is a party to, including the dates of signature or ratification. They can also obtain national legislation concerning protected areas for Jordan or, for example, Tanzania. Bibliographic as well as full text of these documents, where possible, will be made available. This service will be available in all the IUCN languages.

Phase I of the project is almost complete. In Phase II of the project it is aimed to expand the partnership to include institutions such as the Food and Agriculture Organization, which maintains an excellent collection of legal instruments on environmental law, Secretariats of environmental agreements, as well as regional institutions with information on environmental law. To view the prototype, visit the web site at <http://www.ECOLEX.ORG>

Andrew Smith reported on the Species Information System (SIS), Species Survival Commission's emerging data management initiative to support sound environmental decision-making through efficient collection, management, exchange and promotion of high quality species data and information. He highlighted the pressing need for current information on species and the six years of work to develop the system so far, largely through volunteer input. The SSC, representing the world's most complete source of scientific and management expertise on species with 7,000 plus volunteer members in 120 specialist groups is ideally structured to contribute data through an inter-linked database.

He referred to the role of SIS as a provider of information to the Biodiversity Conservation Information System (BCIS). This Consortium has developed protocols for a system for sharing information among some of the major conservation organizations. The Consortium is a joint venture between BirdLife International, Botanic Gardens Conservation International, Conservation International, International Species Information System, IUCN (CEM, Environmental Law Programme, SSC, WCPA), The Nature Conservancy, TRAFFIC, UNEP-WCMC and Wetlands International.

Frits Hesselink, the Chair of CEC, reflected on the ways that CEC has managed knowledge about education and communication and presented three lessons learned in CEC. Lesson 1 was how to improve on content that is relevant and how it could be collected, processed and transferred. Lesson 2 is about managing the knowledge so it is delivered to people when they need it. Lesson 3 was about using the user to develop the knowledge instruments and systems.

CEC views managing knowledge as an instrument to realize its mandate so that relevant knowledge can flow between the right actors. Among its means to share knowledge on education and communication CEC uses training programmes, workshops, the Internet, website and publications. CEC pulls knowledge from its networks, processes that information at the global level, and then disseminates the results through the CEC and IUCN member networks.

CEC was part of an internet "debate" to help define the thinking on the evolution of environmental education towards sustainable development education – a challenge proposed in Agenda 21, Chapter 36. This debate provided useful lessons to be shared with other parts of the Union, and those lessons are captured in the first chapter of the book summarizing the main ideas of the debate. To make the full range of inputs to the debate available to those without internet access, a CD-ROM has been developed to accompany the book.

Knowledge management among IUCN members

Adel Farid Abdel-Kader from the Egypt-based international organization, CEDARE, reported on its work as an enabling agent in support of sustainable development initiatives at national and regional levels, to stimulate the implementation of international agreements and conventions in the region. CEDARE develops environmental information systems to generate knowledge, provide analysis, assessment and information in forms suitable for varying uses in society, such as decision-making, policy analysis, and use by stakeholders. CEDARE also contributes to capacity building activities in the region.

With increasing use of participatory approaches by public and local communities in environmental management and decision-making, public access to environmental information for sustainable development has become a main instrument for informing them and making them aware of possible solutions. The information and communication technologies provide opportunities for individuals and institutions to communicate directly, without bureaucracy, to exchange and share information.

In addition, knowledge networks maximize the rate of knowledge generation from different sources, reduce barriers between sectors and are most suited to the multi-disciplinary approaches of sustainable development. However it is essential to manage information in a network of closely cooperating institutions as well as between the various divisions of a single organization. This requires an institutional framework, which defines a clear structure and coordination mechanism.

Wendy Van Asselt told how the World Resources Report of the World Resources Institute (WRI) has undergone a major transformation in the past two years to make its information more accessible and relevant to different sectors of society, and increase its potential to be disseminated and its information used. One aspect of this communication strategy is to take advantage of information technology and the world wide web.

The World Resources Report explores the interface between development and environment. The Report is produced by the World Resources Institute and UNDP, UNEP and the World Bank and was traditionally text-based, academic and without many graphics. Intended for policy makers, it used to reach a limited audience, being presented as only one type of book, which was put onto a CD-ROM, and the website. A Teachers' Guide was developed to assist teachers to use the Report. Now, with the use of an executive report and graphic representation it attracts media interest and free publicity.

Jason Switzer from the International Institute for Sustainable Development (IISD) shared lessons learned from the organization's four years of research and experience in managing Sustainable Development Knowledge Networks, a model for institutional collaboration which harnesses information and communication technologies to influence sustainable development-related policy-making.

In 1996 IISD established Spinning the Web, a prototype knowledge management and networking experiment. In 1997, together with IDRC and the North South Institute, IISD sponsored the Task Force Report on Canada's International Priorities for the 21st Century. This task force identified knowledge brokering as a key action area; and recommended that efforts should be made to more effectively utilize information and communications technologies (ICTs) to support this priority.

IISD's definition for a Knowledge Network is:

A group of expert institutions working together on a common concern, to strengthen each other's research and communications capacities, share knowledge bases and develop solutions for use beyond the members of the network.

Four key points are captured in this definition:

1. Knowledge Networks require institutional commitment, beyond the participation of individuals and experts (this factor distinguishes knowledge networks from professional associations, advocacy campaigns, etc.). They need structure and discipline to be effective.
2. Institutional collaboration takes place around a single issue or problem rather than a broad spectrum of interests: **Focus and work plans are essential.**
3. Strengthening capacity is critical to this model. IISD create Knowledge Networks in order to learn from each other and build on each other's strengths – so communication and evaluation are critical elements.
4. Knowledge Networks must move beyond basic information exchange to actually working together on solutions. Involving youth is a success factor.

In other words a Knowledge Network is more work than a net.

Tony Whitten, World Bank Senior Biodiversity Specialist, reported on the issues in making biodiversity knowledge available in the World Bank and about what it takes to get an institution to take on knowledge management.

Five years ago consultants came to the Bank with new vocabularies and jargon about knowledge management. The staff was self-sufficient, very busy on project management and had a focused community of practice. There was little interest or support for these new ideas. Information technology lagged behind the rhetoric and use of the web was minimal. Incentives were set up such as money for staff time, but people had other priorities and knowledge management meant nothing to the staff. Senior management insisted on the importance of knowledge management and slowly the walls were broken down, especially when contributions to knowledge sharing became part of personal evaluation.

An internal website on biodiversity never took off because many of the functions were taken over by email and information contained in it could be found easier elsewhere. The external web site works fairly well. People write up best practice pieces for posting on the web. Workspaces are created for limited audiences like those working on a project and you need a password to access the discussion. Help desks have not proved very useful.

Now five years on we have the concept of the knowledge bank. More collegiality has developed. People have even more piles of paper on their desks, and are even busier. There are focused communities of practice, loose networks of people who share knowledge. These are used to find who does what. Knowledge spreads with a speed not believed five years ago, we respond better to the client,

and external users are asking questions. Though there is more use of the web there is still reluctance to its use. The Intranet biodiversity site has been abandoned. There is no formal mission statement, no specific work objectives on knowledge management.

For knowledge management money is not the issue, it is about cultural change and getting people on board. The cultural resistance is slowly changing as it has proved that the tools are useful. Now the knowledge management/knowledge sharing/learning boundaries are getting fuzzier, there is more “letting it happen” and loose control. It is not forced on people as force did not work. There is more clarity and differentiation between knowledge and information. The Bank is enabling knowledge transfer across large distances in a very short time and new tools are being used without people being aware. It is starting to make sense and win approval. However, don’t forget the power of a pizza lunch to get people together to share knowledge.

Peter Croal, from the Canadian International Development Agency (CIDA), pointed out that knowledge management is about getting the right information to the right people at the right time – as now it is like trying to drink from a fire hose. He emphasised that the most important thing is to get knowledge to decision-makers to help them make decisions and reminded the group that half the world still has no access to telephone and 70% of the world’s poor are women.

Peter Croal pointed out that we have to address the digital knowledge divide. CIDA has an objective to be a knowledge-based learning organisation. He pointed out people’s preferred means of learning in CIDA in order as:

1. workshops, courses, training
2. talking to specialists or a resource person
3. manuals/short documents
4. colleagues
5. intranet
6. internet

One lesson learnt – ensure senior management commitment to all approaches concerning knowledge and information management. The culture of the organisation must be well understood, as well as what motivates people.

Gordon Shepherd of WWF International explained how WWF had set up a College to develop conservation leadership for senior staff and partners. The College is a learning network rather than an institute with classrooms delivering regular standardized training modules. It is based on an Internet interactive learning environment to meet the needs of a decentralized organization.

The WWF College uses the different perspectives coming from a variety of disciplines amongst WWF staff and partners from around the world to add value to the course and to its content. The course uses a number of means for learning to take place:

- at the computer;
- face to face and long distance using video conferencing;

- learning on the job;
- sharing experiences with peers;
- providing dynamic content as it is continuously renewed and added to with the input of the participants.

Rather than taking a top-down expert approach with static designed content, the course has a more demand-based approach. It works by setting up learning communities with peers and mentors. Participants are responsible for setting their own learning goals against a competence chart and taking responsibility for their learning. Participants generate knowledge which becomes incorporated into the next course.

Knowledge management examples from the corporate sector

Lara van Druten presented some examples of the trends in the business world and the ways some companies are responding. In what she called the changing DNA of the business world – or trends that are driving the way businesses are operating – she pointed to the pressures from a new intensity in knowledge, where the life of professional knowledge is five years. After that, knowledge needs to be refreshed. In such an intense situation it is your ability that is more valuable than what you know now. The importance of managing knowledge has put pressure on the structure of organizations. Dialogues are no longer appropriate, rather multi-logues are sought with people with different backgrounds and skills. Interaction in multi-disciplinary teams is essential to give synergy, as the nature of problems is so complex. Now consideration is for talent. In order to achieve this we need new organizational structures, that break out of the old structures and create more flexibility. There is more distribution of power as links and nodes are built.

The Vision Web is one company made up of 6 independent companies and multitudinous cross-cutting micro-business projects. Here old ideas of organizations have been tossed out the window, in favour of an organizational form for entrepreneurs. Within the company talent is central, not structure. The company works by sharing in multidisciplinary teams. Performance within that team is not only on achievement but also about what doesn't work. There are rewards for trying something new, so that encourages people to try it.

An alternative organizational form for entrepreneurship is achieved by:

- continuous change in a context of synergy, embedding innovation and dynamism into the organization;
- an organizational philosophy of cultural diversity;
- a grand café plus 20 computers for 270 people;
- knowledge infrastructure facilitating knowledge sharing, knowledge creating, and organizational transparency;
- virtual communities between employees and customers;
- participation (profit shared between each micro-business project).

Skandia Insurance Company has a concept of intellectual capital: make your competitive advantage clear by mapping out what your company, not just its employees, knows. Skandia mapped out

its Financial Capital including physical and monetary capital and also its Intellectual capital, in terms of human competence, agility and attitude and its Structural Capital (relationships with clients, organization, and the ability to renew and create value) in the future. Skandia came up with the idea that if you worked out a long-term strategy, you could see what your organization could or could not do. If you had more measurable elements you could brand it. Organizations are trying to develop corporate universities to develop their human capital. Once there were six corporate universities, now there are 450 international corporate universities.

Lara van Druten asked: How do you go about creating new knowledge if the shelf life of professional knowledge is only five years? Key issues for **ING Business School** in accelerating the speed of professional knowledge:

- Establishing connections between target audiences
 - shaping conditions for informal networking
 - developing up-and-coming top talent
 - create personal development paths
- Translating corporate strategy into action learning projects
 - feed the corporation with content
 - stimulate innovative knowledge creation
 - speeding up new business development
- Moderating virtual communities around strategic subjects
- Facilitating self-organizing networks in virtual space
- Optimizing internal and external synergy
- Creating an ING knowledge exchange and creation platform

Conclusions

Knowledge is IUCN's most valuable capital. Mobilizing knowledge in time to the right people and in the right form is pivotal for maintaining IUCN's position as the world's leading conservation knowledge organization. The member organizations, the Commissions, the Secretariat, and their respective networks are huge generators of knowledge as well as means to disseminate knowledge. IUCN as a network manager has the capability to pull and deliver up-to-date knowledge on different issues.

IUCN already has a wide range of knowledge management activities undertaken by the different components of IUCN. Knowledge is gathered, stored and made available in databases on, for example, species. IUCN disseminates knowledge in publications, websites, policy advice and training courses. New knowledge is generated in Internet debates, list servers, workshops and by e-mail dialogue with commission members, or specialist groups.

However IUCN has ample space for improvements and better synergies. Moreover IUCN could become more customer-oriented, providing knowledge services more in tune with what our clients want and need.

IUCN members and partners are addressing the issue of how to manage knowledge to stimulate conservation and sustainability. Lessons from this work emphasize that executive support is

essential to generate a culture of sharing and to change organizational structures in support of knowledge management. Even with management support, care is needed to understand what motivates people, and what means can be used to entice people to want or use certain types of information.

Internet and Intranet are speeding up communication and sharing. This creates a problem in that too much information bombards some who find it difficult to find just what they want. Despite efforts to put information on line, many prefer to pick up a phone or ask someone rather than look on the web. For others, the lack of connectivity impedes access. To overcome this lack of connectivity IISD has provided it to organizations in developing countries as part of its strategy to link them in learning networks. These knowledge networks share research findings and generate policy issues for sustainability and share the findings more broadly through Internet to a broader community.

As evidenced by most of the examples presented in the session, *partnerships* are essential to bring the diverse skills required into play and to disseminate knowledge. The partners must agree to a *focus*, and a *structure* to the work supported by effective *communication*, internally and externally. *Evaluation* should be a part of all activities, to draw out lessons learnt and be used to enhance effectiveness. IISD has found that the inclusion of *youth* with well-defined roles has been a success factor in knowledge networks as young people bring fresh perspectives, energy, enthusiasm and Internet skills.

Market surveys are essential to understanding what is the demand for knowledge and what is the best way to deliver it. Knowledge must be “*packaged*” in ways that is appropriate to the right audience so that they can make informed decisions. Packaging includes speaking the right language to connect to the target person’s perception. If you look at most web sites today, which are planned from a supply side approach, they are difficult to use and to find “what’s in it for me?” Therefore it is preferable to develop the knowledge product with and *by the users*.

What information is presented and how it is presented so as to appeal to different audiences was highlighted by the delivery of the latest *World Resources Report*. By thinking of how to attract attention by different groups, information has been packaged in different ways. As shown in the report from CEDARE, the mass media and politicians have a high need for information to be aggregated and presented in synopsis. So in the case of the World Resources Report, an Executive Summary presented a report card with easy-to-see trends on the state of ecosystems’ ability to deliver services. The graphic and summarized information triggered great interest from the mass media, and busy decision-makers. However to meet the needs of those requiring more detailed and substantial information, the full report is available in print, and backed up with an on-line database with more substantiated levels of information.

The competitiveness of an organization is a function of what it knows, how it uses what it knows and how fast it can know something new. For IUCN, competitiveness is required to overcome social trends to diminish biodiversity, as well as for the organization to continue to be relevant to its members and donors, and to evolve in a fast changing world.

If knowledge is going to flow optimally to those who need it when they need it, then the managers are required to match supply and demand. They have to provide what is useful, actively sense needs, ideas,

trends, coordinate and act as process manager. The more the users of the information are defined, the more you have to identify the partners for that information. Working in this way requires creating a common culture between partners. Therefore competencies have to be developed including skills of treating our target groups as customers and of providing fast services of benefit to our members.

IUCN's many knowledge efforts should be organized within a light structure such as an IUCN virtual campus. The campus would provide a strategy to:

- improve **conservation** through ensuring the organization is at its best through continuous organizational learning;
- provide a means for the **competence** of the organization to be monitored and developed through keeping tabs on the trends outside the organization, and a means to continuously monitor the demands of clients;
- through **collaboration** develop new competencies for governance and operations amongst staff and members and bring in new ideas from outside;
- determine **content** based on the trends, demands and needs for new competence in the campus, generating it by using an intelligent network that draws on expertise both in and outside the IUCN family;
- export knowledge to new networks.

The campus would become THE international hub for networking, learning and sharing around conservation issues where learning and knowledge management are embedded not in a computer but within the organization. The campus could provide for communities of practice, stakeholder dialogues and online courses.

IUCN could develop a light overarching roof for its knowledge management. One idea is to make a meta-map of databases. IUCN could also create conceptual models or promote existing models to help members manage knowledge, so as not to duplicate information. IUCN needs a knowledge management strategy to:

- define the knowledge areas;
- be demand driven;
- develop the content with the user;
- be collaborative and cooperate with other organizations;
- connect with the corporate sector;
- involve youth.

Participants recommended the first steps that IUCN could take:

- CEC might think of establishing a body or a steering group to decide on the feasible actions, based on a quick assessment of what is available. This would not be “supply driven” but “demand driven”.
- The group could consider the architecture of a meta-database; drawing from existing databases and knowledge centres and give it a light roof to reduce duplication and to try to pull the diverse work of IUCN together.

- The group should develop a pilot and feasibility study that starts small in order to prove the concept of knowledge management. To do this the group might link to a regional programme priority, perhaps picking up two priority themes and studying the viability of the content.
- It will be important to find the time and capacity in IUCN, and to establish different bodies who would be responsible to carry out the work. The group will need to make sure that there is a training programme to implement the concept.
- To undertake its work the group will have to identify partners not only from the IUCN membership but also from the private sector.

The full report is in pdf file on: “Mobilizing Knowledge for Biodiversity”
<http://info.iucn.org/iucncec/news> or hard copies available on request.

ANNEX 1: AGENDA

Mobilizing knowledge for biodiversity

Session 1: Orientation and what IUCN does now in managing knowledge for biodiversity conservation

- 09:00–09:05 **Scope of the workshop**
Chair
- 09:05–09:40 **Orientation**
What is the problem? Short summary of IUCN Review, initiatives on knowledge management and learning in the new IUCN Programme; clarify concepts and defining knowledge management and learning for the discussion.
IUCN reviewer: Bart Romijn, AIDEnvironment, Netherlands
- Reactions
- Reviewing what IUCN does now in managing knowledge: what we have, what has been learnt, next steps
- 09:40–09:55 **PARCS information system**
Javier Beltrán, UNEP-WCMC
- 09:55–10:05 **Environmental Law Information and Learning program**
ECOLEX – joint undertaking of UNEP and IUCN to make environmental law information available on the internet and the IUCN Environmental Law Information System-ELIS. Plus the Law Academy and centres of excellence
Nattley Williams, ELC and Professor Koh Kheng Lian
- 10:05–10:15 **The changing approach in mobilizing and managing species knowledge**
Andrew Smith, IUCN SSC
- 10:15–10:25 **CEC experience in mobilizing knowledge – CEC ESD debate – policy – CEC Spanish email list serve: lessons**
Frits Hesselink, Chair, IUCN CEC
- 10:30–10:45 Coffee
- Session 2: Learning from IUCN members and partners, what they are doing and expanding possibilities for using IT?**
- 10:45–11:00 **Knowledge management for the Arabic region**
Adel Farid Abdel-Kader, CEDARE, Egypt
- 11:00–11:15 **The WRI Report**
Wendy van Asselt, WRI

11:15–11:30	Knowledge networking and its potential to change the dynamics of sustainable development – the Sustainable Development Network <i>Jason Switzer, IISD</i>
11:30–11:45	The World Bank – knowledge management and learning <i>Tony Whitten, World Bank</i>
11:45–12:00	Reflections Lessons in knowledge management in donor organization – working with the culture of the organization <i>Peter Croal, CIDA</i>
12:00–14:00	Lunch
14:00–14:15	WWF College – distance learning and new ways of learning to build organizational effectiveness <i>Gordon Shepherd, WWF</i>
	Session 3: Knowledge management and organizational learning: the keys to being effective. What is happening around the world outside the conservation community?
14:15–15:30	Exploration of how other organizations manage knowledge and institutional learning. Knowledge management initiatives in companies and organizations around the world: what is involved, what solutions are being used and using these ideas for a possible integrating approach for IUCN developed by CEC. <i>Lara van Druten, GT</i>
	Questions and discussion
15:30–15:45	Coffee and networking break
	Session 4: Assimilating the ideas and exploring new directions for IUCN work
15:45–16:20	Small group discussions Learning and exchanging ideas on subsets of the issues/interviews
16:20–16:50	Plenary session Ideas and recommendations for IUCN future directions: interviews with respondents
16:50–17:00	Evaluation/conclusions Announcements

Expected Output:

- Shared terminology
- Report
- Recommendations to IUCN Programme – and CEC programme – on taking forward knowledge management in IUCN

Interactive Session 8:

Sowing the seeds for sustainability: agriculture, biodiversity, economy and society

Organizers: Liz Hopkins (e-mail: liz@iucn-ero.nl)
Rachel Wiseman (e-mail: guest2@iucn-ero.nl)

Introduction

Agriculture in relation to biodiversity is a critical issue to address, since agriculture is the largest single human activity impacting on global diversity. Approximately 10% of the earth's surface is used for growing crops. In Europe this figure is over 50% and of the 81 billion dollar EU budget, 47% is allocated to agriculture. Staying in the OECD countries, in 1999 the overall cost of agricultural policies to consumers and tax-payers was \$US 361 billion or 1.4% of GDP (note, however, that NATO countries spent 2.8% of GDP on defence in 1997). Such expenditure on support to agriculture causes losses in earnings from agriculture in other parts of the world. In Latin America, for example, it has been estimated that income losses are \$3.4 billion annually. These mega-figures can be matched by others: FAO has estimated that food security remains unreachable for more than 800 million people around the world.

With the population growing at a rate of 78 million people per year and global concerns about food security in the 21st century, the production of agricultural goods must apparently increase or be more equitably distributed. At the same time, IUCN and its members demand more attention to the conservation of biodiversity within sustainable development, and view agriculture as being both a potentially destructive and a potentially supportive use of land.

The objectives of conserving biodiversity and achieving food security might seem to be contradictory, but are they? Without the maintenance of resources such as the soil in which crops are planted or careful use and conservation of water supplies, or a variety of wild and domestic crop species to guard, inter alia, against disastrous losses as a result of diseases, agricultural production cannot be maintained. In the developing world between 5% and 10% of agricultural land is lost each year through soil degradation and over 10% of irrigated land is highly salinized. It is essential that countries look towards integrating food security measures with the conservation of biodiversity and natural resources.

A realistic picture of beneficial and sustainable development can help guide IUCN policy. For instance, over the last two decades the area devoted to farming has decreased,

at least in the developed countries, as agricultural technology has advanced and intensification has become possible. This has been promoted by some as a positive change since land taken out of agriculture could possibly be converted back to nature, while high levels of production have still been maintained. However, biodiversity can also be lost from land that has been abandoned by farmers. In developing countries marginal land is brought into cultivation bringing risk to both biodiversity and food security.

The variety of landscapes and related biodiversity across the world has been shaped by agriculture across the centuries. For example, until the advent of chemical-intensive modern rice cultivation practices, rice fields remained as one of the most sustainable agro-ecosystems, supporting a huge diversity of life. The rich array of natural biological control organisms of rice pests as well as the diverse soil benthos which enhance and maintain soil fertility, mean that traditional rice fields can actually be perceived as managed wetlands outside natural protected areas.

Modernization of agricultural practices over the past few decades has played a significant role in the rapid decline in biodiversity associated with agriculture. For example, the heavy use of fertilisers and other agro-chemicals allow the land to be utilised more intensively, but chemical run-off into surrounding rivers and water bodies has had a detrimental impact on the water quality, the biodiversity within these water systems and their ecosystem functions.

The development of intensive irrigation systems has allowed crops to be grown in areas previously deemed infertile, but this has resulted in considerable drainage of wetlands, salination and water pollution. The Diama dam in Senegal has changed the quality of the water considerably and caused much disturbance to the wildlife and natural values of the Djoudj National Park. The Park is a Ramsar and World Heritage site and its degradation has had negative impacts on the social and economic well-being of the surrounding villages.

The impact on agricultural, environmental and cultural diversity of stakeholders who have no direct interest in local economic, environmental or social welfare, is part of the agriculture/biodiversity debate. Large multinational corporations tend to control markets around the globe but they are also gaining greater vertical control of the whole process “from seed to shelf”. This highlights the issue of free and fair trade. Ironically free trade can generally represent anything but freedom for the people at the bottom of the chain. Take for example bananas. In Latin America, where multinationals control the industry, wage rates are low, social conditions of workers are poor and there is little regard for environmental preservation. Not only is this detrimental to the farmers and workers owned by these corporations and to the surrounding landscapes and ecosystems in which these farms exist, but it also threatens the persistence of locally-owned farms, operating in a sustainable manner, as they simply cannot compete. Some multinationals are, however, sponsoring pilot projects to review more sustainable ways of farming (e.g. Unilever) and supermarket chains, at least in Europe, are beginning to respond to consumer demand for more healthy food which is often grown in more environmentally friendly ways.

Genetically modified organisms (GMOs) for the agriculture sector are at the cutting edge of biotechnology, providing the potential to increase production and decrease fertiliser use. However, in their desire to reap the benefits and not to be left behind where biotechnological advancements are concerned, countries have hastily planted GM crops without first making a thorough assessment of the impact on the surrounding environment. It is also feared that limited access to such advanced technologies, controlled as they are by a handful of multinational corporations, will compound the negative impacts of global free trade.

Relation to the IUCN Programme

Until recently, the IUCN programme did not have a direct focus on the agriculture sector in relation to biodiversity, although much work on various types of land-use has been carried out through the members and global secretariat. The European Regional Office has been working on agriculture and biodiversity for some years and is now beginning to focus more on the broad policy areas of trade and multinational impacts on agriculture. The multifunctionality of agriculture within Europe will also be a key area of work for ERO.

IUCN has the knowledge of species and plant biodiversity, through its networks, that is needed to supply the scientific knowledge base required to assess impacts of agriculture practice and policy. It also has wide experience in implementing sustainable development projects taking into account social, economic and cultural considerations. Finally, it can bring together different interests to address key areas of controversy in a considered and measured way to arrive at “standards” or reference points for policy-makers and practitioners.

The results of the Interactive Session need to be further refined and set out in a strategic approach which will address Key Result Areas of the Global Programme. Part of this process will involve a stocktaking of what IUCN is already doing in the field. Refocussing of the existing Programme where there is interest is probably all that is required, not a new programme area.

The Session

Throughout the day an estimated 300 people, from a diversity of NGOs, governments and institutions, attended the session. Taking into account all the instruments that were made available for making the session interactive, over 100 organisations/institutes from over 50 countries were represented in the discussions.

The interactive approach

In addition to providing participants opportunities to be involved through presentations and open discussion sections, a Feedback Form was handed to those attending the session. This enabled ERO to gauge what the participants felt were the main issues raised, what people believe IUCN

should be doing, and what were their own fields of work. Members and other interested groups who were unable to attend the Congress sent contributions in advance, either as a poster presentation or through the internet discussion forum, which was set up in June. These contributions were displayed at the Interactive Session in addition to material brought by IUCN members attending the session.

The posters, the internet discussion forum and the Feedback Form were designed to make the session as interactive as possible, to prevent the session being entirely restricted to those attending the Congress. This was also an invaluable exercise in providing ERO with feedback from more people than could have commented in the short time-frame of the session. The methodology has provided IUCN with connections to many people working in the field. Many links and partnerships have been formed both in the run-up to the session and as a result of the session programme. These form a stage in building up, and introducing, networks of expertise.

Session contents

The morning session examined issues from the grass-roots perspective within drylands and wetlands. Problems within African, Jordanian and Australian drylands were discussed to draw comparisons between different locations with different social and economic structures. In all three areas, over-grazing is one of the largest factors affecting dryland areas. While the solutions for restoring rangeland ecosystems may also be similar, the contrasting social, cultural and economic environments in the different areas will require contrasting sustainable development practices, goals and international aid.

Walter Lusigi (World Bank) addressed sustainable development and desertification in African drylands. Due to the level of poverty in certain African drylands, some practices will simply not be applicable until a certain stage in the development process has been reached. For example, a lack of security of tenure may prevent long-term investments in land and the poor labour situation of a particular farmer may prohibit the acceptance of an otherwise attractive proposition. A community-based approach can help improve dryland degradation as will interaction with farmers on opportunities and constraints from the perspective of their present farming system, rather than prescribing specific treatments. If farmers are made aware of the options to overcome constraints and exploit opportunities, they can select the treatment that best fits their situation and interests.

Mohammed Ajlouni (UNDP/UNCARTT) spoke on the status of agro-biodiversity in Jordan. Agro-biodiversity measures have the potential to help protect and restore farmed areas in Jordan. Implementation will rely on raising awareness about the importance of agro-biodiversity, through training programmes, and reviewing existing policies, legislation and land tenure arrangements to promote the use of land for profitable and sustainable production.

John Benson (Sydney Botanical Gardens) gave a presentation on managing Australian rangelands: for production and biodiversity. In dryland areas that have been heavily grazed, many plant species have not recruited seedlings to adult plants as the seedlings have been grazed before they could establish. This has resulted in ageing cohorts of palatable plant species to a point where their eventual senescence and death will lead to significant changes in the vegetation. In some regions,

non-palatable, woody native species are increasing in abundance and acting like weeds. Fortunately, the value of maintaining deep-rooted native vegetation (soil stabilizing and water resourceful) is now being appreciated and the removal of artesian bores from some regions will assist vegetation to recover after a hundred years of overgrazing. Biodiversity must be monitored over decades and adaptive management applied to maintain restoration.

Wetland presentations focused on two wetland systems, the Lower Mekong Basin and the Macanas Reserve in Panama. Agro-chemicals are having a major impact in both areas as chemicals leach down through the food chain and into the water systems.

Kosal Mam (Wetlands International) spoke on agriculture and wetlands in the Lower Mekong Delta. The national economies of the Lower Mekong states are based primarily on agriculture and natural resources. Subsistence farming has predominantly been replaced by an intensive model of rice production geared towards export. In the northern areas, fertilizers and pesticides are intensively used, leading to human toxication, accumulation of toxic residues in the water and pesticide resistance resulting in the need to increase the dosage. Investment is placed in damming for irrigation and hydropower projects as annual rice yield can be quadrupled. This can drastically alter the flooding regime and soil quality of natural wetlands. Crops that require less water should be promoted, awareness about agro-chemicals must be increased and chemicals appropriately labelled. Biological pest control and green products should be examined and habitat protection needs to be integrated into agriculture policy. At the international level, agro-chemical producers should be made to share liability and regulations be placed on the trade of agro-chemicals.

Rene Chang (Circulo de Estudios Cientificos Aplicados) gave a presentation on the Macanas wetlands where rice plantations have been developed by a big national company. The most critical problems are related to pesticide use. Spraying by air transports the excess over human habitats. Bronchial, dermal, stomach and cerebral health problems have arisen and pesticide residues have been found in maternal milk. The close proximity of the rice plantations to the shore of the wetland has resulted in agro-chemical run-off, causing the mortality of thousands of birds, fish and aquatic plants each year. Further mortality has been caused by the lethal doses of pesticides in insects and worms, which birds feed on. A buffer zone between the Macanas wetland and the rice plantations is required and research on how to recover the native corn, beans, and rice seeds with natural resistance. However, implementing the use of biological and natural pesticides and organic practices is a slow process as the big companies consider this too expensive. Input is needed from the agriculture ministry, health authorities and universities to promote the use of biological pest control, adequate management of pesticides and security for the farm workers.

Towards the end of the morning, policy-level aspects became incorporated as the EU Common Agriculture Policy (CAP), US agriculture policy and sustainable agriculture in Russia were examined. Chris Howe (WWF-UK) addressed the environmental effects of the Common Agricultural Policy (CAP) of the European Union. In the past, CAP price support mechanisms have exacerbated intensification in accessible areas and helped prevent abandonment in remote areas, thereby damaging biodiversity in some areas while maintaining it in others. In addition, the full costs of agriculture have not been internalized while the costs of benefits have not been externalized. Agenda 2000 places an obligation on member states to prevent environmental damage and to make available options to achieve this, such as the introduction of agri-environment schemes and the replacement of direct payments for production with payments for external benefits in the form of wildlife

conservation and management. Further reform of the CAP through eliminating subsidies that cause environmental damage and shifting support from commodities to sustainable rural development would bring significant social, environmental and economic benefits. On a global scale, WTO settlements must not prevent states from supporting sustainable development, from taxing or penalizing damaging activities, or from encouraging voluntary initiatives.

Annie Kirschenmann (IFOAM) spoke on agriculture and the environment in the US. There appears to be a lack of cohesive or overarching policy regarding agriculture, the environment and conservation in the US. Multiple agencies deal with agriculture and the environment and the various programmes are often in conflict with one another. In addition, states, tribes and local governments can enact their own agriculture and conservation laws and funding is generally low for environmental research. The Clinton administration aims to identify US\$ 1.3 billion for conservation programmes in 2001 that help family farmers take steps to protect water quality and the environment, as well as preserve farm land.

Alexander Karpov (University of St Petersburg) addressed the opportunities for sustainable agriculture in CIS. Agriculture in CIS is at the point of bifurcation. It can go different ways depending on state policies and resources available. Sustainable agriculture would unify social, economic and ecological benefits.

The afternoon had a strong focus on policy, looking at the impacts of free trade, multinational corporations and GMOs on agricultural systems and biodiversity across the globe. Peter Nowicki (Imperial College at Wye) started off by speaking on vertical integration. Vertical integration refers to the unified control of multinationals from seeds to agro-chemicals, farm-level production, to retailers. Within a local economy, the added value of each step is retained on the farm or is shared among neighbours. Within a global economy, the added value is diverted from the locality in which the seed grows to the localities where the other steps in the production take place. What is the relationship between government and the private sector? Who controls the research agenda that has an influence upon agriculture? What is the justification for establishing private property rights over genetic structures, such as happens with terminator gene seeds? The issues involved are not purely scientific, nor are they purely economic, nor are they purely social, but intimately inter-related. Debate must bring the three domains together.

Wilfrid Legg (OECD) spoke on reconciling agricultural trade and environmental policy goals. OECD trade negotiations over the past decade have worked to provide some balance between agriculture and the environment. Trade liberalization has led to an increase in trade and a decrease in prices. The undesirable side of trade liberalization includes an increase in livestock herds and so greater greenhouse emissions, an increase in transport, contamination from exotics and greater impacts on the environment in non-OECD countries. Yet, on the broader scale, trade liberalization is predicted to improve global and domestic environmental performance within the agriculture sector. OECD stresses three factors for sustainable agriculture within a freer trade regime: subsidies should be cut; externalities should be internalized; and taxation should be altered to take into account agricultural impacts on society and the environment.

Vandana Shiva (Research Foundation for Science, Technology and Ecology, New Delhi) addressed the issue of free trade versus fair trade. Trade liberalization has led to the devastation of large rural areas and the extinction of cultural and environmental diversity. Liberalization has meant that

developing world countries are no longer growing food for domestic use, but are growing alien crops for an international market. Until recently, India was the largest producer of a diversity of oil seed crops: groundnut, coconut, sesame and mustard. Within a year, modified soybean oil has flooded the market at a low price, thus decreasing the income of the traditional oil seed farmer by 20-30%. One of the major challenges for trade liberalization will be to safeguard the right to protect sustainable practices. This should be higher up the scale of priorities than the rights of overseas companies.

Zhang-liang Chen (National Laboratory of Plant Genetic Engineering, Beijing University) gave a presentation on the potential role of GMOs in food security. China is looking to GM crops to feed an increasing population. Insects have been a major factor in crop devastation in China, but research has shown that transgenic plants have the potential to solve this problem. In particular, a worm which resides in cotton fields has mutated due to high pesticide use and is causing havoc. A GM strain of cotton has been shown to be resistant to this pest and no agro-chemicals are required for the cultivation of this crop. Health and environmental concerns are making it hard to obtain permission to plant trial GM crops. So far, comprehensive studies at Beijing University have shown that GM potatoes have no adverse effects on rats. There is a lack of public awareness about the truth of arguments both for and against different GM crops and it is important that dissemination of factual information is made available.

Bernward Geier (IFOAM) spoke about organic agriculture as an alternative to gene technology. Genetic engineering introduces a new and ultimate level of risk. The necessary large-scale sale of genetically engineered varieties and breeds will further destroy what remains of biodiversity today. Organic agriculture is more energy efficient and thus less dependent on “chemical” input and keeps animals and land in a balance (organic cows are fed by and large from what grows on the farm where they live instead of primarily importing feed). Organic agriculture does not contribute to the ongoing pollution of the environment. Is there sufficient evidence that GM crops can lead to a more sustainable agriculture?

Rodrigo Artunduaga (Instituto Colombiano de Agricultura) submitted a written presentation on the impact of biotechnology on sustainable agriculture development in Latin America and the Caribbean Region (LAC). The potential contribution of biotechnology to sustainable agriculture is truly great and scientists hope that the development of transgenic plants will help to alleviate both the heavy use of pesticides and the susceptibility of traditional cultivars to a number of pest and abiotic stresses. Cotton and some types of corn are of great economic importance in LAC. In certain regions of Mexico, transgenic varieties of cotton resistant to insects or herbicides are grown commercially. While some countries in LAC have biosafety regulations, the majority do not and many do not have the sort of multiple- and inter-disciplinary personnel needed to carry out risk analyses and risk management. LAC must continue to develop and perfect existing regulatory instruments on a par with related international agreements in order to prevent or minimize possible risks derived from the use and handling of transgenic products. For this to occur, competent national institutions must also develop institutional capacities in order to manage and evaluate field trials. Only then will countries in the region be able to take full advantage of transgenic crops capable of enhancing agricultural production and improving food security.

In a special session for the Press on GMOs, **Hartmut Meyer** (GTZ, Biosafety Capacity Building Initiative – Germany) gave a presentation showing that the lack of human and institutional capacity, transparent decision-making processes and public awareness often hamper the development and

implementation of an appropriate biosafety framework in developing countries. It is important to have a scientific risk assessment based on the Precautionary Principle, which addresses potential impacts on the environment, human health and social and economic structures. The German government Biosafety Capacity Building Initiative aims to assist in determining state-of-the-art within a given country, to suggest a mechanism for the formulation of biosafety policy, to provide advice and scientific knowledge on the development of risk assessment and to enable and facilitate decision-making.

Other key papers, posters and discussion forum contributions

Michael Darkoh (University of Botswana) submitted a paper on agriculture and biodiversity in the drylands of Africa. The loss of biodiversity has been accelerated as attempts are made to increase crop and animal production to feed the increasing population and contribute to the growth of the national economies. Over-cultivation, over-grazing, bush fires, cultivation of marginal and easily eroded land and the widespread use of chemicals and pesticides have intensified the degradation of the soil and vegetation and led to an alarming decline of species types and their numbers. A broad landscape planning approach, embracing all elements of the landscape and ecosystems, is required to ensure biodiversity and environmental sustainability. Strategies must respect and incorporate African values, knowledge systems and priorities. The planting of trees on and around farms should be recommended, to provide fuel wood, timber, medicines, etc., and national agricultural policies should be reassessed. The single most important activity that will enhance biodiversity conservation in the medium to long-term is to raise well-informed future generations with a strong commitment to sustainable management of natural resources and biodiversity.

Guiseppe Brundu *et al.* (University of Sassari) sent a poster on the biodiversity of *Medicago* spp. *Rhizobium meliloti* symbiosis in temperate Mediterranean zones. Many species within the *Medicago* genus have significant and wide-ranging agricultural applications due to nitrogen fixation and self-sowing abilities. Nitrogen fixation may lessen the need for certain fertilisers, thus providing a suitable tool for “biological” farming. Self-resowing capabilities are also desirable as this leads to low input agriculture. However, this self-sowing capability also demonstrates the potential of *Medicago* spp. to become invasive aliens when planted outside their natural range. The introduction of exotics could lead to the impoverishment of natural biodiversity if not carefully assessed. Collecting activities, conservation and evaluation of the use of plant genetic resources is advised.

Abdoulaye Ndiaye (Wetlands International, Dakar) provided a poster on the dams of the Senegal Valley: a case study on wetlands, biodiversity and local communities. The Diama dam on the Senegal River was constructed to bring socio-economic benefits to the people by preventing salt water intrusion and by controlling the water levels in the main valley. Rice crops have increased due to the irrigation systems, but the disturbances have been detrimental to the Djoudj National Park and to the surrounding villages. There is now little room for livestock farming and free-floating aquatic plants are clogging the waterways. Sustainable development is now being promoted and a five-year programme is underway to increase local income through ecotourism. While dams are important in Africa, management plans should be adapted to really address conservation goals and to reduce poverty in the long-term.

Adenizi Arimoro (University of Ibadan, Nigeria) produced a poster on desertification, biodiversity and environmental problems in the socio-economic development of Nigeria. Human activities in Nigeria are causing significant changes to the natural ecosystem, mainly into that of an agro-ecosystem. Such activities include: over-grazing, dam construction, bad irrigation design and the mismanagement of pesticides and water. Now the impacts are boomeranging back as the land able to support agriculture decreases, and drought and famine result. Problems arise because risk assessments and environmental impact assessments are not properly implemented and funds are lacking for research facilities.

Sri Indiyastuti (Yayasan Pengembangan biosans dan Bioteknologi, Indonesia) submitted a poster on the invasion of alien seeds. Due to multinational advertising, a centralistic agriculture policy, under-promotion of native crops and lack of control on imports, many Indonesian people are now consuming alien food species. Consequently, local farmers are forced to plant alien species and native crops are becoming extinct. Aims to improve the situation are based on environmental education schemes.

News clippings were presented by **Evaggelos Valliantos** (US Environmental Protection Agency) on “The Indigenous People should be allowed to Rebuild their Land and Culture”. The industrialisation of agriculture in Mexico has brought America’s hybrid corn to undermine the corn sacred to the indigenous people of the Tarahumara Sierra. In addition to cultural losses, unsustainable cash crop plantations are leading to soil erosion and desertification, perpetuating impoverishment and hunger.

“The Last Invasion of Greece”. The coming of agribusiness, agrotoxins, synthetic fertilizers and manipulated crops are leading to the genetic decline of local crop species in Greece. Hundreds of naturally adapted varieties of wheat, corn, rye and barley have been lost and peasants are being evicted from the land they have used sustainably and now the remaining EU subsidies for Greek peasant farmers are coming to an end.

Tatiana Bakinova (Foundation for Sustainable Development of the Republic of Kalmykia) submitted a poster on pasture farming strategy for ecologically sustainable agriculture and the reconstructing of deserted territories’ biodiversity. Kalmyk steppelands have traditionally been used for Kalmyk sheep pasture. The sheep are adapted to the climate and nature and have had a sustainable impact on the land. In the 1960s, large areas were ploughed for grain crops and Kalmyk sheep replaced with merino sheep. Now 80% of pastured territories are badly degraded and desertification has become a major problem. Some pastures have been reconstructed, but still merino sheep are grazed there. It is essential that traditional livestock species and traditional knowledge of rural conditions and farming are put back into practice if the reconstructed steppelands are to be maintained. Complicating this issue is the absence of Kalmyk sheep from Kalmykia, which now have to be bought back from China or Mongolia.

Channa Bambaradeniya et al. (IUCN Sri Lanka) provided a poster on the role of biodiversity in the conservation and future sustenance of the rice field agro-ecosystem. Until the advent of modern rice cultivation practices, rice fields remained one of the most sustainable agro-ecosystems. An ecological study of two traditional rice fields identified 494 species of invertebrates and 103 species of vertebrates. The rich array of natural biological control organisms and the diverse soil benthos, which maintains soil fertility, are important functional aspects. Traditional rice fields are also

important feeding habitats for waterfowl and other wildlife and the rich photosynthetic aquatic biomass contributes to a high primary and secondary productivity.

Summary of the major issues raised

Modern agriculture - impacts on biodiversity in drylands and wetlands

Problems

- soil degradation and desertification
- pollution
- introduction of exotic species
- loss of cultural and ethical values
- dams and irrigation schemes
- large farming units/agro-industrial developments
- lack of access of farmers to biodiversity

Solutions

- management plans for food production, sustainable rural development and biodiversity
- training of farmers to apply sustainable use of natural resources (organic farming)
- involve users in restoration
- development of indicators and monitoring of biodiversity
- respect for cultural and ethical values

Agricultural policy, trade and biodiversity

Problems

- agro-industry has direct and indirect control over farms
- subsidies that undermine sustainable rural development and biodiversity
- market liberalisation leading to devastation of rural areas
- regional and local differences are not sufficiently considered
- “free trade” is not really free; market prices do not reflect the social and environmental costs
- added value does not remain on the farm in the region

Solutions

- facilitate dialogue between public – private sectors
- introduction of “polluter pays” principle
- develop trade measures to incorporate social, cultural and environmental values
- mix of market and public policy tools required

GMOs – intrinsic value and impacts

Problems

- polarity of debate: are GMOs beneficial or harmful to livelihoods, health and environment?
- lack of capacity to regulate the release of GMOs
- release of GMOs without adequate assessment of risks
- increased dependence of farmers on agro-industry
- relative lack of public investment in alternative farming methods and in research
- huge cost and complexity of testing and regulation
- ethical concerns over gene transfer

Solutions

- capacity building for implementation of Biosafety Protocol
- independent examination of evidence: scientific/social/economic
- incentives to support alternative farming practices
- facilitate the dissemination of balanced information to the public

Conclusions – suggested future priorities for IUCN

There was enormous and overwhelming support for IUCN to adopt agriculture as a global focus in its Programme. Many conclusions and suggestions arose from the session encompassing the following:

- carry out local activities and field projects to develop and test sustainable farming practice;
- facilitate linkages between the local, regional and global levels;
- examine the impact and opportunities offered by multinational corporations;
- address the role of current incentives and trade policies in providing biodiversity and rural development benefits;
- act as an independent convenor of all interest groups;
- facilitate development of tools, methods and indicators for assessment of trade impacts;
- provide guidelines for integration of the CBD Biosafety Protocol into agricultural practice;
- assess the multifunctionality of agriculture and its role in support of sustainable rural development and biodiversity conservation.

ANNEX 1: AGENDA

Sowing the seeds for sustainability: agriculture, biodiversity, economy and society

- 09:00–09:05 **Welcome**
HE Anis Mousher, The Royal Society for the Conservation of Nature, Jordan
- 09:05–09:15 **Introduction – aims and objectives**
Professor Hardy Vogtmann, Bundesamt für Naturschutz, Germany
- 09:15–12:00 **Session 1: Farming for nature – from the ground**
(This session will take the “grass-roots” perspective, examining the relationships between the agricultural sector, the environment, biodiversity and local societies. Issues will be approached from a biome perspective and speakers will examine who or what the drivers are behind negative impacts and how to promote and implement sustainable practices and livelihoods.)
Chair: HE Anis Mousher
- 09:15–10:10 **Farming in drylands**

Desertification and sustainable development in African drylands
(Targeting desertification caused by increased human pressure on dryland resources, through community-based development programs)
Walter Lusigi, World Bank, USA (Kenya)

Agro-biodiversity status in Jordan
(Agriculturally important species in Jordan – the current situation and plans for their conservation and sustainable use)
Dr. Mohammed Ajlouni, Dryland Agro-biodiversity Project, Jordan

Australian rangelands: managing for production and biodiversity
(Assessment and implementation of sustainable practices to undo environmental degradation created by hundreds of years of overgrazing)
John Benson, Royal Botanical Gardens, Sydney, Australia

Discussion
- 10:10–10:55 **Farming in wetlands**

The Degradation of the Mekong Delta
(Changes in agricultural practices, designed to enhance productivity and meet increasing global demands, have resulted in a loss of sustainable traditional farming practices and biodiversity)
Kosal Mam, Wetlands International, Phnom Penh, Cambodia

The Macanas Reserve, a wetland for ecodevelopment
(The development of a programme for establishing environmentally sound and sustainable initiatives)
René Chang Marín, Círculo de Estudios Científicos Aplicados (CECA), Panama

Discussion

10:55–11:55 **Farming in temperate areas**

EU Common Agriculture Policy (CAP)
(The role of the CAP in accelerating or applying a brake to the specialization of agriculture, resulting in a decline of biodiversity and the application of advances in technology and of capital to the most productive land)
Chris Howe, WWF, UK

US agriculture and policy
(The influences and impacts of policy on agriculture and the environment in the USA)
Annie Kirschenmann, IFOAM, USA

Opportunities for sustainable agriculture in CIS
(The sustainable future for agriculture in Russia)
Dr Alexander Karpov, Society of Naturalists, St. Petersburg, Russia

Discussion

11:55–12:10 **Brief round-up of the morning**
HE Anis Mousher

12:00–14:00 Lunch

14:00–17:00 **Session 2: Agricultural trade, policy and practice**
(This session will focus on getting the policy context right. How are multinational corporations impacting on the agricultural sector? What role do trade laws and policies play in altering biological diversity and social welfare? What role should GMOs be playing in the future of agriculture? The development and implementation of global policies will be examined.)
Chair: Professor Hardy Vogtmann

14:00–14:50 **Business impacts and influence in the agricultural sector**

Vertical integration – from seed to shelf
(What is meant by vertical integration? Illustrates the link between business and the environment in agriculture)
Peter Nowick, Imperial College at Wye, London

Discussion

14:50–15:45 **The trade debate**

Reconciling agricultural trade and environmental policy goals
(Exploring the agricultural, trade and environmental policy linkages to identify which policy mixes have the potential to maximise beneficial environmental outcomes with agricultural and trade policy reform)

Wilfrid Legg, OECD, Paris

Free trade and fair trade

(The perceptions and impacts of trade rules and practices, from the perspective of India)

Dr Vandana Shiva, Research Foundation for Science, Technology and Ecology, New Delhi, India

Discussion

15:45–16:40 **GMOs – their intrinsic value and impacts**

The potential role of GMOs in food security

(The role GMOs can play in providing food security for an increasing population)

Professor Zhang-liang Chen, National Laboratory of Plant Genetic Engineering, Beijing University, China

Biosafety in South America (ABSENT)

(Keeping up with technology is important for the economy, but what about the environmental and health concerns? Resources are scarce, but implementation of the Biosafety Protocol is necessary)

Dr Rodrigo Artunduaga, Instituto Colombiano de Agricultura, Colombia

Organic agriculture – an alternative to gene technology?

(Organic agriculture respects the inherent nature of plants and animals, seeks to stabilize production systems using natural means and enhances biodiversity. Where is the evidence that GM crops can lead to more sustainable agriculture?)

Bernward Geier, IFOAM, Germany

Discussion

16:40–17:00 **Brief round-up of the afternoon and summary of the day**

Professor Hardy Vogtmann

17:30–18:30 **Press session**

The press session will be coordinated by the IUCN Communications Division and will involve a selection of the speakers.

Interactive Session 9:

Local solutions promoting social equity and cultural diversity

Organizer: Cristina Espinosa (e-mail: cme@iucn.org)

Introduction

The Interactive Session on social equity and cultural diversity in conservation provided important contributions for IUCN's future work. The session had a pragmatic focus and provided a constructive revision of the progress made by IUCN in the implementation of resolutions on social equity and cultural diversity, with a special emphasis on gender, indigenous peoples and traditional communities. The presentations offered local perspectives as well as regional and global views on the social agenda in conservation initiatives. The session brought together local expertise as well as academics and international policy-makers to hear a series of short and concise presentations followed by a rich and open discussion with the participants.

The issues discussed and the recommendations were of extreme importance for IUCN's Quadrennial Programme, and for the building of a more accountable and coherent system of governance and planning. The session threw light on the existing gap between the work done at the local level and policy frameworks established at the national and global levels. Despite some good experiences linking these processes, there is still a need for better integration between local needs and practices with policy and intervention agendas at the regional and international levels.

The integration of gender, indigenous peoples and traditional communities in conservation has not yet reached a central role in the discussion of natural resource management and conservation. One of the session's main contributions was therefore to specifically address these concerns, assess the pitfalls and gaps and identify practical steps that are required to move forward IUCN's social agenda.

A review of local experiences provided an excellent point of reference to assess the impact of global agreements and initiatives, which are aimed to enhance the equitable participation of indigenous peoples, local communities and women within collaborative management of natural resources. This is particularly relevant, considering IUCN's mission of supporting and influencing societies to achieve conservation and social goals.

The Session

Session 9 was divided into two panels. The morning panel was devoted to discussing the integration of gender into natural resource management. In the afternoon Panel 2 focused on reviewing progress made on integrating indigenous peoples and traditional communities into conservation, with a special accent on protected areas management. The two panels had two different audiences. Panel 1 on gender had 68 participants, among them: governmental agencies and grassroots organizations from Asia, Africa and Latin America working on gender. Panel 2 had 75 participants, including representatives from The World Bank, GTZ, SIDA, and indigenous organizations such as Fundación Sierra Nevada Santa Marta, Colombia and the Indian Treaty Council, IUCN staff with expertise on these issues and many members of IUCN's Collaborative Management Working Group (CMWG). The session was very well attended and had an engaged and knowledgeable audience who contributed to a rich discussion.

Each panel session was opened by the coordinator who introduced the chair and rapporteur and explained the goal of the session and the expected discussion topics (a slide with the key issues for discussion was projected at the beginning of each panel session). Then, each chair gave a brief background on the issue and reinforced the interactive nature of the session and the need to distil lessons and produce recommendations. Each presenter had 15 minutes. We worked in advance and during the congress to ensure that the presentations were technically and formally ready. The timing of the presentations was impeccable and therefore allowed enough time for a good discussion.

The presenters, chairs and rapporteurs represented the global and regional Secretariat, Commissions such as CEL, CEESP, and WCPA, and members and partners from different regions. The presentations also combined broad general views with specific case studies.

Session contents

As already mentioned, both panels gravitated around the following common key issues for discussion:

- Assessing effectiveness of existing IUCN policies, guidelines and tools on social equity and cultural diversity in conservation;
- Gaps and challenges identified to use these instruments;
- Specific contributions of case studies:
 - emerging and contentious issues
 - new institutional arrangements
 - gaps and new tasks
 - strengthening regional strategies within global processes.

Panel 1: Gender in natural resource management

The panel started with a review of the gender mainstreaming process in IUCN. After highlighting the major achievements, some major institutional limitations were presented (e.g. lack of adequate budgets, staff and political commitment). However, the main focus was on the limitations in the approach and methodologies used to mainstream gender within IUCN. Basically the review focused on two main issues: first, the need to better demonstrate the added value of integrating gender into natural resources management; and second, the need to create a more democratic and diverse working place that would support the mainstreaming process in IUCN. The session also addressed the need to improve biome- and site-specific training, tool development and guidelines, as well as the urge to better integrate gender with other major social variables such as class and ethnicity, which affect the equity of sharing costs and benefits of conservation. After this review, the results of the Union's *Gender Audit Questionnaire* were presented, which illustrated in figures the status of gender mainstreaming, in terms of staffing, budgeting, programme and project goals, activities and resources. Although some progress can be shown from Montreal to Amman, many gaps need to be filled.

After this general review of the status and process of mainstreaming gender in IUCN, the panel presented local experiences. Elizabeth Odio, the Costa Rican Minister of Environment, presented the Central American experience of integrating gender into environmental policies. The Minister addressed the conditions, challenges and the implications of this process for the whole environmental sector today. The second presentation broached the issues of integrating gender into marine and coastal ecosystem management in Mexico. It presented concrete examples showing the relevance of gender to enhance the management of these ecosystems, and also the positive impact of this process on the status and income of women. The advantage of having favourable institutional frameworks and policies that were gender-sensitive, when working at the local levels, was highlighted. After this case, we had the presentation of the gender and biodiversity network in the WESCANA region, which included Morocco, Tunisia, Turkey and Algeria. This case referred to the synergy of regional interventions that were focused on specific ecosystems, which also had the flexibility to allow women to define their own environmental concerns and conservation agendas, strongly linked to the improvement of their livelihoods. Therefore conservation projects were able to build on existing capacities and concerns of groups of women, and empower them through networks and address issues that are critical both for the environment and for advancing gender equality and equity in these countries. The importance of special provisions for gender equity, like literacy for women, solutions to their unsustainable use of resources, was highlighted. Finally, the IUCN Senior Gender Advisor presented a strategy to guide the work of the Union in regard to mainstreaming gender.

After some clarification questions, the discussion focused on some recurring issues, like the importance of having the support of gender-sensitive policies for field projects, and to take into account broader processes such as trade patterns and globalisation processes which affect gender equity at the local level. Having appropriate institutional frameworks was an important topic of discussion. Another central issue was the need to have better access and exchange opportunities to research results and knowledge from diverse ecological, social and cultural contexts. The development of adequate indicators to assess progress in mainstreaming gender equity in conservation was also stated. There was consensus over the idea that gender approaches have to go beyond a narrow focus on women. The work on gender has to include men and address aspects of power and equity, as well as link gender with a broader agenda of social equity. From this perspective, gender has to be used as an analytical tool rather than as an imposed and pre-fabricated concept. It was also stated that

the Union needs to invest more resources to build capacity within the secretariat to provide better and greater technical assistance to the members, on how to integrate gender into natural resource management, and to assess progress, through qualitative and quantitative indicators. Also important were the remarks on the necessity for linking the efforts and expertise of the Secretariat with members and Commissions. The development of a more integrated vision of conservation, and concrete alternatives to make conservation viable as much as equitable were also addressed as a challenge for IUCN.

Panel 2: Indigenous peoples and traditional communities in protected areas

After the coordinator introduced the chair and rapporteur, the panel started with a presentation on the process of developing the IUCN-WWF guidelines on indigenous and traditional peoples and protected areas. The next presentation provided a background of the process within IUCN, and highlighted the major issues addressed by the guidelines. The next presentation provided an account of a promising co-management experience in the Sarstoon-Temash National Park in Belize, established by the Government in 1994 without prior consultations with the five indigenous communities living within the Park's boundaries. An overview of the negotiation processes with the Government of Belize was provided, as well as an explanation of the steps taken by the five indigenous communities in order to establish a co-management plan. The presentation also addressed the strategies and actions leading towards sustainable ecosystem management, basic research, the empowerment of local organizations, and funding initiatives. This review highlighted efforts made to link conservation with livelihood security from an indigenous perspective. Finally, the presentation explored some connections between the case of Sarstoon-Temash National Park and the IUCN-WWF guidelines. The next presentation was from IUCN's Eastern Africa Office and presented the struggle of traditional and local communities to overcome an historic process of marginalization and land expropriation. This presentation linked the problem of environmental degradation with ethnic extermination through increased famine, war and desertification. It also demonstrated, with various examples across Africa, that centralized command and control conservation systems are no longer economically or politically viable; that local people can and do manage their natural resources in a responsible manner; and that conservation is as much socially driven as it is natural science driven. In this context, according to the presentation, the challenge for IUCN is to learn lessons from existing work in this field, to place these lessons in national and international policy contexts in order to promote increased rights and responsibilities for indigenous peoples in both natural resource management and national development.

The next presentation provided a detailed account of the Cultures and Biodiversity Congress (CUBIC) 2000, held in Yunnan Province, China, resulting in the Yunnan Initiative. This Initiative provides a vision, principles and actions to enhance the ability of local groups to strengthen their evolving cultural traditions while finding innovative solutions for improving their livelihoods and enhancing biodiversity. This initiative unveils the contentious aspects arising from the co-management of Protected Areas such as land tenure security, local criteria and indicators for sustainable resource use, biodiversity conservation, intellectual property rights and benefit-sharing, among others. The next presentation was on conservation with communities in South Asia, and it provided an account of the progress made by governments and environmental organizations towards more collaborative and truly participatory conservation initiatives. The presentation used several examples of community-based conservation in South Asia to show that the democratization of protected areas

management is an interdisciplinary, comprehensive and flexible process, that needs to combine community-based management with co-management schemes, depending on the social, political and institutional context. It also provided a set of key issues and lessons learned for future policy and project implementation.

After some clarification questions, the discussion of Panel 2 focused on the need to build a middle ground between policy and field interventions, global conventions and national policies, by bringing together representatives from indigenous organizations, researchers, conservation organizations and national governments to create adequate spaces for negotiation and consultation. Bridging gaps among disciplines and languages was also identified as a priority in order to build capacity within IUCN to better implement resolutions dealing with indigenous peoples and traditional and local communities. Finally, the discussion highlighted the need to better understand the role of traditional knowledge in relation with the resilience and adaptability of livelihoods, to bring together researchers and practitioners, to network among different parts of the Union working on similar issues and to create concrete mechanisms to advance this agenda.

Conclusions and recommendations

Common lessons learned from panels 1 and 2:

- Integrating gender, indigenous peoples and local communities into natural resource management and conservation is a cost-effective alternative to achieving social and environmental sustainability.
- Strategies to mainstream gender and indigenous peoples need to focus both at the policy and local levels to be more successful.
- Flexible, inclusive and site-specific approaches that consider the specific social, economic and ethnic contexts, work better than prescriptive approaches. This was shown for both the case of mainstreaming gender and for integrating indigenous peoples and traditional communities within participatory management of natural resources.
- Creating adequate spaces for negotiation and empowering all stakeholders are crucial elements for success when mainstreaming gender, social and ethnic equity in conservation.
- Interventions designed by local actors are more able to find real alternatives for promoting sustainable use of natural resources.
- Qualitative indicators are needed to assess the social impact of conservation (gender, indigenous peoples, poverty, etc.).
- There is a rich body of experience on gender, indigenous peoples and traditional communities in conservation, which is available to support:
 - dissemination of lessons for networking, advocacy and capacity building;
 - further discussion of conceptual issues;
 - policy development targeting main bottlenecks;
 - enhanced collaboration between IUCN Commissions, members, partners and Secretariat;
 - further links with applied research.

General recommendations

- IUCN should build more capacity on participatory management of natural resources (focused on gender equity, and sustainable livelihoods for indigenous peoples and local communities).
- This capacity cannot be built only through training, but requires IUCN to expand its base of social scientists and to provide adequate funds and institutional space within the Secretariat and the membership.
- IUCN should provide global, regional and national leadership, advocacy and practical guidance to promote social, economic and ethnic equity in conservation.
- IUCN should support further documentation of case studies.

Specific recommendations

- Incorporate gender equity and participatory management for indigenous peoples and local communities as a high priority within KRA4 – Equitable Sharing – building on existing results and resources.
- Coordinate IUCN networks (CMWG, CIFM, SUI, TFLCPA, GMT) working on these issues.
- Develop an effective communication strategy and system of knowledge on these issues (e.g. use participatory management networking service to link Web sites and networks, use *World Conservation*, Knowledge Network, etc.).
- Establish an advisory group on social equity and biodiversity, with a focus on gender, sustainable livelihoods for local communities and indigenous peoples in conservation, to better link field/policy levels.
- Establish global networks to coordinate proper participation and consultation of indigenous peoples and local community organizations (e.g. World Parks Congress, Durban 2003, implementation of IUCN/WWF guidelines).
- Dissemination of the papers presented, as well as the discussion and recommendations, as soon as possible. (All the papers can be found at www.iucn.org/themes/spg/index.html). Use existing sites, such as the magazine *World Conservation*, to disseminate these results and to foster this discussion.

Results and follow-up

This session favoured a closer collaboration among different parts of IUCN that work on these issues. Some collaboration had been already initiated with WCPA, WWF and CIFM, but this meeting provided an opportunity to work closer with CEL, and with CEESP CMWG.

As a specific follow-up to this meeting, IUCN's Social Policy Programme is establishing an Advisory Group on Indigenous Peoples, which will have its first meeting in early 2001.

The Social Policy Programme is also producing a publication comprising the whole set of full length background papers and texts of all presentations (reduced for this publication), as well as a more substantial summary of the discussion and recommendations.

ANNEX 1: AGENDA

Local solutions promoting social equity and cultural diversity

PANEL 1: Gender within natural resource management

Chair: Khawar Mumtaz, IUCN Councillor

Rapporteur: Lorena Aguilar, IUCN Gender Senior Advisor

- 09:00–09:20 **Welcome and brief review of mainstreaming gender in IUCN**
Dr Cristina Espinosa, Global Facilitator, IUCN Social Policy Programme (SPP)
- 09:20–09:40 **Assessing gender in IUCN: some data from the gender audit questionnaire**
Gabriella Richardson, IUCN Zambia, SPP
- 09:40–10:00 **Toward equitable conservation: gender policies within the Ministries of Environment**
Elizabeth Odio, Vice-president of Costa Rica and Minister of Environment
- 10:00–10:20 **Gender as a tool to enhance sustainability of marine and coastal ecosystem management in Mexico**
Itzá Castañeda, Red Mujer y Medio Ambiente
- 10:20–10:40 **Gender equity within natural resource management to enhance social sustainability: lessons from Morocco and Tunisia**
Dinia Hayat, Coordinator of the WESCANA Regional Women and Biodiversity Project, and Kamel Esseghairi, SPP and WESCANA Liaison Person
- 10:40–10:55 **IUCN policy on gender: setting the course**
Lorena Aguilar, IUCN Gender Senior Advisor
- 10:55–11:15 Coffee break
- 11:15–12:00 **Plenary, wrap-up, and recommendations**
- 12:00–13:45 Lunch

PANEL 2: Indigenous people and traditional communities in protected areas

Chair: Johanna Sutherland, Australian University of Canberra, and Commission on Environmental Law

Rapporteur: Pascal Girot, CEESP, Collaborative Management Working Group

- 13:45–14:00 **Developing the IUCN/WWF Principles and Guidelines on Indigenous and Traditional People and Protected Areas: issues, challenges and follow-up**
Gonzalo Oviedo, WWF
- 14:00–14:15 **Co-management of protected areas and indigenous people: lessons from Belize**
Gregorio Ch'oc, Chairman of Kekchi Council, Belize

14:15–14:30	Some lessons from Africa in involving traditional communities in natural resource management <i>Edmund Barrow, IUCN Regional Office for Eastern Africa, Forest Conservation and SPP Programme Officer</i>
14:30–14:45	The Yunnan Agenda for Conservation of Cultural and Biological Diversity in China <i>Xu Jianchu, Kunming Institute of Biodiversity</i>
14:45–15:00	Traditional ecological knowledge, protected areas and lessons from India <i>Ashish Khotari, Local Commission and Protected Areas Task Force, WCPA</i>
15:00–15:15	Coffee break
15:15–16:00	Plenary, wrap-up, and recommendations
16:00–17:00	Plenary: Discussion of the recommendations for IUCN to further mainstreaming gender, indigenous and traditional people in conservation

Interactive Session 10:

Developing and investing in biodiversity business

Organizer: Frank Vorhies (e-mail: fwv@iucn.org)

Overview

This session aimed to address the question “Can we harness the forces of private enterprise in support of biodiversity conservation?” In the light of this question, it reviewed new approaches to developing and investing in biodiversity-enhancing businesses. This area of discussion was tied in to Key Result Area 3 of IUCN’s new Programme dealing with incentives and finance and explored ways of channelling direct private investment into biodiversity and of engaging private enterprise in the IUCN mission. The session sought substantive guidance on the opportunities for the World Conservation Union to create a vibrant biodiversity sector.

The session was attended by approximately 75 participants from IUCN’s membership, partners, donors and the private sector.

Presentations

The session was based on presentations made by a broad range of IUCN members and partners involved in the development of, and investment in, a variety of biodiversity businesses. These included, in summary:

- **Flora and Fauna International**, who addressed the forces that are currently stimulating partnerships between businesses and the biodiversity sector. This presentation focused on the traditionally different aims and goals of environmentalists, and business people. It stressed the growing convergence between the goals of these two groups that has taken place over recent years, and their increasing dialogue and partnerships.
- **The Netherlands Committee for IUCN**, who described a methodology by which to identify biodiversity businesses. The presentation emphasized that although the Convention on Biological Diversity is signed by states, not businesses, the latter have both the interest and the efficiency to contribute towards its goals. This fact was recognized by the Netherlands, who have established a tax-free green fund in which citizens can invest in biodiversity. The presentation stressed the importance of IUCN becoming involved in positive biodiversity investment, and also in taking action to address the ways in which businesses impact negatively on biodiversity.

- **The Organization for Economic Co-operation and Development**, who looked at the ways in which it is possible to create a market for biodiversity. This presentation underlined the need to identify the types of biodiversity values that are marketable, including both use and non-use values, and both private and public goods. It emphasised the importance of new and emerging markets in biodiversity and described some of the activities being undertaken in this area by OECD – such as the use of economic and financial instruments to promote private sector engagement in biodiversity business.
- **Earthwatch Institute**, who examined the emerging biodiversity business trends in the UK. Certain key features characterise these trends, such as the fact that although most companies have environmental management divisions they do not take into account biodiversity, that the development of partnerships with NGOs represents a major way forward in promoting private investment in biodiversity, that published case studies and strategies dealing with business investment in biodiversity give valuable information, that the development of a biodiversity culture at all levels of companies can be a valuable tool with which to promote biodiversity business, and that a Corporate Biodiversity Action Plan approach is very appealing to businesses because it presents a clear structure within which to work.
- **Conservation International**, who addressed the potentials of ecotourism as a tool for conservation and presented some of the lessons learned by CI on this topic. At the local level, ecotourism can ensure community involvement and benefit from biodiversity business. At the regional level it can increase capacity in biodiversity business, and at the global level it can encourage both governments and industry to adopt conservation-friendly practices. Yet there are risks – the tourism industry is not yet regulated, for the main part, and this may lead to a situation where people will start to “love nature to death”. Certification can help to meet this challenge of ensuring the proper quality and conservation benefits of ecotourism.
- **World Wide Fund for Nature**, who described the development of the Forest Stewardship Council, and its attempts to provide timber companies with incentives to manage and utilize forests sustainably. The presentation outlined the growing consumer demand in the West for sustainably-harvested timber, the acceptance by timber retailers of this demand, and the processes involved in setting up forest certification.
- **The International Federation of Organic Agriculture Movements**, who spoke about conservation agriculture. The presentation stated that IFOAM had a membership of over 750 organizations and institutions, spread over 105 countries. It outlined the processes of setting standards for organic agriculture, and its certification. Taking several case studies from Italy, including the Santa Rita Dairy Co-operative, the Co-operative Festa Natura and the Co-operative Satra Sardinia, the presentation described some of the efforts made under the IFOAM/IUCN Vignola Declaration and Action Plan to urge governments to promote investment in organic agriculture. It also highlighted the possibilities for adding value to biodiversity enterprises by combining organic agriculture with sustainable tourism.
- **The Marine Aquarium Council**, who underlined the need for certification in the international ornamental fish trade. Describing the ways in which coral reefs are one of the most important and biodiversity-rich ecosystems, the presentation underlined the threats that these ecosystems currently face from the aquarium fish trade, which is worth some US\$ 1 billion a year. It argued

that certification is a way of increasing the responsibility of consumers and traders, and of encouraging the sustainable harvesting of ornamental fish.

- **IUCN Poland**, who described a series of projects supporting organic agriculture in Poland. The presentation stated that in 1999 there were 500 organic farms, covering over 11,000 hectares. It is expected that, during 2000, there will be 3 times more farmers and 5 times this area. Yet the market for organic produce is still small, consumer demand is low and the level of awareness is low among farmers. Working with selected farmers' groups, IUCN aims to improve markets for selected products by assisting in marketing, processing and technical advice, and by improving government and consumer awareness of organic agriculture.
- **International Finance Corporation**, who described their work in making loans and moving investment funds into biodiversity business. The presentation described the function of the IFC in leveraging investment funds into key biodiversity areas such as organic agriculture and ecotourism, and its focus on securing public benefits by stimulating private enterprise to invest in biodiversity. Regarding biodiversity investments, the IFC also works closely with the GEF.
- **The Terra Capital Fund**, a US\$18 million fund for biodiversity investment in Latin America. The presentation described how this fund expects a 20% average annual rate of interest from its investments, which cover various sectors including organic agriculture, tourism, native species aquaculture, native species reforestation and non-timber forest products. It described on-going projects from all over Latin America, including the cultivation of organic berries in Chile, heart of palm plantations in the Brazilian Amazon, organic vegetable production in Brazil and Babassu palm production in Brazil.
- **The United Nations Conference on Trade and Development**, who described the Kijani Initiative that is being developed by IFC and IUCN to bring investment funds to biodiversity conservation in Africa. This initiative plans to provide technical assistance as well as private equity to enterprises in Africa who want to invest in biodiversity business. Potential areas of operation include organic agriculture, conservation tourism and bio-medicines.
- **African Wildlife Foundation**, who described their system of Conservation Service Centres in Kenya, Tanzania, Zimbabwe and South Africa. The presentation described the functioning of these Centres, which aim to structure and promote community, private and government partnerships in wildlife enterprise and to set in place win-win situations for all these stakeholders.
- **Conservation International**, who described the Conservation Enterprise Fund. The presentation outlined the establishment of the CEF in 1998, with an IFC/GEF loan of US\$ 1 million. The CEF focuses on global biodiversity hotspots and lends money to small and medium-sized businesses. Criteria for lending include the biodiversity efficiency of an enterprise, its viability and ability to generate profits. Case studies were given of a shade farming coffee co-operative in Mexico and a US organic coffee and spice importer working with producers in Indonesia, Guatemala and Grenada. Although facing many challenges and obstacles, the presentation stressed the exciting opportunities and rapid growth of markets in biodiversity products, and underlined the importance of biodiversity as an investment sector.

- **IUCN Vietnam**, who described aspects of biodiversity business in Vietnam. The presentation described how IUCN's programme in Vietnam included a number of activities relating to biodiversity and business. It stressed that the current transition of the Vietnam economy from a centrally-planned socialist model to a market economy presented many opportunities for such initiatives. IUCN activities in support of development and investment in biodiversity business include training, information generation and planning in organic agriculture, traditional medicines, trade and environment, and sustainable use of wildlife species.
- **The Nature Conservancy**, who described the recently-established Eco Enterprise Fund. The EEF is a venture capital fund for TNC's partners in Latin America and the Caribbean who want to go into business partnerships with the private sector. The fund provides long-term financial support to these groups, as well as business advice. Based in Costa Rica, the fund will support projects in ecotourism, non-timber forest products and agroforestry.
- **The World Bank**, who described GEF's attempts to support initiatives in Chiapas Mexico dealing with organic coffee certification. The presentation highlighted the need to embed appropriate economic incentives in the market at the community level, and described how certification was one way to do this.
- **Conservation Agriculture Network**, who described certification processes in Latin America. CAN is a coalition of non-profit groups who want to transform agriculture through certification, based on the principle of sustainable agriculture. They work with bananas, coffee, citrus, cocoa and ecotourism. The presentation described in detail the ECO OK coffee certification programme, which covers 7 million hectares of agroforestry habitat and protected area buffers, and markets organically certified coffee to retailers and consumers in the USA, Latin America and Japan.
- **IUCN**, who described the World Heritage Enterprise Project, a global partnership for protected areas enterprise. The project is being developed by the IUCN Economics Unit with technical input from the UNESCO World Heritage Centre and the World Commission on Protected Areas. Like the Kijani Initiative, investment capital will come from the IFC/GEF. Core financial support for biodiversity due diligence, capacity building and business plan development is being sought from the UN Foundation.

Issues raised

The presentations stimulated much interest and discussion among participants. Major issues raised from the floor included:

- The tools that are required to mobilize business skills for both corporate and non-governmental sectors to encourage the development of biodiversity investment in the future.
- The need to protect the interests of local communities and primary producers who become involved in partnerships with the private sector, including issues relating to fair trade.
- The need to safeguard against pressure being applied to national economies and biodiversity integrity by the operations of large companies and industries.

- The need to be able to speak business language, to engage in dialogue with the corporate sector, and to be able to demonstrate to businesses the commercial gains and profit from biodiversity enterprise.
- The multiple economic, fiscal and financial barriers that exist, especially in developing countries. The urgency of overcoming these distortions that currently discourage private investment in biodiversity, or encourage negative impacts, and of setting in place positive and enabling incentives for sustainable biodiversity business.
- The growing pressure from consumers for businesses to invest in biodiversity-conserving technologies and products, and the importance of feeding information to consumer awareness and lobby groups.
- The pros and cons of certification as an incentive for sustainable biodiversity investment, and the procedures and processes involved in setting up certification schemes for biodiversity products.
- The paucity of technical and market information among investors, producers and consumers, and the need to improve the quality and sharing of information about biodiversity business opportunities.
- The ways in which the gains from biodiversity investment, and participation in biodiversity business, can be spread to the poorer and more marginal groups in developing countries, not just richer or more informed elites.
- The need to ensure that biodiversity investments are spread over different ecosystems, sectors, countries and products, and to stimulate global trade, production and marketing networks.
- The requirements for funding and undertaking monitoring activities to ensure that biodiversity businesses promote conservation and adhere to proper ethical and social norms, and the need to develop appropriate and verifiable indicators of success for biodiversity businesses.

Conclusions and recommendations

The session pointed to the rich range of opportunities for investment in biodiversity business, as illustrated by the experiences and information provided by presenters and other workshop participants.

It is clear that investment in biodiversity business is growing rapidly, throughout the world, and will in the future provide an increasingly important tool for mobilising conservation activities.

Participants recommended strongly that IUCN, its members and partners, should continue their work in promoting biodiversity business, and as neutral arbitrators and brokers who can help to raise awareness on biodiversity business, mobilize and channel funds, and ensure that the resulting enterprises and activities are sound in conservation, development and social terms.

They underlined the urgent need to place investment higher on the global biodiversity agenda, and to work with governments, the private sector, NGOs, researchers and community groups to ensure that the emerging sector of biodiversity business develops in a way which will simultaneously benefit both consumers and producers, and will act as a stimulus to the better conservation of key ecosystems and biological resources.

ANNEX 1: AGENDA

Developing and investing in biodiversity business

Morning Chair: Frank Vorhies, IUCN Economics Unit

- | | |
|-------------|---|
| 09:00–09:15 | Global business partnerships
<i>Mark Rose, Fauna and Flora International, UK</i> |
| 09:15–09:30 | Identifying biodiversity as a business
<i>Wouter Veening, Netherlands Committee for IUCN, The Netherlands</i> |
| 09:30–09:45 | Creating markets for biodiversity
<i>Dan Biller, OECD, France</i> |
| 09:45–10:00 | Corporate biodiversity strategies
<i>Robert Barrington, Earthwatch Institute, UK</i> |
| 10:00–10:15 | Conservation tourism
<i>Christopher Holtz, Conservation International, USA</i> |
| 10:15–10:30 | Forest Stewardship Council (FSC)
<i>Gordon Shepherd, WWF International, Switzerland</i> |
| 10:30–10:45 | Conservation agriculture
<i>Antonio Compagnoni, IFOAM and AIAB, Italy</i> |
| 10:45–11:00 | Organics in Central and Eastern Europe
<i>Dorota Metera, IUCN Office for Central Europe, Poland</i> |
| 11:00–11:15 | The ornamental fish industry
<i>Paul Holtus, Marine Aquarium Council, USA</i> |
| 11:15–12:00 | What is to be done?
<i>All participants</i> |
| 12:00–14:00 | Lunch |
| | <i>Afternoon Chair: Tony Whitten, The World Bank</i> |
| 14:00–14:05 | A perspective from the African Wildlife Foundation
<i>Isidore Gwashure, AWF, Kenya</i> |
| 14:05–14:15 | Investing in biodiversity business
<i>Zeke Oman, IFC, Switzerland</i> |

14:15–14:30	The Terra Capital Fund <i>Philipe Lisbona, A2R, Brazil</i>
14:30–14:45	The Kijani Initiative: biodiversity business in Africa <i>Constantine Bartel, UNCTAD, Switzerland</i>
14:45–15:00	The Conservation Enterprise Fund <i>Jennifer Morris, Conservation International, USA</i>
15:00–15:15	Biodiversity business in Vietnam <i>Nicole Casellini, IUCN Vietnam, Vietnam</i>
15:15–15:30	The Eco-Enterprise Fund <i>Tammy Newmark, The Nature Conservancy, USA</i>
15:30–15:45	Conservation through market mechanisms in Chiapas and El Salvador <i>Daniele Giovannucci, World Bank, USA</i>
15:45–16:00	Sustainable coffee certification in Meso-America: the case of El Salvador <i>Juan Marco Alvarez, Salva NATURA, El Salvador</i>
16:00–16:15	The World Heritage Enterprise Project <i>Frank Vorhies, IUCN Economics Unit, Switzerland</i>
16:15–17:00	What is to be done? <i>All participants</i>

Interactive Session 11:

Integrating biodiversity science and environmental policy and management

Organizer: Susan Mainka (e-mail: SAM@iucn.org)

Introduction

Conservation biology, the science base for conservation theory and practice, is a new science and has developed rapidly over recent decades. Two fundamental problems – the increasing number of humans and the increasing rate of consumption – are driving the need for conservation biology knowledge. In 1988, Michael Soulé and Kathryn Kohm published the first “Research priorities for conservation biology”, which was the agenda that the Society for Conservation Biology developed for the study of conservation biology. Increasing awareness of environmental problems has led to increased funding and a more vigorous programme of research in both pure and applied academic settings. However, the linkage between conservation science research and management and policy decisions is tenuous.

IUCN has a unique role to play as the forum in which scientists and decision-makers can meet and share ideas. This niche for IUCN leads to two complementary needs:

- 1. For the IUCN programme and key conservation policy fora to benefit from new research findings; and*
- 2. For key policy problem areas in the programme to be fed into the mainstream scientific agenda.*

In short, how can IUCN maintain effective links with the conservation science base and how can we ensure that better science leads to better conservation management and decisions? In an attempt to answer these questions, the Interactive Session sought to:

- Identify ways for IUCN to mobilize science in support of biodiversity conservation;*
- Identify opportunities for scientists to more effectively contribute to conservation.*

The workshop programme and issues addressed

Approximately 250 people attended the plenary sessions and 80 participated in the working groups. Tim Sullivan, of the Chicago Zoological Society, acted as the main facilitator and provided the introduction to the aims of the workshop and expected outputs. This was followed by a series of six short

presentations from conservation experts answering the question: “What are the biological research priorities to achieve conservation in my field?” The speakers outlined current priority research areas for biodiversity including habitat loss, fragmentation, overexploitation, exotic species, pollution and climate change; the implications of local and commercial bushmeat consumption for conservation in tropical forests; methods for exchange of scientific information and local knowledge between biologists and artisanal fishers, in particular for seahorse populations; strategies and policies to address invasive species, particularly grey squirrels in Europe; ways to conserve fragmented landscapes by establishing biodiversity corridors; research priorities for designing effective marine reserve networks; and ecological implications of economic crisis. Panellists focused their presentations on how to make research relevant and accessible for local communities and decision-makers.

At the conclusion of the presentations, Dr Georgina Mace presented a summary of the information required to make conservation decisions. These main themes included:

1. Basic biological information;
2. Interactions of life history and threat processes;
3. Interface between biology, life history and environment;
4. Interface with socio-economic factors;
5. Monitoring and adaptive management.

Following the summary discussion, four working groups were created to address three specific questions:

1. What do conservation practitioners (land and wildlife managers and policy-makers) need to know that scientists can provide?
 - On which issues do practitioners feel they need more scientific input to solve problems?
 - Are there issues which managers deal with regularly that scientists don't address sufficiently or at all?
2. What do scientists think practitioners need to know in order to manage or develop policy for conservation purposes?
 - Which research results or fields of inquiry should practitioners be making more use of?
 - What are the emerging fields of science that will be of most importance to practitioners?
3. How can we better integrate information and knowledge from biological science into policy and management?
 - What are the main obstacles to more effective use of science and policy and management?
 - What mechanisms and processes can IUCN incorporate into its programme in order to overcome these obstacles?
 - In what form and to whom do scientific results need to be communicated to be effective?
 - How can practitioners get their information and knowledge needs on to the scientific research agenda?

The working groups met for two hours and at the conclusion of the working group session, each group reported back to plenary.

Participants discussing Question 1 determined that practitioners wanted to know about:

- Basic biology, ecology and taxonomy;
- Interactions with threatening processes;
- Multidisciplinary approach including economics and human psychology;
- Risk assessment techniques;
- Prioritization techniques.

The working groups discussing Question 2 agreed that scientists wanted to share information on:

- Basic biology, ecology and taxonomy;
- Interactions with threatening processes;
- Multidisciplinary approaches.

Participants noted that scientists must provide user-friendly data, clear data maps and information on ecological restoration and economic valuation of biological functions to practitioners while working with a multidisciplinary approach. Information should be targeted at three different levels of the decision-making process: on the ground; middle management; and top decision-makers. In addition, participants suggested managers could benefit from understanding the value and limits of science. Finally, to better integrate scientific information into policy, group members stressed that scientists must improve synthesis of information, understand core cultural differences, ensure that science is relevant and make information accessible in a timely manner.

Participants discussing Question 3 concluded that the barriers between science and policy were due to a number of factors, including:

- Much science not being appropriate for management;
- Core cultural differences between scientists and policy-makers;
- Communication Gap;
- Timing of the information;
- Insufficient importance given to science by policy-makers;
- Training of scientists;
- Need for more interdisciplinary work.

Suggested solutions for IUCN to overcome these barriers in implementation of the Quadrennial Programme included:

Encourage inter-disciplinary work in relation to conservation needs

- Mobilize economics in relation to use issues etc;
- Encourage synthesis of data quickly for field managers;

- Commissions to coordinate and collate information for different regions;
- Encourage revitalization of Science Departments and of Wildlife Departments.

Making information relevant to policy-makers

- Demystify science – improve communication;
- Give recognition to scientists for management-orientated work;
- In IUCN contracts, make sure that data are available immediately and do not delay while waiting for publication that may occur much later;
- IUCN to encourage synthesis of data quickly for field managers;
- Prepare guidelines for translating science to policy-makers.

Education and Communication

- Need to distinguish needs of different constituencies including: communities, practitioners, scientists, policy-makers, donors. Each have differing problems, obstacles, and stakeholders;
- Need to make information “FUN” – through seminars on writing etc.

The Session concluded with initial reactions from four speakers, namely Dee Boersma of the Society for Conservation Biology, Colin Bibby of BirdLife International, Jan Plesnik, incoming Chair of SBSTTA and Sue Mainka of SSC. Concluding speakers agreed that the main requirements to ensure relevance and utility of conservation biology information included a strong emphasis on interdisciplinary approaches to research, greater understanding of how to influence human behaviour and due attention to providing the information in a targeted, user-friendly and timely manner.

Conclusions and recommendations

1. Both scientists and practitioners agreed that there was a continuing need for basic biological information including especially taxonomy and genetics.
2. Scientists and practitioners also agreed the need to understand how basic biology interrelates with threat processes such as alien invasions, climate change and pollution as well as socio-economic factors.
3. Participants highlighted the fact that effective communication of the information to target audiences was just as important as the information itself. Several recommendations were made regarding producing user-friendly, accessible information in a variety of formats.

Within the IUCN Quadrennial Programme, specific activities to enhance integration of science into management and policy could include:

- Holding seminars for promising scientists to show them how to deal with policy-makers etc.;
- Raising awareness among scientists of the need to produce information for practitioners;
- Using consultant contracts with terms of reference that include the need to make science understandable;
- Employing writing teams for IUCN information to translate science into “practitioner-speak”;

- Supporting an increase to and encourage the Aldo Leopold Fellowship for senior scientists to learn how to communicate;
- Strengthening opportunities for practical training, especially inter-disciplinary activities education;
- Developing guidelines for scientific communication to practitioners;
- Evaluating effectiveness and use of currently available guidelines;
- Including managers' input in all future Action Plans;
- Synthesizing results from existing Action Plans to evaluate effectiveness.

ANNEX 1: AGENDA

Integrating biodiversity science and environmental policy and management

09:00–09:10	Welcome/introduction to workshop <i>Tim Sullivan</i>
09:10–09:30	Background. Priorities for conservation biology in the future <i>Dee Boersma, The Society for the Conservation of Biodiversity</i>
09:30–11:30	Presentations (15 minutes each) The role of science in tackling the problems of unsustainable hunting and wild meat trade in tropical forests <i>Elizabeth Bennett, Wildlife Conservation Society</i> Making biological research work for fisheries conservation <i>Amanda Vincent, Project Seahorse, McGill University, Montreal</i> Biotic invasions: lessons from the Grey Squirrel Eradication Project in Italy <i>Piero Genovesi, IUCN SSC Invasive Species Specialist Group</i> Biodiversity conservation in fragmented landscapes – lessons and research priorities <i>Gustavo Fonseca, Conservation International</i> What are the biological research priorities to achieve conservation of marine biodiversity? <i>Sandy J. Andelman, National Center for Ecological Analysis and Synthesis, University of California Santa Barbara</i> Ecological impact of the Venezuelan economic crisis <i>Jon Paul Rodriguez, Centro de Ecologia, Instituto Venezolano de Investigaciones Cientificas</i>
11:30–12:00	Summary of main themes from presentation <i>Georgina Mace</i>
12:00–14:00	Lunch break
14:00–15:00	Working Group session
15:00–15:30	Break
15:30–16:30	Working Group reports
16:30–17:00	Wrap-up session <i>Tim Sullivan, Dee Boersma, Colin Bibby, Jan Plesnik, Sue Mainka</i>

Interactive Session 12:

The ecological limits of climate change

Organizer: Brett Orlando (e-mail: borlando@iucn.org)

Introduction

The participants at the Interactive Session on the ecological limits of climate change resolved that the world cannot achieve the Union's twin goals of biodiversity conservation and ecosystem maintenance without taking climate change into account. They agreed that IUCN should fully integrate climate change into its overall programme of work. Participants also exchanged views on the role of carbon sequestration. The IUCN members hold diverse views on this controversial issue and it was agreed that IUCN should continue to foster dialogue, using its unique ability to convene diverse stakeholders. Participants also agreed that the Union's experience in conservation and management should be harnessed to make sure carbon sequestration activities are environmentally sound.

As a result of the Amman Congress, IUCN is poised to contribute more to the climate change issue by bringing to bear its scientific and technical networks, regional presence, and widespread membership. IUCN looks forward to working with its Members and partners in the years ahead to improve knowledge, build capacity and strengthen governance so that the world can more effectively address climate change and its implications for biodiversity and natural resources.

Interactive Session

Akiko Domoto, Member of the Japanese Parliament and former IUCN Vice-President and Regional Councillor for East Asia opened the interactive session on the ecological limits of climate change. Domoto, a key contributor to the ninth Global Biodiversity Forum held during the Kyoto Protocol negotiations in December 1997, indicated her support for the Union to develop a programme of work on climate change.

Brett Orlando, Climate Change Programme Officer for IUCN, presented the proposed climate change work programme and its relationship to the overall IUCN programme. Our planet is warming faster than at any time in the last 10,000 years, driven by increasing amounts of carbon dioxide and other greenhouse gases. Because of our use of coal, oil and gas for energy, and the clearing of forests for fuelwood and food, emissions of carbon dioxide are 12 times greater than a century ago. The demand for fossil fuels is expected to climb further – and so are emissions due largely to lifestyles in developed countries and rapid industrialization in the developing world.

A decade ago, a group of scientists first alerted governments to the imminent threat of climate change. Their latest findings suggest human activities are clearly having an impact on the global climate, and that species, ecosystems and livelihoods will be negatively affected by these changes. Forests, inland waters, drylands, and coastal and marine ecosystems are projected to experience significant changes in structure and function. Substantial evidence suggests that climate change is a primary cause of the recent and severe extensive coral bleaching. Climate change will aggravate the ongoing extinction crisis, which is documented in the *2000 IUCN Red List of Threatened Species*. IUCN can no longer achieve its twin goals of biodiversity conservation and ecosystem maintenance without taking climate change into account.

At the first World Conservation Congress (Montreal, Canada, 1996), our members called for IUCN to develop a strategy on climate change. Through consultations with members, Regional and Country Offices and technical programmes, the Climate Change Initiative is developing ways to integrate climate change into the overall IUCN programme of climate change work. Through the Initiative, IUCN creates links between climate change and the conservation of forests, wetlands, species and the establishment of protected areas – what is known as the “heartland” of the Union. IUCN is bringing to bear the knowledge of its six professional Commissions, as well as Regional Offices and technical programmes to work towards four objectives:

- a. understand and improve the availability of information about the effects of climate change on nature and society;
- b. find ways to minimize the adverse effects of climate change;
- c. create equitable solutions that support biodiversity;
- d. build the capacity in societies to tackle the problem and participate effectively in decisions.

The Initiative harnesses the attributes that make IUCN unique and builds on its strengths: the convergence of governmental and non-governmental actors; the reach to different regions of the world; and the diversity of interests and perspectives. The Initiative participates in the work of the UN Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC) and building synergy with the Convention on Biological Diversity (CBD), the Ramsar Convention on Wetlands and the UN Convention to Combat Desertification (UNCCD).

The main outputs of the climate change work programme are to improve knowledge, build capacity and strengthen governance so that the world can more effectively tackle climate change and its implications for biodiversity conservation and ecosystem maintenance.

Atiq Rahman, Director of the Bangladesh Centre for Advanced Studies, an IUCN member, addressed the relationship between climate change, biodiversity and development. Recent events such as Hurricane Mitch and the floods in Bangladesh and Mozambique foreshadow the likely impacts of climate change. Scientists tell us that we are on the verge of dangerously interfering with the global climate system. Although uncertainties remain, we know enough to take action now in order to avoid the worst consequences for biodiversity and livelihoods.

The reason we face the climate change problem is because of the way development has been pursued over the several decades. The current development model values economic efficiency above all, and

devalues ecological and social goods including biodiversity. We need to build a new model that recognizes livelihoods, food security and human health. One study conducted by UN Environment Programme, the US NASA, the World Bank and others demonstrated the linkages between large global processes including biodiversity, climate change, desertification, water scarcity, population, and poverty. The conclusion is that each problem reinforces the other, so we cannot solve one without the other.

IUCN is in a unique position to examine the linkages between these issues. A large number of groups are working on biodiversity and more are working on climate change but very few are working on the relationship between these two important issues. IUCN, with its broad membership and reach across societies, can bring together the climate change and biodiversity issues. Those involved in the climate change discussions would welcome Union's contribution to the topic and would be interested in participating in IUCN's Climate Change Initiative.

Janos Pasztor, Coordinator for Information and Outreach for the Climate Change Convention Secretariat, discussed the Convention and the key issues facing Parties at the sixth Conference of the Parties. The Convention, adopted in 1992 at the Rio Conference, now has over 180 Parties, making it almost universal in terms of membership. The Convention contains only voluntary commitments for industrialized countries to reduce emissions. It was recognized further action would be needed in the future. The Kyoto Protocol to the Convention, negotiated in December 1997, contains binding commitments for industrialized country (so-called Annex I) Parties to reduce greenhouse gas emissions by 5 percent below 1990 levels in the commitment period from 2008 to 2012.

The Protocol provides interesting new economic incentives for Parties to reduce emissions. These include the use of land use, land use change and forestry activities (also known as sinks) and the so-called offshore mechanisms: (1) international emissions trading; (2) joint implementation; and (3) the clean development mechanism (CDM). A key political issue is the extent to which Annex I Parties can use the CDM and emissions trading to achieve their commitments: should Parties be allowed to do all their emissions reductions abroad, only a small percentage, or somewhere in between?

The same issue applies for the use of carbon sinks. In Kyoto, Parties agreed to a limited set of activities – afforestation, reforestation and deforestation. But some industrialized countries, notably Canada, the US, Australia, and Japan are now pushing for additional activities such as forest management and agricultural soils to be included. The role of carbon sinks in the CDM is among the most contentious issues to be discussed in The Hague. Many industrialized and developing countries believe it is extremely important to include sinks in the CDM; while others believe it is a diversion from domestic energy reductions in industrialized countries. These issues are very difficult politically because they determine how much it will cost to implement the Kyoto Protocol. The Hague meeting needs to strike a balance between providing an economically efficient way for largest emitters to take action on the one side and developing a system that demonstrates those reductions are real and credible.

COP-6 must also address assistance to developing country (so-called non-Annex I) Parties to strengthen their involvement in the Convention. Parties over the last two years have undertaken technical work to develop frameworks under the Convention for capacity building, technology transfer, adaptation for developing countries. What is not yet negotiated is financing for these activities. Many Parties would support the Global Environment Facility (GEF) in playing a more active role

but the GEF will require replenishment from its major contributors. Given the scale of activities involved, it may be necessary to create new funding mechanisms. For example, an adaptation fund could be established with resources generated by a levy on CDM projects. A fund for technology transfer is also possible.

Looking into the future, the Kyoto Protocol must be ratified as soon as possible. However, industrialized countries will only ratify the Protocol if there is a successful outcome at The Hague. In order for the Protocol to enter into force, at least 55 Parties, which represent 55% of industrialized country emissions in 1990, have to ratify it. If the US, which represents 33% of global emissions, does not ratify the Protocol, it will be meaningless.

After the above plenary presentations, members broke into four regional groups to discuss how climate change will affect them, what measures are currently underway in the region, and how IUCN could contribute more. The four groups were the OECD countries, Africa and Asia, Latin America, and the Arab countries. In reporting back to plenary, the discussion groups focused on the role of IUCN.

Members from the OECD countries encouraged IUCN to focus on education and public awareness at the national and regional level on the impacts of climate change on biodiversity. They also stressed that the Union could play a role in coordinating country efforts to these issues. Members encouraged IUCN to contribute to scientific information on climate change vulnerability including to the Intergovernmental Panel on Climate Change.

A particular conservation concern was the loss of species to climate change; and it was suggested that attention be paid in the next four year programme to devising ways to address the survival of species that are the most vulnerable to climate change. Emphasis was placed on making climate change information available to members through a number of information management tools such as the IUCN website, an information database on climate change impacts and newsletters. Members from the OECD countries also suggested that IUCN could do more to change public attitudes about the use of fossil fuels and raise awareness on innovative clean technologies.

Members from Africa and Asia stressed that their regions are among the most vulnerable to climate change. They noted that impacts on these two regions would range from increased flood and drought, coral bleaching, sea level rise, increased vector-borne diseases, species loss, and the displacement of populations. They highlighted that these impacts would reinforce the cycle of poverty, and complicate efforts to promote sustainable livelihoods.

Members noted that the response of governments and NGOs in Africa and Asia has been weak and that IUCN has a substantial role to play filling the gap. IUCN was encouraged to focus on:

- a. building capacities of governments and NGOs to negotiate better in the Convention process;
- b. improving information availability on climate change impacts;
- c. providing guidance on how to minimize adverse impacts;
- d. promoting the development of regional responses to climate change.

Members from Latin America pointed out that extreme events, such as Hurricane Mitch and the floods in Venezuela, may become more frequent in a climate-changed world. They expressed concern

about the loss of species and changes in water availability, as well as the possibility of population displacement and other negative socio-economic impacts because of climate change. They highlighted the many activities already underway initiated by governments and NGOs – from regional dialogues to climate change vulnerability studies and carbon sequestration projects. Members from Latin America stressed that there was still a role for IUCN in the region, and that those efforts should focus on investigating climate change impacts, information management, and capacity building for members to more effectively participate in the national and international decision-making.

Members from the Arabic countries stressed that climate change will negatively affect agriculture and food security by influencing water availability and accelerating desertification. Some UNFCCC Parties such as the Jordanian Government have prepared their national communication to the Convention, which includes an inventory of their greenhouse gas emissions and strategies for reducing those emissions. IUCN was encouraged to help NGOs and governments investigate practical measures that the Arab region can take to address climate change. Members called for IUCN's assistance in developing a regional network to exchange information and make available existing information in Arabic.

Plenary discussion: It was concluded that IUCN should:

- Serve as a network of knowledge on climate change and biodiversity for members and the broader environmental constituency;
- Facilitate dialogue between governments and NGO on climate change issues;
- Contribute to technical information about the effect of climate change on nature and society and how to adapt.

The role of carbon sequestration in combating climate change

In the afternoon, a panel exchanged views on the role of carbon sequestration activities in addressing climate change. Interview panellists included:

Kristalina Georgieva	Director, Environment Department, The World Bank
Claude Martin	Director General, World Wide Fund for Nature
Juan Mayr	Minister of Environment, Government of Colombia and former IUCN Regional Councillor for Latin America

Describe your view on carbon sequestration and its role in addressing climate change.

Georgieva: Land use change and forestry activities contribute substantial amounts of carbon dioxide (about 20% of the global total) to the atmosphere every year so they are a significant part of the climate change problem. Enhancing carbon sinks is technically feasible, according to the IPCC, though issues such as project leakage need to be addressed. On balance, it is politically desirable to include sinks in the implementation of the Kyoto Protocol particularly through the Clean Development Mechanism.

Martin: WWF is opposed to the use of sinks in the CDM. This position has been heavily criticized, but WWF believes that including sinks in the CDM could create a large loophole for Annex I coun-

tries, allowing them to avoid reducing emissions at home in the energy sector. Using sinks would weaken pressure for change in production and consumption patterns in industrialized countries. An additional concern is that sinks projects will lead to negative outcomes for biodiversity.

Mayr: Carbon sequestration is a good opportunity for promoting sustainable development in developing countries. In Columbia, where there is wide scale environmental degradation and loss of forest cover, carbon sequestration could provide positive incentives for community and environmental restoration. Colombia has developed a national strategy for carbon sequestration in consultation with forest communities. These communities expressed strong interest in projects, viewing them as an opportunity for increasing jobs, decreasing drug traffic, and improving the social fabric of rural communities. Through carbon sequestration, Colombia can improve the environment and help alleviate poverty.

Do you believe that by supporting carbon sequestration in developing countries you are letting industrialized countries off the hook?

Mayr: We believe carbon sequestration can be part of a clean development strategy. The world cannot afford to wait for the development of cost-effective technologies to reduce carbon dioxide emissions. Carbon sequestration is a measure which we can employ now and which allows us to make progress in the social development of our country at the same time.

How can WWF's current position accommodate the interests of a country, like Colombia, which supports carbon sequestration?

Martin: Reducing emissions in industrialized countries is the first priority. If these countries don't take action, they will displace the problem in other regions. Conservationists who argue that carbon sequestration will create opportunities to protect forests, forget that there are still slash and burn activities in many countries, including industrialized countries. The net effect of the carbon sequestration game is zero.

Who has the right to decide to "sell" the global function of carbon sequestration that forests provide: governments or communities? And who determines what is a fair price?

Georgieva: Until the Climate Change Convention decides on the basic rules of the game, this is a difficult question to answer. Further, it will take five or six years to develop a market that is fair and workable. Perhaps a fair price can be established during the process of certifying the carbon credit.

Mayr: National governments should be involved in the initial stages by helping to set the framework but communities should also participate in the decision-making.

Martin: The right to "sell" carbon should be made by communities that live in these forests. We should not wait for the Convention to decide on these matters. They should be discussed now. It is also important to recognize that policies change with changes in governments. A company could have an arrangement with one government, and when another comes in power, the forest might be harvested.

The interview panel was concluded so that members could discuss the issues raised in smaller groups. Three discussion groups were formed and asked to assess the advantages and disadvantages

of carbon sequestration activities and the role of IUCN in addressing this controversial topic. The discussion groups were mixed across regions in order to facilitate a broad exchange of perspectives.

What are the advantages and disadvantages of carbon sequestration activities?

All three groups expressed serious concerns about the potential for carbon sequestration activities to exacerbate social inequities and further the loss of biodiversity. There was strong scepticism that this instrument intended to combat climate change could be used as a tool for biodiversity conservation. The groups agreed that carbon sequestration activities, to the extent they are used to combat climate change, should be associated with environmental and socio-economic assessments and continuous monitoring of social and ecological impacts.

What should IUCN's role be on the controversial topic?

The three groups agreed that the Union did have a role to play in this issue, and that IUCN should focus on the following activities:

Promote awareness: IUCN was encouraged to develop a set of communication materials for members including a simple-language explanation of carbon sequestration and the associated biodiversity and equity issues.

Facilitate dialogue: As the world's umbrella environment organization, IUCN should convene dialogue forums at the national, regional and global levels to support policy-making in this area.

Develop decision-making tools: IUCN should develop criteria and guidelines for carbon sequestration activities that take into account biodiversity and equity issues to help guide decision-making.

IUCN's role in climate change

In the final session, a panel of distinguished representatives from the IUCN network commented on the day's discussion and expressed views on how the Union could contribute more to the climate change debate.

Nick Davidson, Deputy Secretary General of the Ramsar Convention on Wetlands noted the Ramsar Convention is developing stronger links with the Climate Change Convention. As a partner organization, IUCN and its Climate Change Initiative could help the Ramsar Convention develop guidance for Contracting Parties on climate change. IUCN's strength is in bringing different constituencies together and is well placed to assist in bringing the Ramsar and Climate Change Conventions together. The Union can develop projects demonstrating how wetlands and climate change policy is linked on the ground.

Lynn Holowesko, IUCN Regional Councillor for the Caribbean and former Vice-Chair of the World Commission on Protected Areas asserted that the climate change agenda emphasizes finance and economics. But, the agenda should be focussed on people and biodiversity, she argued. IUCN should focus on making sure climate change measures promote ecosystem restoration and provide benefits to communities, especially on islands. IUCN should make sure that developing countries have the information and capacity to address the adverse effects of climate change.

Richard Sandbrook, former IUCN Regional Councillor for West Europe argued that the conservation community has avoided the climate change problem. IUCN needs to raise awareness within its own constituency to the threat posed by climate change. The conservation community should be much braver in talking about climate change, and confronting the inequality between North and South over the climate change problem.

ANNEX 1: AGENDA

The ecological limits of climate change

09:00–09:10	Opening/welcome <i>Akiko Domoto, IUCN Vice-President and Regional Councillor for East Asia</i>
09:10–09:20	Explanation of programme <i>Irene Guijt, Facilitator</i>
09:20–09:30	IUCN Programme: 2001–2004 – Climate Change <i>Brett Orlando, IUCN Climate Change Programme Officer</i>
09:30–10:00	Climate change and its relationship to the conservation and sustainable use of biodiversity and natural resources <i>Atiq Rahman, Director, Bangladesh Centre for Advanced Studies</i>
10:00–10:30	Key issues in the UN Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol <i>Janos Pasztor, Coordinator, Information and Outreach, Climate Change Convention secretariat</i>
10:30–11:15	Discussion groups on climate change vulnerability and adaptation
11:15–12:00	Plenary feedback session, focusing on IUCN's role
12:00–14:00	Lunch
14:00–14:45	Interview panel on carbon sequestration in combating climate change <i>Kristalina Georgieva, Director, Environment Department, The World Bank</i> <i>Claude Martin, Director General, World Wide Fund for Nature</i> <i>Juan Mayr, Minister of Environment, Government of Colombia and former IUCN Regional Councillor for South America</i>
14:45–15:45	Discussion groups on carbon sequestration
15:45–16:30	Plenary feedback session, focusing on IUCN's role
16:30–16:55	Defining IUCN's role on climate change <i>Nick Davidson, Deputy Secretary General, Ramsar Convention on Wetlands</i> <i>Lynn Holowesko, Regional Councillor for the Caribbean and former Vice-Chair, World Commission on Protected Areas</i> <i>Richard Sandbrook, former IUCN Regional Councillor for West Europe</i>
16:55–17:00	Closing